GLOBAL MARKETS ANALYSIS
Monetary and Capital Markets

THE EU'S CARBON BORDER ADJUSTMENT MECHANISM AND THE POTENTIAL GAPS IN CARBON PRICES

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SUMMARY

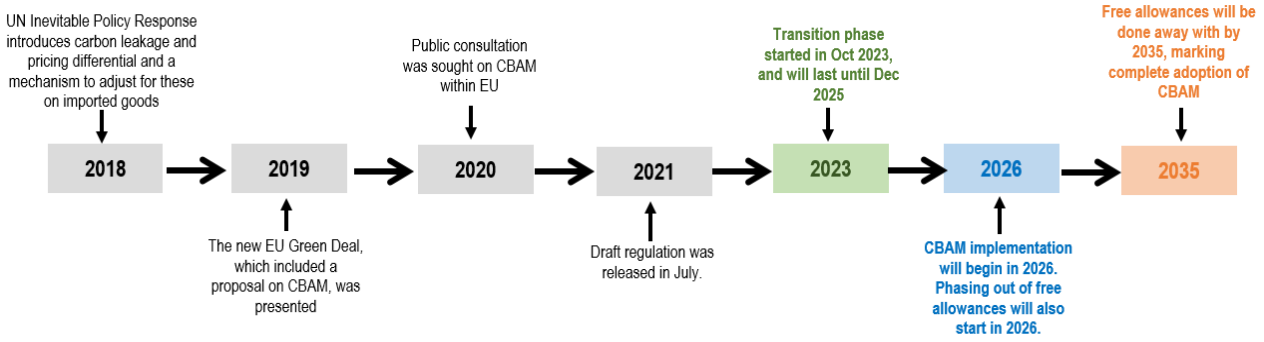
- **The EU's Carbon Border Adjustment Mechanism (CBAM) is a first-of-its-kind levy on a set of imported products that bear significant carbon leakage risk.**[1] CBAM, which is a part of the EU's *Fit for 55 package— a set of proposals aiming to reduce the net greenhouse gas emission at least 55% by 2030,* came into effect on October 1, 2023. It aims to put a fair price on carbon emitted during the production of goods entering the European Union (EU), thus ensuring a level playing field between European and non-European producers. This first stage, the transitional phase, entails data collection and reporting, and will go on until December 31, 2025.
- **CBAM will be phased in for a set of products, also called the in-scope products, as the free allocations currently given to these products under the current Emission Trading System (ETS)**[2] **are phased out**. In its current form, CBAM includes 6 product categories, which are the most carbon-intensive goods, namely, aluminum, steel, cement, fertilizers, hydrogen and electricity, also called "in-scope products." These products represent around 50% of the emissions covered under the EU ETS. During the transition period, European importers of these in-scope goods must report greenhouse gas emissions embedded in their imports. Given the phased implementation of the regulation, the first levy under CBAM would start in 2026 and is expected to gain significant scale by 2030, when CBAM's coverage is forecasted to increase to 48.5% of the current freely allocated allowances. The free allocations will be completely phased out by 2034.
- **In this note, we estimate the potential impact of CBAM on the carbon price gap of a sample of in-scope products for the EU's key trade partners.**[3] Assuming a smooth rollout, we explore the role of four key factors that are vital in the estimation of the carbon price differential between the EU and its trade partners. These factors are (i) the net carbon price prevailing in each of the trade partners, which can be in the form of emission permit price, carbon tax or excise/duty on fuel; (ii) the carbon intensity[4] of a sample of products for each of the trade partners; (iii) the coverage of CBAM and free allocation within the EU; and (iv) carbon pricing policies under consideration in each of the trade partners. Quite intuitively, we find that the carbon price differential between the EU and its trading partners of in-scope products is mostly large and positive. As CBAM coverage increases over time, the levied carbon price differential on the imported goods would range between 0.2–20% of imported price of the product in 2030. Further, emission allowances that are complemented by a trading system have played a vital role in jurisdictions with the carbon price comparable to that of the EU. However, for an ETS to close the carbon price differential, it should be supported with a system of realistic emission caps and allocations.
- **Our estimations of the carbon price gaps are based on a set of assumptions,** which are likely impacting our estimates. Some of our assumptions are likely resulting in the underestimation of carbon price gaps, for example assuming, (i) the EU allowance price of Euro83/certificate until 2030; and (ii) an improvement in carbon intensities. On the other hand, assuming no improvement in the carbon price of countries with ETS in effect or pipeline, is a downside risk to our estimates.

[1] Carbon leakage occurs when the production of certain goods is moved out of a country to benefit from lower costs due to easier climate policies or when EU products get replaced by more carbon-intensive imports.
[2] https://www.consilium.europa.eu/en/infographics/fit-for-55-eu-emissions-trading-system/
[3] Top 10 exporters of in-scope products excluding Russia and Ukraine.
[4] Carbon intensity or carbon emission intensity is defined as CO2eq emissions from the production of one unit of a product like a ton of steel.

This Monitor was prepared by Deepali Gautam and Esti Kemp.

After years of deliberations, CBAM, an EU carbon border levy, was phased in Oct 2023

Figure 1. CBAM—historical developments and implementation timeline



Source: IMF staff

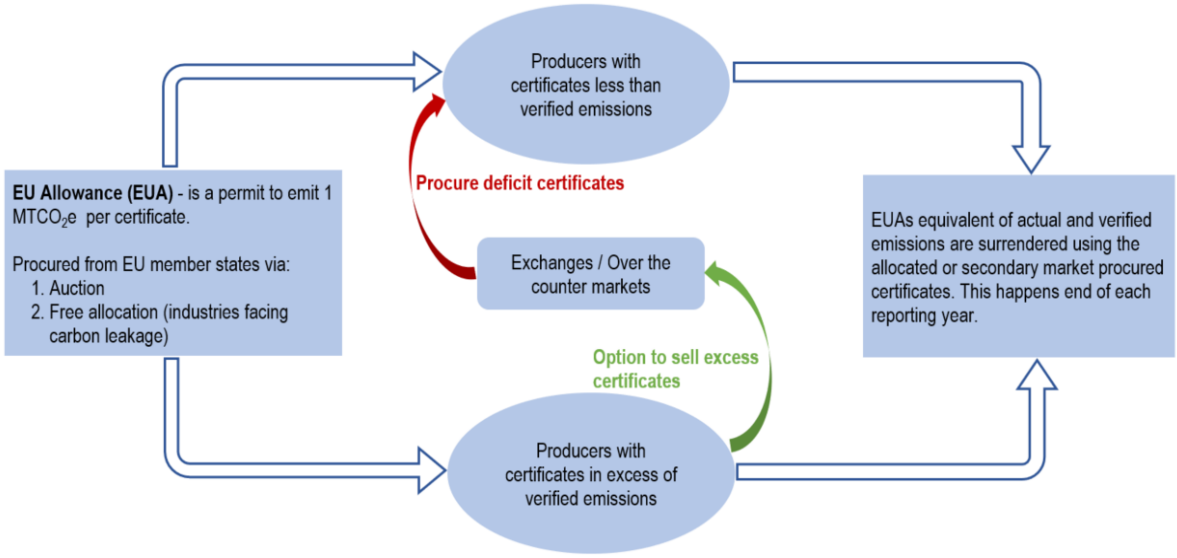
- **The concept of a carbon border levy was first modeled in by UN's Principals for Responsible Investments in Inevitable Policy Response report.** This gained traction within the EU policy circles by 2019 as criticism emerged within the EU ETS policy regarding the allocation of free emission allowances[5] to industries susceptible to carbon leakage. It was argued that this system was failing to create incentive for producers to reduce carbon emissions.[6] Hence, CBAM was incorporated in the 2019 EU Green Deal,[7] which culminated into CBAM draft regulations being published in 2021.
- **The EU's CBAM aims at replacing the system of free allocation to carbon leakage-sensitive industries in a phased manner, between 2026 and 2035.** By the end of this period a new system of reporting emissions, and acquiring allowances that is uniform for both domestic producers and importers, will be adopted. Under the current EU ETS, which was launched in 2005, carbon leakage- sensitive industries are allocated free allowances for emissions, while capping the annual amount of emission that companies may emit. Over time, the cap will gradually be reduced, and the free allocations of allowances will be phased out for industries covered by the CBAM. By 2035, importers and domestic producers will have to acquire emission allowances through auctions done in the same marketplace, marking complete adoption of CBAM.

[5] Emission permits under the current ETS could either be acquired by auctions or allocated for free. In 2022, about 50% of all emission permits were allocated for free. However, the share of freely allocated allowances varies by industry/product.

[6] Some researchers argue, the free allocations created opportunities for firms to profit from the EU carbon market as they were able to pass on the "value of a freely obtained allowance" in the price of their product. "The Phantom of Leakage (June 2021)"— Carbon Market Watch, estimates these profits in the range of ~euro 50bn during 2008–19.

[7] EU Green Deal floats numerous policies that aim to make European Union climate neutral by 2050. The deal was proposed in Dec 2019 and approved by the European parliament in Jan 2020.

Figure 2. Functioning of the EU's cap-and-trade ETS



Source: IMF staff

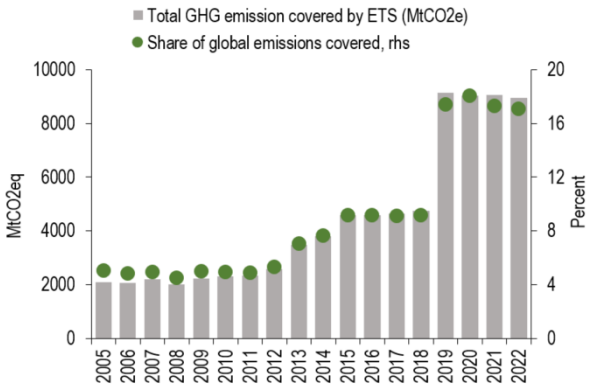
- **The implementation of CBAM is set to be carried out in the following three stages:**
    1. Transition stage— A data collection stage that takes place between October 1, 2023, and the end of 2025, during which time importers will report emissions on "in-scope goods" quarterly and specify any carbon price effectively paid in the country of origin. In addition, by the end of 2024, the importers of in-scope goods[8] must acquire the status of "authorized CBAM declarant."
    2. Phased implementation stage— Carbon import price will accrue in January 2025. Hence, importers of "in-scope" goods must purchase and surrender CBAM certificates at a price discovered in the EU ETS market. The authorized CBAM declarants will make the first payment in 2026. Hence, this stage is expected to take place between 2026–2033. During this time, the free allocation of allowances to domestic producers of in-scope goods will be phased out.
    3. Full implementation stage— set to start in 2034, marking a complete shift to CBAM to determine allowances requirements[9], which will be complemented by EU ETS for allowance price discovery.
- The European Commission has indicated that changes/improvements could be made based on the experience during the transitional or first stage.
- Other major goods importing countries like US and UK are also evaluating a mechanism to adjust carbon price on imports.

[8] Currently the in-scope products include steel, cement, aluminum, electricity, hydrogen, and fertilizers.
[9] Emission allowance represents $1TCO_2e$ (metric ton) emission.

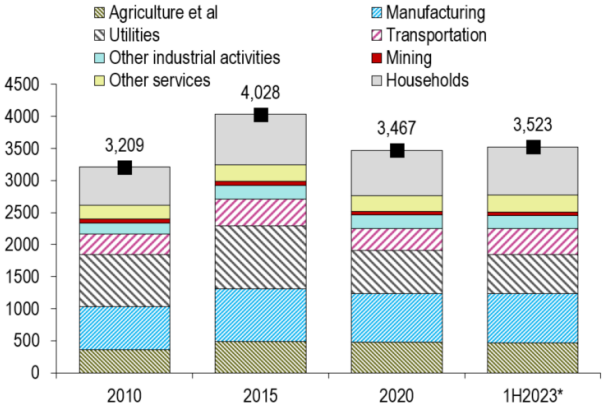
On a global scale, less than a fifth of global Green House Gas (GHG) emissions are covered under ETS.

In comparison, the EU ETS covers a much higher portion, 45%, of the region's total emissions.

3. Emission covered ETS
(MtCO2e, percent)



4. EU Emission by economic activity (pattern filled blocks covered by the EU ETS)
(MtCO2e, percent)



Note: In Figure 4, patterned filled blocks represent activities completely or partially covered under EU ETS. Also, the 1H2023 data are annualized for comparison over time.
Sources: S&P Global, European Commission, ICAP, Eurostat, and IMF staff calculations.

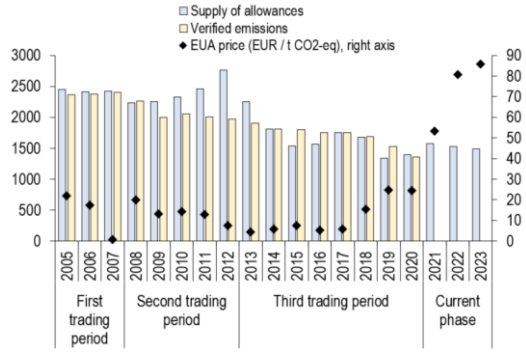
- The share of Greenhouse Gas (GHG) emissions covered under global ETS more than doubled from 7% to 17% between 2005 and 2022. However, this has been primarily driven by China and the EU, as most other major emitters have not yet adopted an explicit carbon pricing system.
- China's share of global emissions covered by ETS amounts to 10ppts, given that China accounts for ~30% of global GHG emissions and has carbon pricing mechanisms covering a 1/3rd of these emissions.
- The EU's share of global emissions covered by ETS amounts to ~3ppts, given that the EU's emission under ETS coverage accounts for only ~6% of global emissions, with roughly 45% of the region's total emissions covered by ETS.
- The EU launched the world's first ETS in 2005, which now covers major sectors like electricity & heat generation, industrials (refineries, steel, metals, cement, etc.), along with EEA aviation, and maritime transport.
- The scope of the EU ETS is limited to regional emissions, while global trade integration has started shifting production and associated emissions, out of the EU.[10]
- On top of that, the adoption of the EU ETS in 2005 levies a carbon price on domestic producers, which, in absence of free allocation of allowances, could have created incentives for production to move to countries with looser climate regulations. A phenomenon termed as carbon leakage.
- As pointed out earlier, CBAM aims to replace the set up of free allocation of emission allowances that are currently used to address such carbon leakage. Upon complete adoption, CBAM certificates would be available at the same price as allowances in the EU ETS market, thereby addressing the potential issue of carbon leakage while internalizing the cost of emissions at the importers' end.

[10] Goods imported into the Euro area have increased from 11.2% of GDP in 2000 to 22.5% in 2022.

- While estimating carbon leakage in the absence of free allocations can be difficult in practice, the share of free allocations in total permits issued in the EU could serve as a useful proxy. Between phases 1 – 3 of the EU's ETS, 78.5% of allowances were allocated free, which has declined to 50% in 2022.

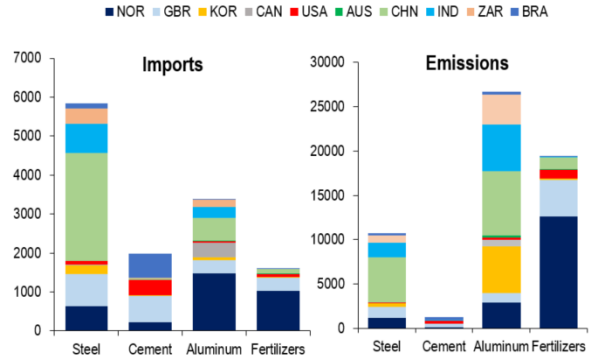
Price discovery in the EU ETS has improved since its inception in 2005 and will play a critical role in pricing carbon leakage.

5. Emissions, allowances, and their impact on auction price
(MtCO2e, Euro/MtCO2e)



CBAM's scope is smaller than that of the EU ETS, and the in-scope products account for 50% of emissions covered by its ETS.

6. CBAM in-scope products imports and corresponding emissions estimates, by the largest trading partners and products
(Mt, MtCO2e)



Note: Figure 6 is based on 2021 trade data. The emissions estimates are arrived at using product level carbon intensities by country.
Sources: European Environment Agency, UN Comtrade, and country authorities.

- Efficient price discovery in the EU ETS is paramount as under CBAM, importers in the EU would be liable to acquire allowances against emissions from the imported goods at prices discovered in domestic markets, i.e., the EU ETS.
- The first three phases of the EU's ETS had been marked with surplus allocations, which in some years resulted in poor price discovery.
- In the current phase, however, price discovery has improved substantially, as the average traded price of permits in 2023 has been Euro 82.3/tCO_2e, which is estimated to rise to Euro 100/ tCO_2e by 2025.[11]

- Currently, the CBAM is applicable only to a subset of products included in the EU ETS. The in-scope CBAM products include electricity, aluminum, steel, cement, and fertilizers, which account for 50% of emissions covered by the EU ETS.
- Here on, we analyze the potential gap in carbon pricing that would open due to CBAM implementation at the levels of products and trade partner countries and products, albeit with some assumptions.
- Among the top trade partners, Russia and Ukraine together account for 19% of EU imports of the in-scope products. However, they have been excluded from the discussion as neither country has a carbon market, plus, the ongoing war makes any developments on that front uncertain.
- Norway, the UK, the USA, Canada, Korea, Australia, China, India, Brazil, and South Africa, which are the next 10 largest trading partners across the in-scope products, are considered for our assessment.
- In terms of the products coverage, we have excluded electricity and fertilizer from our discussion.[12]

[11] S&P global research.
[12] Most electricity is imported from within the region, while standardized emission intensities of fertilizer production at the country level could not be found.

Table 1. Different carbon pricing instruments across countries with significant exports of commodities under CBAM to the EU

Country	Emission allowance	Carbon tax	Fuel excise	Fossil fuel subsidy	System in place	Policy discussion underway/ announcements on ETS	Average Net ECR, 2021 (Eur/ton CO2 eq)
Australia	✗	✗	✓	✓	Australian government issues carbon credit units (ACCU) for voluntary reduction/capture of carbon, i.e. 1 ACCU for reduction/capture of 1 ton CO2eq. The instrument was traded at $[20]/tco2e	Establisment of trading platform for ACUU is currently underway, and expected to go live in 1H2024	13.38
Brazil	✗	✗	✓	✓		Legislation to set up a cap-and-trade system is currently under consideration since Spet. 2023	5.9
Canada	✓	✓	✓	✗	A federal system is in place which sets the minimum price for permits, CAD50/tco2e for 2022, however states also have their own system in place.		36.79
China	✓	✗	✓	✓	ETS covers a third of total emissions and traded at $8.4/ton with average daily volume of 33,500 in 2023.		5.67
India	✗	✗	✓	✓	Trading certificates in above-target energy savings for entities in 13 sectors. The implied price is $2.5/ton CO2eq*	Process underway to fix carbon emission intensity benchmarks and reduction targets for three years for companies in petrochemicals, iron and steel, cement and pulp and paper. Mandates to be applicable in 2024-26 and trading to start in 2025-26.	12.99
Korea	✓	✗	✓	✓	ETS covers about 3/4thof total emissions and traded at $8/ton in 2023. While fuel excise tax exists, it has been continuously reduced since Nov 2021 citing pandemic relief or recently high inflation.		41.54
Norway	✓	✓	✓	✗	EU ETS, and Carbon tax on xx sectors cover over 80% of the country's emission.		93.53
South Africa	✗	✓	✓	✗	Emission taxed at approx. $8.7/ton of CO2eq		17.24
United Kingdom	✓	✓	✓	✗	The average price of carbon permit in 2023 was Euro 62/tCO2eq.	A mechanism to adjust carbon price of imported goods is currently under consideration.	87.52
United States	✗	✗	✓	✓	ETS exist at state level like in California, Massachusets and Washington. The average trading price in 2023 for carbon credits traded in California ETS was Euro 29, while the average settlement price in auction held by Washington state was Euro 48 in Dec 2023.	A mechanism to adjust carbon price of imported goods is currently in discussion.	12.11

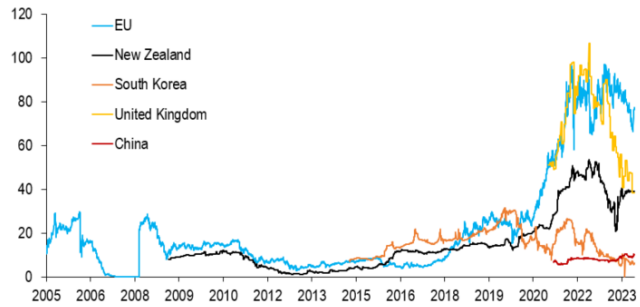
Note: Net ECR is net effective carbon rate and is estimated by OECD. India's current carbon credits trading price is as of March 2023.
Sources: Australia's Clean Energy Regulator, Environment and Climate Change Canada, International Carbon Action Partnership, S&P Global; Statista, OECD; and Bloomberg.

- Carbon pricing can be in the form of a levy paid for carbon emissions or fuel consumption or just the direct emission certificates/allowances.
- In our sample of top trade partners of the EU, carbon pricing is below the EU allowance price of Euro 82.3/tCO2eq, the average for YTD 2023 in all countries, with the exception of Norway.
- For countries that have lower yet carbon price comparable to that of the EU have also adopted carbon allowances and an ETS. Cases in point being UK, Korea, and Canada. Further, in countries that have adopted forms of carbon pricing other than allowances, namely carbon tax and fuel excise, like in South Africa, carbon price on a per tonCO_2eq basis is small.
- In other jurisdictions that have some system of carbon trading, price discovery has been poor. For example, allowances in China (mandated)[13] and India (voluntary) trades at around $8.4/tCO2eq, and $2.5/ tCO2eq, respectively. In India, this is a direct result of the absence of a mandate. In China, on the other hand, the mandate has little impact in absence of a limit on a number of free allocations. As a result, China's ETS market dulled[14] soon after its relaunch in July 2021.

[13] In China, where the ETS covers 1/3 of all emissions by law.
[14] On the inaugural day of China's new cap-and-trade ETS, i.e., July 16th 2021, the volume of carbon allowance traded was 4.1 mn. which dwindled to 260,000 contracts for the rest of 2021. The average prices for the year were also ~9% lower than on July 16th, 2021.

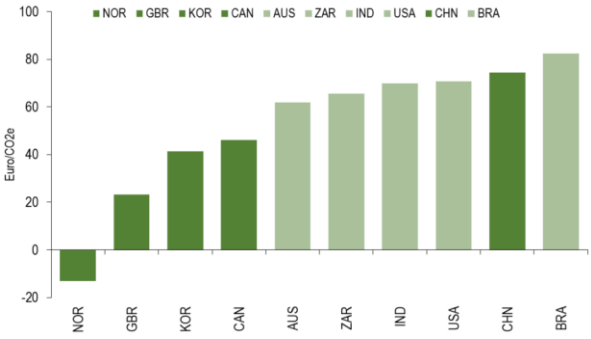
Prices of emission permits have shown sensitivity to market perception of policy priorities.

7. Price of emission permits across jurisdictions
(Prices in Euros/unit)



Most large exporters have positive and large gaps in carbon pricing relative to the EU, despite having an ETS in place in some cases.

8. Carbon pricing gaps vis-à-vis EU allowance prices
(Euros/tCO_2e)



Note: In figure 8, the carbon price gaps are estimated based on each country's average net effective carbon rate (ECR) in OECD's "Pricing Greenhouse Gas Emissions (2022)," and the EU ETS allowance price of Euro 82.8/tCO_2e, 2023 average traded price. The darker bars represent countries with an ETS.
Sources: UN COMTRADE; Bloomberg; International Carbon Action Partnership; and IMF staff calculations.

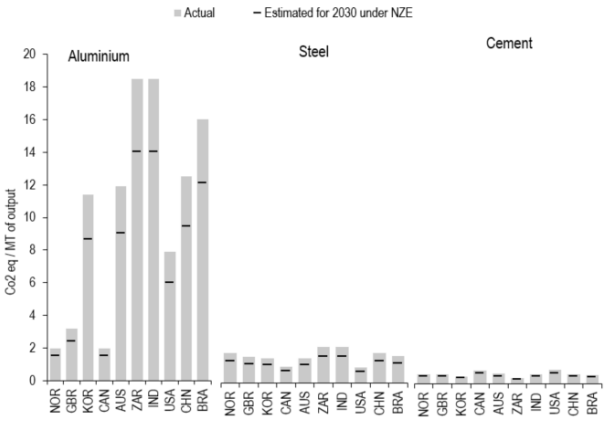
- The traded price of carbon allowances is affected by factors beyond the emission caps and free allocation of allowances in the system.
- For example, in February 2022, as an immediate aftermath of Russia's war against Ukraine, the carbon permit price in the EU ETS fell about 40% in a week, while natural gas prices rose on concerns over supply shortages. However, despite turbulences, the carbon price in the EU has averaged at around Euro 85/unit, which is higher than that in most other jurisdictions.
- Korea has been announcing cuts in fuel excise duties since November 2021 to manage inflationary pressures and assist in recovery from the pandemic recession. This affected the sentiments for carbon allowance prices, which fell ~60% in H1 2022.
- In late July 2023, the UK government announced an issuance of 53.5 million of additional allowances—about half a year's worth of UK emissions covered by the scheme—between 2024 and 2027. Since then, the allowance prices have fallen by about 30% and are currently trading in the range of Euro 50.
- Currently, the carbon pricing differential between the EU and the exporting countries is large, ranging between Euro 23-82/tCO2eq.[15] However, the implications of any nominal carbon price gap on an exporting partner would be determined by its proportion relative to the value of the exported product.
- By that measure, the carbon price gap across the in-scope products considered is meaningful when measured as a percentage of the total value of imports for South Africa, India, Australia, and Brazil (at 25.5%, 19%, 19.1%, and 9.7%, respectively).[16] Other countries in the sample have a differential of 1.5-4% of import value, while that of China is 7.7%.
- These carbon price gaps can be addressed from the exporting countries' side by adopting processes to reduce carbon intensities and/or adopting an ETS like cap-and-trade, which spells out sectoral coverage, emission limits, and a market for trading of carbon permits so issued.
- On the EU's side, the free allocations given out during the CBAM implementation course would play a pivotal role in defining the size of carbon price gaps.

[15] Based on the sample of 10 major countries shown in Figure 6. Each allowance represents emissions of 1 ton of CO_2e.
[16] This is based on the volume weighted average of the FOB value of imports of aluminum, steel, and cement of the respective countries in 2022.

Carbon intensities affect the carbon cost per unit of output and have room to improve…

9. Carbon intensities by product—current and projected

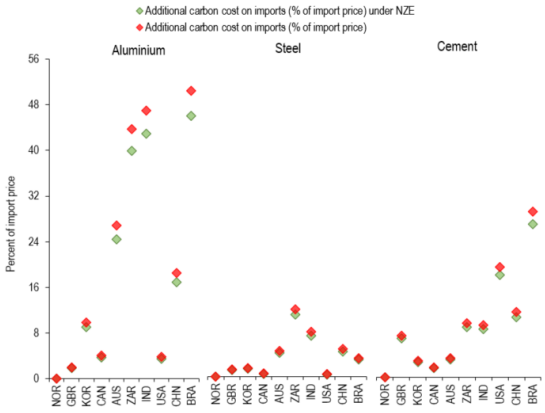
(CO_2eq/Mt of output)



.. however, their role in closing the carbon price differential gap is likely to be small.

10. Carbon emission cost by product, percent of import prices

(Percent of import price)



Note: The carbon intensities shown in figure 9 include indirect emissions. In panel 2, the import prices are calculated using FOB value and the quantity of imports of each product as reported by UN's COMTRADE database. The additional carbon cost of imports under NZE is estimated using the same import prices.

Sources: Industry reports; International Energy Agency; UN COMTRADE; and IMF staff calculations.

- The in-scopegoods of the CBAM have varying degrees of carbon intensity both at the product and country level.
- Aluminum, for one, has the highest carbon intensity, but it varies across countries.[17] The carbon intensity of aluminum production processes in India, South Africa, China, Australia and Korea ranges between 11-19 tCO2eq/ton of output, which is multiple times that of processes in Norway, the UK, and Canada. Cement and steel, however, have much lower carbon intensities, with their distribution also varied at the country level.
- A wide range of industry level reports indicate efforts underway to improve the carbon intensities of the production processes of these products at the country level. However, country and industry level targets are difficult to obtain. Hence we rely on projections from the International Energy Agency for carbon intensities in 2030 under its Net Zero Emission (NZE) by 2050 scenario.
- Under the NZE by 2050 scenario, carbon intensity across aluminum, cement and steel production processes are modeled to be reduced by 22–26% by 2030. We assume this relative change in carbon intensity for each industry to be uniform across countries.
- To estimate the impact of lower carbon intensities on carbon price gaps relative to import value across countries and products, we make two assumptions (i) the carbon price differential in the EU and the exporting countries remain at the same level, i.e. the initial carbon price gaps as shown in Figure 6, and (ii) the improvement in carbon intensities[18] as estimated for 2030 under the NZE by 2050 scenario are realized (Figure 7).
- We find that process improvements that lower carbon intensity generally only result in a marginal reduction in carbon price gaps, except in some unique cases where the carbon price gap is large. In these cases the product's carbon intensity reduces significantly. For example, for Aluminum produced in Brazil, India, and South Africa, we estimate the carbon price gap as a percent of import value to reduce by 4.4pp, 4.1pp and 3.8pp, respectively.
- Post process improvements, the ex-Norway[19] cross-country average carbon price gap relative to import value is estimated to decline by 2.0, 0.8 and 0.3 ppts to 21%, 9.5%, and 3.6% for Aluminum, Cement, and Steel, respectively.

[17] Carbon intensity for a product's process can vary because of multiple factors, like the type of process, the mix of electricity used, the measurement of emission to name a few. Also, between countries, the stage of the process is also critical.

[18] Reduction in carbon intensity and improvement in carbon intensities can be used interchangeably.

[19] Norway's carbon price gap is negative, implying a higher carbon price than in the EU.

The impact of CBAM in first couple of years its implementation phase will be nominal and will start building up rapidly from 2029 as free allocations get phased out at a faster pace.

Table 2. Timeline for Phasing out Free Allocations

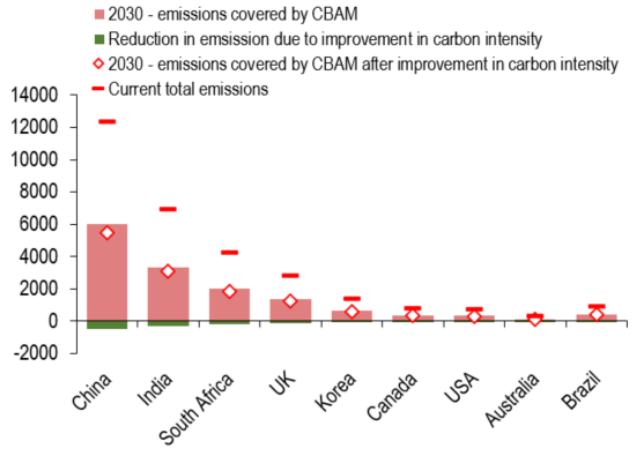
	2026	2027	2028	2029	2030	2031	2032	2033	2034
CBAM (%)	2.5	5	10	22.5	48.5	61	73.5	86	100
Free allowances (%)	97.5	95	90	77.5	51.5	39	26.5	14	0

Sources: The European Commission

- As discussed earlier, the EU's current ETS allocates free allowances to domestic industries that are identified as susceptible to carbon leakage. Free allowance will eventually be phased out and importers will pay the same carbon price on in-scope goods as domestic producers.
- Importers that do not have proof of an equivalent carbon price paid in the country of origin will have to acquire the balance in the EU market through auction and surrender on an annual basis.
- In 2026, only 2.5% of free allocations will be phased out, i.e. auctioned, while the other 97.5% of free allowances remain in place. This implies that only the corresponding share of imported in-scope products will be required to match the EU carbon pricing, which would be nominal on an aggregated level in the early years.[20]
- Hence, while the impact of CBAM on exporting countries' revenue will grow exponentially from 2029 onwards, the impact during the initial years will be minimal. In a sense, the initial years will serve as a warm-up phase for trading partners.

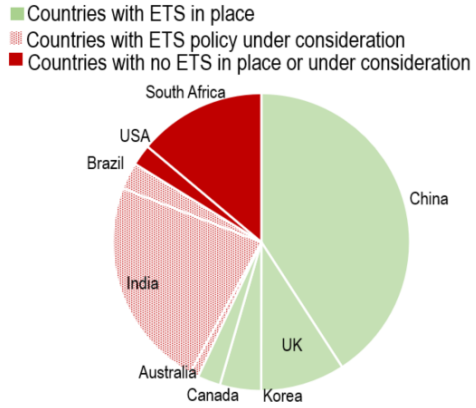
By 2030, the impact on exporting countries will be meaningful

11. CBAM covered emissions—by country
(MTCO$_2$eq)



From the major trade partners of the EU, India and Brazil are considering ETS implementation

12. Emissions from in-scope imported goods—country share



Note: In figure 11, the series "Current total emissions" refers to country level emissions from production of aluminum, cement and steel imported into the EU in 2022. The series "2030" refers to the part of these emissions covered by CBAM in 2030, and the series "2030 after improvement in carbon intensity" is effectively the series "2030" adjusted for reduction in emissions due to carbon intensities by 2030 under NZE by 2050. In Figure 12, the country level share is based on emissions from import of aluminum, steel and cement in 2022.

Sources: International Energy Agency; UN Comtrade database; and IMF staff calculations.

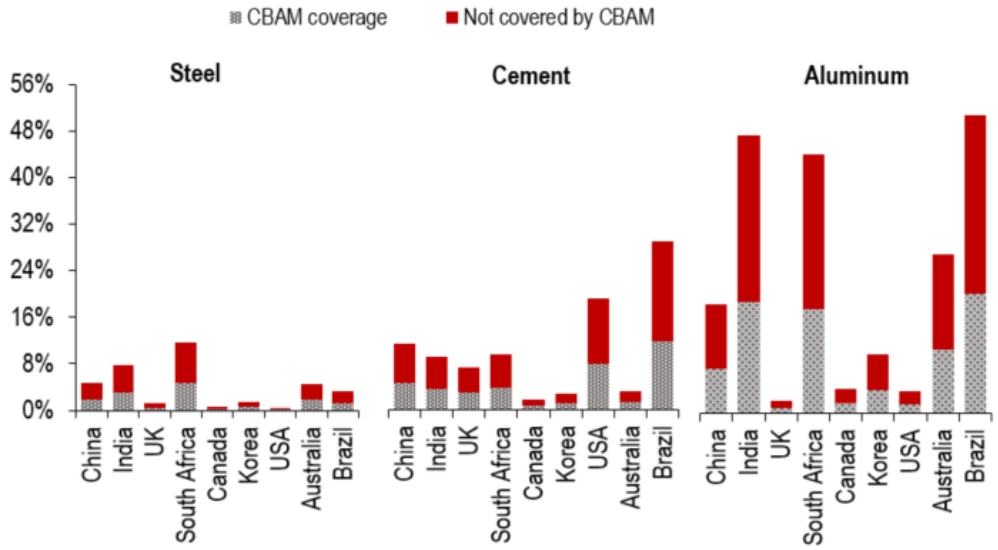
- By 2030, the coverage of CBAM is expected to expand to 48.5% of free allowance allocations. Factoring in the reduction in carbon intensity, CBAM will apply on ~45% of current emission volume from imported in-scope goods and will have to match the EU allowance price either domestically or in the EU ETS market.
- Two major trade partners, namely India and Brazil, have an ETS policy in the pipeline with a target implementation by 2030. This could increase the share of emissions covered by ETS from 57% in 2022 to potentially 83% in 2030.

[20] A standalone increase of 1.3%, 1.2%, and 1.1% of average aluminum import prices for Brazil, India & South Africa in 2022.

- Hence, it is important to review the ETS policy pipelines of the trade partners.
- However, as noted above, the price discovery of carbon credits is highly susceptible to the number of free allocations. Hence, it is difficult to estimate a carbon price in these jurisdictions. Therefore, we identify this eventuality as a potential downside risk to our estimates of carbon price gaps, but omit it from our calculations.

After incorporating all three factors, i.e., process improvements, free allocations within the EU, and carbon pricing mechanism in place or in the pipeline, the gap in carbon prices with the EU is large for most countries and products.

13. Estimated overall gap in carbon price in 2030 – by product and country



Sources: International Energy Agency; UN Comtrade database; and IMF staff calculations

- As seen in Figure 11, which shows the carbon price gaps with the EU at country and product levels, the range of the CBAM covered carbon price gap would be 0.2%-20% by 2030.
- However, this estimate is heavily influenced by several factors, including the design of the CBAM by 2030, the carbon pricing policy of trade partners, and the price of ETS in the EU. Nevertheless, we would like to emphasize that the CBAM could create the environment for carbon pricing policies in trade partners.
- In addition, the carbon price gap is estimated, assuming the EU allowance price of Euro82.8/unit, which many industry experts expect to increase to Euro100/mtCO2e by as early as 2025[21]. If that were to materialize, the carbon price gap estimates would increase proportionately.

[21] "Carbon Pricing, In Various Forms, Is Likely To Spread In The Move To Net Zero" S&P Global.