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Greening global trade, one container at a time

Executive summary

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Promoting trade in environmental goods and low-carbon technologies can be a powerful tool to combat the climate crisis. The transition to a low-carbon economy will only be possible if green goods and technologies – everything from septic tanks and catalytic converters for vehicles to biofuels and mercury-free batteries – are developed, deployed and diffused at an unprecedented pace. Looking at the share of environmental imports and exports to total imports and exports in 2022, we find that Germany, Japan and South Korea are the largest producers of green goods, but Germany, the UK and France are the largest consumers. Between 2000 and 2022, Germany has seen the largest increase in exports of environmental goods as a share of GDP (+6.9pps), followed by South Korea (+6.2pps) and China (+5.0pps), while US exports fell by -1.3pp over the same period. Some small economies also have a comparative advantage: In 2022, North Macedonia, the Slovak Republic and Hungary had the largest green trade surplus (measured as a percentage of GDP) due to their specialization in a few environmental products that account for a significant share of their exports.

Removing tariffs on green goods could boost exports volumes by over +10% per year, which amounts to about USD184bn. Barriers to trade in environmental products are still significant, with tariffs at a high 5.4% compared to 8.6% for all goods. Given ambitious plans to develop domestic green industries, there is a risk of seeing further tariffs on green goods. But this would be counterproductive: Reducing the cost of importing green goods would make them more affordable and accessible to consumers and businesses alike, as well as stimulating competition among producers, driving innovation domestically and globally. However, the main obstacle to green trade is protectionism in the form of non-tariff measures such as technical barriers to trade or export-related measures. To remove these barriers and accelerate the green transition, international cooperation needs to move from regional to multilateral.

There can be no green trade without green shipping. Approximately 11bn tons of goods are carried by sea every year worldwide (85% of total global trade), a figure that is estimated to triple by 2050. Though maritime transportation is currently responsible for only about 3% of global greenhouse-gas emissions, this share could surge to 17% by mid-century if no action is taken today. Carriers know that besides being a challenge, decarbonizing

also represents a market-gain opportunity for those players that are ahead in the greening of their fleets, as rising demand for clean transportation will give them carbon pricing power. As of today, 13 of the world's 30 largest shipping companies have already set a net-zero target between 2040 and 2060 and the sector's capex is expected to continue growing in 2023 and 2024 after two record years. However, it will need to invest a minimum of USD23bn per year to achieve its climate targets.

The EU is leading in the adoption of carbon-pricing mechanisms affecting global trade. The EU is taking steps to address shipping emissions by including them in the EU Emission Trading System (EU ETS) and implementing the EU Carbon Border Adjustment Mechanism (EU CBAM). This move aims to align with climate objectives, promote energy efficiency and low-carbon fuels and level the playing field for EU industries. The inclusion of shipping emissions in the EU ETS could lead to a +20% increase in maritime transport costs and a -11% reduction in shipping demand. Additionally, if the EU CBAM incentivizes carbon pricing policies in non-OECD countries, it could significantly lower the carbon intensities of their exports.

Coherent policy action is needed to reap the benefits of green trade and we see five main calls for action. First, leading economies should re-engage in promoting and facilitating green trade to help increase the supply and lower the price of green technologies. Second, all stakeholders need to agree on what counts as a green product. Third, governments should give clear guidelines and standards for sustainable production and consumption through appropriate labelling (green scores) and public price subsidies. Fourth, customs duties for green products need to be reduced further or even removed to make them more affordable for consumers, which would require a deep reform of the WTO most-favoured-nation tariffs. Finally, governments need to redirect excess savings towards financing companies that produce a green product, while implementing additional tax breaks for those businesses. From a regulatory perspective, financing could be eased if "green loans" were to be introduced within the next Basel regulations for the banking sector.

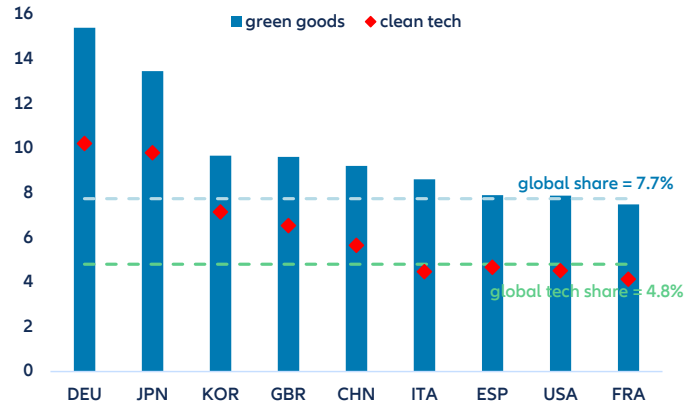
Which countries are in the driving seat of green trade?

Promoting trade in environmental goods and low-carbon technologies can be a powerful tool to combat the climate crisis. The transition to a low-carbon economy will only be possible if green goods and technologies[1] – everything from septic tanks and catalytic converters for vehicles to biofuels and mercury-free batteries – are developed, deployed and diffused at an unprecedented pace. In this context, global trade plays an essential role, especially by diffusing essential goods and technologies from developed to developing countries. Encouragingly, global green trade is on the rise: Environmental goods as a share of total global exports have grown from around 2.7% in 2000 to around 7.7% in 2022. Similarly, the share of environmental goods in global imports has grown from 5.5% to 6.9%.

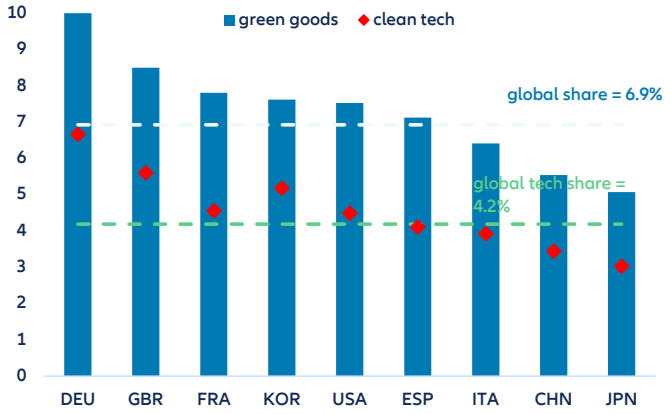
High-income countries are currently the main exporters and importers of environmental goods. European economies rank among the top exporters, though they are being outpaced by China. Meanwhile, the US is falling behind. Looking at the share of environmental imports and exports to total imports and exports in 2022, we find that Germany, Japan and South Korea are the largest producers of green goods, but Germany, the UK and France are the largest consumers (Figure 1). Between 2000 and 2022, German has seen the largest increase in exports of environmental goods as a share of GDP (+6.9pps), followed by South Korea (6.2pps) and China (5.0pps), while US exports fell by -1.3pp over the same period (Figure 2). Imports, on the other hand, have grown the most in Germany (4.4pps), followed by the UK (3.0pps) and France (2.7pps), while China and South Korea have seen their import shares fall by -2.4pp and -0.6pp, respectively.

Figure 1: Environmental goods as share of total goods trade, 2022 in %

a. Exports



b. Imports

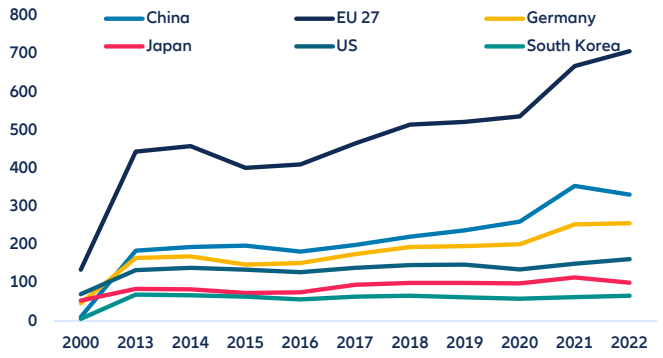


Sources: UNComtrade, Allianz Research

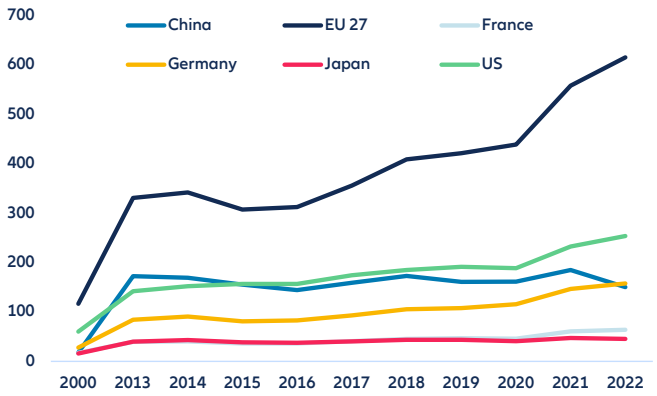
1 There are many definitions of these categories that partially but not entirely overlap each other. As a starting point, we use a list of environmental goods provided by the IMF (2021), which uses data from the OECD/Eurostat (1999). To this list we add 108 products related to environmental and social issues and technological advances that meet the definition of environmentally adapted goods, including electric and hybrid vehicles, electric accumulators, and rechargeable batteries. A subset are low-carbon technologies (LCTs), including wind turbines, solar panels, biomass systems and carbon-capture equipment. The LCT products designation is based on Pigato et al. (2020).

Figure 2: Top five environmental goods trade over time, 2000 - 2022 in bn USD

a. Exports



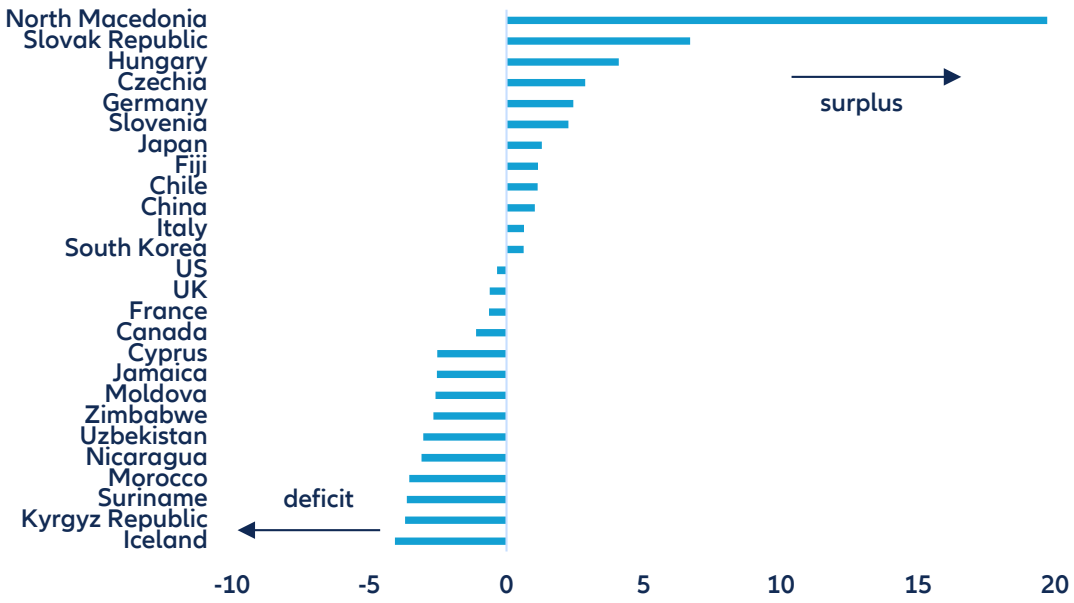
b. Imports



Sources: UNComtrade, IMF, Allianz Research

But some small economies have a comparative advantage. While China surpassed Germany to become the economy with the largest environmental goods trade surplus (in USD) in 2020, the picture looks quite different when measured as a percentage of GDP (Figure 3). In 2022, North Macedonia, the Slovak Republic and Hungary had the largest green trade surplus due to their specialization in a few environmental products that account for a significant share of their exports. North Macedonia traded USD3.2bn worth of environmental products – mainly catalysts, electronic boards and controls, or filtering and purifying machinery – while Hungary is specialized in electric accumulators and lithium ions, electronic boards and controls and the compilation of hybrid and electric vehicles. The Slovak Republic also specialized in the latter.

Figure 3: Trade balance in environmental goods as share of nominal GDP, 2021 in %



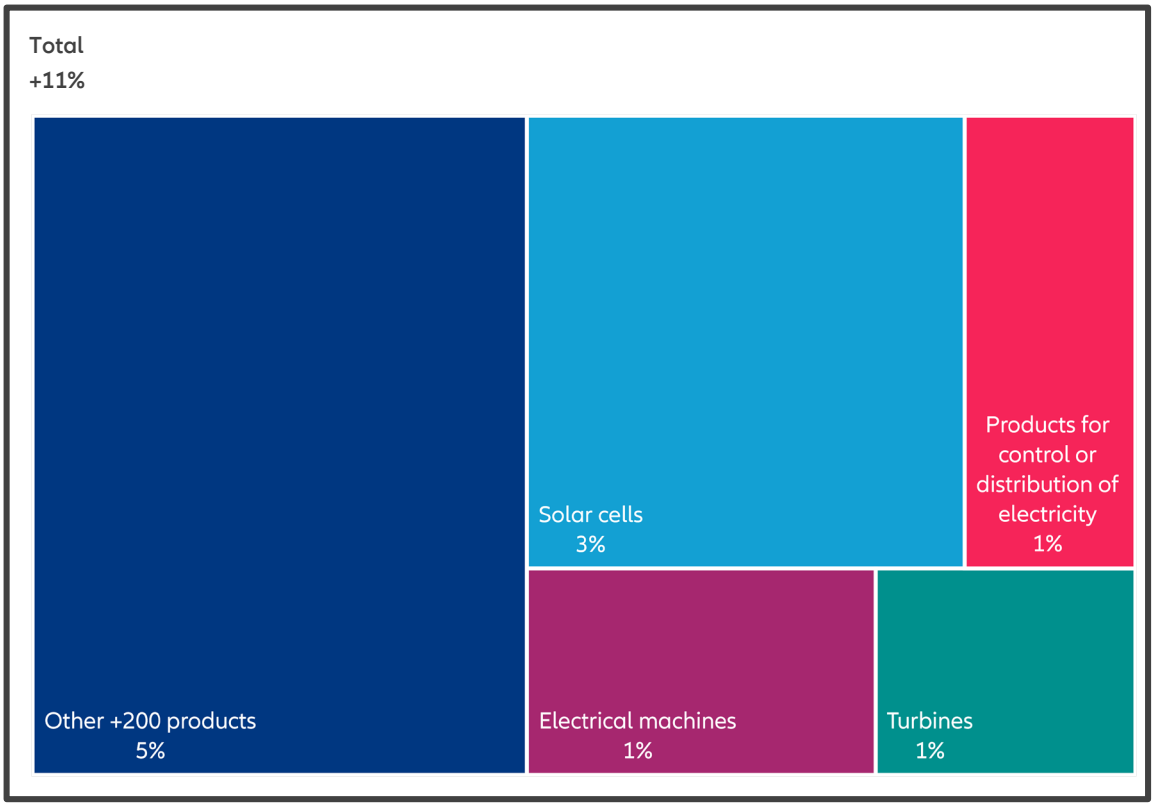
Sources:UNComtrade, WDI, Allianz Research

Removing tariffs on green goods could boost global green trade volume by over 10% per year

Barriers to trade in environmental goods and services stand at a high 5.4% compared to 8.6% for all goods. While tariffs on environmental goods are, on average, 2.7pps lower than those for conventional goods, there are strong differences between countries: The lowest simple applied tariffs are, on average, applied by Iceland and the Seychelles, while the highest tariffs are applied by the Maldives and India.

Removing tariffs on green goods could boost export volumes by over +10% per year which amounts to about USD184bn. Tariffs have historically been used to protect domestic industries from foreign competition. Given governments' ambitious plans to develop domestic green industries, they may be tempted to impose further tariffs on green goods. But this would be counterproductive for combating climate change: Reducing the cost of importing green goods would make them more affordable and accessible to consumers and businesses alike. Lower tariffs would also stimulate competition among producers, driving innovation domestically and globally. Moreover, if countries collaborate and engage in mutual trade agreements focused on green goods, they can set global standards and ensure that the environmental benefits of these products are maximized. According to our estimates, using price elasticities of individual products, eliminating tariffs would increase green goods trade by 11%, with solar cells being the top contributor (Figure 4).

Figure 4: Increase in green goods trade from a removal of tariffs



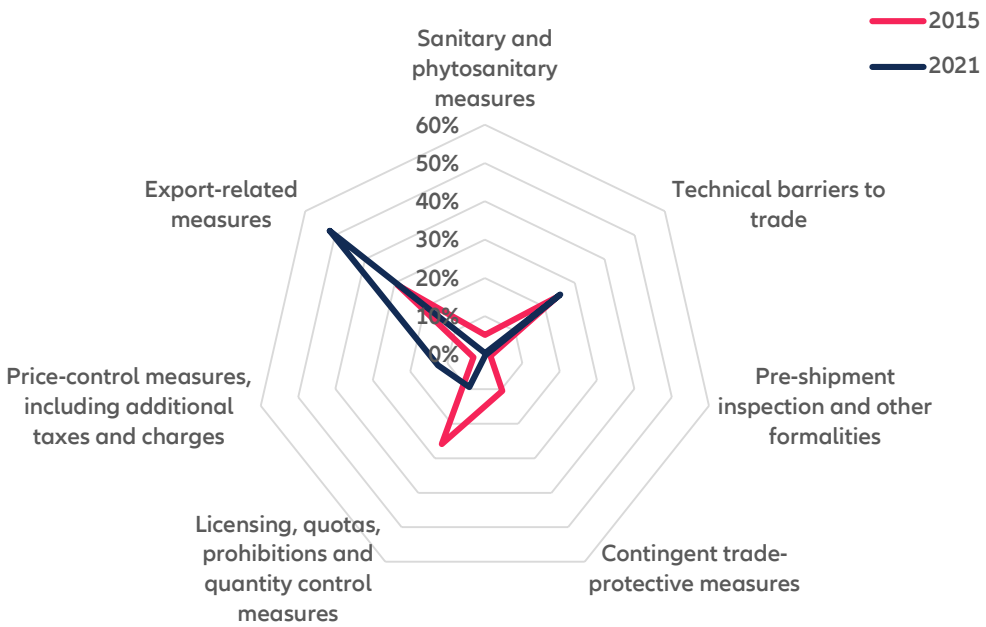
Sources: National sources, Allianz Research

Protectionist measures are the main obstacles for green trade. Trade in green products is often affected by various non-tariff measures (NTMs), particularly technical barriers to trade that include export-related measures, licensing, quotas, prohibitions and quantity control measures. These tend to be higher in industrialized countries. While NTMs applied to environmental products increased at a similar pace as overall NTMs, their absolute number is much smaller. In 2022, only 3.3% of NTMs in force affected green products. Export-related measures were the most used channel in 2015 while in 2021 this shifted to export-related measures and technical barriers to trade (Figure 5). Green products affected through NTMs are mostly those in machinery and electrical, as well as chemicals.

In addition to NTMS, the flow of trade in environmental goods relies on factors such as political stability, technological and financial capacity and regulatory frameworks. While removing tariff barriers is a necessary first step towards promoting the dissemination of green technologies, it does not guarantee sustainable development outcomes or the expansion of sustainable energy. In the global shift towards decarbonized production and consumption systems, the deployment of climate-related technologies and services is crucial. Trade plays a vital role in reducing costs and facilitating the spread of these innovations to new markets. By addressing trade barriers, we can accelerate this process, benefiting consumers, businesses and exporters while also attracting foreign direct investment into climate-related projects. Lowering trade barriers is a key step towards achieving these goals.

Removing further trade barriers for green trade requires stepping-up international cooperation from regional to multilateral. Multilateral negotiations to reduce or eliminate tariffs and NTMs on environmental goods and services were launched as part of the Doha Development Agenda in 2001. However, the lack of progress ultimately led 46 WTO members to launch the negotiations of a plurilateral Environmental Goods Agreement in 2014. But negotiations stopped altogether in 2017 and have not resumed since. Disagreements over the criteria to define the scope of environmental goods and services led to difficulties in reaching consensus on the multilateral and the plurilateral stage. Countries

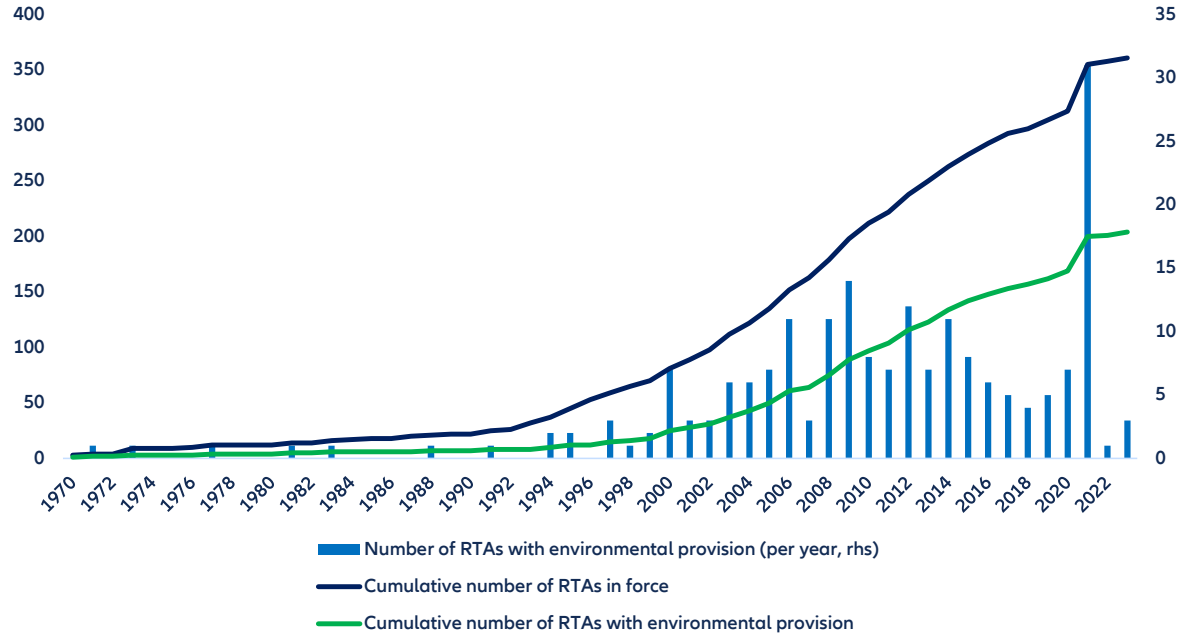
Figure 5: Cumulative non-tariff measures by type, 2015 and 2021 in %



Sources: UNCTAD Trains, Allianz Research

have thus turned to regional cooperation to promote trade in green products. Since 1970, the number of regional trade agreements including an environmental provision has risen tremendously. This has helped to harmonize environmental regulation and standards. Still, environmental provisions included in trade agreements are heterogeneous and may range from environmental topics in the preamble to concrete articles on environmental standards, tariff reductions, or cooperation in specific articles or amendments. In 2023, 204 out of the 361 regional trade agreements in force contained some sort of environmental provision (Figure 6). While the numbers vary significantly over time, 31 trade agreements containing some sort of environmental provision entered into force in 2021 alone, followed by one in 2022 and three more up to September 2023.

Figure 6: Regional trade agreements and environmental provisions, number



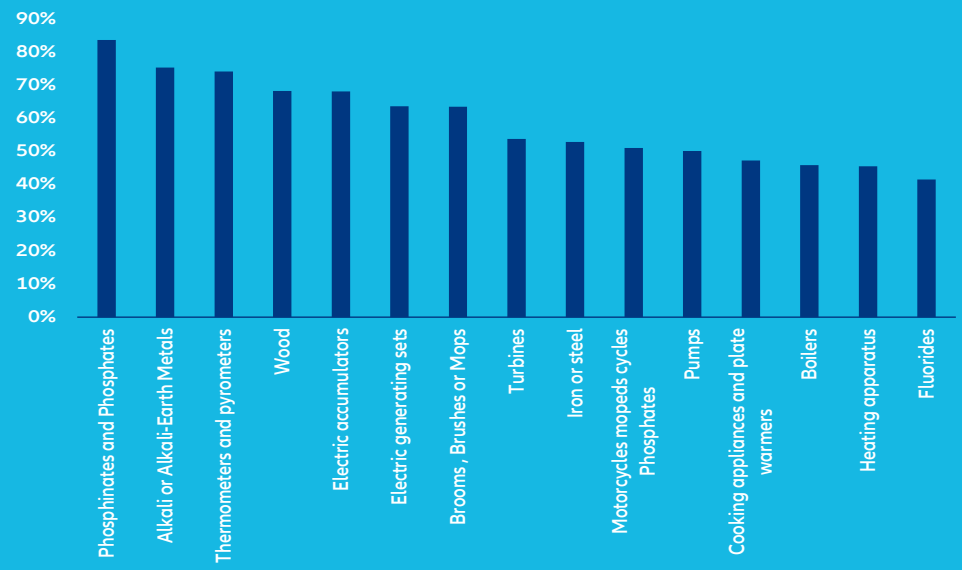
Sources: WTO RTA Gateway, Allianz Research

BOX: China will continue to play a key role in greening goods in the US and Europe

Is there a good reason to diversify away from green products imported from China? In two extremes of strategic cooperation, we have the cases of blind dependence and complete decoupling. Using trade data for the period January-July 2023, we look at the most important green products for which the US and the EU are dependent on China. The case of blind dependence can be ruled out for both regions as China is not the single source of supply for any of the green products imported by them. But there are green products that take up between 50% and 85% of market shares in both the US and the EU (Box Figures 1 and 2) with significant divergence across the major economies in the EU. While we do not expect a complete de-coupling, the need to diversify away from China will depend on the region's ability to produce these goods domestically and the social, economic and environmental costs from diversification.

A gradual boost in domestic production may help secure supply chains. The US has a significantly low level of ability to produce six out of the top 10 green products (wood, electric accumulators, electric generating sets, brooms and brushes, turbines, iron or steel) that it relies heavily on China for. Using supply tables from the US Bureau of Economic Analysis, we construct the ratio of total commodity output to total imports and find an average value of six for the seven green products listed above, against an average value of 478 across all products. In essence, the US can only produce six times more of these green products relative to what it imports. For the EU, the situation is similar and results suggest a low level of ability to produce some of the green products grouped into four main categories (chemicals and chemical products, furniture, electrical equipment, and metals) for which the average value of the domestic-production to imports ratio is 6.65.

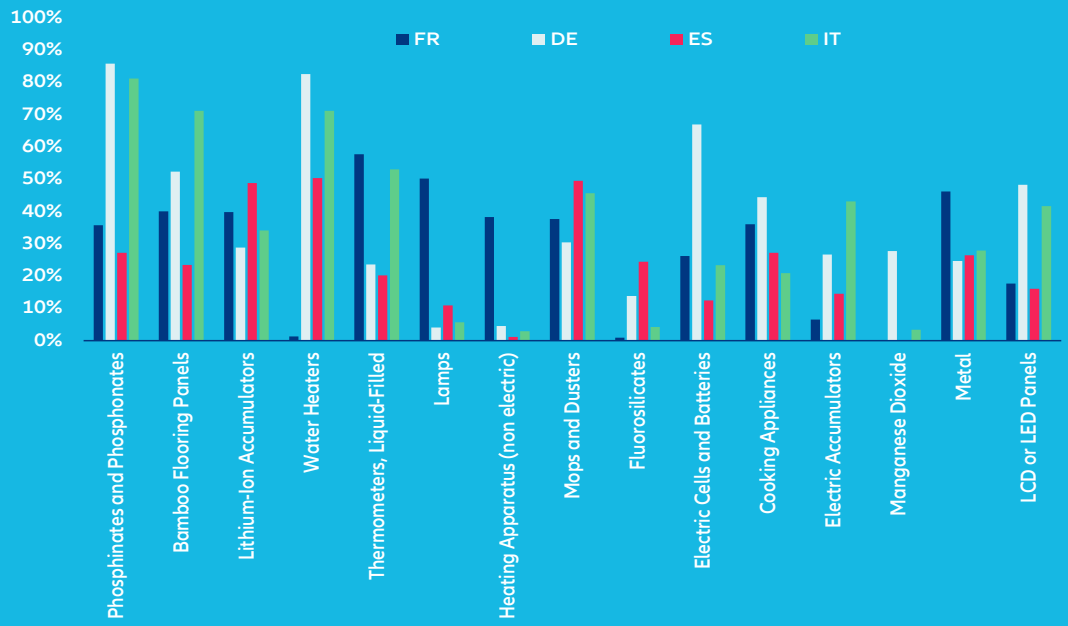
Box Figure 1: US import dependence from China for selected green products, Jan-Jul 2023 in %, top 15



Sources: UN Comtrade, Allianz Research.

Note: Imports from China as a share of total US imports of the same product.

Box Figure 2: EU import dependence on China for green products, Jan-Jul 2023 in %, top 15



Sources: Eurostat, Allianz Research

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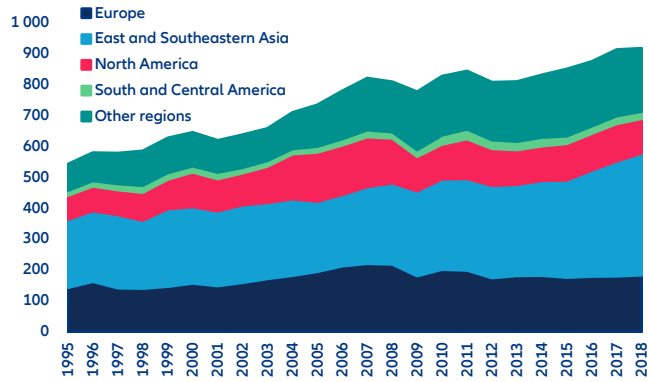
How can the shipping industry contribute to the greening of trade?

Approximately 11bn tons of goods are carried by sea every year worldwide (85% of total global trade), a figure that is estimated to triple by 2050. Though maritime transportation is currently responsible for only about 3% of global greenhouse-gas emissions (GHG), this share could surge to 17% by mid-century if no action is taken today. In fact, since 2000, global CO2 emissions from the maritime industry have increased by +42%, with East and Southern Asia contributing the most to this increase, accounting for 43% of sector's total CO2 emissions today (Figure 7). China alone is responsible for around 30% as it owns seven of the world's top 10 container ports.

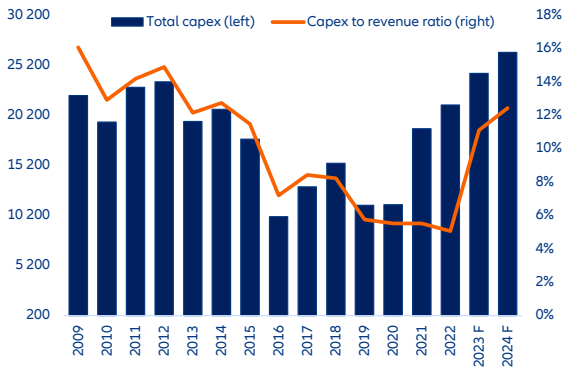
Shipping companies are running a race against time to achieve net-zero emissions. To achieve net-zero emissions by 2050 in the maritime shipping sector, emissions must stabilize around 2025, despite anticipated increased activity, and then decrease until 2030 (Figure 8). In this context, greening fleets has become a top priority for the industry: 13 of the world's 30 largest shipping companies[2] have already set a net-zero target between 2040 and 2060. This entails investing massive amounts of cash for acquiring new vessels equipped with cutting-edge technologies and next generation engines, installing scrubbers as well retrofitting engines. The sector's capex[3] grew by +70% y/y in 2021 and +13% y/y in 2022, far above the ten-year historical average of +3% y/y. Even though revenues are expected to drop in 2023 and 2024 as freight rates have normalized, capex is expected to continue growing by +12% and +9% y/y, respectively. This will push the industry's capex-to-revenue ratio to 11% and 12%, respectively, compared to the five-year historical average of just 6%. However, some regions are moving faster than others. Though Asian companies account for half of global vessels tonnage, European companies have made more progress in defining decarbonization goals and establishing fleet-renewal projects. These companies are likely to be best positioned to meet the rising demand for clean transportation, and therefore to have more carbon pricing power over those liners that are lagging behind.

Figure 7: CO2 emissions from the maritime industry by region over time (mn tons)



Sources: OECD, Allianz Research

Figure 8: Total annual capital expenditures of the thirty largest shipping companies (USD mn, left) and average capex-to-revenue ratio (line, right)



Sources: Bloomberg, Allianz Research.

2 We have considered the world's 30 largest shipping companies, namely: AP Moeller-Maersk, CMA-CGM, COSCO, Hapag-Lloyd, Evergreen Marine, Nippon Yusen, Orient Overseas, Hyundai Merchant Marine, Yang Ming Marine, Zim Integrated Shipping Services, Mitsui OSK lines, Wan Hai Lines, Kawasaki Kisen Kaisha, National Shipping of Saudi Arabia, Shipping Corp of India, Overseas Shipholding Group, Danaos Corp, Korea Line Corp, Tsakos Energy Navigation, Great Eastern Shipping Co, Mediterranean Shipping Company, Euronav, Ship Finance International, Golden Ocean Group, Genco Shipping & Trading, Eagle Bulk Shipping, DHT Holdings, Zhonggu Logistics Co, SITC International, Matson Inc.

3 Capital expenditures or capex refers to the amount of money used to maintain or expand a company's asset base.

Overall, the industry needs to invest a minimum of USD23bn per year to achieve its climate targets. Considering that the volume of goods transported by sea is progressively growing, and that around 50% of existing container ships will have to be renewed or retrofitted by mid-century (Table 1), we estimate[4] that the sector will have to invest a minimum of USD23bn per year to achieve the net-zero goal in 2050. Financial statements as of 2022 suggest that companies can afford these annual investments until 2030 without external financing. In this context, decarbonizing shipping will require a coordinated international effort from regulators and the private sector.

The shift to the net-zero emissions will also require efforts to increase the adoption of alternative fuels, such as biofuels, methanol and hydrogen, among others, by investing in the necessary infrastructure. By 2022, biofuels accounted for less than 0.5% of shipping energy demand; by 2030, low-emission fuels (particularly methanol) should account for nearly 15% of total energy demand. While over 100 infrastructure projects are currently underway for the integration of ammonia and hydrogen, more technical advancements and policy support are still needed. Methanol has been also gaining a lot of interest as a marine fuel, and ports around the world have been working to make it available and bunker it. However, as of today, methanol-bunkering projects are primarily found in China, Australia, the Middle East and Europe, with Rotterdam being the largest methanol hub on the continent. As such, only container shippers operating in these geographies have access to alternative fuels.

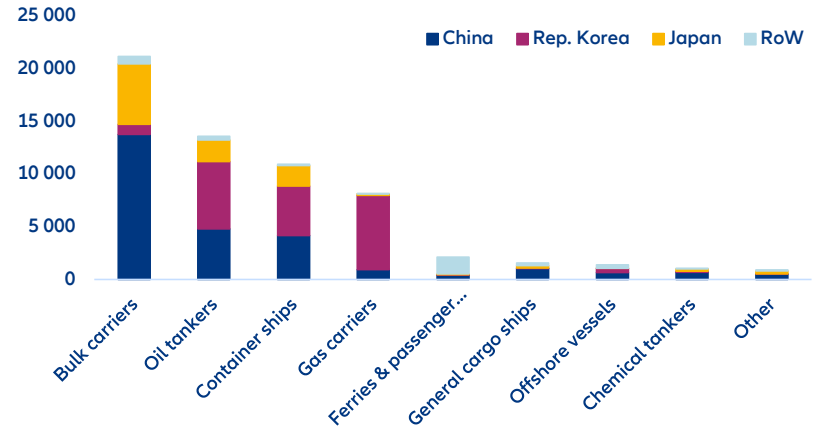
The concentration of shipbuilding know-how and engineering capacity in Asia could pose a risk as the lack of diversification can generate production bottlenecks. China, South Korea and Japan manufacture 94% of all vessels and around 98% of global containership capacity (Figure 9). These Asian nations have taken the lead in developing zero-emission vessels and the associated infrastructure. The Global Maritime Forum for instance recognized over 200 projects in this area as of May 2023, with China, Singapore, and Japan having made significant strides in ammonia-fueled ship designs and certifications. New orders for ships reached a record high in 2022, with cruise companies returning to operations, governments increasing their naval budgets and shipping liners renewing their fleets. Thus, shipyards have been operating at full capacity, which is putting plans to accelerate decarbonization at risk, as construction and delivery periods are becoming longer, given that the know-how (particularly for complex and new-generation ships) is concentrated in a single region.

Table 1:Average age (in years) of fleets in different regions in 2022

	In terms of number of ships	In terms of carrying capacity
World	21.9	11.5
Developing Economies	20.9	12.6
Developed Economies	21	10.5
Small Islands (developing)	18.6	9.9
Least Developed Countries	27.9	17.4

Sources: UNCTAD, Allianz Research.

Figure 9: Deliveries of newbuilds by vessel type and country of construction, in 2022 (thousand gross tons)



Sources: UNCTAD, Clarksons Research, Allianz Research.

4 We have considered the following factors: 1) around 50% of the existing fleet currently complies with required carbon intensity levels, 30% will have to be renewed, 20% will be retrofitted and further brand-new capacity (+20%) will have to be added to cope with increasing trading volumes. 2) The price of a new methanol container ship ranges between USD180-210mn, while retrofitting costs can go up to USD30mn per vessel depending on the age, size and engine generation.

The last piece of the puzzle is infrastructure. Several initiatives have been launched to establish green shipping corridors on busy routes and to develop ports into energy centers. For instance, the C40 global network of mayors from major cities is focusing on reducing shipping emissions, introducing green and digital shipping corridors, and fostering multiple initiatives through the Green Ports Forum. These initiatives include global maritime emission reduction, transforming ports into energy hubs, promoting zero-emission technologies and green jobs, and linking resources for financial and technical project assistance.

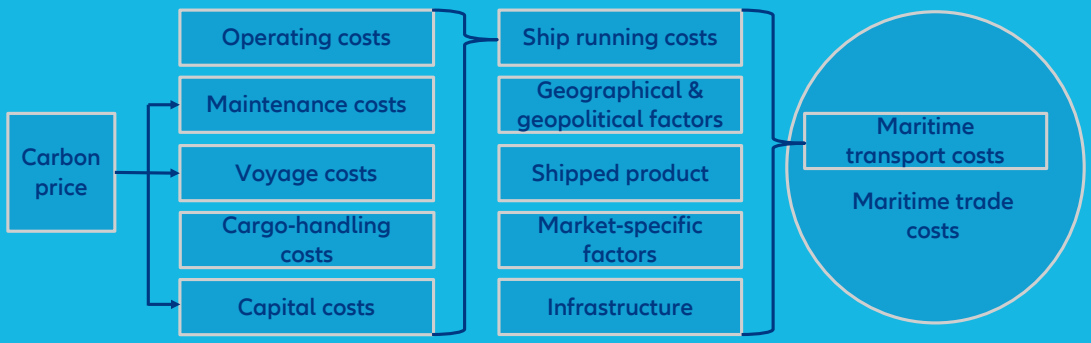
Highlighting this effort, Los Angeles and Shanghai began a decarbonized green shipping corridor in 2022. Concurrently, the EU's 'Fit for 55' package mandates ships to use shore-side electricity, in line with the European Green Deal, to meet the electricity needs of berthed vessels. By 2030, maritime ports are set specific shore-side electricity targets based on their annual port calls, with various exemptions in place. Additionally, by 2025, Member States must ensure adequate LNG refueling points at core maritime ports, designated according to market requirements.

BOX: How will EU ETS and EU CBAM reshape global shipping and trade emissions ?

Carbon pricing will have a substantial impact on greening global trade. By including shipping emissions in the EU Emission Trading System (EU ETS) ,and with the introduction of the EU Carbon Border Adjustment Mechanism (EU CBAM), the EU is the frontrunner in introducing carbon-pricing mechanisms that primarily affect trade. From January 2024, the EU ETS will cover CO2 emissions from large ships of 5,000 gross tonnage and above that enter EU ports, regardless of their flag. The system will account for 50% of emissions from voyages that start or end outside the EU, allowing third countries to manage the remaining emissions. In contrast, it will cover 100% of emissions for voyages occurring between EU ports and those within EU ports. While CO2 is presently the primary focus of the EU ETS, methane (CH4) and nitrous oxide (N2O) emissions will also be included from 2026 onwards. The inclusion of maritime transport emissions under the ETS comes with a decreasing cap to ensure alignment with the EU's climate objectives, fostering energy efficiency and promoting the adoption of low-carbon and alternative fuels.

The EU ETS integrates elements from the updated EU Monitoring, Reporting, and Verification (MRV) Regulation for maritime transport. As part of the system, shipping companies are required to acquire and utilize EU ETS allowances for their reported CO2 emissions, with compliance monitored by EU Member States using guidelines similar to those in other ETS sectors. To facilitate a smooth transition, during the initial phase, shipping companies will surrender allowances for 40% of their 2024 emissions in 2025, 70% of their 2025 emissions in 2026, and by 2027, they will account for 100% of their emissions. The system's implementation will undergo periodic reviews, factoring in any relevant updates from the International Maritime Organisation (IMO).

Box Figure 3: Carbon price impact channels on maritime transport costs



Source: Allianz Research

The introduction of a maritime carbon price will likely lead to an increase in voyage expenses, such as fuel, maintenance and capital costs (Box Figure 3). These added expenses fall under ship running costs, a subset of the broader maritime transport costs. Given that these running costs are just one component of maritime transport expenses, a carbon price won't necessarily cause an equivalent rise in overall transport costs. Transport costs account on average for about 9% of import values, with large spreads depending on the region and the transported good. Several studies have been conducted on the potential effects of a maritime carbon price (Box Figure 4)[5] . On average the observed sources report a 7% maritime transport cost increase for a carbon price of USD30. This would relate to a cost increase of 20% at a full exposure to the current EU ETS price of about EUR80[6]. Assuming a price elasticity of -0.57, this would lead to a reduction shipping demand of about 11% for the routes that are fully affected by this carbon price[7].

The primary objective of the EU CBAM is to provide a level-playing field for EU industries that are exposed to carbon pricing from the EU ETS and thus have a cost disadvantage versus foreign producers. In practice, importers to the EU will be charged a carbon that is equivalent to the EU price, while the carbon price that they already paid at home will be deducted from the payment obligation[8]. It should be kept in mind that the carbon prices are supposed to internalize damages originating from the greenhouse-gas emissions contribution to climate change. While costly for some producers, carbon prices are supposed to put the global economy on a higher and sustainable growth path, an effect that is widely ignored when performing partial analytics of carbon-pricing impacts. In that sense, the hope is that the EU CBAM contributes to incentivize the introduction of carbon-pricing policies outside of the EU.

Box Figure 5 might give a hint of the impact that a successful "export" of EU carbon pricing policies might have on the carbon intensity of traded goods. It shows the correlation between the OECD carbon-pricing score (the percentage of emissions in a country effectively exposed to a carbon price of EUR60) and the OECD emission intensity of exported goods (using their carbon footprint). Evaluated at the mean carbon pricing score of 36%, a 1% increase in the emissions that are effectively priced at EUR60 correlates to a reduction of the emission intensity by 2%. To put it in simple terms, the hope would be that, for instance, increasing the Non-OECD countries' average carbon pricing score of 11% to the sample's EU countries average of 44% would reduce the emission intensity of their exports by 66%[9]. Unfortunately, correlation does not necessarily equal causality in this case. The high carbon intensities of exports might at least partially be responsible for the low carbon pricing scores and forcing higher carbon prices on these countries might be much less effective than the correlation suggests.

5 See also Isabelle Rojon, Nicholas-Joseph Lazarou, Nishatabbas Rehmatulla, and Tristan Smith (2021). The impacts of carbon pricing on maritime transport costs and their implications for developing economies. Marine Policy, Volume 132.

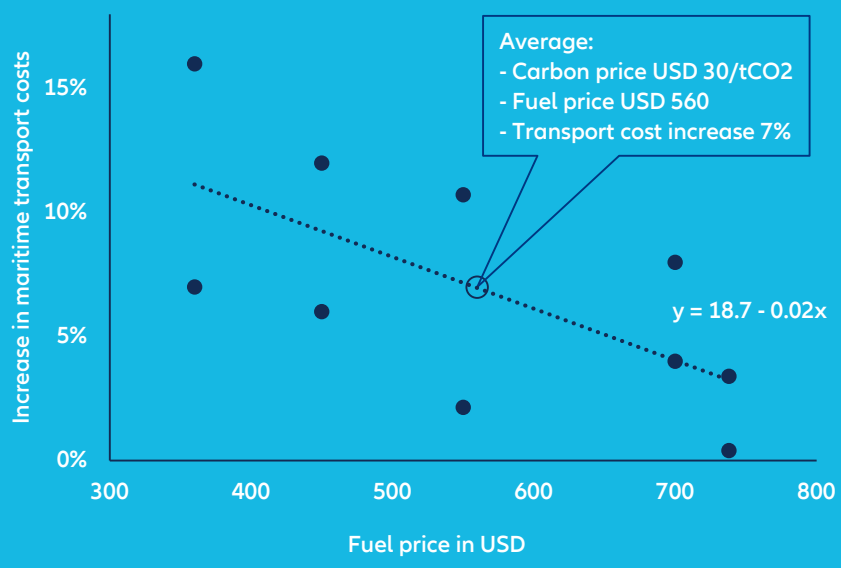
6 At 1.07USD/1EUR.

7 For a review on maritime own-price elasticities see Axel Merkel, Magnus Johansson, Samuel Lindgren, and Inge Vierth (2022). How (in) elastic is the demand for short-sea shipping? A review of elasticities and application of different models to Swedish freight flows. Transport Reviews, 42:4.

8 For more details on the EU CBAM see our previous publication https://www.allianz.com/content/dam/onemarketing/azcom/Allianz_com/economic-research/publications/specials/en/2023/october/2023_10_13_What-to-watch.pdf

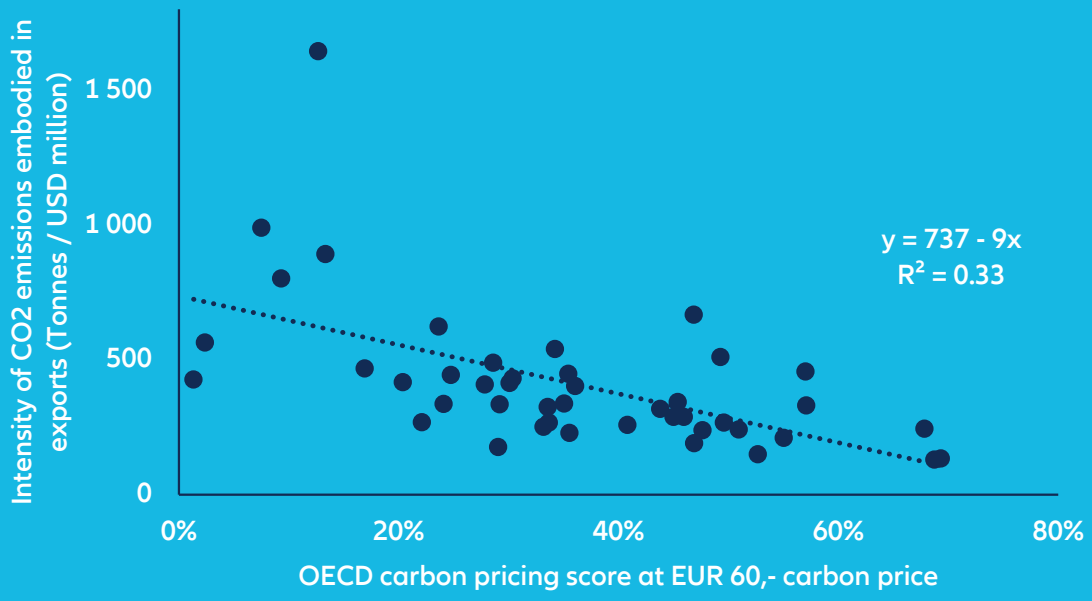
9 66% relates to applying the elasticity on the whole range, using the linear estimate shown in Box Figure 3 yields a reduction of 47%.

Box Figure 4: Literature review[10] of a USD 30 carbon price impact on maritime transport costs



Sources: Data from Rojon et al. (2021)[11], Allianz Research

Box Figure 5: Correlation of carbon pricing policies and CO2 intensity of exports for selected countries[12]



Sources: OECD, Allianz Research

10 From Rojon et al. (2021) we included: Faber, Rensma (2008), Kronbak, Yang, Chen (2009), Faber, Markowska, Eyring, Cionni, Selstad (2010), and Anger, Faber, Koopman, van Velzen, Long, Pollitt, Comberti, Barker, Fazekas, Blachowicz (2013).

11 Rojon, Nicholas-Joseph Lazarou, Nishatabbas Rehmatulla, and Tristan Smith (2021). The impacts of carbon pricing on maritime transport costs and their implications for developing economies. Marine Policy, Volume 132

12 Country list: Australia, Austria, Belgium, Canada, Chile, Colombia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Lithuania, Latvia, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Türkiye, United Kingdom, United States, Argentina, Brazil, China (People's Republic of), India, Indonesia, Russia, South Africa.

Next steps in greening trade: financing and policy recommendations

Coherent policy action is needed to reap the benefits of green trade. Leading economies should re-engage in promoting and facilitating green trade at the multilateral, plurilateral and regional level to help increase the supply of green technologies, lower the price of these technologies, boost the economy and be able to achieve net zero targets worldwide. Supportive policies and regulations that incentivize and promote green trade practices include:

- An agreement on the definition of green products among key international institutions and governments: specific plastics, biodiesel and petroleum oil are some of the controversial products that are included in the list of environmentally friendly products.
- Clear guidelines and standards for sustainable production and consumption, as well as financial incentives such as tax breaks for businesses engaged in green trade. Part of the excess savings should be directed into financing companies that produce a high share of green products. Taxation on adequate investment products should be reduced and an automatic spread-reduction for loans to companies implemented that addresses the greening of their products; and/or introduce "green loans" within the next Basel regulations for the banking sector.
- Increased investment in green technologies and infrastructure. This includes funding research and development of renewable energy sources, energy-efficient technologies and sustainable transportation systems.
- Trade agreements that include provisions encouraging the adoption of environmentally friendly practices and the reduction of carbon emissions. Custom duties for green products need to be reduced further or should even be made duty free so that they are affordable for consumers. A deep reform of WTO most-favoured nation tariffs would be needed.
- International cooperation and capacity building to facilitate the exchange of knowledge, best practices and technologies. It is important to establish partnerships that promote sustainable supply chains and ensure transparency in the sourcing of raw materials.
- Incentivizing consumers to buy green products through appropriate labelling (green scores) and public price subsidies. Increase consumer awareness and demand through education about the environmental impact of choices and providing them with information on sustainable products can influence their purchasing decisions.

By addressing these factors collectively, we can create an enabling environment for green trade to thrive globally. This will not only contribute to mitigating climate change but also foster economic development and improve the overall well-being of societies.

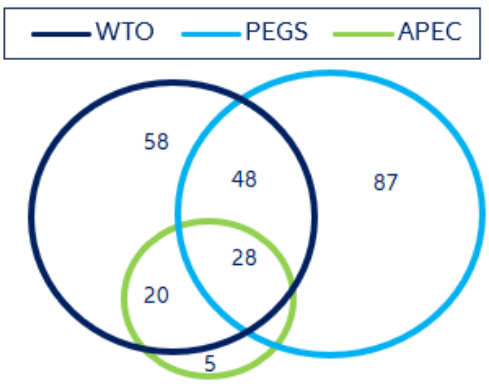
BOX: Trade finance needs to be inclusive and supportive before going fully green

Banks and financial institutions are increasingly incorporating environmental, social and governance (ESG) standards into their trade finance offerings. This is a positive trend as it underlines the increasing demand for such financial products. However, the implementation of stricter sustainability criteria could exacerbate the existing trade finance gap. This gap, which represents the difference between the demand and supply for trade finance, stands at a about USD5trn in the EU and roughly the same for US SMEs, according to our estimates.

Harsher ESG criteria could potentially limit further access to financing for companies, especially for SMEs, which already account for 40% of rejected trade finance requests. As a consequence, the challenge for financial institutions is to ensure that these products are also inclusive. Financial institutions should design trade finance products that consider firm, country and sector specificities rather than just "converting" existing products into sustainable versions.

- One option could be to have dynamic ESG criteria that incentivize suppliers to progress into sustainability over time.
- Adopting specific criteria to emerging markets could also be a relevant path. Current ESG requirements might not fit well to regions like Africa. Sustainability metrics have been designed in and for developed economies and it's essential to develop relevant metrics to measure the sustainability of trade in emerging markets.
- Financial institutions should provide support to firms so that they can achieve their transition and be included in green trade finance.

Appendix: Green goods classifications, number of product lines at the HS 6-digit level



Sources: UNCTAD, Allianz Research. Note: WTO is the definition by the World Trade Organization, PEGS is the definition by the OECD for plurilateral environmental goods and services and APEC stands for the list of environmental goods from the Asia-Pacific economic cooperation.

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