

Policy tool



#1

Trade facilitation

Policy tool

Speed up customs clearance, reducing GHG emissions associated with inefficient customs procedures and road freight by adopting trade facilitation measures.

#1 Trade facilitation



What is trade facilitation?

Trade facilitation refers to policies aimed at simplifying, modernizing and harmonizing export, import and transit processes, to make international trade more efficient and effective. These measures include improving customs procedures, reducing trade barriers, enhancing transparency and promoting the use of modern technologies and more efficient logistics. By eliminating unnecessary bureaucracy, paperwork and delays, trade facilitation helps to expedite the movement of goods across borders, reduces transaction costs and enhances the competitiveness of businesses.

How can adopting trade facilitation measures lead to a reduction in carbon emissions associated with customs procedures and help mitigate climate change?

The WTO's Trade Facilitation Agreement (TFA) entered into force in 2017. It aims to simplify, harmonize and expedite customs procedures and border controls between trading partners. The Agreement contains provisions covering various areas, including transparency, advance rulings (i.e. a written decision provided by a member to the applicant prior to the importation of a good), customs cooperation, trade facilitation measures for goods in transit, and the use of modern technologies.

Studies show that a full implementation of the TFA could reduce trade costs by an average of 14.3 per cent and increase global trade by up to USD 1 trillion per year, with the biggest gains in the poorest economies (WTO, 2015). Currently, the rate of TFA implementation commitments stands at around 77 per cent for the full WTO membership, but only at 43 per cent for least developed countries (LDCs), where businesses face some of the highest trade costs.¹ Developing members and LDC members receive assistance with implementation from the WTO TFA Facility, an initiative aimed at helping developing and LDC members assess their specific needs and identifying possible development partners to help them meet those needs.

A key trade facilitation measure is the digitalization of trade processes, to make them more accessible, faster and cost-efficient. Digitalization can also help make trade more climate-friendly by, for example, encouraging the use of electronic documentation, thus reducing paper

Case study: Mariposa crossing on the US-Mexican border

Trade between the United States and Mexico exceeds USD 1 million per minute, with the majority of this trade transiting through land border ports of entry. The Mariposa port of entry in Nogales, Arizona (United States) is one of 48 border crossings between the United States and Mexico (according to the [Smart Border Coalition](#)). To facilitate freight transport at the Mariposa border crossing, several policies were adopted by the two countries, including:

- the **US Free and Secure Trade Program** (2001), which was established to enhance border security while facilitating the movement of low-risk commercial goods between the US, Canada and Mexico. It included pre-registering drivers, vehicles and cargoes, and certifying every link in the supply chain such as the manufacturer, carrier and importer; and
- the **Joint US-Mexico United in Cargo Processing Program** (2018), which was implemented at certain border crossings, with the aim of harmonizing and expediting the processing of commercial cargo by implementing joint inspections and coordinated customs procedures.

The [US Environmental Protection Agency](#) estimates the two programmes achieved an 85 per cent reduction in GHG emissions and particulate matter emissions at the Port of Nogales-Mariposa crossing, mostly due to a substantial reduction in vehicle queue lengths and crossing times. The United in Cargo Processing Program has since been expanded to nine other locations along the US-Mexico border.

waste and the associated carbon footprint ([UNCTAD, 2021](#)). For instance, paperless, electronic invoicing was found to potentially reduce GHG emissions per invoice by 63 per cent compared to traditional invoicing in Finland ([Tenhunen and Penttinen, 2010](#)).²

By aiming to improve border logistics and infrastructure and reduce waiting times at border controls, including at ports and land borders, trade facilitation measures can also help reduce energy consumption and associated GHG emissions from freight transport. For example, by harmonizing and standardizing trade procedures, the TFA reduces duplication and unnecessary inspections, leading to more efficient shipping and freight processes and lower carbon emissions ([WTO, 2022h](#)).

Reducing waiting times at the border is crucial to reduce emissions, particularly when trade volumes are increasing over time. Indeed, a 2016 study that modelled emissions from trucks at a land border crossing predicted dramatic increases in emissions as traffic volumes and congestion rise. A doubling in traffic meant GHG emissions increased 3.5 times, while tripling of traffic led to a sixfold increase ([Reyna et al., 2016](#)).

What could be done to align trade facilitation policies with wider climate action policy plans?

Aligning trade facilitation with wider climate action policy plans can help the transition to a low-carbon economy. Governments could integrate into their nationally determined contributions (NDCs) trade facilitation considerations and the adoption of green customs procedures. These include electronic documentation, harmonizing inspections and expedited conformity assessment procedures, and facilitating the implementation of low-carbon freight transport and more carbon-efficient routes and logistics systems. Governments could also integrate climate mitigation and adaptation considerations in trade facilitation plans.

Additionally, WTO discussions can foster policy coherence between trade and climate objectives by facilitating dialogue and collaboration between members - for example, at the Committee on Trade Facilitation or the Committee on Trade and Environment. By promoting dialogue and knowledge-sharing platforms, WTO regular work can facilitate the exchange of experiences and best practices, allowing members to align the TFA implementation effectively with their climate action policy plans. Developing and LDC members may seek assistance from the TFA Facility.

The WTO Secretariat also operates different technical assistance initiatives and training courses that can help address members' specific situations, particularly in developing and least developed economies. By leveraging its expertise and global network, the WTO Secretariat can support governments in aligning trade facilitation with their wider climate action policy plans. For example, the WTO Secretariat, in cooperation with the World Bank and the World Economic Forum, recently launched the Action on Climate and Trade, a new capacity-building initiative, which aims to help requesting developing economies, including LDCs, use trade to meet their climate change mitigation and adaptation goals.

Policy tool



#2

**Government
procurement**

Policy tool

Drive lower carbon emissions by using government procurement as a tool.

#2 Government procurement



What is government procurement?

Governments purchase goods and services (including construction services) using taxpayers' money to fulfil their governmental functions and provide public services. Such purchases are generally referred to as government procurement.

How can government procurement of more climate-friendly low-carbon goods and services help mitigate climate change and promote the just transition to a low-carbon economy?

Government procurement is of great economic importance, accounting for 10-15 per cent of national GDP, on average, and about 13 per cent of world GDP (around USD 13 trillion per year) (World Bank, 2021). This buying power can be deployed at all levels of government to help mitigate climate change and promote a just transition to a low-carbon economy. Through so-called green government procurement (GGP) policies, governments can influence private sector producers through their purchases of low-carbon goods and services, create markets for new green goods and services and stimulate innovative solutions to climate change problems by awarding public research and development (R&D) contracts.

In addition, GGP can help governments reduce their own carbon footprint. Government procurement is estimated to be directly or indirectly responsible for 15 per cent of global greenhouse gas (GHG) emissions (WEF, 2022).³ According to the World Economic Forum, abating such emissions would lead to a USD 4 trillion boost to the green economy and create around 3 million net new jobs.

Greater emphasis on GGP policies can therefore significantly reduce GHG emissions while producing significant economic benefits through new green jobs, enhanced energy and other resource-use efficiency, and stimulating innovation (World Bank, 2021). According to the [6th Assessment Report by the Intergovernmental Panel on Climate Change \(IPCC\)](#), current domestic government procurement systems usually mandate cost-effectiveness but only in some cases do they allow or mandate climate change considerations. The WTO [Environmental](#)

[Database](#) indicates that GGP policies take many forms and various members are already introducing low-carbon considerations into government procurement (see box).

Furthermore, aligning public procurement rules with other related objectives, such as promoting innovation, can have multiplying effects.

The International Energy Agency's (IEA) Net Zero by 2050 Roadmap indicates that, while the needed decarbonization of the world economy by 2030 is largely

WTO members' experiences with sustainable public procurement practices

According to the [WTO Environmental Database \(EDB\)](#), members have notified to the WTO at least 77 environment-related government procurement measures since 2009. These have pursued a series of objectives, including promoting environmental goods and services (27), energy conservation (20), climate change mitigation and adaptation (9) and renewable energy (4).

Not all WTO members are parties to the Government Procurement Agreement (GPA). Currently, 48 members are covered by it. Still, data from the EDB provide some examples of government action in this area, such as:

- Japan's Basic Policy for the Promotion of Contracts considering Reduction of Emissions of Greenhouse Gases (2019);
- Iceland's public procurement rules amendment to consider climate and social-related criteria and labels (2017);
- Canada's public procurement innovation programme for small and medium-sized enterprises (SMEs) and environmental solutions (2015); and
- Montenegro's green procurement strategy which considers innovation and degree of environmental protection as eligible elements for bidders (2015).

achievable with readily available technologies, by mid-century almost half of required emissions reductions will have to come from new technologies (IEA, 2021b; IMF, 2021). Government procurement can thus play a central role in helping nascent technologies take the key step from R&D to market readiness by serving as “first customers”, promoting learning curves, and providing economies of scale (Janeway, 2018).

By revising and updating domestic government procurement policies and incentivising purchases of low-carbon solutions, including nascent technologies, such a realignment can help promote several objectives at once.

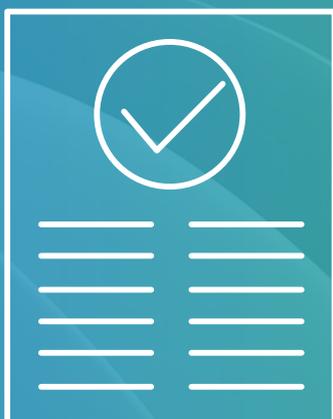
What could be done to align government procurement policies with wider climate action policy plans?

In line with their domestic climate goals, governments could revise their domestic government procurement policies to include climate-sensitive criteria, such as science-based, low-carbon requirements in tenders. They could make such criteria not just optional but mandatory. In addition, GGP policies could be combined with more open government procurement markets. This would help to increase the number of suppliers participating in procurement tenders and to give government purchasers access to better or less costly climate-friendly goods, services and technological solutions. Research has confirmed that stable and open markets are key factors in low-carbon technology development, uptake and dissemination (Xin *et al.*, 2022).

WTO rules – including its Government Procurement Agreement (GPA 2012) – can play an important role in ensuring that open government procurement markets are leveraged to support climate objectives. For example, the GPA 2012 helps governments to overcome a potentially costly and climate-inefficient home bias in government procurement by ensuring that GGP practices are non-discriminatory, based on open markets and in line with good governance practices. Moreover, the GPA 2012 already has features that facilitate climate change mitigation through government procurement. For instance, it allows the application of technical specifications aimed at the protection of the environment and the evaluation of tenders using the environmental implications of a good or service as a criterion.

WTO regular work and discussions can also help by providing examples of what members are already doing in terms of government procurement, including by providing dedicated fora for policy learning and exchange, such as the Committee on Trade and Environment or the Committee on Government Procurement, and by providing technical assistance to those seeking to explore this topic further.

Policy tool



#3

Regulations and certification

Policy tool

Use international standards to avoid regulatory fragmentation when upgrading energy efficiency regulations.

#3 Regulations and certification



What are technical regulations and standards?

Technical regulations set out mandatory product characteristics or requirements for their related processes and production methods. Standards are similar, but are voluntary in nature. To assess compliance with such measures, conformity assessment procedures (e.g. testing, verification, inspection and certification) may be used. Regulations are often adopted to fulfil legitimate policy objectives, including those related to climate action.

How can regulations, such as energy efficiency requirements, help mitigate climate change?

The role of energy efficiency regulations in addressing climate change can be twofold. First, energy efficiency requirements for certain consumer goods, such as electric vehicles, construction material or household appliances, can help reduce domestic energy consumption and related GHG emissions, by excluding the most polluting goods from the market. Second, energy efficiency labelling schemes, notably on household appliances or in emission-intensive industries, can lead to more informed decision-making by consumers. As awareness of the availability of more energy-efficient and less emission-intensive goods grows, labelling schemes can be instrumental in allowing consumers to more easily choose greener products when they wish to do so.

The key role of regulatory instruments in climate change mitigation efforts was recognized by the [6th Assessment Report by the IPCC](#). Studies reviewed in the Report estimate that the growing number of energy efficiency measures around the world have saved at least 500 metric tonnes of CO₂ equivalent per year since 2000 ([IPCC, 2022](#)). For example, in South and South-East Asia, energy efficiency in buildings has improved by 5-6 per cent annually since 2010. Energy efficiency regulations therefore offer great emission-reducing potential for the future, having already reduced annual energy-related emissions by 12 per cent in the 2000-17 period and potentially delivering over 40 per cent of the abatement required to be in line with the Paris Agreement targets by 2040 ([IEA, 2021a](#)).

Although some markets have introduced new regulations mandating the exclusive sale of high-efficacy LED lamps as opposed to less energy-efficient forms of lighting, progress in this area must be sustained to ensure that all economies sell predominantly LED technology by 2025, and with increasing efficiency, to align with the IEA's Net Zero Emissions by 2050 Scenario. Energy efficiency

WTO members' experiences with energy efficiency regulations

Since 2009, over 1,180 energy efficiency and conservation regulations have been notified to the WTO by over 70 WTO members ([EDB](#)). The number of measures notified over the years has stayed constant, with a minimum of 68 measures notified each year and a peak in notifications in 2021 (147 measures notified).

Most of the regulations target commercial appliances and industrial equipment (such as air conditioning, and heating and cooling systems), household appliances (e.g. clothes dryers, refrigerators and dishwashers), and fluorescent lamps, construction products and material.

Some recent examples include:

- *Draft East African Standard 1064-1&2:2021* – a minimum energy performance standard for lighting products harmonizing requirements across East African economies (2022);
- The European Union's new Ecodesign for Sustainable Products Regulations (2022) providing EU-wide rules for improving the energy performance of certain goods;
- Chile's law on energy efficiency, which provides for the establishment of energy efficiency standards for light-, medium- and heavy-duty vehicles (2021); and
- Indonesia's Minimum Energy Performance Standard and Label for Energy Utilizing Household Products (2021).

measures in the building sector, such as insulation or more efficient appliances, could also help reduce GHG emissions in the sector by 50 per cent by 2050 (Creutzig et al., 2021).

What could be done to align energy efficiency regulations with wider climate action policy plans?

When adopting climate-related regulations, adherence to WTO principles is important. For example, coherence, effectiveness and international cooperation – as well as harmonization with international standards – will make measures more effective in achieving climate goals (WTO, 2022g). The importance of international cooperation in tackling climate change was also recognized by the IPCC in its 2022 Report (IPCC, 2022). It holds particularly true for technical regulations and standards. For example, different measuring methodologies for calculating the energy efficiency of goods across trading partners can lead to legitimacy issues and make tracking global emissions reduction efforts more challenging. Moreover, different methodologies can also increase unpredictability and compliance costs for producers and unnecessarily restrict international trade (WTO, 2022i).

WTO rules and institutions help promote coherent and fit-for-purpose regulations as well as alignment with international standards, including for the measurement of carbon emissions embodied in traded goods or energy efficiency. The WTO also provides a platform where international cooperation is encouraged and discussions on climate-related measures take place (see box). In order to reduce regulatory fragmentation, WTO members have held multiple discussions on at least 80 specific energy efficiency regulations at the Committee on Technical Barriers to Trade. Through these discussions, WTO members have contributed to more regulatory convergence on energy efficiency, which has advanced cooperation on some of the current climate-related challenges.

When adopting climate-related regulations or standards, it is crucial to keep in mind that developing economies face specific challenges which may render compliance more difficult, including in the area of energy efficiency. A well-developed domestic quality infrastructure⁴ can help surmount some of these limitations. Providing support and technical assistance to developing economies in this area could help them demonstrate their carbon competitiveness, which will be crucial for a just transition to a low-carbon economy. It could also help SMEs take full part in global low-carbon value chains.

The WTO Secretariat, including in close cooperation with institutions working on international standards, can help governments' efforts to ensure that standards development and regulatory practices are better aligned with their climate action plans.

Policy tool



#4

Services

Policy tool

Accelerate mitigation efforts, support adaptation and assist disaster recovery by reviewing domestic regulations and restrictions for providers of climate-related services.

#4 Services



What is trade in services?

Ranging from communications to transport, finance, education, tourism and environmental services, the services sector is the backbone of the global economy and one of the most dynamic components of international trade. Technological advances have made it easier to supply services across borders, thereby opening new opportunities to engage in international trade in services for economies and individuals. While increasingly traded in their own right, services also serve as crucial inputs into the production of goods. Policies in relation to services trade also contribute to a wide range of national objectives, including those related to climate change mitigation and adaptation. At the WTO, trade in services is governed by the General Agreement on Trade in Services.

How can services trade help local communities mitigate and adapt to climate change, in particular during climate disasters?

Reviewing domestic regulations and barriers to trade in key climate-related services could be part of an economy's climate change mitigation and adaptation strategies. Many green technologies central to reducing GHG emissions and making economies more resilient to climate change do not involve only goods but also key related services, such as installing, monitoring and maintaining certain climate-related goods ([Swedish National Board of Trade, 2014](#)).⁵

It is also important to consider services restrictions and administrative procedures impacting ancillary services (e.g. electricity grid balance and storage operations) so that climate mitigation and adaptation projects can be properly implemented in a timely and cost-effective way.

Under the WTO General Agreement on Trade in Services, environmental services are one of the least open sectors. Only 59 WTO members have undertaken specific commitments in at least one of the seven environmental services sub-sectors⁶ and several members who did so limited their commitments to consulting and/or advisory services ([WTO, 2022g](#)).

While services markets may be more open than what is currently captured in WTO commitments, there is still considerable scope to further facilitate the provision of services by domestic and foreign suppliers who have environmental and climate expertise.

Barriers to trade in environmental services can take many forms. These include monopolies and exclusive rights for certain services, restrictions on the movement

Examples of climate-related services notified by WTO members and reform experiences shared in Trade Policy Reviews

According to the [WTO EDB](#), since 2009, there have been 12 climate-related notifications made by WTO members to the Council for Trade in Services and 58 climate-related references regarding the services sector in [Trade Policy Reviews](#) of 51 WTO members. These vary widely from preferential market access for climate-related service providers to low-carbon requirements for services and efforts to improve investment and access to technology in key climate-related services sectors (such as tourism, renewable energy generation and advisory services for low-carbon agriculture).

Some recent examples include:

- preferential treatment by at least 30 members to services and service suppliers from LDCs in climate-related sectors;
- sustainable forestry requirements for services providers in Gabon (2017);
- EU rules incentivising cross-border electricity trade, with increasing shares of renewable energy (2020); and
- Guyana's Low Carbon Development Strategy, which includes the expansion of Guyana's fibre optic capability, support for call centres and business process outsourcing, and completion of telecommunications liberalization (2022).

of professionals and various restrictions on businesses, such as restrictions on foreign ownership, on type of legal entity, on the number and location of subsidiaries, and on the number of foreign employees. Furthermore, reform of domestic services regulation, by simplifying and streamlining administrative requirements and procedures, can facilitate access to and investments in these key services.

Similarly, in the area of climate adaptation, international trade can help economies prepare for, cope with and recover from extreme weather events more effectively. Indeed, trade can facilitate the development and deployment of technologies and practices that support climate adaptation, such as climate-resistant crop varieties, early warning systems for extreme weather events and water conservation and storage systems. Trade openness also creates wider access to services that help prepare for climate-related events. In this context, trade in services, such as weather forecasting, insurance, telecommunications, transportation, logistics and health services, can play a key role in the preparation of firms, citizens and governments for climate-related events ([WTO, 2022h](#); [WTO, 2022j](#)).

In the case of disaster relief and health services, trained professionals, such as doctors and rescue personnel, may require special authorizations before beginning work in a disaster zone. Trade measures taken by a disaster-affected economy might include giving consideration, therefore, to how WTO provisions relating to trade in goods and services can facilitate the entry and clearance/authorization of relief items and personnel ([WTO, 2022j](#)).

What could be done to align trade measures for key climate-related services with wider climate action policy plans?

Taking prompt action to review and revise restrictions, where appropriate - including in the form of streamlined domestic regulations - to trade in key services related to climate mitigation and adaptation can support governments' climate action strategies. For example, economies may wish to revise restrictions affecting the temporary movement of certain categories of technical experts, such as climate mitigation and adaptation specialists and agricultural and water technicians, for the purpose of supplying services. They may also wish to ease the establishment of foreign suppliers of air pollution or renewable energy services, simplify administrative requirements or licensing procedures for climate-related services suppliers or facilitate the remote supply of environmental monitoring and climate-smart services, such as air pollution control services.

Similarly, in order to better respond to extreme weather events, administrations could have systems in place to facilitate the movement of goods and services, such as food, healthcare and communication services, that assist the preparation for and recovery from disasters induced by climate change. One way to do this would be to facilitate the recognition of professional qualifications of foreign service providers of relief services and reconstruction, in a manner compatible with WTO rules. Governments could also improve the supply of weather-related services to build their capacity to anticipate extreme weather events.

As governments increasingly adopt services-related trade measures to enhance their climate change mitigation and adaptation strategies, the WTO has a number of bodies, such as the Council for Trade in Services and the Committee on Trade and Environment, where members can share their experiences and learn from each other how to best leverage trade in services in support of climate action. Moreover, the WTO Secretariat can also help provide technical information whenever requested by members, with the aim of identifying specific ways in which trade policies related to services can be leveraged for climate action, including through tailored technical assistance and capacity-building activities.

Policy tool



#5

Import tariffs

Policy tool

Help accelerate the transition to a green economy by rebalancing tariff policies that may inadvertently benefit carbon-intensive sectors.

#5 Import tariffs



What are import tariffs?

An import tariff (also known as a customs duty on imports) is a financial charge or tax on imported goods due on their importation. Most customs duties are imposed on an *ad valorem* basis - that is, based on the value of the imported good (e.g. a 10 per cent duty on a computer worth USD 1,000 will be USD 100). Other types include “specific” tariffs based on the number or weight of imports. Most-favoured-nation duties are the standard customs duties that WTO members apply to all other WTO members.

How can reviewing import tariffs in carbon-intensive and lower-carbon sectors help to mitigate climate change?

Import tariffs can be a relevant source of revenue for governments. However, revising tariff levels can also improve access to selected goods into an economy and help companies participate in global value chains. Current import tariffs tend to be lower in carbon-intensive industries than in clean industries. By reviewing and rebalancing import tariffs, there are significant opportunities to improve global income while reducing carbon emissions and integrating economies into low-carbon value chains ([Shapiro, 2021](#)).⁷

While WTO data⁸ shows that average applied tariffs to some renewable energy (RE) equipment is relatively low at 3.5 per cent, some members' applied tariffs can be as high as 12 per cent, with significant variations. On the other hand, applied tariffs for fossil fuels are generally low at 0.8 per cent for crude oil, 1.6 per cent for coal and around 2-2.4 per cent for coke and other fuels (among the top ten importers).

In the automotive sector, applied tariffs are generally higher than in the energy sector: on average 11 per cent for hybrid and electric vehicles (EVs), with some members having tariffs as high as 61.5 per cent. Overall, average tariffs applied to conventional combustion vehicles are comparable to those for hybrid and electric ones. However, low-carbon vehicles exported to major markets (representing a global market share of 55 per cent)

WTO members' experiences in using tariff reductions to achieve climate action objectives

The [WTO EDB](#) shows that at least 31 WTO members from all regions and levels of economic development have used tariff reductions for environmental purposes.

In the Trade Policy Reviews (TPRs) of these economies, there are 53 examples of tariff reductions, mostly for RE technologies (25), followed by low-carbon and EVs (11). For example:

- Nicaragua provides tariff exemptions to machinery, equipment, materials and inputs used in new RE projects (2021 TPR);
- Mongolia RE research and production equipment from customs duties (2021 TPR);
- Argentina has an import quota (where lower tariffs are applied) of 6,000 hybrid, electric and hydrogen fuel cell motor vehicles (2021 TPR);
- Thailand promotes the use of RE through import tariff exemption or reductions (2020 TPR);
- Samoa permits duty-free imports of “energy saving devices” (e.g. EVs) (2019 TPR);
- Egypt has fixed customs tariffs at 2 per cent for imported equipment and materials relating to solar and wind energy (2018 TPR);
- Barbados (2022 TPR) and the United States (2022 TPR) provide tariff exemptions for organic farming and lumber, respectively; and
- Malawi (2016 TPR), Tajikistan (2021 TPR), Georgia (2022 TPR) and Pakistan (2022 TPR) provide tariff exemptions for goods needed at a time of disaster (including for food).

Average applied tariffs on RE equipment and fossil fuels (among top ten importers)

- Certain RE equipment – 3.2 per cent **compared with**
 - crude oil - 0.8 per cent
 - coal – 1.6 per cent
 - coke & semi-coke – 2 per cent
 - petroleum gases & other gaseous hydrocarbons – 2.1 per cent
 - pitch – 2.2 per cent
 - oils (coal tar) – 2.4 per cent

still face applied tariffs that are 1.6 to 3.9 percentage points higher than for conventional combustion vehicles.

Reviewing import tariffs could therefore be an effective policy tool that governments could deploy to promote the affordability and uptake of products needed for the transition to a low-carbon economy, such as sustainably sourced RE equipment and low-carbon and EVs. Evidence of such potential has already been seen in the wind and solar energy sectors, where economies of scale have contributed to lower production costs.⁹

Some economies and regions have started exploring the option of revising tariff levels (see box). For example, since Asia-Pacific Economic Cooperation (APEC) leaders committed in 2012 to reduce tariff rates of 54 “environmental goods” to 5 per cent or less, exports and imports of such goods have increased by 5.7 per cent and 13.5 per cent, respectively ([APEC, 2021](#)).

Recent analysis suggests that the use of global supply chains in the photovoltaic (PV) market saved PV installers up to USD 85 billion from 2008 to 2020 in China, Germany and the United States, and that solar panel prices would be 20–30 per cent higher in 2030 in a scenario without globalized supply chains ([Helveston et al., 2022](#)). Furthermore, global trade in solar PV products could increase solar power generation by 750 gigawatts (GW) by 2060 if half of the existing trade barriers were removed, while it would decrease by 160–370 GW in a scenario where more trade barriers were imposed ([Wang et al., 2021](#)).

As described above, there is significant scope for reviewing import tariffs currently applicable in certain carbon-intensive and lower-carbon sectors (see box). Rebalancing tariffs by even a relatively small number of percentage points could make an important

contribution to reducing RE costs and increasing the uptake of low-carbon technologies.

What could be done to align import tariffs with wider climate action policy plans?

At the WTO, members have negotiated maximum import tariff rates for most goods. This means that members are free to revise and potentially reduce their tariffs to align them with their climate action plans, either unilaterally or as part of wider trade and climate cooperative approaches. Tariffs for key goods required for the transition to a low-carbon economy could be revised where appropriate to accelerate the green transition.

The WTO Secretariat can support such efforts by providing technical assistance upon request and by improving knowledge and understanding of how tariffs have been used to achieve climate objectives. Discussions already ongoing in various WTO bodies should contribute to a better understanding of how revising import tariffs on selected goods linked to the just transition to a low-carbon economy could be used by members to support their climate change mitigation plans.

Trade remedies in the context of climate change strategies

Trade remedies are border measures – usually additional duties – applied by governments on imports of a product where the total quantity of the imports has surged (safeguard measures) or the imports from a given source are dumped (sold at less than their normal value) or subsidized (anti-dumping and countervailing measures, respectively) and where such imports have been found to cause injury to the competing domestic industry. Trade remedies form an integral part of the multilateral trading rules with detailed procedural and substantive requirements that must be fulfilled to have the right to apply such measures.

The use of trade remedies on imports of some renewable energy goods, such as solar panels and wind turbines, has increased in recent years. The WTO's [Trade Remedies Data Portal](#) contains information on anti-dumping (AD) and countervailing duty (CV) actions taken by WTO

members on certain renewable energy goods. It includes 35 AD and 19 CV duty investigations initiated between 2008 and 2021 on certain solar (16 and five, respectively), wind (13 and seven) and biodiesel (six and seven) products.*

All WTO members have the right to use trade remedies, and whether and how (within the constraints of the WTO rules) any individual member does so is the result of its own policy decisions. In taking such decisions, members consider a host of factors and elements, which may in some cases include climate change impacts.

*The products in question were identified using the following keywords: solar, photovoltaic, biodiesel and wind.

Policy tool



#6

Subsidies

Policy tool

Unlock additional resources to assist climate action by reforming environmentally harmful support measures.

#6 Subsidies



What are subsidies and support measures?

Governmental support measures provide financial or other incentives to firms to promote certain outcomes. They can take different forms, including direct government expenditures, tax incentives, equity infusions, soft loans, government provision of goods and services, and price support. The WTO Agreement on Subsidies and Countervailing Measures (SCM Agreement) construes a subsidy as a financial contribution, income, or price support provided by a government or a public body which confers a benefit to its recipient. The Agreement regulates subsidies that are specific, i.e. the eligibility for which is limited to certain beneficiaries.

How can reforming environmentally harmful support measures help mitigate climate change and promote sustainable trade?

Government support measures can be important policy tools to correct market failures and enhance social welfare. At the same time, if not well calibrated, they can distort production and trade, reduce economic efficiency, exacerbate negative spillovers, and cause damage to the environment and human health.

The potential for government support measures to exacerbate environmental degradation and impede the transition to a low-carbon economy has been widely discussed. This is relevant for sectors including in fossil fuels, hard rock mining, agriculture, fisheries, forestry, transport, water supply and consumption, and construction. A 2022 study estimates that the world is spending at least USD 1.8 trillion a year, equivalent to 2 per cent of global GDP, on subsidies that are leading to the destruction of ecosystems and species extinction (Koplow and Steenblik, 2022). According to World Bank estimates, subsidies for fossil fuels, agriculture and fisheries alone amount to USD 1.2 trillion per year in fiscal expenditures (World Bank, 2023).

While the impact of detrimental subsidies is cause for concern, reforming and repurposing subsidies could offer promising environmental benefits while freeing up scarce fiscal resources. The International Institute for Sustainable Development (IISD) estimates that reforming fossil fuel

subsidies by 2025 by rationalizing harmful subsidies would reduce CO₂ emissions by an average of 6 per cent by 2030. The IISD further estimates that reinvesting just a third of these savings into energy efficiency and renewable energy would add an additional 3 per-cent reduction in CO₂ emissions (IISD, 2022).

In the area of agriculture, the Organisation for Economic Co-operation and Development (OECD) has identified vast opportunities for reforms that could lead to lower GHG emissions while ensuring broad access to nutritious food, such as phasing out price support measures that could harm the environment and enhancing resilience towards extreme weather events. Such changes could also align the sector with climate goals. The OECD also recommends the introduction of an effective system that puts a price on GHG emissions coming from agriculture (OECD, 2022a).¹⁰

Examples of support measures for climate action notified to the WTO

Since 2009, over 2,500 support measures adopted for climate action have been notified to the WTO by 78 members (EDB). The environment-related objectives of such support include afforestation/reforestation, air pollution reduction, alternative and renewable energy, climate change mitigation and adaptation, energy conservation and efficiency, and ozone layer protection.

Some recent examples include:

- Australia's Clean Technology Innovation Programme supporting the development of clean technologies to reduce GHG emissions;
- Lao PDR's profit, value added and other tax exemptions for energy efficiency investments;
- El Salvador's direct grants for reforestation and fruit tree diversification projects; and
- Mauritius's Bio-Farming Support Scheme increasing accessibility of farmers to organic inputs and promoting organic farming.

All of these studies suggest that phasing out and repurposing environmentally harmful subsidies could unlock substantial resources to support positive action on climate.

In any subsidy reform process, a variety of economic, trade and social considerations would come into play, including those related to a just and equitable transition to a low-carbon economy. There would also be potential challenges from vested interests as certain subsidy programmes were phased out ([IMF-OECD-World Bank-WTO, 2022](#)). Greater transparency and a deeper understanding of the flows of subsidies are prerequisites to ensuring effective and accountable reform. In addition, increased global cooperation and dialogue could have a positive role in preventing an inefficient “race” to subsidize environmentally positive, or “green”, technology, which could cause avoidable trade tensions, distort international competition, and disproportionately harm smaller, fiscally constrained developing economies.

What could be done to align support measures with wider climate action policy plans?

A better understanding of the environmental impacts of existing subsidies and other support measures across all sectors would help to identify the priorities for reform in this area. In this context, careful design of any new subsidies could contribute to addressing the climate crisis while minimizing trade frictions and other potential negative spillovers. The environmental impacts of support policies and the possibility of repurposing them to support climate change mitigation and adaptation plans could be evaluated by governments.

WTO members have increasingly notified support measures for climate action (see box). Moreover, the WTO not only provides a forum to address and resolve trade-related challenges but also facilitates enhanced trade cooperation in support of sustainable development. Issues relating to improving transparency on subsidies, and evaluating the effectiveness of existing rules to address certain types of subsidies, are frequently raised by members in various WTO bodies, such as the General Council, the Committee on Subsidies and Countervailing Measures, the Committee on Agriculture, and the Committee on Trade and Environment ([IMF-OECD-World Bank-WTO, 2022](#)).

At the WTO Ministerial Conference in June 2022, trade ministers demonstrated the important role the WTO can play on subsidy reform when they reached a landmark agreement to curb USD 22 billion in annual public spending on harmful fisheries subsidies that encourage illegal, unreported, and unregulated fishing, fishing overfished

stocks and fishing in the unregulated high seas ([WTO, 2023a](#)). These are resources that can be put to better use. A second phase of these negotiations is ongoing to additionally reduce subsidies to overcapacity and overfishing.

Furthermore, two new plurilateral environmental initiatives at the WTO specifically address the environmental effects and potential reform of subsidies. First, within the [Trade and Environmental Sustainability Structured Discussions](#), participating members¹¹ are discussing how to identify the environmental and trade impacts of subsidies. They are reviewing existing information to better understand these impacts and potential information gaps and examining opportunities to address such impacts. Participants have deliberated on agricultural, fossil fuel, industrial and “green” or environmentally positive subsidies. These discussions aim to intensify work on areas of common interest, promote transparency, and identify concrete actions that members could adopt in an inclusive and transparent manner, taking into account the diversity of the membership and specific development needs.

Second, the co-sponsors of the [Fossil Fuel Subsidy Reform](#) initiative underway at the WTO are focusing their work on the comprehensive benefits — spanning trade, economy, society and the environment — of addressing fossil fuel subsidies and reallocating government funds towards green, climate-resilient projects. The participating members¹² have called for enhanced transparency on fossil fuel subsidies and for balancing developmental and social considerations during the reform of these subsidies. Participants have also discussed areas where the WTO could contribute to efforts to advance reform, including promoting good practices to ensure that fossil fuel support measures adopted during energy crises remain targeted, transparent and temporary in nature. Other efforts could include developing a deeper understanding of the classification of subsidies based on trade and environmental effects and enhancing subsidy transparency by making better use of existing WTO mechanisms.

Finally, some participants in the [WTO Dialogue on Plastics Pollution and Environmentally Sustainable Plastics Trade](#) have also raised the relevance of subsidies to virgin plastics (i.e. new materials that are often used to manufacture plastic products), in particular in the context of their effects on the competitiveness of potential effective and environmentally sustainable alternative plastics and non-plastic substitutes.

As the global community seeks to increase climate financing, especially to support developing economies’ quest for a just transition, repurposing environmentally harmful and market-distorting subsidies can be a win-win for people and the environment.

Policy tool



#7

Trade finance

Policy tool

Support the diffusion of climate-related technologies and equipment by facilitating and increasing trade finance, such as loans and guarantees.

#7 Trade finance



What is trade finance?

Trade finance comprises credit facilities used by importers and exporters to facilitate international trade. These instruments bridge risks and the time gap between when the exporter wants to receive payment for producing and shipping goods and when the importer receives them, making it easier for importers and exporters to engage in international trade transactions.

How can trade finance help mitigate and adapt to climate change, especially in developing economies?

For global merchandise trade flows of over USD 25 trillion annually to flow smoothly, there needs to be a well-functioning trade finance market serving the needs of traders, especially those in developing economies where requests for trade finance are more likely to get rejected. Indeed, some 60-80 per cent of world trade relies on trade finance, such as trade credit and insurance/guarantees, mainly of a short-term nature. International supply chains rely on sophisticated supply-chain financing operations, which optimize payment flows throughout the chain of suppliers, including for SMEs.

In general, the supply of trade finance meets demand in only a few regions of the world. Recent WTO-International Finance Corporation studies on West Africa and the Mekong regions reveal that available trade finance benefits mainly well-established importers and exporters, leaving many SMEs and women-led businesses unserved. No more than 25 per cent of these economies' trade is supported by trade finance. The studies show that raising this trade coverage from 25 per cent to 40 per cent would increase annual trade flows by 8 per cent on average, resulting in an increase of 80 per cent of trade flows in ten years (WTO and IFC, 2022; WTO and IFC, 2023).

At the same time, important efforts have been undertaken to explore "greening trade finance" (see box), not least in the context of the OECD Arrangement on Officially Supported Export Credits. In October 2021, participants in the OECD Arrangement agreed

to end export credit and tied aid support for unabated coal-fired power plants (i.e. coal power without carbon capture utilization and storage) (OECD, 2022b). In March 2023, they also agreed in principle to expand the scope of green or climate-friendly projects eligible for longer repayment terms, as permitted under the OECD's Climate Change Sector Understanding, which sets out to provide adequate financial terms to projects identified as significantly contributing to climate change mitigation. The expanded scope now covers environmentally sustainable energy production, CO₂ capture storage and transportation, and the transmission, distribution and storage of energy. Also covered are clean hydrogen and ammonia, low-emissions manufacturing, zero and low-emissions transport and clean energy minerals and ores.

While information on the specific trade finance gap between demand and supply for climate-related goods is still limited, it is probably of a similar nature to the overall trade finance gap and should be closed to

Trade finance for climate projects: the case of the Asian Development Bank

The Asian Development Bank (ADB) Trade and Supply Chain Finance Program aims to close the trade finance gap, which widened to an estimated USD 2.5 trillion in 2022. Since 2009, the Program has provided USD 67 billion to support trade through guarantees, loans and knowledge support. In light of the ADB's commitment to making regional trade and supply chains greener and more resilient, it also supports transactions that contribute to achieving economies' global climate action goals. For example, the ADB worked with Basisbank to help Panex, a producer in Georgia of innovative thermal building panels that reduce energy waste. The ADB provided USD 2 million to Panex to help it import energy-efficient raw materials and to export its products to Armenia and Azerbaijan. Buildings are responsible for about 40 per cent of global energy consumption. ADB's partnership with Basisbank and Panex is helping to reduce GHGs in Georgia and neighbouring countries.

increase trade in products and technologies needed for the transition to a low-carbon economy and for climate change adaptation.

Projects essential to decarbonize economies, such as the construction of renewable energy generation plants, depend on importing affordable inputs from manufacturers in other economies. The same applies in climate change adaptation, where international trade is crucial for many developing economies to obtain drought-resistant crop varieties or products needed to adapt urban infrastructure so that it can withstand flash floods or extreme heat.

International trade plays a crucial role, therefore, in ensuring that the supply of products required for climate action reaches those most in need in a timely and affordable fashion. Without sufficient flows of trade finance to facilitate the importation of key inputs, many climate-related projects may be delayed or cancelled.

What could be done to improve trade finance flows for climate-related products and projects and align them with wider climate action policy plans?

Banks report that common barriers to trade finance availability include the difficulty of borrowers to meet the requirements of banks providing trade finance, insufficient collateral of borrowers for the high perceived risk and shortages of low-cost funding.

To breach the trade finance gap, it is important that relevant parties – including private banks (which account for most of the trade finance market), export credit agencies, and regional development banks – enhance their existing efforts to mobilize resources to increase trade finance programmes. One way they can do so is to join forces to develop risk-sharing frameworks that support trade in the products underpinning the energy transition and climate change adaptation projects. For example, the European Bank for Reconstruction and Development has partnered with financial institutions to promote international trade transactions that disseminate green technologies in their markets.

Efforts at the multilateral, regional and national levels could aim to pool resources, wherever possible, and to develop risk-sharing mechanisms that take some of the risk away from the private sector, including by way of encouraging co-financing between the various providers of trade finance. The flow of trade finance can also be enhanced by building the capacity of local lenders, strengthening banking relationships, improving access for SMEs and women-led businesses, and aiding decision-making through better quality data. These measures require coordinated action by financial institutions, national policymakers, regulators and international organizations.

Climate finance is increasingly intertwined with Aid for Trade financing, notably in renewable energy infrastructure. This is an area where Aid for Trade and various key stakeholders can play a catalytic role by helping to mobilize finance for green infrastructure and by helping the private sector take advantage of opportunities in the low-carbon economy ([WTO, 2022b](#)).

Moreover, technical assistance provided by regional or multilateral development agencies can focus on providing developing economies with trade finance facilitation programmes to enhance their financial institutions' trade finance departments. The WTO Secretariat and the International Finance Corporation are already working with small traders and financial institutions at the local level to improve understanding of the ecosystem of trade finance and to enhance access to trade finance training programmes in emerging markets, mainly in Africa.

Policy tool



#8

**Food and
agriculture**

Policy tool

Improve how food and agricultural markets function, while contributing to climate action, by easing trade in food.

#8 Food and agriculture



What are some key trade-related policies affecting trade and markets for food and agriculture?

Trade-related policies that may affect trade and markets for food and agricultural products include import tariffs, domestic support measures, and export restrictions. Governments often levy import tariffs on food and agricultural products (e.g. to generate revenue or protect domestic producers). Moreover, some governments provide support to the agricultural sector, including assistance linked directly to prices, production or inputs. Finally, some governments impose export restrictions on food, which can reduce the availability of food on global markets and raise international food prices.

How do policies affecting trade and markets for food and agricultural products relate to climate action?

Climate change is expected not only to affect global temperatures and rainfall patterns, but also increase the frequency, intensity, and duration of extreme weather events (IPCC, 2023). These events are likely to affect markets for food and agriculture, both directly (impacting production and productivity) and indirectly (affecting transport and logistics, including ports). At the same time, in 2019, approximately 22 per cent of global GHG emissions came from agriculture, forestry and other land use (IPCC, 2023).

Trade already plays a key role in global food security. One in every five calories consumed around the world – and possibly as many as one in four – is traded (OECD-FAO, 2022). As climate change deeply affects agricultural yields, this role will only increase, with trade helping food flow predictably and smoothly from where it is abundant to where it is needed.

A variety of trade policies affect trade and markets for food and agriculture, including import tariffs, support measures and export restrictions. Import tariffs on food and agricultural products can raise domestic prices for consumers and input costs for producers. According to the multi-agency [SDG Trade Monitor](#), the weighted tariff average that governments applied to imports of

agricultural goods was 6.2 per cent in 2021. However, tariff peaks¹³ on some agricultural products are often much higher than average levels, at times even exceeding 1,000 per cent ([WTO, 2023b](#)).

When government support to the agricultural sector is linked directly to prices, production or inputs, it can distort trade and markets, undermining the competitiveness of producers in other regions, and often resulting in further carbon emissions and inefficient or unsustainable patterns of resource use. At the same time, other types of support are important for environmental protection and conservation, research, infrastructure development or training to help farmers improve their productivity sustainably. Data from the OECD for 2020-22 indicates that USD 630 billion per year on average was provided by governments in the form of support to producers¹⁴ ([OECD, 2023](#)).

Export restrictions on food can reduce its availability in global markets and raise international prices. While these measures can reduce prices domestically in the short term, they can also adversely affect access to food abroad, especially for vulnerable populations in net food-importing developing economies ([Bouët and Laborde Debucquet, 2017](#)). Export restrictions can also prompt other economies to introduce similar measures to keep domestic prices low, thereby raising global prices and exacerbating market volatility.

All these policies may impact governments' climate mitigation or adaptation plans. Market access barriers affecting pro-climate technologies and innovations in

“Food production and local producers are increasingly vulnerable to the adverse impacts of climate change. At the same time, recent reports have found that food systems are contributing up to one-third of greenhouse gas emissions, up to 80 per cent of biodiversity loss and use up to 70 per cent of freshwater. However, sustainable food production systems should be recognized as an essential solution to these existing challenges.”

António Guterres,
UN Secretary-General,
[Food Systems Summit 2021](#)

WTO members' experiences with climate-related agriculture measures

Since 2009, over 540 climate-related measures affecting the agriculture sector have been notified to the WTO by 67 WTO members ([WTO EDB](#)). The number of measures notified over the years has increased constantly, with a sharp rise in measures notified in 2021 (106).

Policies include different types of support measures pursuing a variety of specific objectives, including climate-smart agricultural practices, low-carbon extension and infrastructure services, afforestation and soil degradation recovery, and relief from extreme weather events and climate-related crop losses.

Some recent examples include:

- Australia's provision of regional weather and climate guides to assist farmers in risk management decisions and in adapting to climate change (2021);
- Chile's extension and advisory services on smart irrigation and Energy Efficiency Pre-Investment Programmes (2021);
- Canada's Growing Forward 2 program supports On-Farm Energy Management conserve energy and reduce emissions (2021);
- El Salvador's efforts to adapt coffee plantations to climate change (2021);
- Tonga's research services for sustainable soil, crop and livestock production and climate resilient systems (2021); and
- India's National Mission for Sustainable Agriculture (2021).

food and agriculture can also impede their uptake and use. Reforming policies that affect trade and markets can therefore strengthen climate adaptation and mitigation by improving food security and nutrition, and by strengthening the ability of producers, consumers and traders to cope with unexpected crises ([WTO, 2022g](#); [WTO, 2022j](#)).

At the same time, well-functioning, sustainable agriculture and food systems may provide game-changing ways to mitigate climate change and conserve biodiversity. Domestic climate action plans can contribute by reducing market distortions, lifting trade restrictions, improving competition and food safety standards, and – in the longer term – ensuring that the true costs of food and farm goods are reflected when traded. Governments could also support climate adaptation and mitigation efforts by strengthening environmental programmes, advisory services, research and rural infrastructure.

Moreover, reforming and repurposing support to the farm sector can represent an important contribution to strengthening the sustainability and resilience of food systems ([FAO, UNDP, UNEP, 2021](#); [FAO, WTO, World Bank Group, 2023](#)).

What could be done to align policies affecting trade in food with wider climate action policy plans?

More open, fair and well-functioning global markets for food and agricultural products, anchored by the rules-based multilateral trading system, can play a critical role in shaping and assisting global climate action and strengthening global food security, including by reducing the impact of food crises hitting net food importing developing economies and LDCs the hardest.

Governments could revisit the impact of import and export restrictions on food and agricultural markets, as well as how support policies affect various parties, with the aim of enabling consumers to access the food and nutrition they need.

Changing agricultural practices and land use patterns could lower emissions related to farm production and trade. Paired with coordinated climate action, trade could also contribute to reducing the sector's carbon footprint by allowing economies to specialize more in foods they can produce with a relatively low carbon footprint.

Use of WTO agreements in curbing trade-restrictive measures can help reduce food and fertilizer price volatility. Governments could also support the resilience of global markets for food and agricultural products by promptly sharing information about policies affecting trade, including by complying with WTO notification commitments, and by participating in other information exchange mechanisms, such as the [Agricultural Market Information System](#), an inter-agency platform aimed at enhancing food market transparency.

The WTO agreements and various WTO bodies provide members with the opportunity to mobilize market incentives (market access), fiscal resources (domestic support and export competition) and a science-based regulatory framework (sanitary and phytosanitary systems) that could be efficiently leveraged to promote climate-smart agricultural innovation, dissemination of pro-climate technologies and practices, and better use of natural resources. In June 2022, at the 12th Ministerial Conference of the WTO, trade ministers agreed to a [package](#) of measures, including a [declaration](#) confirming the vital role of trade in improving global food security, a [decision](#) exempting World Food Programme food purchases for humanitarian purposes from export restrictions, and an [Agreement on Fisheries Subsidies](#), which commits members to eliminating the most harmful fisheries subsidies.

WTO members are also currently [negotiating](#) an update to the rulebook on food and agriculture, with food security one of the priorities ahead of the 13th Ministerial Conference in Abu Dhabi in February 2024.

Policy tool



#9

**Sanitary and
phytosanitary
measures**

Policy tool

Protect economies from the spread of disease and pests exacerbated by climate change by strengthening sanitary and phytosanitary systems.¹⁵



#9 Sanitary and phytosanitary measures

What are sanitary and phytosanitary (SPS) measures?

Sanitary and phytosanitary (SPS) measures are rules and procedures that governments use to ensure that food and beverages are safe to consume and to protect animals and plants from pests and diseases. These measures must be anchored in science, based on a risk assessment and, where possible, follow the international standards, guidelines and recommendations developed by Codex Alimentarius, the World Organization for Animal Health, and the International Plant Protection Convention.

How can strengthening SPS systems help protect people, the environment and livelihoods in a world affected by climate change?

Climate change is increasingly affecting ecosystems and agricultural production across the world. Extreme weather events, droughts and rising temperatures also affect the global prevalence of pests and diseases and contribute to increased food safety risks. Plant pests are estimated to be responsible for the loss of up to 40 per cent of crop production, costing the global economy more than USD 220 billion annually (FAO, 2021). Invasive insects alone cost economies at least USD 70 billion per year and global warming may already be facilitating the establishment of pests in new areas.¹⁶ Crop losses not only have devastating economic and food security impacts, but can also lead to significant increases in the carbon emission intensity of agricultural production (Heeb *et al.*, 2019).

The impact of climate change on animal health is predicted to be considerable, including through the spread of vector-borne diseases, such as bovine fever, increased susceptibility of animals to infections, and greater difficulty in controlling outbreaks of diseases (Rockov and Dubrow, 2020; Paz, 2021).¹⁷ Climate change therefore has consequences for the production of and trade in livestock and livestock products as well as for the livelihoods of farming communities and

economic growth. Livestock diseases can lead to higher emission intensities of related products by increasing mortality, and negatively affecting the wellbeing, productivity and fertility of livestock (Ezenwa *et al.*, 2020; Kipling *et al.*, 2021).

Finally, long-term shifts in temperature, humidity, rainfall and overall weather patterns affect the persistence and occurrence of bacteria, viruses, parasites, harmful algae, fungi and corresponding foodborne diseases while increasing the risk of toxic contamination (WHO, 2018).¹⁸

As climate change deeply affects agricultural yields, trade will increasingly play a key role in global food security by helping food flow predictably and smoothly to areas in need of supply (FAO, 2018). At the same time, trade can also act as a transmitter of pests, diseases and food safety risks to areas where they were previously unknown. Economies normally protect themselves against such risks by establishing SPS systems to regulate the importing of agricultural goods. Given the effects of climate change increasing these challenges, it is likely that the ongoing growth in SPS measures adopted in recent years (see box) will not abate.

Trends in the notification of SPS measures by WTO members

Since 1995, WTO members have notified more than **33,000 SPS measures** to the SPS Committee. While in 1995 less than 200 measures were notified, in 2022 that number had grown to 2,172 measures in one year. These measures have been proposed and/or adopted by members from all regions and levels of development. Most measures (48 per cent) were adopted to protect food safety, followed by animal health and plant protection (16 per cent each), protect humans from animal and/or plant pests or diseases (14 per cent) or to protect the territory from other damage from pests (6 per cent).

To protect people from new pest and disease risks linked to climate change, it will be equally important to adopt strategies and policies that strengthen SPS systems and to direct investments towards such systems, not only to protect their own populations and agriculture sectors, but to ensure agriculture exports can continue to reach markets where they are needed. This is particularly relevant for vulnerable economies experiencing severe consequences of climate change and extreme weather events.

What could be done to strengthen SPS systems and align them with wider climate action policy plans?

WTO members recently recognized in the MC12 [SPS Declaration](#) that climate change will bring about new challenges for the design and application of SPS measures. The capacity to face these challenges will differ across economies and food systems. Many developing economies are particularly affected by the impacts of climate change because they are located in areas where climate change is likely to have the most severe consequences. Farmers, producers and governments in Africa, Asia and the Pacific, and Latin America and the Caribbean are the most affected as they often lack the skills and resources needed to adapt quickly.

There is a pressing need, therefore, to prioritize efficient food safety, animal and plant health systems as an integral part of climate adaptation plans as well as for the benefit of people across the world. A better understanding of the ecology of pests, diseases and their hosts, and their improved surveillance, combined with improved modelling of climate change and its impact, is necessary to analyse and prioritize risks and improve the reliability of predictions. Access to enhanced climate modelling and improvements to risk assessment capacities are required to enable governments to prepare for the consequences of climate change and to act accordingly. Early warning systems and other rapid response mechanisms, such as contingency planning and readily available disease and pest eradication methods, will be equally important tools in preparing for emerging issues, especially in a world dealing with the effects of climate change.

Adherence to the WTO's SPS Agreement can also be an effective response by ensuring that new SPS measures introduced in the context of climate change remain anchored in science, based on risk assessments and, where possible, harmonized with other measures, following international standards, guidelines and recommendations and avoiding unnecessary fragmentation.

Discussions are ongoing at the WTO, not least at the SPS Committee, on how science, research and innovation could help sustainably increase production to feed a growing world population, while securing the livelihood of farmers and addressing emerging challenges like climate change.

The work of the [Standards and Trade Development Facility](#) (STDF) aims to support SPS capacity building in developing economies. Hosted by the WTO, the STDF is a global partnership that facilitates safe trade by driving SPS improvements in developing economies. The STDF brings together stakeholders from across agriculture, health, trade and development. It operates as a funding mechanism ([in 2022](#), donors contributed over USD 6 million in funding), providing support for the development and implementation of SPS projects. It also acts as a knowledge platform, piloting projects and learning from innovative, collaborative and cross-cutting approaches in SPS capacity development.

As early as 2009, the STDF drew attention to the implications of climate change for emerging SPS risks and global trade flows, including through targeted [events, publications and briefing notes](#). The WTO Secretariat's technical assistance activities can equally support reflections on how to strengthen regulatory frameworks in the face of growing challenges.

Policy tool



#10

**Internal taxation
and carbon pricing**

Policy tool

Reduce policy fragmentation and compliance costs by improving coordination of climate-related, non-discriminatory internal taxes, including carbon pricing and equivalent policies.

#10 Internal taxation and carbon pricing



What are internal taxes and carbon pricing?

Governments adopt internal taxes and other “pricing” tools for a variety of policy objectives, including revenue generation (e.g. value-added taxes) or to put a price on negative externalities. “Carbon pricing” – generally understood as the price paid by economic actors per tonne of CO₂-equivalent¹⁹ emitted, is one of the policy instruments often used to mitigate climate change. Carbon pricing can take different forms, the most common of which are excise taxes on carbon-intensive goods (known as implicit carbon pricing), direct carbon taxes or emission trading schemes (known as explicit carbon pricing).²⁰

How can internal taxes and carbon pricing help mitigate climate change and why is coordination important?

While the design and reform of internal taxation may raise a series of important political, social and economic considerations, carbon pricing is often considered as a key policy option available for tackling climate change ([Carbon Pricing Leadership Coalition, 2022](#)).²¹ Carbon pricing can be an effective policy as it provides an economic signal to emitters which incentivizes shifts in consumption and investment patterns, resulting in lower emissions. It also enables economies to specialize according to their comparative advantage in producing low-carbon goods, contributing to climate change mitigation ([Le Moigne, 2023](#)).

Governments have increasingly used internal taxation tools, therefore, to achieve climate-related objectives (see box). Two thirds of all NDCs submitted under the Paris Agreement consider the use of [carbon pricing to achieve emission reduction targets](#). This means that more than 100 economies can potentially look into carbon pricing as a way to reduce their GHG emissions through emission trading schemes, carbon taxes and other approaches.

WTO members' experiences with using internal taxes to achieve climate objectives

The [WTO EDB](#) shows that at least 57 WTO members from all regions and levels of economic development have used internal taxes for environmental purposes.

In the Trade Policy Reviews (TPRs) of these economies since 2009, 109 examples of internal taxation schemes adopted for climate-related objectives can be found, mostly concerning the energy sector (61), followed by manufacturing (28) and chemicals sectors (10). About 50 per cent of such schemes are found in TPRs conducted in 2021 and 2022, the latest years available.

Examples include:

- New Zealand's charges of a synthetic GHG levy on goods containing hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) under the Climate Change Response Act (2022);
- Argentina's tax on CO₂ emissions incorporated in 2017 into its domestic fuel tax (2021);
- Viet Nam's imposition of a decreasing excise tax on conventional combustion, hybrid or electric motor vehicles as well as an “environmental protection tax” on petroleum, coal, plastic bags, and various pesticides and herbicides (2021);
- the introduction by Mauritius of new excise duties for energy inefficient household appliances, washing machines, and electric lamps (2021);
- Zimbabwe's imposition of internal taxes on fuel, encompassing a strategic reserve levy, a debt redemption levy and a carbon tax (2020); and
- a charge levied by Switzerland and Liechtenstein per additional gramme of CO₂/km on motor vehicles whose CO₂ emissions are above the target limit for the type of vehicle (2022).

However, there is also significant fragmentation of carbon pricing policies. A patchwork of over 70 different carbon pricing schemes already exists globally but they cover only 23 per cent of total emissions. Carbon prices vary widely across the globe, from less than USD 1 to more than USD 130 per tonne of CO₂ emitted, according to the [World Bank's Carbon Pricing Dashboard](#). This fragmentation can lead to additional administrative and compliance costs for exporters, especially micro, small and medium enterprises, while increased coordination could significantly reduce the overall costs of achieving the Paris Agreement goals ([WTO, 2022g](#)).

Furthermore, to address potential carbon leakage and competitiveness concerns arising from variations in the level of carbon prices, economies are increasingly considering the introduction of border measures, such as border carbon adjustments. Unless effectively managed and coordinated, the situation could escalate into trade tensions, which could adversely affect overall well-being and undermine the beneficial role of trade in fighting climate change through a range of channels, such as the diffusion of green technologies ([WTO, 2022g](#)).

What could be done to enhance coordination of internal taxes, carbon pricing and equivalent policies and align them with wider climate action policy plans?

The coordination of internal taxes, including carbon pricing, can be achieved through various international platforms. In the context of the [first Global Stocktake taking place during COP28](#), where parties and stakeholders assess their progress in achieving the Paris Agreement goals, governments have a key opportunity to review their domestic policies and align internal taxes²² and carbon pricing instruments with their wider climate action plans.

International cooperation is especially important in addressing the challenges associated with carbon pricing because divergent interests and policy approaches exist among economies, with some governments prioritizing alternative policies such as regulations mandating reductions in GHG emissions, subsidies in support of low-carbon technologies and public low-carbon infrastructure programmes.

By facilitating exchange of best practices and sharing administrative costs among economies, international cooperation can contribute to improving the efficiency of carbon pricing schemes and reducing their administrative costs ([Mehling, Metcalf and Stavins, 2019](#)). Cooperation and coordination among economies

on carbon pricing can also pre-empt trade tensions and accusations of protectionism in relation to carbon pricing policies, and ensure all views and concerns, including those of developing economies, are taken into account in discussions on carbon pricing approaches.

Different approaches have been proposed. For example, an international carbon price floor system would set differentiated minimum international carbon prices according to economies' different levels of economic development, with a higher international carbon price floor for high-income economies and a lower one for low-income economies ([Parry, Black and Roaf, 2021](#)). Another possible approach is based on a model framework in which different domestic or regional carbon prices could be determined by a dynamic formula based on various criteria, such as historical emissions, level of development, and economic costs of climate change. Coupled with a moderate share of carbon pricing revenues allocated to support lower-income economies, this approach would be sufficient to keep emissions on a 1.5-2 degrees Celsius rise in global warming trajectory compared with the pre-industrial period, in line with the Paris Agreement objectives, and allow economies to realize an equivalent reduction of carbon emissions employing other policy instruments such as regulations or subsidies (Bekkers *et al*, 2023).²³

Finally, the [Inclusive Forum on Carbon Mitigation Approaches](#), an initiative hosted by the OECD, has been convening governments and stakeholders since February 2023 to take stock of and consider the effectiveness of different carbon mitigation approaches, including carbon pricing, regulations and support measures. Relevant discussions also take place under the [Forum on the Impact of Response Measures of the United Nations Framework Convention on Climate Change](#). At the WTO, discussions on carbon pricing and equivalent initiatives have been taking place in the CTE and the Trade and Environmental Sustainability Structured Discussions.²⁴

Endnotes

- 1 More information on the rate of implementation commitments is available in the [TFA Database](#).
- 2 Similarly, paperless trade reform in the Asia-Pacific region could lead to GHG emission reductions of an average 32-86kg per transaction, under conservative assumptions, amounting to saving between 8.9 million and 23.4 million tonnes of CO₂ equivalent ([UN ESCAP, 2021](#)).
- 3 This footprint is explained by the mix of goods and services that governments purchase, which notably comprises goods or services of the construction, transport, defence, utilities, waste management and other industries ([WEF, 2022](#)).
- 4 Domestic quality infrastructure includes well-functioning laboratories, certification bodies and accreditation facilities that can boost trust in the safety and quality of traded goods (whether produced at home or exported). This can encourage engagement in trade, helping producers from developing economies integrate into green global value chains.
- 5 For example, IRENA estimates that of the total amount of person-days needed to develop a solar PV plant of 50 MW, only 22 per cent are associated with manufacturing, compared with 56 per cent associated with services, such as operations, maintenance, installation and grid connection ([WTO and IRENA, 2021](#)).
- 6 Environmental services encompass infrastructure services, including sewage, refuse disposal and sanitation as well as “non-infrastructure” services, such as those related to air pollution prevention and mitigation, noise abatement and the remediation of contaminated sites. More information available on the [WTO website](#).
- 7 A recent counterfactual analysis shows that if trade policy reform eliminated the environmental bias in trade policy by imposing the same tariff and non-tariff barrier structure in all industries, this would yield a win-win outcome: global real income would slightly increase (by 0.65 per cent) while global carbon emissions would fall by 3.6 per cent (Shapiro, 2021). See also [WTO \(2022g\)](#) pp. 104-105.
- 8 Data available from 84 WTO members (European Union counting as one) having reported their tariffs in the 2022 edition of the World Customs Organization (WCO) Harmonized System (HS22). The figures provided are based on all available reporters, except for fossil fuels which reflects tariffs applied by the top ten importers.
- 9 For example, in the case of solar PV, the increasing size of solar PV module plants serving the global market through trade allowed those plants to reap significant economies of scale, which contributed almost 40 per cent of the decline in their costs since 2001 ([Kavlak et al, 2018](#)).
- 10 Adopting climate-smart innovations – which enhance agricultural productivity while curbing GHG emissions – also holds potential. These measures could slash agricultural emissions by over 40 per cent, rehabilitate 105 million hectares of agricultural land, and make healthy foods more affordable, as highlighted by a joint study from the World Bank and International Food Policy Research Institute ([World Bank and IFPRI, 2022](#)).
- 11 At the time of writing, 75 WTO members participate in the Trade and Environmental Sustainability Structured Discussions.
- 12 At the time of writing, 48 WTO members participate in the Fossil Fuel Subsidy Reform initiative.
- 13 “Tariff peaks” are relatively high tariffs, usually on “sensitive” products, amidst generally low tariff levels. For industrialized economies, tariffs of 15 per cent and above are generally recognized as “tariff peaks”.

- 14 Both directly, as payments to producers, and indirectly, in the form of market price support (OECD, 2022a).
- 15 This policy tool closely reproduces material from the STDF briefing note entitled [Strengthening SPS systems to mitigate and adapt to climate change \(STDF, 2023\)](#).
- 16 Examples include fall armyworm, which attacks different plant species including staple food crops such as maize and sorghum, coffee leaf rust, banana Fusarium wilt, as well as different species of fruit flies.
- 17 Examples include the spread of bluetongue virus into Europe, Rift Valley fever in Africa, and highly virulent influenza viruses in Asia.
- 18 For example, changes in temperature, precipitation and other environmental factors affect the geographic distribution and persistence of foodborne pathogens like salmonella, campylobacter and e. coli. On land, rising soil temperatures facilitate a higher uptake of toxic heavy metals in staple crops, e.g. arsenic in rice.
- 19 CO₂ equivalent (CO₂-eq) is the amount of carbon dioxide (CO₂) emission that would cause the same temperature change, over a given time horizon, as an emitted amount of another greenhouse gas (GHG) or a mixture of GHGs ([IPCC, 2018](#)).
- 20 An ETS — also known as a cap-and-trade system — sets a limit on total direct GHG emissions from specific sectors and sets up a market where the rights to emit are traded.
- 21 The [Carbon Pricing Leadership Coalition](#) (CLPC) is a voluntary initiative composed of a number of governments, civil society representatives and international institutions, such as the World Bank and the IMF. It is administered by the World Bank.
- 22 WTO rules provide ample space for members to pursue their own legitimate domestic goals (including climate-related ones) through internal taxation, as long as they respect a set of principles and provisions that seek to avoid the introduction of unjustifiable or arbitrary discrimination or disguised protectionism through the back door. In this context, Article I (on the “General Most-Favoured-Nation Treatment”), Article III (on “National Treatment on Internal Taxation and Regulation”) and Article XX (on “General Exceptions”) of the GATT are particularly relevant. See [WTO \(2020\)](#).
- 23 Equivalence in terms of emission reduction does not mean equivalence in terms of economic effects.
- 24 For example, at the CTE meetings held since November 2020, various members have informed the wider WTO membership about their proposals to adopt or revise carbon pricing policies, while others have raised concerns about border measures related to carbon pricing.