Carbon pricing trends in Asia

The impact of emissions trading schemes and the EU's Carbon Border Adjustment Mechanism in five key Asian countries

CARBON MARKET WATCH

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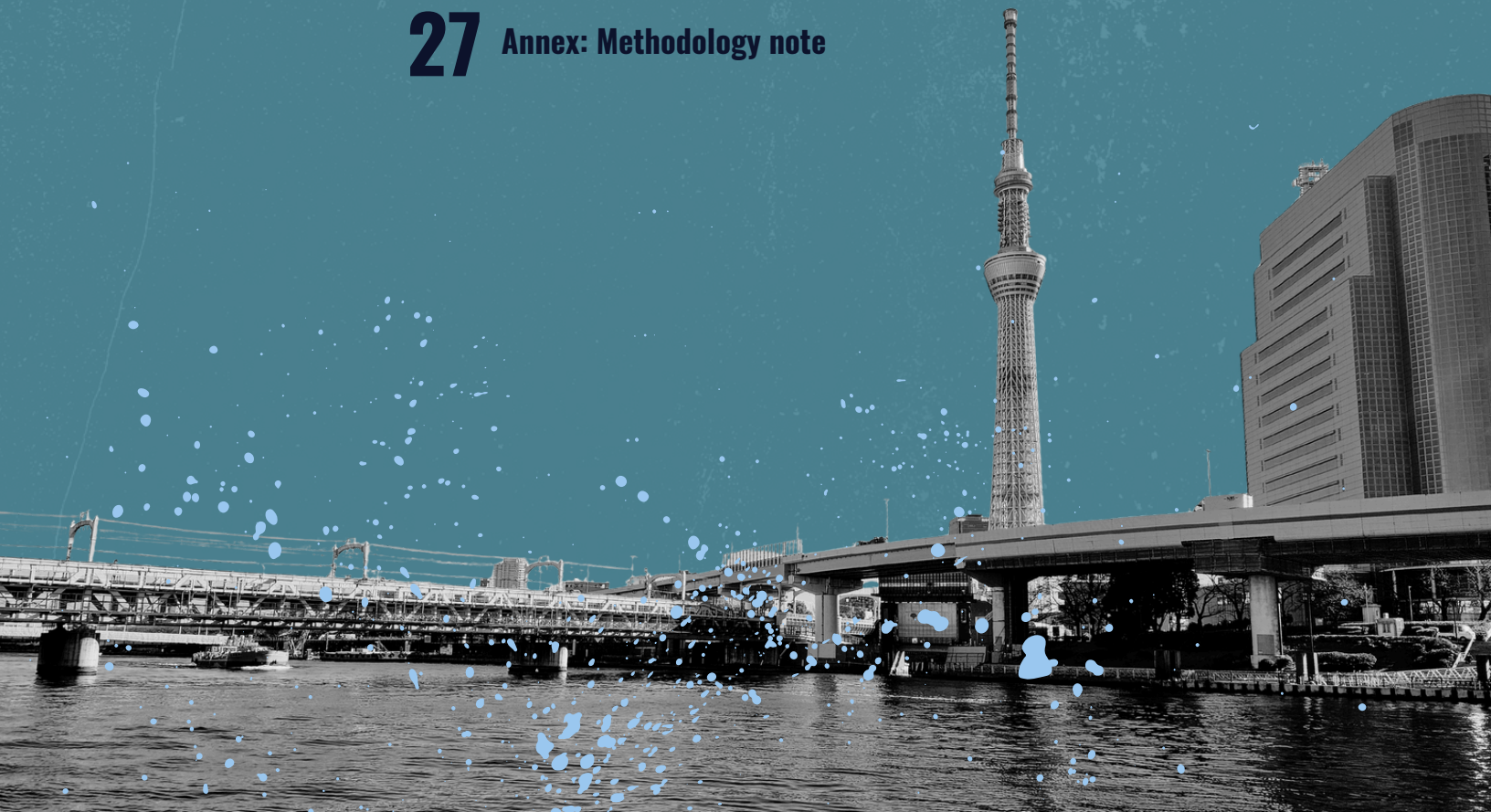


Executive summary

Asian economies are accelerating the development of carbon pricing systems as a central tool to drive decarbonisation. With the region responsible for around half of global emissions, these frameworks will be decisive for global climate action. Carbon pricing is advancing unevenly across the region. Japan and South Korea already operate large-scale systems covering, respectively, 60% and 79% of national emissions, while Vietnam, Indonesia, and the Philippines are still in the early stages of designing and piloting carbon-pricing instruments.

This also comes at a time when the EU's Carbon Border Adjustment Mechanism (CBAM) starts entering into force, and exports to the EU in sectors such as cement, steel, iron, aluminium, fertilisers, electricity and hydrogen will gradually face a carbon cost. Under the CBAM regulation, importers can claim a reduction in the number of CBAM certificates they have to surrender in order to account for a carbon price "effectively paid" in the country of origin. From a national economic perspective, it is far preferable to impose carbon costs internally, where the revenue can be reinvested in domestic decarbonisation, rather than paying a levy at the EU border.

This report examines potential CBAM costs for Japan, South Korea, Vietnam, Indonesia, and the Philippines, based on their trade exposure, production outlooks, and progress toward implementing a domestic carbon price signal.

While the CBAM is often seen as a major threat to Asian exporters, this report shows that its overall impact remains limited and decreases with the implementation of an effective domestic carbon pricing system. CBAM-covered goods always represent only a small share of total exports, which limits its impact. Even in the most exposed cases, estimated CBAM fees remain in the order of hundreds of millions of dollars, not billions.

Sandbag modelling suggests that Japan and South Korea feature as countries that will pay among the highest EU CBAM fees, and in a full pricing scenario (from 2034 onwards) this results in only $619 million from South Korean products (for a sense of proportion, this is

just 1.74% of the value of their traded goods), $291 million from Japanese products (0.96% of the value of their traded goods).

More importantly, these costs can be significantly reduced. Stronger domestic carbon pricing and cleaner production directly lower CBAM payments. This makes effective carbon pricing a strategic opportunity to deliver emission reductions while investing in green competitive production.

For Asian economies to reap the benefits of solid trade relations, to strengthen their climate policies, clean production processes, and ultimately the decarbonisation of their economies, they should prioritise:

- Setting a clear, declining cap on emissions in line with the country's climate goal to guarantee a climate outcome and give long-term visibility to (public and private) stakeholders

- Phasing out of offsetting and focusing instead on direct emissions reductions

- Shifting from free allocation to auctioning to create a real price signal and generate revenue to reinvest in climate action and support for communities affected by climate change

- Targeting support to top-performing producers and to low-carbon technologies investments

Introduction

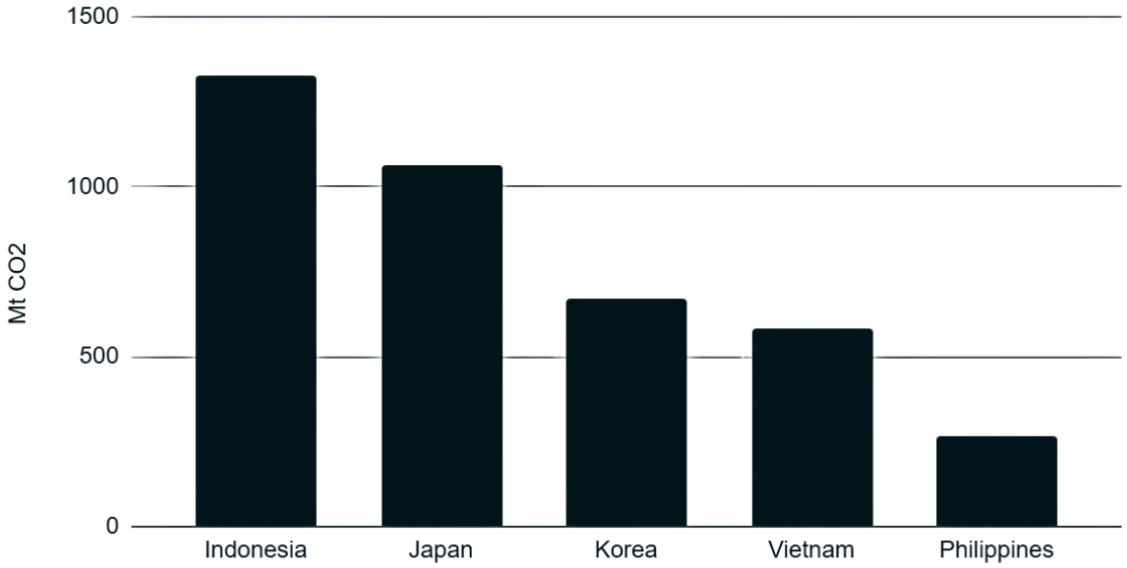
Around half of the world's emissions come from the Asia-Pacific region, which also accounts for half of global power demand. Decarbonisation is a global issue, and key Asian economies are accelerating their efforts to slash emissions. Among several pieces of legislation, programmes and policies, carbon pricing frameworks are taking the center stage.

Carbon pricing mechanisms across Asia reflect the region's economic diversity and differing climate policy ambitions, with marked contrasts between East Asian economies and more dynamic, emerging Southeast Asian markets. In East Asia, South Korea already boasts one of the most advanced emissions trading systems (ETS) in the world, and Japan is implementing a sophisticated carbon pricing framework building on the existing experiences of the local cap-and-trade programmes (Tokyo and Saitama) and evolving carbon tax. These ETSs allow their respective economies to align with their industrial decarbonisation strategies and net-zero commitments laid out in the nationally determined contributions (NDCs) to the Paris Agreement.

In contrast, other Southeast Asian countries, such as Indonesia, the Philippines, and Vietnam are still in the early stages of designing and piloting carbon pricing instruments. This group needs to balance developmental priorities, energy security concerns, and institutional capacity constraints. These countries are also heavily influenced by the extensive presence of carbon crediting projects, which end up featuring prominently in the proposed ETSs.

These variations underscore how economic structure, fossil energy dependency, and reliance on exports shape the pace and form of carbon pricing across the region, with East Asian economies generally further ahead in operationalising market-based CO_2 emission reduction tools than their Southeast Asian counterparts.

2024 GHG emissions for the 5 countries considered



Source: EDGAR& IEA, 2025

Carbon pricing vs carbon crediting

Carbon pricing through taxes or ETSs must be clearly distinguished from carbon crediting schemes, including voluntary carbon markets and Article 6 of the Paris Agreement. Carbon crediting systems do not directly price emissions but serve as a means, in principle if not always in practice, to fund different types of climate action. However, carbon credits have weak track records of delivering real and permanent emission reductions as numerous academic studies and Carbon Market Watch have shown.

Carbon credit markets also suffer from opaque financial flows and unequal distributions of power, as well as inadequate benefit sharing and grievance mechanisms. This is a real problem, since carbon credits are typically used by companies or countries to "compensate" for their emissions through so-called offsetting. In practice, offsetting undermines climate ambition: heavy polluters can avoid costly internal decarbonisation while presenting themselves as climate leaders, using carbon credits as a greenwashing tool.

Country focus

Overview

This analysis zooms in on five key Asian economies, taking two examples from Eastern Asia (Japan and Korea), which are major exporters to the EU, and three examples from Southeast Asia (Indonesia, Vietnam and the Philippines), where carbon markets and carbon crediting systems are becoming a major climate regulatory tool.
The first part of each country's analysis investigates the status quo of carbon markets, focusing on centralised compliance mechanisms (ETSs), including sectors covered, auctioning share, and reliance on carbon removals and offsets.

The second part will dig deeper into the expected effects of the EU's Carbon Border Adjustment Mechanism on each economy, outlining different scenarios of EU CBAM scope, and deriving financial implications at current carbon price levels and hypothetical 2035 carbon price levels in the selected countries. The assumptions are made based on current trade volume levels, full CBAM pricing, and a CBAM certificate price of approximately €80. A methodology note by Sandbag can be found in Annex I.

Japan

• Green Transformation Policy (GX) ETS

Building on existing local cap-and-trade programmes, Japan launched the voluntary phase of its national GX ETS in 2024. This is supposed to transition into a mandatory scheme in 2026.

Greenhouse gas reduction targets **By 2030** • Reduce GHG emissions by 46% from 2013 level, including LULUCF credits • Continue efforts to cut emissions by 50% (nationally determined contribution) **By 2050** Net zero GHG emissions (updated nationally determined contribution)	**Overall emission covered by ETS** Around **60%** of Japan emissions
Coverage More than **700** companies	**Inclusion thresholds** Scope 1 emissions for companies averaging in excess of **100,000 tonnes** annually over three years
Timeline **2024-2025** Voluntary phase (Phase 1) **2026-2033** Pricing phase (Phase 2)	**Cap** The approach to cap setting is not confirmed yet. A study group was established to clarify legal and regulatory aspects, including cap setting.
Auctioning • From **2026**, price floor and price cap are planned to be introduced. The floor will be set at **$11** per tonne and the cap at **$27** per tonne. A gradual rise is anticipated.	**Use of revenue** Not established yet.

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- Exemptions will likely be established that take into account R&D investments by covered companies.
- Auctioning will initially rely on free allocation based on sectoral benchmarks covering about **90%** of regulated emissions.

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Offsets

Two types of credits allowed:

1. **Joint Crediting Mechanism (JCM)** is a bilateral scheme allowing Japan (under Article 6 of the Paris Agreement) to invest in decarbonisation in 28 partner countries and gain credits for the investments (renewables, energy efficiency, waste and transport).
2. **A domestic crediting mechanism**, the J-Credit programme, that accounts for GHG reduced or removed by sinks through efforts to introduce energy-saving devices and manage forests.

Carbon credits are allowed for up to **10%** of each operator's annual emissions.
Carbon capture and storage and carbon capture and utilisation are not eligible for crediting.

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Other carbon pricing policies

- **Carbon tax:** Tax for Climate Change Mitigation on fossil fuels since 2012
- **Carbon tax:** GX-Surcharge will be introduced in the 2028 financial year for fuel importers and domestic extractors.
- **Sub-national ETSs**: in Tokyo and Saitama.
- **Domestic and international crediting mechanism**: J-Credits and JCM

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• Impact of EU CBAM

The EU is Japan's third largest trading partner for Japan. However, CBAM-covered sectors make up only a small fraction of Japan's exports to the EU, accounting for roughly 5% of their total value. Within these sectors, Japan's exposure is mostly concentrated in steel, which alone represents about 3% of the total value of Japanese exports to the EU. In production terms, exports of iron and steel to the EU represent roughly 1.5% of Japan's crude steel production, though this share is growing.

Japan exported 1.5 million tonnes of CBAM goods in 2024, of which 90% (1.4 million tonnes) were concentrated between four flat-rolled steel products. The proposed downstream extension would add 190,000 tonnes of goods, of which 140,000 tonnes were gear boxes for vehicles. A potential future extension of CBAM to new sectors (polymers, organic chemicals and refinery products) would add another 470,000 tonnes, almost exclusively of polymers (250,000 tonnes) and organic chemicals (220,000 tonnes).

It is estimated that Japan's flat-rolled steel products are exclusively manufactured through the blast-furnace route, with emissions under the CBAM scope (e.g. excluding from coking, lime production, pre-consumer scrap use and blast furnace gases exported to power stations) amounting to 1.73 tonnes of emissions per tonne of crude steel.

We consider the following carbon price scenarios.

Price ($ per tonne of CO_2)	Current	2035 (low)	2035 (high)
Japan (price floor and price ceiling from April 2026)	$0	$20	$50

In the current scope, expected CBAM fees are $193 per tonne of steel on average across products. This estimate assumes a CBAM certificate price of €80 and full implementation of the mechanism (see the methodology note in Annex I). As Japan currently doesn't apply a carbon price to these emissions, no deduction is applied. For 2035, Sandbag estimates total CBAM fees due from Japanese imports will stand at $291 million, assuming no carbon price in Japan.

Extended CBAM scope

Gear boxes can be made of a combination of flat and long steel, as well as aluminium, with an estimated combined emission intensity of 0.8 tonnes of emissions per tonne of material produced. The emission intensity of polymers and organic chemicals is, on average, 2.9 tonnes and 0.5 tonnes per tonne of material produced respectively. The emission intensity of Japan's electricity grid is 485 grams of emissions per kilowatt hour, which defines our estimated indirect emissions. The different CBAM extensions would increase total CBAM fees by $19 million for downstream products, $17 million for precursors, $40 million for pre-consumer scrap, $6 million for new sectors and $14 million for indirect emissions, in the no-carbon-price scenario in Japan.

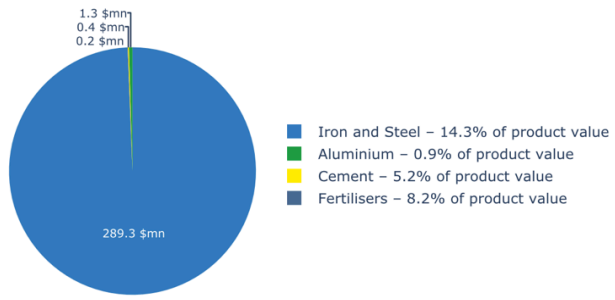


Figure 1. CBAM Fees per sector, current scope

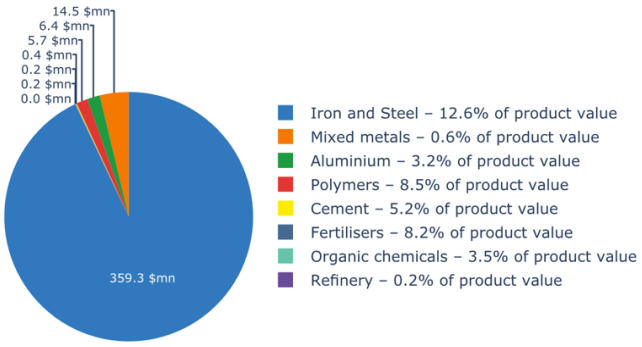


Figure 2. CBAM Fees per sector, extended scope

Transformation

Japanese steelmakers have pledged to pursue emission reduction pathways involving various technologies. Some, like Nippon Steel's Course50 involve the adaptation of existing blast furnaces using hydrogen and carbon capture and storage (CCS) but this approach is unlikely to scale up. A more realistic outcome in the coming decade is the conversion of a few integrated BF-BOF plants into electric arc furnace (EAF) plants,[1] as promoted by the government's Act on Strengthening Industrial Competitiveness, amended in 2024 to offer a tax credit for such conversions.

We expect that 1.5-2 million tonnes of steel production capacity (2% of Japan's production) could be converted, and their output could be used to replace the volumes currently

[1] BF-BOF stands for blast furnace – basic oxygen furnace; EAF stands for electric arc furnace

exported to the EU. We calculated the emission intensity of such products by considering a blend of imported direct reduced iron (with an emission intensity of 1.325 as per the CBAM default value for “other countries”) and scrap acceptable for the manufacturing of flat-rolled products. In such a scenario, CBAM fees would fall to $122 million and $57 million respectively in the case of a $0 and $50 Japanese carbon price.
For indirect emissions, we consider that those EAF can function on 100% green electricity. In this case, a full extension of the CBAM would increase total CBAM fees to $79 million.

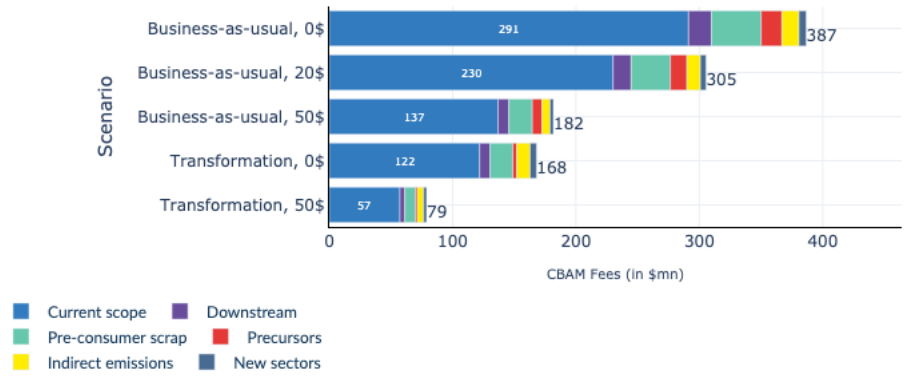


Figure 3. CBAM Fees under different scenarios and scopes

South-Korea

• Korea Emissions Trading System (K-ETS)

The Korea Emissions Trading System (K-ETS), which was established in 2015 and is now the third largest carbon market in the world (after the EU’s and China’s), is entering its fourth phase in 2026. It is routinely reviewed through the Basic Plan for the Emission Trading System and the Allocation Plan issued by the Korean government. The most recent Basic Plan, the fourth, was published in 2024.

GHG reduction targets **By 2030** • Reduce emissions by at least 35% reduction below 2018 levels (Carbon Neutral Framework Act)Reduce emissions by 40% below 2018 levels (updated nationally determined contribution) **By 2050** • Carbon neutrality (Carbon Neutral Framework Act)	**Overall emission covered** Certified ETS emissions in 2022: 572 million tonnes or **79%** of national GHG emissions.
Timeline **Phase 1:** Three years (2015 to 2017) **Phase 2:** Three years (2018 to 2020) **Phase 3:** Five years (2021 to 2025) **Phase 4:** Five years (2026-2030)	**Cap** **Phase 1:** 1.7 billion tonnes **Phase 2:** 1.8 billion tonnes (increase due to expanded coverage) **Phase 3:** 3 billion tonnes (further expansion in scope, but the phase 3 cap reflects a 4.7% decrease in emissions compared to the 2017-2019 baseline) Additionally, there are **180 million tonnes** in reserves (market stabilisation, market creation, and new entrants).
Coverage Power, industry, buildings, transport, aviation, maritime, and waste **816 entities** as of 2025.	**Inclusion thresholds** Companies emitting more than **125,000 tonnes per year**, and facilities with emissions in excess of **25,000 tonnes per year**. The scheme calculates the threshold covering both direct emissions and indirect emissions from electricity consumption. The same inclusion thresholds apply.

Auctioning • Free allocation is provided fully for emission intensive, trade exposed sectors based on a leakage index. But at least **10%** of allowances must be auctioned in sectors that are not at risk of carbon leakage. • The auctioning share for the power sector will be gradually raised to **50% by 2030**. • Sectors receive allowances based on historical activity levels, except **12 sub-sectors** which receive allowances through benchmarking	**Use of revenue** **$136.4 million** in 2024 Revenue from auctioning goes into the Climate Response Fund, which supports emissions mitigation infrastructure, low-carbon innovation, and technology development for small- and mid-sized companies covered by the K-ETS.
Offsets Domestic offset credits allowed since phase 1. International credits (subject to qualitative criteria) have been allowed since phase 2. Both domestic and international credits must be converted to Korean Credit Units to be used for compliance. In phase 3, up to **5%** of each entity's compliance obligation, regardless of type	**Market and trading** In phase 3, financial actors and brokers could enter the market exchange. Market actors can trade Korean Allowance Units, Korean Offset Credits, and Korean Credit Units.

• Impact of EU CBAM

The EU is the third largest export destination for South Korea and accounts for around 10% of total exports. About 12% of South Korea's exports of CBAM products go to the EU, with exposure mainly concentrated in iron and steel.

South Korea exported 3.6 million tonnes of CBAM goods to the EU in 2024, of which 3.1 million tonnes related to seven flat-rolled basic steel products. Downstream extension would add 210,000 tonnes, mainly of vehicle or machinery parts (100,000), steel cables (50,000) and refrigerators (10,000). New sectors would add 5.3 million tonnes of goods of

which 1.30 million tonnes would be refinery products, 2.7 million tonnes would be polymers and 1.3 million tonnes would be organic chemicals.

Sandbag's analysis estimates that South Korea's flat-rolled steel products are exclusively manufactured through the blast-furnace route, with emissions under the CBAM scope of 1.7 tonnes of emissions per tonne of crude steel.

We consider the following scenarios for South Korea's carbon price.

Prices ($ per tonne CO_2)	Current	2035 (low)	2035 (high)
South Korea	$7	$50	$80

In the current scope, expected CBAM fees are $185 per tonne of steel, on average, before deduction for the carbon price paid in the country of origin. Estimated total CBAM fees due from South Korean imports are $619 million.

Extended CBAM scope

The emission intensity of refinery products, polymers and organic chemicals is, on average, 0.29 tonnes of emissions per tonne of output, 2.9 tonnes of emissions per tonne of output and 0.66 tonnes of emissions per tonne of output respectively. The emission intensity of South Korea's electricity grid is 431 grams of CO_2 per kilowatt hour, which defines our estimated indirect emissions. The different extensions would increase total CBAM fees by $17 million for downstream products, $45 million for precursors, $92 million for pre-consumer scrap, $142 million for new sectors and $60 million for indirect emissions, before deduction for already paid emissions.

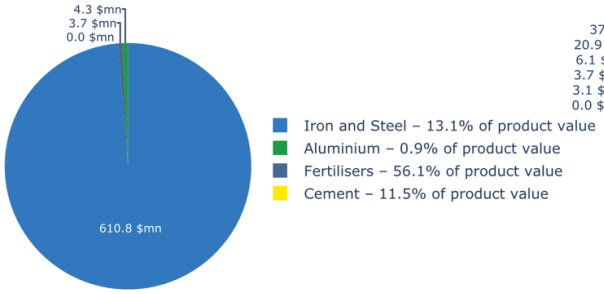


Figure 4. CBAM Fees per sector, current scope

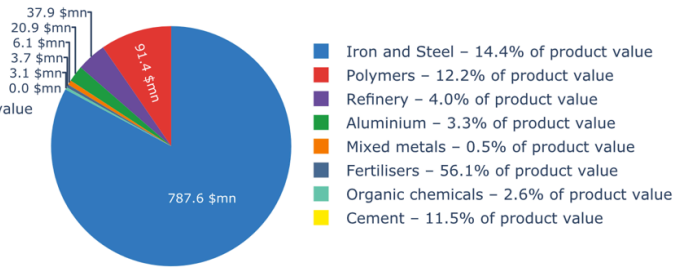


Figure 5. CBAM Fees per sector, extended scope

Transformation

South Korea is home to steelmaker POSCO's HyREX project, a green steel plant due to reach pilot phase in 2028 and commercial scale by 2035, with an expected 2.5 million tonnes of annual production capacity.[2] The plant will use hydrogen DRI, for which the emissions intensity is assumed to be 0.33 per tonne of DRI.

In the scenario where South Korea's flat steel exported to the EU all originates from this plant (blended with scrap), CBAM fees would be reduced to $175 million and $28 million in the case of a $7 and $80 South Korean carbon price respectively.

For indirect emissions, we consider that the EAF that will be deployed can function on 100% green electricity. In such a case, a full extension of the CBAM would increase total CBAM fees to $369 million in the case of a $7 per tonne carbon price.

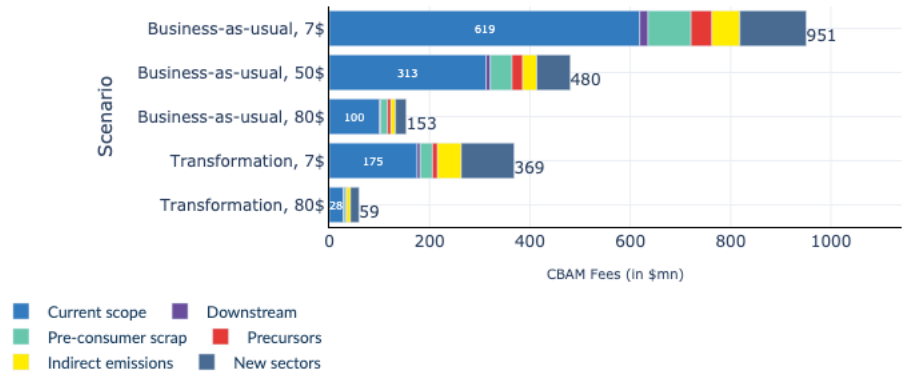


Figure 6. CBAM Fees under different scenarios and scopes

[2] Korean Steel Industry Association (2025): *Korean Steel Industry's Decarbonization Plan*

Vietnam

• Vietnam ETS

Vietnam's national carbon market began with a pilot phase from 2025 to 2028 and full operations will commence in 2029. The market aims to support the country's greenhouse gas reduction targets while promoting financial flows to carbon projects and enhancing corporate competitiveness.

Target • Net zero by 2050 • Conditional target: 43.5% below business-as-usual levels by 2030 if there is international support • Unconditional target: 15.8% below BAU • 2035 NDC not submitted.	**Overall emissions covered by ETS** Pilot ETS covers about half Vietnam's total CO_2 emissions.
Timeline • 2025-2028: Pilot phase with free allowances • 2029 onwards: Start transitioning towards auctioning of allowances and expanded sectoral coverage.	**Cap** Intensity-based cap and sectoral benchmarks
Coverage Thermal power plants, iron and steel production facilities, and cement producers.	**Inclusion thresholds** Facilities with annual GHG emissions above 3,000 tonnes to submit a biennial inventory report of their emissions from 2025 onwards.

Offsets	Market and trading
Allows for the inclusion of certified carbon credits from domestic and international sources: the Clean Development Mechanism, the Joint Crediting Mechanism with Japan, and the Article 6.4 mechanism of the Paris Agreement Covered entities can offset up to 30% of their compliance obligation	The market will operate under a centralised model, with trading on the Hanoi Stock Exchange and oversight by the Vietnam Securities Depository and Clearing Corporation.

• EU CBAM effects

The EU accounts for around 12% of Vietnam's total exports. Vietnam's exposure to CBAM-covered sectors is mainly concentrated in steel, with exports to the EU representing about 13% of the country's total steel export value. In contrast, aluminium exports to the EU accounted for around 7% of total aluminium exports, while fertiliser and cement exports to the EU accounted for less than 1% of their respective export markets.

Vietnam exported 3.4 million tonnes of CBAM goods to the EU in 2024. These were mostly flat-rolled steel products (2.1 million), semi-finished iron and steel (500,000) and steel bars and rods (460,000). Downstream extension would add 110,000 tonnes of goods, mostly of steel cables (58,000) and forklift trucks (16,000). New sectors would add another 191,000 tonnes, of organic chemicals (77,000), polymers (105,000) and refinery products (9,000)

Sandbag estimates that Vietnam's flat-rolled steel products are exclusively manufactured through the blast-furnace route, with emissions under the CBAM scope of 1.71 tonnes of carbon dioxide per tonne of crude steel. Long products are made from both BF-BOF and EAF-scrap routes, with an estimated combined emission intensity of 0.96 tonnes of carbon dioxide per tonne of crude steel.

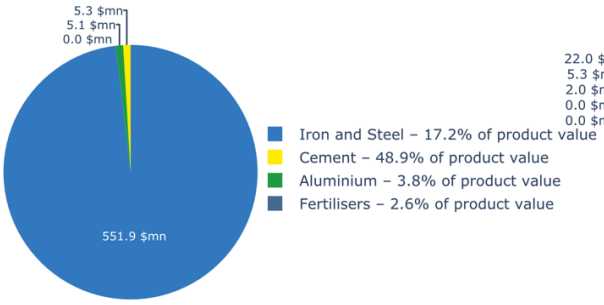
We consider the following carbon price scenarios in Vietnam:

Prices ($ per tCO_2)	Current	2035 (low)	2035 (high)
Vietnam	$0	$12	$30

In the current scope, expected CBAM fees are $162 per tonne of steel, on average, before deduction of the carbon price paid in the country of origin. Total CBAM fees due from Vietnamese imports are $562m.

Extended CBAM scope

The average emission intensity of organic chemicals, polymers and refinery products is respectively 0.8, 2.76 and 0.9 tonnes of carbon dioxide per tonne of output. The emission intensity of Vietnam's electricity grid is 475 grams of CO_2 per kilowatt hour, which defines our estimated indirect emissions. The different extensions would increase total CBAM fees by $13 million for downstream products , $35 million for precursors, $76 million for pre-consumer scrap, $139 million for new sectors and $69 million for indirect emissions, before deduction for already paid emissions.



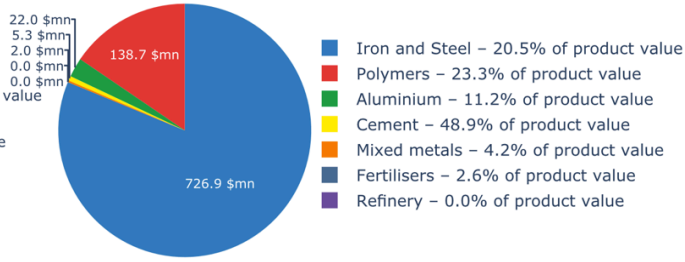


Figure 7.CBAM Fees per sectors, current scope Figure 8.CBAM Fees per sectors, extended scope

Transformation

The Vietnam Steel Association is pushing for transition towards the use of electric arc furnaces as part of its response to the CBAM,[3] so we can presume that long steel products exported to the EU by 2034 will come from scrap-based EAF (with an emission intensity of 0.09 tonnes of CO_2 per tonne of steel).

In such a scenario, CBAM fees would be reduced to $440 million and $299 million in the case of a $0 and $30 Vietnamese carbon price respectively,

[3] Ton Taynam (2025) *Vietnam's steel industry moves toward net zero 2050: opportunities from the green transition*

For indirect emissions, we consider that those EAF can function on 100% green electricity. In this case, a full extension of the CBAM could increase total CBAM fees to $499 million in the $30 scenario.

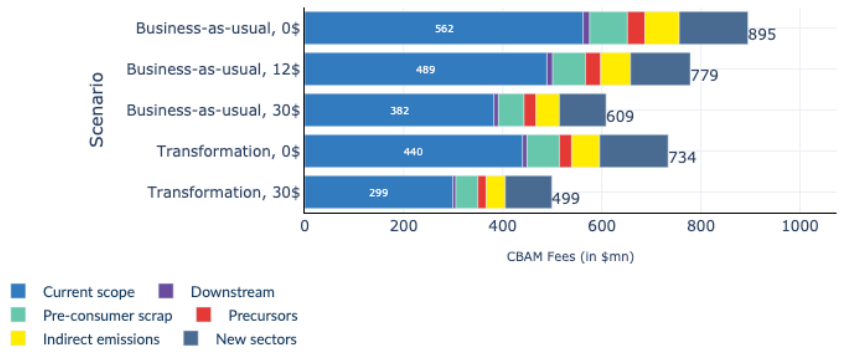


Figure 9. CBAM fees under different scenarios and scopes

Indonesia

Indonesia has recently become the third biggest emitter in Asia (after China and India), overtaking Japan.

GHG reduction targets **By 2030** • **32%** below business as usual, including land use emissions (unconditional, enhanced NDC) • Up to **43%** below business as usual, including land use emissions (conditional on international support, enhanced NDC) **By 2060** • Climate neutrality	**Overall emissions covered by ETS** ETS covers around **18%** of Indonesia's emissions.
Timeline **Phase 1:** 2023 and 2024 **Phase 2:** 2025 to 2027 **Phase 3**: 2028 to 2030	**Cap** Intensity-based ETS for the power sector. Total emissions limits for phases 2 and 3 are not yet determined.

Coverage **63** entities covering **146** installation (in 2024) **Phase 1:** Coverage was limited to coal-fired power generators connected to the state-owned company PLN's grid. **Phase 2:** The government plans to expand the scheme to include coal-fired power plants with capacity above 25 MW and not connected to PLN's grid, gas-fired, gas engine, and combined cycle power plants. Phase 3: all fossil fuel power plants.	**Inclusion thresholds** In 2024, coal-fired power generation with capacity exceeding **25MW**. The inclusion threshold will be lower (**2MW**) in phase 3, from 2028.
Offset The use of domestic offset credits (SPE-GRK) is allowed with no quantitative limits	**Other carbon pricing instruments** A carbon tax was expected to be launched in 2025. Domestic crediting mechanism: Indonesia Emissions Reduction Certification

• EU CBAM effects

The EU is Indonesia's fifth-largest trading partner, accounting for approximately 7.4% of Indonesian exports. However, exports of CBAM-covered goods to the EU account for only around 4% of Indonesia's total global exports of CBAM-covered products.

Indonesia exported 1.1 million tonnes of CBAM goods to the EU in 2024. These were mostly split between five product types: flat-rolled steel (640,000 tonnes), semi-finished steel (143,000) and stainless steel (60,000), ferro-nickel (89,000) and steel structures (48,000). Downstream extension would only add 13,000 tonnes, whereas new sectors would add 485,000 tonnes, split between organic chemicals (314,000), polymers (57,000) and refinery products (113,000).

We estimate the emission intensity of Indonesia's flat-rolled steel at 2.1 tonnes of CO_2 per tonne of crude steel, average semi-finished steel products at 1 tonne of CO_2, stainless steel at 2.5 tonnes of CO_2 and ferro-nickel at 3.5 tonnes of CO_2 per tonne of metal produced.

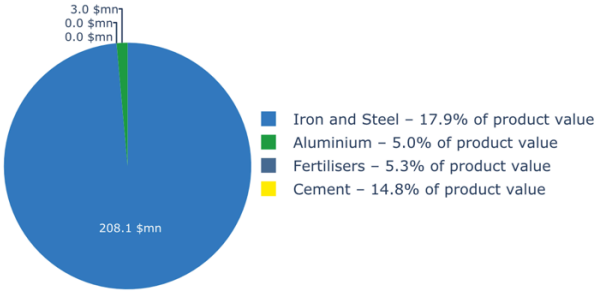
We consider the following scenarios of carbon price in Indonesia:

Prices ($ per tCO_2)	Current	2035 (low)	2035 (high)
Indonesia	$0	$20	$35

In the current scope, expected CBAM fees are $194 per tonne of steel, on average across all products, before deduction for the carbon price paid in the country of origin. Total CBAM fees due from Indonesian imports will be $211 million.

Extended CBAM scope

The average emission intensity of organic chemicals, polymers and refinery products is respectively 0.2, 2.8 and 0.9 tonnes of CO_2 per tonne of output. The emission intensity of Indonesia's electricity grid is 475 grams of CO_2 per kilowatt hour, which defines our estimated indirect emissions. The different extensions would increase total CBAM fees by $2 for downstream products, $15 million for precursors, $25 million for pre-consumer scrap, $13 million for new sectors and $52 million for indirect emissions.



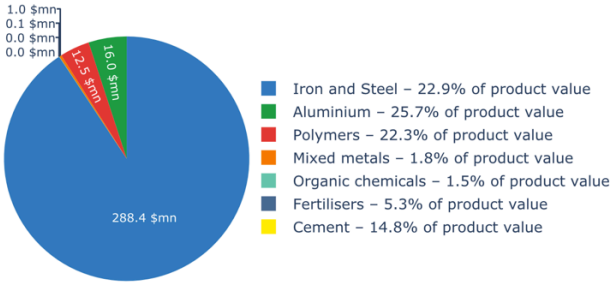


Figure 10. CBAM Fees per sector, current scope Figure 11. CBAM Fees per sector, extended scope

Transformation

For the transformation scenario, we expect that CBAM exports to the EU (in its current scope) could be 20% less emission-intensive than the current average. In such a scenario, CBAM fees would be reduced to $155 million and $98 million in the case of no and $35 Indonesian carbon price respectively. A full extension of the CBAM would increase total CBAM fees to $159 million with a carbon price of $35.

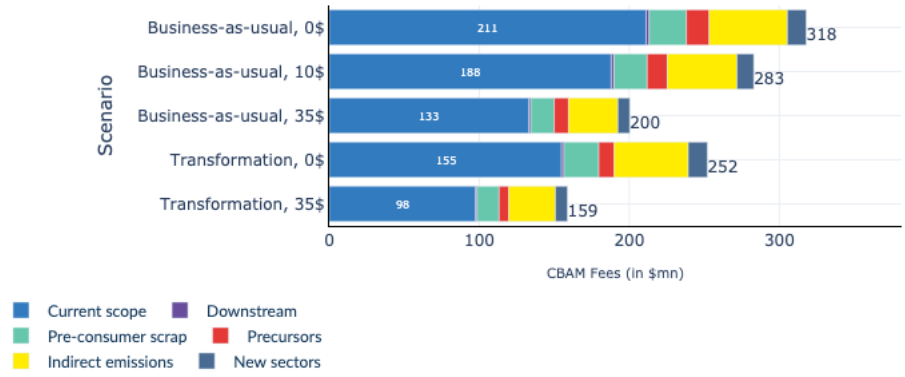


Figure 12. CBAM Fees under different scenarios and scopes

Philippines

The Philippines has announced what has been described as a hybrid "cap-and-invest" mechanism, blending features of an ETS and a carbon tax.

GHG reduction targets **2030:** Conditional pledge to keep emissions **75%** below business as usual levels (excluding the land use sectors)	**Cap** Sectoral caps - levels not defined.
Timeline ETS under consideration	**Coverage** Energy, transport, industry, agriculture and forestry, and waste sectors

Auctioning Allowances allocated to companies based on production share.	**Offsets** Carbon credits from internationally recognised offset projects, including forestry, renewable energy, carbon capture and storage and methane reduction activities. Adjustment procedures will be defined for crediting under Article 6 UNFCCC.

• EU CBAM effects

The EU is the fourth-largest export destination of the Philippines and accounts for around 7% of the country's total trade in goods. About 9% of the Philippines' exports of CBAM products go to the EU, with exposure mainly concentrated in iron and steel.

The Philippines exported 6,900 tonnes of CBAM goods to the EU in 2024, mostly screws, nuts and bolts (3,7 tonnes) and construction structures (2,800 tonnes), all likely made from long steel metallurgy. Downstream extension would add 1,400 tonnes, also mostly of long steel products. New sectors would add 45,700 tonnes split between organic chemicals (24,400 tonnes) and polymers (21,200 tonnes).

As there are no blast furnaces in the Philippines, its long steel products are almost certainly made from scrap-based EAF, at low emission intensity.

We consider the following carbon price scenarios in the Philippines:

Prices ($ per tCO_2)	Current tax	2035 (low)	2035 (high)
Philippines	$0	$10	$20

Under the current scope, expected CBAM fees are $34 per tonne, on average for iron and steel products, before deduction of the carbon price paid in the country of origin. However, higher steel prices in the EU caused by the phasing out of free allocation in the EU ETS should provide $28 extra revenue. Total CBAM fees due from Philippine imports are $263,000 in absence of a recognised carbon price paid, and $208,000 in the case of the highest $20 per tonne of CO_2 price scenario.

Extended CBAM scope

The average emission intensity of organic chemicals and polymers are 1.1 and 2.3 tonnes of CO_2 per tonne of output respectively. The emission intensity of the electricity grid in the Philippines is 611 grams of CO_2 per kilowatt hour, which defines our estimated indirect emissions. The different extensions would increase total CBAM fees by $2.5 million for new sectors and $884,000 for indirect emissions, before deduction for already paid emissions.

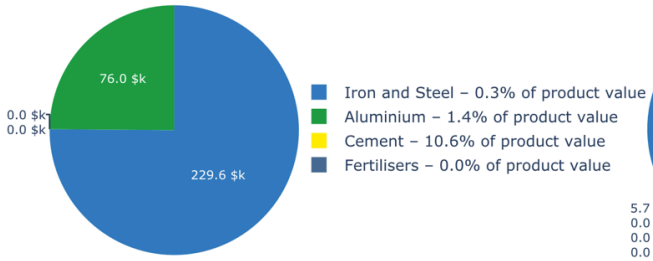


Figure 13.CBAM Fees per sectors, current scope

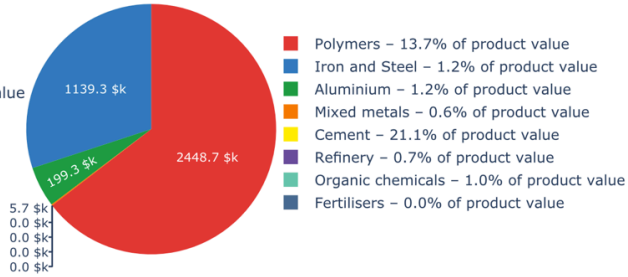


Figure 14. CBAM Fees per sectors, extended scope

Transformation

The most achievable change for the steel sector is a decarbonisation of indirect emissions via power purchase agreements. This would not reduce CBAM fees under the scheme's current scope, but it would reduce them in case of extension, down to $1.8 million and $1,.4 million in the case of a $0 and $20 Philippine carbon price, respectively.

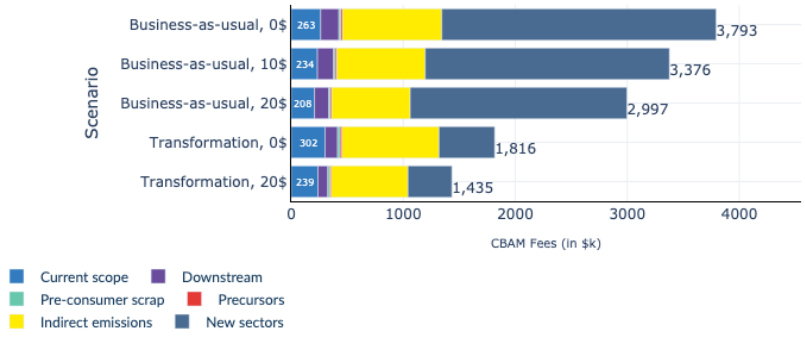


Figure 15. CBAM Fees under different scenarios and scopes

Recommendations

With the world picking up the pace on carbon markets, economies in East and Southeast Asia must reap the benefits of solid trade relations to strengthen their climate policies, clean production processes, and ultimately the decarbonisation of their economies. Carbon markets can play an essential role by shifting a higher share of the burden of CO_2 pollution onto the shoulders of those who actually pollute. To do so fairly and efficiently, some lessons can be drawn from long-standing carbon markets that have proven ability to reduce carbon emissions.

1. Don't rely on carbon removals and offsetting mechanisms

Removing a tonne of carbon dioxide does not (fully) compensate for a tonne of emissions. While carbon removals have a place in climate policy, that is primarily to address future residual emissions that are important to society and cannot be abated, and to eventually enter "net negative emissions" territory around mid century.

Instead, these countries can begin by focusing on "low-hanging fruit", such as electrification, energy efficiency, and the wide-scale roll out of renewables.

A different conversation must be had on offsetting: Asian ETSs must rapidly phase out of offsetting because this undermines the effectiveness of carbon pricing and reduces climate ambition. Financial resources are limited and must be spent on direct emission reductions instead.

2. Set a cap and an endgame

An ETS quantifies and prices industrial emissions and in some cases (such as the EU, UK and California) sets a falling cap . Other ETSs price emissions without specifically mandating an upper limit, for example by using intensity caps. Without an absolute cap, an ETS is only partially a climate instrument: a gradually declining cap is the essential feature mandating that emissions decrease in line with the country's climate goals.

The biggest intensity-based ETS in the world, China, already announced the intention to switch to a cap-and-trade system by 2030. Most existing, functioning ETSs already implemented an absolute cap and saw emission reductions as a result. A cap not only guarantees that the ETS has a specific climate outcome, but also provides long-term visibility to public and private stakeholders on the direction of travel for the economy, nudging investments into renewable energy, clean production facilities, and sustainable transport as a result.

3. Start auctioning allowances

Without the auctioning of allowances under an ETS, there is functionally no carbon price, so there is no financial incentive to decrease emissions.

Implementing the polluter pays principle, with big polluters internalise the cost of the CO2 they emit, represents a massive opportunity for governments as it allows them to raise a stable and consistent revenue stream that ideally is then reinvested into decarbonisation projects, adaptation, and support for communities affected by climate change. This is especially important in the countries considered in the briefing: according to this Climate Risk Index, the Philippines is the seventh most exposed country to climate risks, and Vietnam is the tenth most exposed.

4. Reward best performers

Linking free allocation, compensation schemes and public investments to concrete decarbonisation steps and to producers of sustainable products (rather than high emitters) can support the transitional period from no pricing to full pricing by making worst performers pay for their pollution first. This would also strengthen the business case for first movers in clean production, renewable energy and electrification. This can be achieved, for example, by awarding free allocation through a benchmark system that rewards top performers, or connecting the disbursement of compensation schemes to investments in a whitelist of proven sustainable technologies.

Annex I - Methodology note by Sandbag

Simulations of CBAM effects are presented based on sales volumes observed in 2024, a CBAM certificate price of €80 and assuming full implementation of the CBAM (with fully phased out free allocation for the covered sectors as scheduled in EU law for 2034). Emission intensities are assumed to be reported based on actual data and do not use the default values set in the legislation. Details on emission intensity calculations are given here.

Results are given for the following CBAM scopes:

- Current scope (as per the Regulation currently in place)
- Downstream (as per the extension to 177 products proposed by the Commission on 17 December 2025)
- Pre-consumer steel and aluminium scrap (as per the amendment proposed by the Commission on 17 December 2025)
- Precursors: lime, coke, ferro-silicon, alumina, pre-bake anode
- Indirect emissions
- New products: 12 organic chemicals, seven refinery products, seven polymers (listed here)

Scenarios are selected for different carbon prices applicable in the country of origin:

- "Business-as-usual", based on 2024 import data where goods have the average emission intensity of the country of origin
- "Transformation", whereby the goods imported have a lower emission intensity than the current country average.

CBAM fees versus net CBAM costs:

As free allowances are phased out in the EU ETS, EU-located factories will bear increasing carbon costs under the EU ETS, which they will aim to pass through to their clients.

$$Net\ CBAM\ costs = CBAM\ fees - revenues\ from\ price\ increase$$

The proportion of those costs that firms can pass on to their customers (the ***cost pass-through rate***) depends on demand elasticity and the CBAM's effectiveness at

mirroring EU carbon prices. Based on previous research,[4] and on the existence of provisions against circumvention in the CBAM regulation, we assumed a pass-through rate of 80%. In other words, CBAM goods will be sold in the EU at a premium (that is,. **a price increase**) equal to 80% of average ETS costs.

If indirect emissions were covered by the CBAM, indirect cost compensation (ICC) would likely be phased out in the EU and the increase in cost for electricity users would mostly be passed through to customers, leading to higher sale prices. So net costs are calculated as:

$$revenues\ from\ price\ increase\ =\ pass\_through\ rate \times (value\ of\ removed\ free\ allocation\ +\ value\ of\ removed\ ICC)$$

[4] Sandbag (2023) *A Scrap Game: impacts of the EU Carbon Border Adjustment Mechanism*

Annex II - EU CBAM effects: net costs changes over different scenarios

The graphs below show the net CBAM cost for each country, calculated as CBAM fees minus revenue from price increases. Results vary depending on three key factors: the scope of CBAM coverage (current or extended), the difference in the carbon price level between the producing country and the EU, and whether the carbon intensity of goods follows a business-as-usual or transformation scenario.

Japan

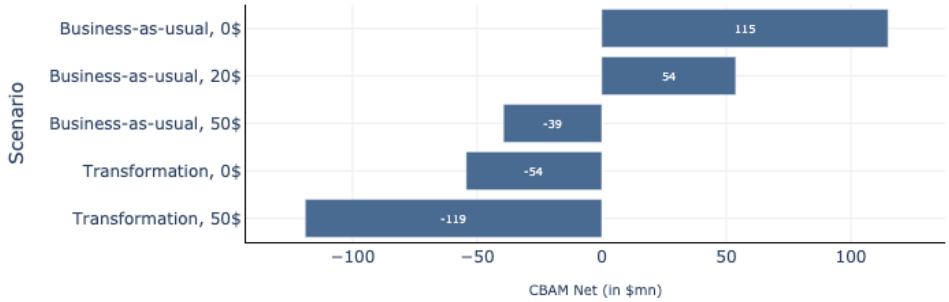


Figure 16. Net CBAM costs (current scope)

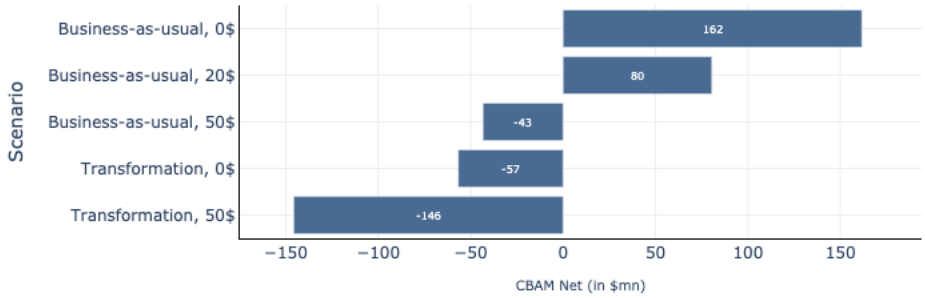


Figure 17. Net CBAM costs (extended scope)

Total net costs are $115 million, under the current scenario with no carbon price in Japan, and $137 million and $-39 million respectively in the high $50 price scenario. A negative net

cost means a positive financial flow from the EU to exporters. Higher steel prices in the EU caused by the phasing out of free allocation in the EU ETS should provide $115 extra revenues per tonne, leading to **a net cost of $77** per tonne of steel, compared to 2025 levels, for no carbon price.

South Korea

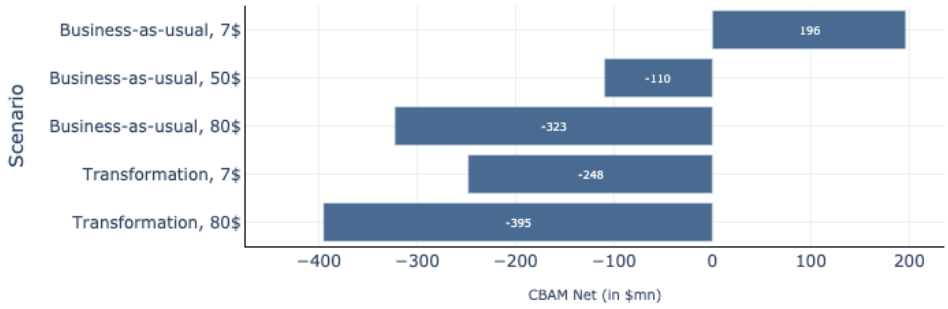


Figure 18. Net CBAM costs, current scope

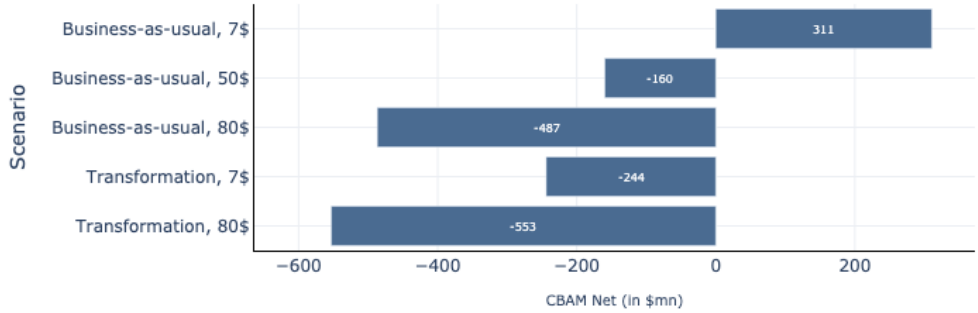


Figure 19. Net CBAM costs, extended scope

Total net costs are $196 million for a $7/tCO$_2$ carbon price, and $100 million and $-323 million respectively in the case of the high $80/ tCO$_2$ price scenario. Higher steel prices in the EU caused by the phasing out of free allocation in the EU ETS compared to 2025 levels should provide $117 extra revenues, leading to **a net cost of $68** per tonne of steel.

Vietnam

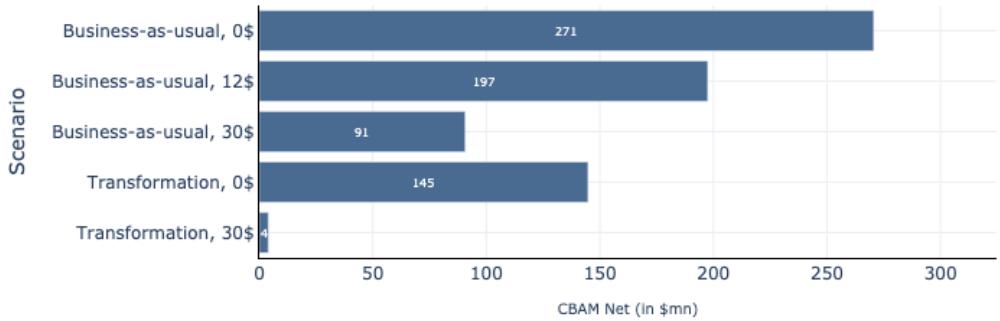


Figure 20. Net CBAM costs, current scope

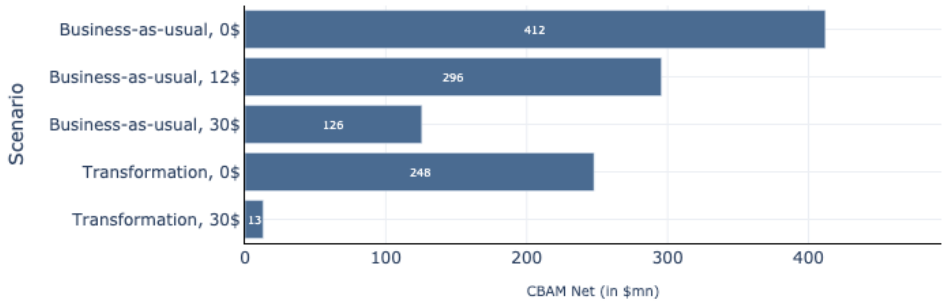


Figure 21. Net CBAM costs, extended scope

Total net costs are $271 million in absence of a recognised carbon price paid, and $382 million and $91 million respectively in the case of the high $30/ tCO_2 price scenario. Higher steel prices in the EU caused by the phasing out of free allocation in the EU ETS should provide $84 extra revenues, leading to **a net cost of $78** per tonne of steel, compared to 2025 levels.

Indonesia

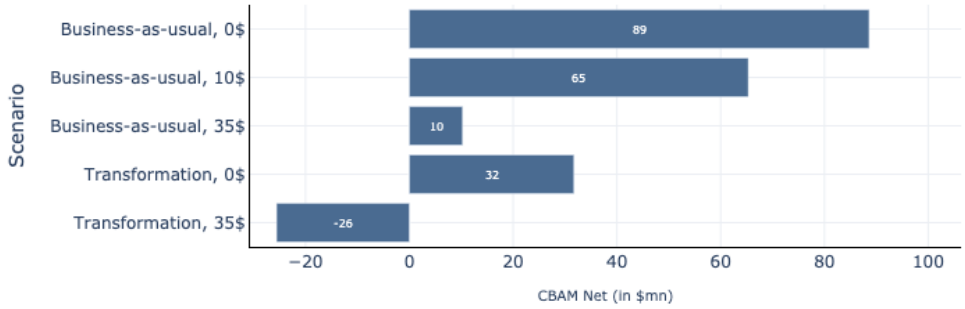


Figure 22. Net CBAM costs, current scope

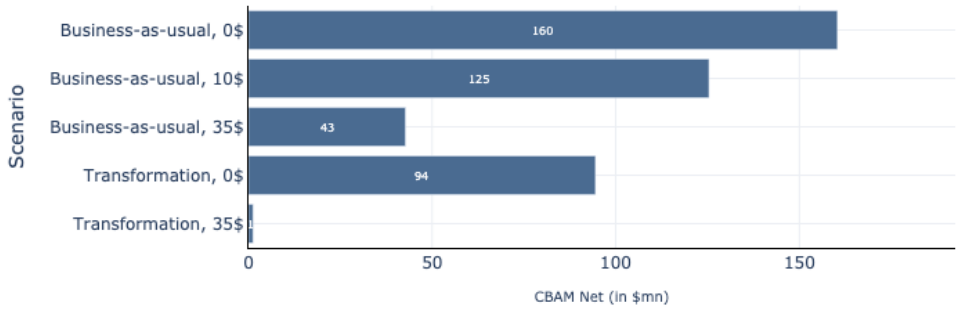


Figure 23. Net CBAM costs, extended scope

Total net costs are $89 million in the absence of a recognised carbon price paid, and $133 million and $10 million respectively in the case of the highest $35/ tCO_2 price scenario. Higher steel prices in the EU caused by the phasing out of free allocation in the EU ETS should provide $113 in extra revenue, leading to **a net cost of $81** per tonne of steel, compared to 2025 levels.

Philippines

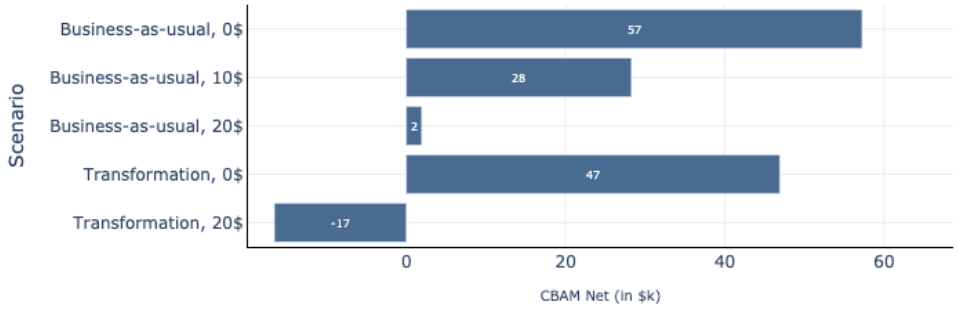


Figure 24. Net CBAM costs, current scope

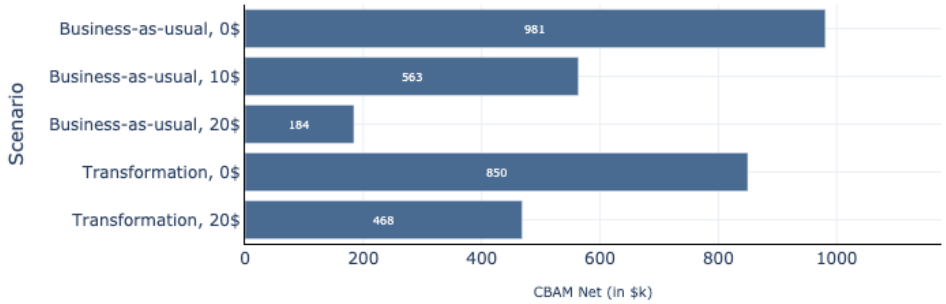


Figure 25. Net CBAM costs, extended scope

Total net costs are $57,000 in the absence of a recognised carbon price paid, and $2,000 in the case of the highest $20/tCO$_2$ price scenario. Higher steel prices in the EU caused by the phasing out of free allocation in the EU ETS should provide $28 extra revenues, leading to **a net cost of $6** per tonne of steel, compared to 2025 levels.

CARBON MARKET WATCH

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