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The EU's Carbon Border Adjustment Mechanism

Considerations for Indonesia

Citation: International Network of Energy Transition Think Tanks (INETTT) and Institute for Essential Services Reform (IESR) (2026): The EU's Carbon Border Adjustment Mechanism: Considerations for Indonesia.

Publication number: 007/10-2026

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Acknowledgements

This report was developed under the guidance of Rabia Ferroukhi (Executive Director, INETTT Secretariat) and led by Ranisha Basnet (Head of Policy and Network Programme, INETTT Secretariat). The authors and the project team thank Fabby Tumiwa (IESR), Eleanor Batilliet, Kajol, and Karina Marzano Franco (Agora Industry), Laura El-Katiri (INETTT Secretariat) for their valuable review and feedback.

Special thanks to Neil MacDonald for editing and proofreading and WeDoDesign for the design and layout.

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Abbreviations

BAPPENAS	Ministry of National Development Planning (Indonesia)
CBAM	Carbon Border Adjustment Mechanism
CMEA	Coordinating Ministry for Economic Affairs (Indonesia)
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DBL	Direct Backward Linkage
DEN	Dewan Energi Nasional (National Energy Council)
DFL	Direct Forward Linkage
EAF	Electric Arc Furnace
ETS	Emissions Trading System
EU	European Union
EU ETS	European Union Emissions Trading System
EV	Electric Vehicle
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GR	Government Regulation
GRP	PT Gunung Raja Paksi
IESR	Institute for Essential Services Reform
IISIA	Indonesian Iron & Steel Industry Association
KEN	Kebijakan Energi Nasional (National Energy Policy)
MCM	Mandatory Carbon Market
MEMR	Ministry of Energy and Mineral Resources
MRV	Measurement, Reporting, and Verification
MoEnv	Ministry of Environment (Indonesia)
MoEF	Ministry of Environment and Forestry (Indonesia), before being separated into the Ministry of Environment and the Ministry of Forestry in 2024
MoF	Ministry of Finance (Indonesia)
MoI	Ministry of Industry (Indonesia)
MoT	Ministry of Trade (Indonesia)
NDC	Nationally Determined Contribution
NEK	Nilai Ekonomi Karbon (Economic Carbon Value Framework)
PCF	Product Carbon Footprint
RIPIN	Rencana Induk Pembangunan Industri Nasional (National Industrial Development Master Plan)
SEZ	Special Economic Zone
SIG	Semen Indonesia Group
SIINas	Sistem Informasi Industri Nasional
SME	Small and Medium Enterprise
SOE	State-Owned Enterprise
SRN-PPI	Sistem Registri Nasional Pengendalian Perubahan Iklim
SRE GRK	Sertifikat Pengurangan Emisi Gas Rumah Kaca
TBL	Total Backward Linkage
TFL	Total Forward Linkage
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States dollar
VCM	Voluntary Carbon Market

Executive summary

This brief examines the impact of the European Union's Carbon Border Adjustment Mechanism (CBAM) on Indonesia.

The main findings suggest the following:

- Although immediate macro-economic impact is limited, CBAM introduction exposes the country to some significant structural risks. The industrial sector already accounts for nearly 45% of final energy use and 34% of greenhouse gas (GHG) emissions at the national level. Rising industrial output, central to the National Long-Term Development Plan 2025–2045 and near-term growth ambitions, will intensify these pressures.
- Direct CBAM-affected exports to the EU are limited, with minimal impact on gross domestic product (GDP). However, as global carbon-pricing spreads and CBAM-type measures proliferate, Indonesia's carbon-intensive industrial profile presents growing competitiveness risks. CBAM expansion in the EU or wider adoption of carbon-pricing measures globally could put the country at a growing disadvantage due to high carbon intensity.
- Iron and steel represent the most vulnerable sector under the CBAM, followed by aluminium and fertilisers. Indonesia is the world's 13th largest crude steel producer, exporting 729.5 million tonnes (Mt) to the EU in 2023, with carbon intensities for these products exceeding both EU and global averages. Indonesian aluminium and fertiliser output are more carbon-intensive than the EU benchmark, although below global averages. CBAM expansion to cover products like pulp and paper, textiles and glass and ceramics – which account for more significant Indonesian exports to the EU – could sharply increase the country's exposure.
- Despite limited direct impact, CBAM implementation is likely to have significant indirect effects on upstream and downstream industries. Upstream domestic sectors such as mining, quarrying and energy as well as downstream sectors such as construction, automotive manufacturing, and packaging could face higher costs. Trade diversion from other CBAM-affected countries may also increase the inflow of carbon-intensive goods into Indonesia, reinforcing competitive pressure on domestic producers.

- Parts of the country with high concentration of carbon-intensive industries will be heavily affected by CBAM implementation, even with low GDP impact at the national level. Provinces with strong metal and mineral clusters – notably Banten, West Java, East Java and North Sumatra – are especially exposed, alongside Special Economic Zones and industrial parks such as Gresik, Galang Batang, Kendal, Batang and the Krakatau Industrial Estate Cilegon.
- Indonesia's institutional and technical systems are not yet ready to help companies absorb CBAM-related changes. The national carbon market and emissions trading could strengthen key CBAM-affected export sectors. However, Indonesia's measurement, reporting and verification (MRV) infrastructure remains fragmented, with a lack of coordination between the main industrial base (SIINas) and the climate-mitigation registry (SRN-PPI) and no means to obtain unified, verified, product-level emissions data.
- Larger steel and aluminium firms are upgrading their capacity for lower-carbon production in line with EU benchmarks, with some investing in electric arc furnaces and improved energy efficiency. Yet most manufacturers, especially small and medium enterprises (SMEs), lack the technical, financial and human resources to comply with CBAM requirements.
- CBAM compliance offers a way to accelerate Indonesia's own industrial transformation, particularly if supported with strong MRV systems, clean energy expansion and international cooperation. A dual approach combining industrial decarbonisation with robust carbon-pricing instruments would protect national trade competitiveness and minimise CBAM certificate obligations. Clearer MRV rules, affordable verification pathways, sector-specific training and targeted financing for clean technologies would help Indonesian exporters adapt.
- Engagement with the EU could reduce CBAM-related costs, particularly if the bloc could be persuaded to recognise domestic Indonesian carbon payments and technical standards. With adequate support, Indonesia would be able to modernise its manufacturing, attract green investors and reinforce long-term growth in line with CBAM requirements. Without such investments, the CBAM and measures like it could increasingly constrain Indonesia's export strategy.
- The potential gains from such climate policies can only be fully realised with strategic planning, coordination, and sustained investments. In addition, advancing Indonesia's energy transition and CBAM compliance will depend on active international cooperation, support consistent with the recognition of "common but differentiated responsibilities" in addressing climate change, and meaningful recycling of CBAM revenues from the EU back to trade partners for low-carbon economic development.

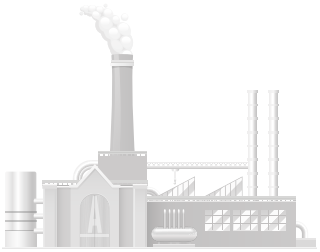
About this study

This country-level case study forms part of a series on the design, implementation and implications of the European Union's Carbon Border Adjustment Mechanism (CBAM). Phased implementation, reporting requirements, sectoral scope, and economic impacts of the CBAM are all analysed, particularly in relation to trade and competitiveness for developing countries. With this approach, the series aims to enhance understanding among policymakers of the mechanism's potential effectiveness, as well as challenges likely to arise and how CBAM implementation can help shape sustainable pathways for global decarbonisation, provided context-specific considerations and priorities are considered and access to financing is facilitated.

These CBAM impact studies initially focus on selected developing countries.

This case study on Indonesia explores the potential consequences of CBAM implementation along with the country's preparedness and possible responses. The study – developed by the International Network of Energy Transition Think Tanks (INETTT) and its member think tank, Institute for Essential Services Reform (IESR) Indonesia – considers exporting-country perspectives and highlights the nuances of CBAM impact at both the national and sub-national levels.

1 Implications of EU carbon pricing



The inclusion of indirect emissions in CBAM carbon accounting could provide a competitive edge for some developing countries.

Border Carbon Adjustments (BCAs) are a policy tool designed to internalise the carbon cost of imported goods and thus encourage cleaner industrial production in exporting markets that aligns with decarbonisation goals of the importing market. BCAs aim to support domestic industries that invest in low-carbon technologies, specifically by imposing equivalent carbon costs on imports while also mitigating the risk of potential "carbon leakage," where production relocates to regions with weaker environmental standards.[1] These mechanisms primarily target energy-intensive, trade-exposed sectors such as steel, aluminium, cement, and chemicals.[2]

The European Union's Carbon Border Adjustment Mechanism (CBAM), implemented in 2023 under Regulation 2023/9562, represents the first large-scale application of a BCA. It forms part of the EU's broader climate strategy to reduce net greenhouse gas emissions at least 55% by 2030 (compared to 1990 levels) and reach climate neutrality by 2050.[3] These goals are embedded in the European Green Deal (2019), as well as in the "Fit for 55" legislative package (2021) that harmonises EU climate, energy, transport, and fiscal policies.[4,5]

The CBAM complements the EU Emission Trading System (EU ETS) – the world's first mandatory carbon market – by requiring EU-based importers to purchase carbon certificates when bringing goods from outside the EU, equivalent to compliance costs paid for goods produced within EU. Deductions are available if a comparable carbon price has already been paid in the country of origin (see also Box 1).[6]

While the CBAM aims to level the playing field for EU industries subject to carbon pricing, it poses economic and technical challenges for non-EU producers, particularly those in developing countries. Along with facing higher overall emissions intensities, such producers often lack the infrastructure for emissions measurement, verification, and reporting. CBAM compliance, therefore, increases their export costs to the EU and can create new competitive disadvantages. Furthermore, many global south countries lack established carbon markets and have weakened currencies (against Euro) making compliance even more costly.

Currently, the CBAM only recognises the direct emissions except for fertilisers and cement. This further exacerbates global disparities, as many countries in the Global South have a renewable-rich electricity mix, with Brazil being a prime example. The inclusion of indirect emissions in CBAM carbon accounting would reduce the carbon intensities of their exports and thus provide a competitive edge.

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[1] *Chris Kardish et al., Carbon Border Adjustments: Considerations for Policymakers (2022), https://www.c2es.org/wp-content/uploads/2022/06/carbon-border-adjustments-considerations-for-policymakers.pdf.*

[2] *Centro de Estudos de Integração e Desenvolvimento (CINDES), Global Dialogue on Border Carbon Adjustments: The Case of Brazil (2024), https://www.iisd.org/system/files/2024-07/border-carbon-adjustments-brazil.pdf.*

[3] *European Commission, Guidance Document on CBAM Implementation for Importers of Goods into the EU (2024), https://taxation-customs.ec.europa.eu/document/download/bc15e68d-566d-4419-88ec-b8f5c6823eb2_en?filename=TAXUD-2023-01189-01-00-EN-ORI-00.pdf.*

[4] *European Commission, "Fit for 55," 2025, https://www.consilium.europa.eu/en/policies/fit-for-55/.*

[5] *European Council, "European Green Deal," Consilium, 2025, https://www.consilium.europa.eu/en/policies/european-green-deal/.*

[6] *European Commission, Carbon Border Adjustment Mechanism, n.d., accessed April 11, 2025, https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en.*

These disparities must be addressed to uphold the principle of "common but differentiated responsibilities" under the Paris Agreement. As such developing economies will need financial and technical support to build the capacity for accurate emissions accounting and CBAM compliance.[7,8]

CBAM implementation is expected to generate significant revenue – around EUR 1.5 billion annually starting in 2028 – which can boost the EU budget for initiatives like the Innovation Fund and the "Next Generation EU" recovery plan.[9] According to a preliminary report from the European Commission, the total revenues from the sale of CBAM certificates will be divided into two parts. Each member state will contribute 25% of the revenue to a temporary fund that supports the decarbonisation efforts of European companies. The remaining 75% will be directed back to EU as its own fund. While the fund aims to maintain the competitiveness of European companies in third-country markets – where they compete with cheaper and more carbon intensive products – it will be awarded to European companies producing selected CBAM goods irrespective of whether they export to the third-country markets or not. This provides a strategic advantage to European companies that have decarbonisation plans. Despite some previous discussions, none of the expected revenue is earmarked to support decarbonisation efforts in developing countries.[10] This has raised concerns about equity and the way the CBAM influences exporting countries' own industrial climate strategies.[11] Notably, countries with their own carbon-pricing system may still be required to pay the price difference if their domestic carbon costs are lower than those under the EU ETS, although no CBAM proceeds would be available to them for industry carbonisation.

Box 1. Background to the CBAM

The European Union Emissions Trading System, or EU ETS, establishes a carbon price on goods and services across the bloc's 27 member countries. By requiring companies to purchase emissions allowances under a gradually declining cap, the EU ETS creates economic incentives for progressive decarbonisation. A complementary scheme, ETS2, adopted in 2023, is set to extend carbon pricing to fuel usage in buildings, transport, and small industries starting in 2027. Both systems create financial incentives for emission reductions, specifically by capping total emissions and requiring companies to buy allowances.[12] Complementing this framework, the CBAM obliges EU-based importers to buy carbon certificates reflecting the cost of compliance with EU emissions standards, with deductions available if an equivalent carbon price has been paid in the country of origin.[13]

The transitional phase of CBAM implementation, governed by Implementing Regulation (EU) 2023/1773, introduced reporting obligations for imports of goods covered by the mechanism, effective between October 2023 and December 2025. During that transition period, importers have been required to report their direct emissions from production, indirect emissions from electricity use, and embedded emissions from precursor materials. They have also had to provide data on quantities imported, total embedded emissions per tonne or per megawatt-hour, and any carbon price already paid in the country of origin.[14]

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[7] *Trishant Dev and Avantika Goswami, The Global South´s Response to a Changing Trade Regime in the Era of Climate Change (Centre for Science and Environment, 2024), https://test-assets-opsaa.iica.int/storage/resource/2024/07/e7d13e0fc5b6f6b3b3d9b59fff112500.pdf.*

[8] *Rahat Sabyrbekov and Indra Overland, "Small and Large Friends of the EU's Carbon Border Adjustment Mechanism: Which Non-EU Countries Are Likely to Support It?," Energy Strategy Reviews 51 (January 2024): 101303, https://doi.org/10.1016/j.esr.2024.101303.*

[9] *European Commission, Questions and Answers: An Adjusted Package for the Next Generation of Own Resources, Text, 2023, https://ec.europa.eu/commission/presscorner/detail/en/qanda_23_3329.*

[10] *European Commission, Report from the Commission to the European Parliament and the Council, Provisionally published (Brussels, Belgium, 2025), https://taxation-customs.ec.europa.eu/document/download/3903da9d-44fd-4508-8915-f27ef25fe033_en?filename=Review%20Report_0.pdf.*

[11] *Anne Glaser, and Oldag Caspar, "Less Confrontation, More Cooperation: Increasing the Acceptability of the EU Carbon Border Adjustment in Key Trading Partner Countries," 2021, https://www.germanwatch.org/sites/default/files/GERMANWATCH_Increasing%20the%20acceptability%20of%20the%20EU%20CBAM_2021-06-17_0.pdf.*

[12] *European Commission, "ETS2: Buildings, Road Transport and Additional Sectors," accessed November 19, 2025, https://climate.ec.europa.eu/eu-action/carbon-markets/ets2-buildings-road-transport-and-additional-sectors_en.*

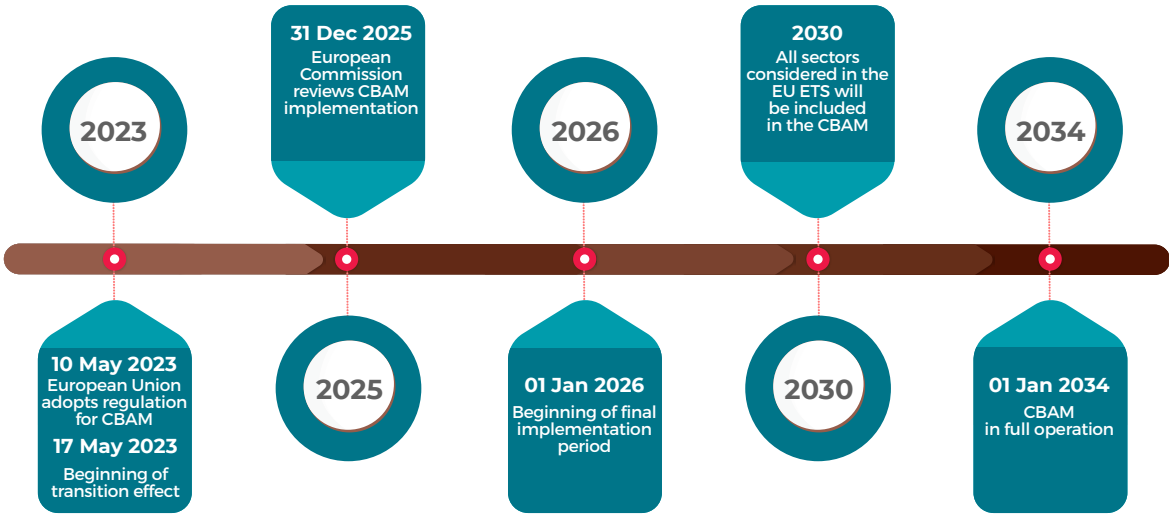
[13] *European Commission, Carbon Border Adjustment Mechanism.*

[14] *European Commission, Guidance Document on CBAM Implementation for Importers of Goods into the EU.*

Until the end of 2024, companies were allowed to use the EU methodology, equivalent methods, or default reference values. Since January 2025, only the EU methodology is accepted, with estimated equivalents based on previous methods being allowed for no more than 20% of the total reported emissions for each import.[15] However, starting 2027, the European Commission may likely include the carbon pricing available in other countries, along with the methodology for calculation in the CBAM registry.[16]

The CBAM initially applies to sectors most at risk of carbon leakage – including cement, iron and steel, aluminium, fertilisers, electricity, and hydrogen – with exemptions for low-value consignments, military imports, and, from 2025, small importers bringing in under 50 tonnes of goods annually.[17, 18] Implementation depends on close coordination among non-EU producers, EU-based importers, customs authorities, national regulators, and the European Commission, which oversees emissions reporting, verifies declarations, and manages the CBAM registry.

Figure 1. CBAM implementation timeline



Source: Authors, based on European Commission (2024)

From 2026, importers must register as "authorised declarants," submit verified annual emissions data, and purchase CBAM certificates linked to EU carbon allowance prices. These certificates must cover the embedded emissions of imports from the previous year, with the first compliance cycle in 2027, covering for 2026 imports. As free allowances under the EU ETS are phased out, the volume of certificates required will rise progressively until 2034, when they are meant to cover all embedded emissions. From that point, EU producers would no longer receive any free allocations.[19]

[15] *European Commission, Guidance Document on CBAM Implementation for Importers of Goods into the EU.*

[16] *European Commission, Officially Published: Simplifications for the Carbon Border Adjustment Mechanism (CBAM), 2025, https://taxation-customs.ec.europa.eu/news/officially-published-simplifications-carbon-border-adjustment-mechanism-cbam-2025-10-20_en.*

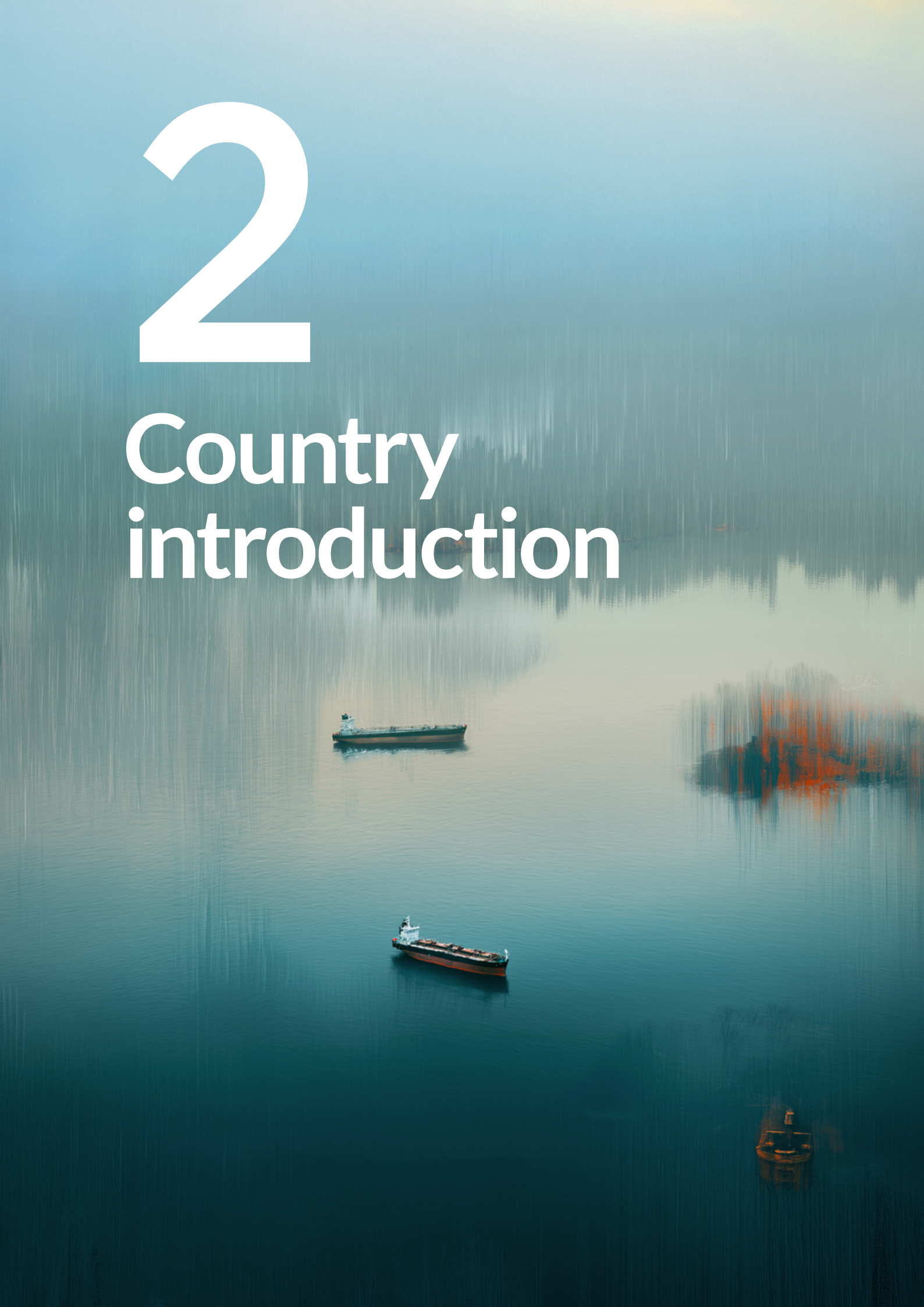
[17] *European Commission, Carbon Border Adjustment Mechanism (CBAM) - Questions and Answer (n.d.), accessed November 19, 2025, https://taxation-customs.ec.europa.eu/document/download/013fa763-5dce-4726-a204-69fec04d5ce2_en.*

[18] *European Commission, Officially Published.*

[19] *Adrien Assous et al., A Scrap Game: Impacts of the EU Carbon Border Adjustment Mechanism (2024), https://sandbag.be/wp-content/uploads/Sandbag-CBAM-Scrap-Game-2024.pdf.*

2

Country introduction



While short-term CBAM impacts may appear manageable, the longer-term risks are more substantial, especially given Indonesia's deep integration into global manufacturing and commodity supply chains.

Indonesia's industrial sector is one of the highest contributors to the country's greenhouse gas (GHG) emissions and faces persistent challenges in modernising production processes. In 2023, industry consumed around 557 million barrels of oil-equivalent (BOE), making up 45% of the country's total final energy use[20], and emitted 453.8 million tonnes of carbon dioxide equivalent ($MtCO_2e$), or 34% of national GHG emissions (including power and process emissions). With economic growth expected to continue or accelerate, emissions due to industrial activity are set to keep rising.[21]

These energy and material use trends jeopardise Indonesia's ability to meet its international climate commitments. Carbon intensity, furthermore, has started to diminish the country's attractiveness in international markets and hinder green investments, undermining its global competitiveness. This trajectory runs counter to the aspirations outlined in Indonesia's National Long-Term Development Plan 2045, which targets sustained economic growth of 6–7% per year, as well as the goal of President Prabowo Subianto (elected in 2024) to achieve up to 8% growth by 2030. Manufacturing is a key growth driver, expected to contribute over 20% of gross domestic product (GDP) by 2029.[22,23] Decarbonising the industrial sector is therefore imperative.

As a major global exporter of thermal coal, oil, iron and steel products, and nickel, Indonesia is navigating a shifting trade landscape that is partly shaped by the global response to the climate crisis. Coal remains one of the country's most valuable export commodities, generating USD 34.5 billion and accounting for approximately 13.3% of national exports in 2023.[24] Over 40% of those coal exports went to India and China, underscoring Indonesia's trade reliance on key Asian energy markets.[25] However, by mid-2025, coal exports to those countries had declined by an estimate 12% and 14%, respectively, signalling a broader regional shift toward cleaner energy sources.[26,27]

In response, Indonesia has started reorienting its trade strategy to support the global energy transition and enhance domestic value creation. This includes drawing on nickel reserves to supply the green energy sector and expanding the downstream processing of minerals like copper for clean energy technologies.[28] This strategic shift coincides with growing regulatory pressures in international markets, heralded by the European Union's introduction of the CBAM.

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[20] *IESR, Indonesia Energy Transition Outlook 2025 (2025).*

[21] *Kementerian Perindustrian, Peta Jalan Dekarbonisasi 9 Subsektor Industri – Booklet Annual Indonesia Green Industry Summit AIGIS 2025 (2024).*

[22] *Bappenas, "Rencana Pembangunan Jangka Panjang Nasional Tahun 2025–2045 (Undang-Undang No. 59 Tahun 2024)," Kementerian PPN/Bappenas, 2024, http://peraturan.bpk.go.id/Details/299728/uu-no-59-tahun-2024.*

[23] *Bappenas, "Rencana Pembangunan Jangka Menengah Nasional Tahun 2025–2029 (Peraturan Presiden No. 12 Tahun 2025)," Kementerian PPN/Bappenas, 2025, https://peraturan.bpk.go.id/Details/314638/perpres-no-12-tahun-2025.*

[24] *BPS, Indonesia Foreign Trade Statistics 2024 (2025), P.20, https://www.bps.go.id/en/publication/2025/07/07/6de51ef555c018f6ba7168d1/statistik-perdagangan-luar-negeri-indonesia-ekspor-2024-buku-i.html.*

[25] *BPS, "Exports of Coal by Major Countries of Destination 2012-2023," 2023, https://www.bps.go.id/en/statistics-table/1/MTAzNCMx/exports-of-coal-by-major-countries-of-destination--2012-2022.html.*

[26] *APBI-ICMA, "Indonesia Coal Exports Post Rare Decline so Far in 2025," 2025, https://apbi-icma.org/media-article/indonesia-coal-exports-post-rare-decline-so-far-in-2025-maguire.*

[27] *Energy Shift Institute, Coal Mining in Indonesia: The Paradox of Strength and Uncertainty (2025), https://energyshift.institute/wp-content/uploads/2025/06/Energy-Shift-Institute_Coal-Mining-In-Indonesia-Report-The-Paradox_202506.pdf.*

[28] *ESDM, "Smelter PT Freeport Indonesia Di Gresik Resmi Beroperasi," ESDM, 2024, https://www.esdm.go.id/id/media-center/arsip-berita/smelter-pt-freeport-indonesia-di-gresik-resmi-beroperasi.*

As Indonesia adjusts its trade strategy to align with global energy transition trends, it must also account for evolving trade regulations in its export markets. The EU's climate-related trade requirements firstly impact EU-based importers of carbon-intensive goods, and secondly, their non-EU suppliers. Consequently, CBAM implementation could significantly affect Indonesian trade, particularly in carbon-intensive industrial products. The EU accounts for 6.4% of Indonesia's total trade[29], making it the fifth-largest trading partner. Indonesia exports a notable portion of its aluminium (9.42%), iron and steel (6.64%), and fertiliser (0.95%) to the EU. Furthermore, the potential expansion of CBAM to sectors such as pulp and paper and textiles would increase exposure, as the EU accounted for about 4.2% of Indonesia's pulp and paper exports and 11.2% of textile exports in 2023.[30]

CBAM initially targets the iron and steel, aluminium, cement, and fertiliser sectors. While these industries are not Indonesia's largest export commodities, they are significant due to their high emission intensity and linkage to strategic industrial value chains. Furthermore, future CBAM application could encompass other commodities, such as glass ceramics, pulp and paper, and textiles industries that are critical to drive economic growth under Indonesia's National Long-Term Development Plan (RPJPN) for 2025-2045. The RPJPN 2025-2045 tackles a range of priorities, from enhancing human-resource quality to promoting sustainable economic growth and bolstering Indonesia's global presence.[31]

A comprehensive impact assessment is needed to determine the full economic and environmental implications of the EU carbon pricing and CBAM implementation, both for directly affected industries and for wider trade patterns. In the meantime, this study assesses Indonesia's CBAM readiness by examining the most affected sectors and considering how vulnerable the economy is to trade disruption. It also considers whether existing climate and industrial policies are sufficiently aligned and how well current institutions can manage all these pressures.

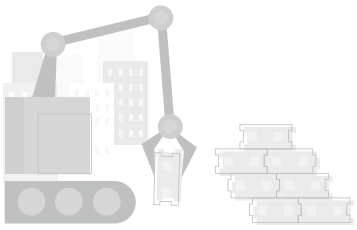
While short-term CBAM impacts may appear manageable, the longer-term risks are more substantial, especially given Indonesia's deep integration into global manufacturing and commodity supply chains. The analysis that follows identifies current gaps and highlights policy options that could help Indonesia meet international climate expectations without undermining its own trade competitiveness. The analysis also highlights the need for upholding the principle of common but differentiated responsibilities (CBDR) and ensuring Indonesia's has adequate means of implementation, including finance, foreign investment, capacity building and technology transfer.

[29] *European Commission, "EU Trade Relations with Indonesia," February 26, 2026, https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/indonesia_en.*

[30] *BPS, Foreign Trade Statistical Bulletin Exports by State Commodity Groups, December 2023 (2024), https://www.bps.go.id/en/publication/2024/03/06/4e89436e3c00d447fd4ff46b/buletin-statistik-perdagangan-luar-negeri-ekspor-menurut-kelompok-komoditi-dan-negara--desember-2023.html.*

[31] *Undang-Undang Nomor 59 Tahun 2024 Tentang Rencana Pembangunan Jangka Panjang Nasional Tahun 2025-2045 (Law No. 59 of 2024 on the National Long-Term Development Plan for 2025–2045)., Pub. L. No. 59 (2024), https://peraturan.bpk.go.id/Details/299728/uu-no-59-tahun-2024.*

3 Impact of the EU CBAM on Indonesia



Even with limited impact on GDP at the national level, CBAM measures heavily affect certain provinces with high concentrations of carbon-intensive industries.

The CBAM has started influencing Indonesia's industrial and trade landscape, even though direct exposure to the EU measure remains limited. While its immediate effects fall on a few of the most carbon-intensive sectors exporting to the EU, it also creates risks through indirect trade links and shifting global supply chains. As CBAM requirements and other international carbon-pricing measures expand, Indonesian producers increasingly need to account for and reduce embedded emissions.

The section that follows considers how these changes are set to affect key export industries, domestic value chains, and the wider economy.

3.1 Exposure of CBAM-covered products and sectors

Indonesia ranks as the world's 13th largest crude steel producer, at 19 million tonnes (or 1% of global output) in 2025,[32] and the 8th-largest cement producer, accounting for approximately 1.6% of global production in 2024.[33] Yet its export shares to the EU remain relatively low minimising direct CBAM exposure at this stage. In 2023, iron and steel accounted for 6.64% and aluminium for 9.42% of total exports per commodity destined for the EU. Fertilisers accounted for less than 1% of the total export volume to the EU.[34]

Indonesia's carbon intensities exceed both EU and global averages for iron and steel, as well as cement. For aluminium and fertiliser, meanwhile, Indonesia is more carbon-intensive than the EU, but still below the global average. Table 1 outlines the country's exports to the EU along with the comparative emission intensity for each product. With the CBAM in effect, cleaner production methods are urgently needed to maintain or expand trade in these commodities exported to the EU.

[32] *World Steel Association, "December 2025 GHG Emission Intensities of the Steel, Fertiliser, Aluminium, and Cement Industries in the EU and Its Main Trading Partners Crude Steel Production and 2025 Global Crude Steel Production Totals," Worldsteel.Org, 2026, https://worldsteel.org/media/press-releases/2026/december-2025-crude-steel-production-2025-global-crude-steel-production/.*

[33] *Global Cement, "Global Cement Top 100 2026," 2025, https://www.globalcement.com/magazine/articles/1390-global-cement-top-100-2026.*

[34] *BPS, Foreign Trade Statistical Bulletin Exports by State Commodity Groups, December 2023.*

Table 1. Indonesia's export commodities and emission values for CBAM-targeted products, 2023

Product	Volume of exports to the EU (million tonnes)	Value of exports to the EU (million USD)	Share of export volume to the EU (%)	Indonesia's CO_2 emission intensity (t-CO_2/t-product)	EU average CO_2 emission intensity (t-CO_2/t-product)	Global average CO_2 emission intensity (t-CO_2/t-product)
● Iron & steel	1.16	729.5	6.64	1.6 – 1.5*	1.10	1.92
● Aluminium	0.000000522	37.18	9.42	5.44	4.07	9.09
● Fertiliser	0.001	1.18	0.95	1.92	1.90	2.40
● Cement	0.00	0	0.00	0.64**	0.56	0.62

Source: Vidovic *et al.* (2023)[35]; Climate Action Tracker (2025)[36]; Fertilizer Canada (2023)[37]; Lebling *et al.* (2020) [38] ; BPS (2024)[39]
*based on data projection from 2016-2030
**based on data from 2020

At the same time, industries such as pulp and paper, textiles, and glass and ceramics are highly exposed to potential CBAM expansion. Pulp and paper accounted for 250,000 tonnes of exports to the EU in 2023, while textile accounted for 230,000 tonnes, with export volumes to the EU and other markets poised for growth unless the introduction of carbon-pricing mechanisms makes Indonesian output uncompetitive.[40] Table 2 shows the export volume of CBAM-affected products plus additional selected sectors like pulp & paper, textile and glass & ceramics.

[35] *Danko Vidovic et al., Greenhouse Gas Emission Intensities of the Steel, Fertilisers, Aluminium and Cement Industries in the EU and Its Main Trading Partners (2023), https://doi.org/10.2760/359533.*

[36] *Climate Action Tracker, "Cement and Iron Steel Emission Intensity," 2025, https://climateactiontracker.org/cat-data-explorer/sector-indicators/?sector=Industry&indicator=Cement%20emissions%20intensity%20(per%20product)&country=IDN&scenario=historic&scenario=benchmark&mode=countries.*

[37] *Fertilizer Canada, Ammonia Production Greenhouse Gas Emissions Benchmarking (2023), https://fertilizercanada.ca/wp-content/uploads/2023/10/Nitrogen-Benchmarking-Report-Final.pdf.*

[38] *Katie Lebling et al., Climate Action Must Progress Far Faster to Achieve 1.5 C Goal, November 19, 2020, https://www.wri.org/insights/climate-action-must-progress-far-faster-achieve-15-c-goal.*

[39] *BPS, Foreign Trade Statistical Bulletin Exports by State Commodity Groups, December 2023.*

[40] *Ibid.*

Table 2. Indonesia exports to the EU for products under current CBAM scope and selected products discussed for potential CBAM expansion (not yet covered), 2023

Product / Commodity	2023	
	Total volume of exports (million tonnes)	Total volume to the EU (million tonnes)
• Iron & steel	19.63	1.16
• Aluminium	0.0031	5.22 x10-7
• Fertiliser	3.61	0.001
• Cement	11.05	0.00
• Pulp & paper*	12.55	0.25
• Textile*	1.97	0.23
• Glass & ceramics*	0.82	0.019

Source: BPS (2024)[41]

*Note: Pulp and paper, textiles, and glass and ceramics are included as indicative sectors for potential future CBAM coverage; they are not part of the current CBAM scope.

Initially, the CBAM will not significantly affect Indonesia's overall economy or disrupt trade with the EU. Model simulations suggest a slight export contraction of around 0.1%, with the impact on GDP remaining minimal at 0.0002%,[42] or potentially, according to another study, about 0.006% by 2050.[43] These low current export numbers for CBAM-affected products could also, conversely, suggest a very limited EU leverage with the CBAM in reducing Indonesia's carbon emissions.

Nevertheless, the country can anticipate indirect CBAM implications. For example, if Indonesian intermediate industrial goods are processed in other countries, any embedded emissions could still be scrutinised when re-exported to the EU. Table 3 highlights strong bilateral trade with China, Australia, and India, where Indonesia exports a large share of carbon-intensive commodities. Any of those countries, in addition to re-exporting goods partly or wholly of Indonesian origin to the EU, could also adopt carbon-pricing measures of their own. For instance, the Australian government completed its mid-2024 Carbon Leakage Review which recommended adopting border carbon mechanism in phased approach for selected commodities. Australia will consider the recommendations in its 2026-27 review of the Safeguard Mechanism.[44,45] Such discussions highlight how CBAM-like frameworks could progressively shape global trade to prevent carbon leakage.

[41] *BPS, Foreign Trade Statistical Bulletin Exports by State Commodity Groups, December 2023.*

[42] *CSIS Indonesia, The EU Carbon Border Adjustment Mechanism (CBAM): Implications for Indonesia (2025), https://www.csis.or.id/publication/the-eu-carbon-border-adjustment-mechanism-cbam-implications-for-indonesia/.*

[43] *Indonesia's Ministry of Trade and Ministry of Industry, "Leveraging Industrial Decarbonisation Options in Indonesia by Anticipating International Carbon Tariffs Study and Presentation," 2025.*

[44] *Ernst & Young Global, "Australia Considers CBAM to Address Carbon Leakage," 2023, https://www.ey.com/en_gl/technical/tax-alerts/australia-considers-cbam-to-address-carbon-leakage.*

[45] *Tom Major, "Australia Considers Carbon Border Adjustment Mechanism," Argus, 2023, https://www.argusmedia.com/en/news-and-insights/latest-market-news/2479504-australia-considers-carbon-border-adjustment-mechanism.*

Table 3. Export volume of CBAM-targeted commodities from Indonesia, 2023

Ranking	Export market	Export quantity, 2023 (million tonnes)							
		Iron & steel	%	Aluminium	%	Fertilisers	%	Cement	%
● 1	European Union	0.93	6.64%	0.02	9.42%	0.03	0.95%	0.00	0.00%
● 2	United Kingdom	0.01	0.04%	0.00	0.86%	0.00	0.12%	0.00	0.00%
● 3	USA	0.07	0.47%	0.03	15.22%	0.06	1.73%	0.00	0.00%
● 4	Canada	0.02	0.15%	0.00	1.88%	0.00	0.00%	0.00	0.00%
● 5	Japan	0.03	0.24%	0.00	1.67%	0.13	4.20%	0.00	0.00%
● 6	Australia	0.16	1.16%	0.01	5.54%	0.50	15.61%	2.07	55.24%
● 7	China	9.74	69.86%	0.09	40.20%	0.43	13.37%	0.15	3.93%
● 8	India	0.85	6.10%	0.01	2.60%	0.97	30.57%	0.01	0.28%
● 9	Malaysia	0.61	4.39%	0.01	5.04%	0.05	1.63%	0.05	1.26%
● 10	Turkey	0.46	3.31%	0.03	11.60%	0.00	0.06%	0.00	0.00%
● 11	Singapore	0.10	0.73%	0.00	2.09%	0.03	1.06%	0.00	0.01%
● 12	Philippines	0.69	4.93%	0.00	1.66%	0.53	16.52%	0.69	18.33%
● 13	Others	0.16	1.16%	0.00	0.19%	0.45	14.17%	0.78	20.92%
● Global total		13.94	100%	0.22	100%	3.19	100%	3.75	100%

Source: UN (2024)[46]

Note: Figures may differ from Table 1 & 2 due to differences in trade classification methodology between BPS and UN Comtrade reporting systems.

Indonesia's export shares to the EU have been growing. For instance, iron and steel export volume and value to the EU have experienced over 30% and 34% compound annual growth rate over the 2018-2022 period, respectively.[47] This underscores the need to monitor the evolving trade regulations as well as the impact on the domestic value chains.

[46] *UN, "UN Comtrade Database," 2024, https://comtradeplus.un.org/TradeFlow.*

[47] *The Indonesian Iron & Steel Industry Association, "Dampak CBAM Terhadap Ekspor Produk Baja RI," accessed April 28, 2026, https://iisia.or.id/news/dampak-cbam-terhadap-ekspor-produk-baja-ri.*

Projections on CBAM implementation show varied economic impacts across sectors. The iron and steel industry faces the greatest exposure in terms of trade volumes and potential cost burdens, while the fertiliser sector may benefit due to relatively low carbon intensity. The estimated adjustment cost for CBAM-affected imports from Indonesia between 2023 and 2026 was projected at USD 422 per metric tonne for aluminium, USD 285 per metric tonne for steel, and USD 40 per metric tonne for ammonia.[48]

CBAM-related market adjustments could reduce Indonesia's output in the most carbon-intensive sectors in the years ahead. By 2035, the country's production is estimated to fall by around 0.5% for iron and steel, 0.4% for non-ferrous metals (including aluminium and related products), and 0.1% for non-metallic minerals (including cement). In contrast, chemicals, including fertilisers, are projected to grow by about 0.1%, consistent with higher Indonesian exports to the EU. By 2050, overall export rates of the CBAM-targeted goods from Indonesia are projected to decline slightly by 0.3% for iron and steel, 0.6% for non-ferrous metals, and 0.1% for non-metallic minerals (including cement). In contrast, the overall export value of Indonesian chemical industry, including fertilisers, is expected to increase by about 0.2% by 2050.[49]

Even if the initial impact appears limited, the CBAM-affected sectors could benefit from targeted decarbonisation strategies, enhanced emissions reporting, and incentives to boost energy efficiency and embrace clean technologies. International co-operation programmes and technical standards could help the country maintain its competitiveness in an increasingly CBAM-influenced global market.

3.2 Economic and social implications

While immediate, direct impact is limited, the indirect effects of CBAM implementation are expected to be more substantial. Anyone upstream in the supply chain for an affected industry, like coal miners, bauxite and limestone suppliers, and energy providers, could face new uncertainties and risks of disruption. So would downstream industries, such as automotive, construction and packaging, which all rely heavily on CBAM-targeted materials (shown in Table 4). As Indonesian producers adjust to CBAM obligations, cost increases will ripple across the value chain.

To assess these indirect effects, the analysis applies input-output linkage analysis, tracing how shocks to CBAM-affected sectors propagate upstream through backward linkages to input suppliers, and downstream through forward linkages to output-dependent industries. Backward-linkage analysis confirms that the country's mining and transport sectors are heavily intertwined with CBAM-affected industries. At the same time, forward-linkage analysis indicates that decarbonisation pressures on producers of basic materials could disrupt some key domestic projects and reduce Indonesia's international export competitiveness in sectors relying on those materials as inputs. Taken together, these structural linkages suggest that disruptions in CBAM-affected industries could cascade increasingly through domestic value chains.

[48] *Indonesia's Ministry of Trade and Ministry of Industry, "Leveraging Industrial Decarbonisation Options in Indonesia by Anticipating International Carbon Tariffs Study and Presentation."*

[49] *Ibid*

Table 4. Backward and forward linkages of CBAM-targeted sectors

Targeted sectors	Backward-linkage industries	Forward-linkage industries
• Fertilisers	Mining & quarrying Other processing industries Fertilisers	Agriculture, Forestry, and Fisheries Fertilisers
• Cement	Mining & quarrying Other processing industries Transportation & warehousing	Construction Other processing industries
• Iron & steel	Mining & quarrying Other processing industries Basic iron & steel	Other processing industries Construction Basic iron & steel
• Aluminium	Mining & quarrying Other processing industries	Construction Other processing industries

Source: Authors

The four CBAM-affected industries covered in this study – namely fertilisers, cement, iron and steel, and non-ferrous basic metals – are part of the core of Indonesia's production system (see Table 5). Their backward- and forward-linkage indicators are relatively high, which means two things: firstly, they depend heavily on inputs from upstream sectors; and secondly, they supply essential intermediate materials that many other domestic industries rely on. Despite such strong systemic connectivity, the direct contribution of these industries to total national output remains relatively low, highlighting a structural challenge in aligning economic scale with strategic importance in decarbonisation efforts.

Table 5. Industry linkages and percent of industry output in total output for Indonesia in 2020

		Backward linkages			Forward linkages			
Code	Products	DBL	TBL	TBL (norm.)	DFL	TFL	TFL (norm.)	% national output
• 1	Agriculture, forestry, and fisheries	0.2063	1.3669	0.7157	0.7606	2.6510	1.2687	0.0900
• 2	Mining & quarrying	0.3638	1.6967	0.8883	0.8091	2.8360	1.3573	0.0537
• 3	Fertilisers	0.6087	2.1170	1.1084	1.1301	4.0212	1.9245	0.0025
• 4	Cement	0.5545	2.0382	1.0672	1.3782	2.6304	1.2589	0.0023
• 5	Basic iron & Steel	0.6088	2.1626	1.1323	1.3038	3.3730	1.6143	0.0062
• 6	Non-ferrous basic metals	0.6618	2.1331	1.1169	0.7325	2.2359	1.0701	0.0061
• 7	Other processing industries	0.6134	2.1244	1.1123	0.7220	2.3300	1.1151	0.2663
• 8	Electricity	0.8153	2.9375	1.5380	0.7391	2.7464	1.3144	0.0249

Code	Products	Backward linkages			Forward linkages			% national output
		DBL	TBL	TBL (norm.)	DFL	TFL	TFL (norm.)	
● 9	Natural & artificial gas products, steam/hot water supply, cold air and ice products	0.3657	1.6465	0.8621	0.9910	3.5495	1.6987	0.0016
● 10	Water supply, waste management, waste and recycling	0.3767	1.7861	0.9351	0.2670	1.4680	0.7025	0.0024
● 11	Construction	0.6111	2.2051	1.1545	0.0756	1.1132	0.5327	0.1200
● 12	Wholesale and retail trade, car and motorcycle repair	0.2985	1.5562	0.8148	0.0434	1.0761	0.5150	0.1021
● 13	Transportation and warehousing	0.5318	2.0633	1.0803	0.4037	1.6626	0.7957	0.0534
● 14	Provision of accommodation and food & beverages	0.5611	2.0651	1.0812	0.1618	1.2190	0.5834	0.0414
● 15	Information & communication technologies	0.3801	1.7213	0.9012	0.6209	2.1652	1.0362	0.0391
● 16	Financial services and Insurance	0.2331	1.4009	0.7335	0.6697	2.2400	1.0720	0.0324
● 17	Real estate	0.2397	1.4684	0.7688	0.2808	1.4141	0.6768	0.0336
● 18	Company services	0.4518	1.8331	0.9598	0.9657	2.6503	1.2684	0.0289
● 19	Government administration, Defence, and compulsory social security	0.4839	1.9770	1.0351	0.0650	1.1296	0.5406	0.0263
● 20	Education Services	0.2981	1.5879	0.8314	0.0570	1.0933	0.5232	0.0266
● 21	Health Services and Social Activities	0.6181	2.2494	1.1777	0.0447	1.0724	0.5132	0.0239
● 22	Other Services	0.4563	1.8821	0.9854	0.1789	1.2919	0.6183	0.0163

DBL = direct backward linkage; DFL = direct forward linkage; TBL = total backward linkage; TFL = total forward linkage; TBL (norm.) = normalised total backward linkage; TFL (norm.) = normalised total forward linkage; % national output = percentage of total Indonesian national industrial output.

Source: Authors' calculation based on Badan Pusat Statistik (BPS), Input-Output Tables Indonesia 2020[50]

[50] *Badan Pusat Statistik. (2025). Input-output tables Indonesia 2020. BPS-Statistics Indonesia. https://www.bps.go.id/en/publication/2025/01/27/ea74e60a8662a70a734fa431/input-output-tables-indonesia-2020.html*

Another indirect CBAM impact could arise from the diversion of trade flows from other affected trade partners away from the EU and towards Indonesia. As the EU imposes carbon tariffs on high emissions imports, its main suppliers, frequently in China, Singapore, the US, or Japan, may reroute these products to markets without CBAM requirements.[51] In effect, this diversion could increase the flow of carbon-intensive products into Indonesia, which could in turn undermine domestic industries, boost national carbon intensity and effectively shift "carbon leakage" problem onto the country.[52] Stronger standards and control policies could help mitigate or avoid such negative impacts. Indonesia could improve its monitoring, reporting and verification (MRV) capabilities, treating CBAM adaptation as an opportunity to track trade flows and identify embodied emissions in its own imported goods.[53,54]

Even with this limited impact on GDP at the national level, CBAM measures heavily affect certain provinces with high concentrations of carbon-intensive industries, such as the initial CBAM-targeted sectors. Such industries often operate out of Indonesia's Special Economic Zones (SEZs), Industrial Estates and other designated industrial zones. For instance, Sei Mangkei SEZ (North Sumatra)[55] prioritises palm oil and rubber downstream industries, while Galang Batang SEZ (Riau Islands)[56] is a mineral processing hub, particularly for bauxite downstream and related derivatives.

[51] *Guilherme Magacho et al., Impacts of CBAM on EU Trade Partners: Consequences for Developing Countries (Agence Française de Développement, 2022), https://www.afd.fr/en/ressources/impacts-cbam-eu-trade-partners-consequences-developing-countries.*

[52] *Christoph Böhringer et al., "Potential Impacts and Challenges of Border Carbon Adjustments," Nature Climate Change 12, no. 1 (2022): 22–29, https://doi.org/10.1038/s41558-021-01250-z.\\uc0\\u8221{} {\\i{}Nature Climate Change} 12, no. 1 (2022*

[53] *Dwi Pangestu Ramadhani and Yoonmo Koo, "Comparative Analysis of Carbon Border Tax Adjustment and Domestic Carbon Tax under General Equilibrium Model: Focusing on the Indonesian Economy," Journal of Cleaner Production 377 (December 2022): 134288, https://doi.org/10.1016/j.jclepro.2022.134288.*

[54] *Tong Yue et al., "The Impact of the EU Carbon Border Adjustment Mechanism on China Based on the Climate Club," Carbon Management 16, no. 1 (2025): 2505727, https://doi.org/10.1080/17583004.2025.2505727.*

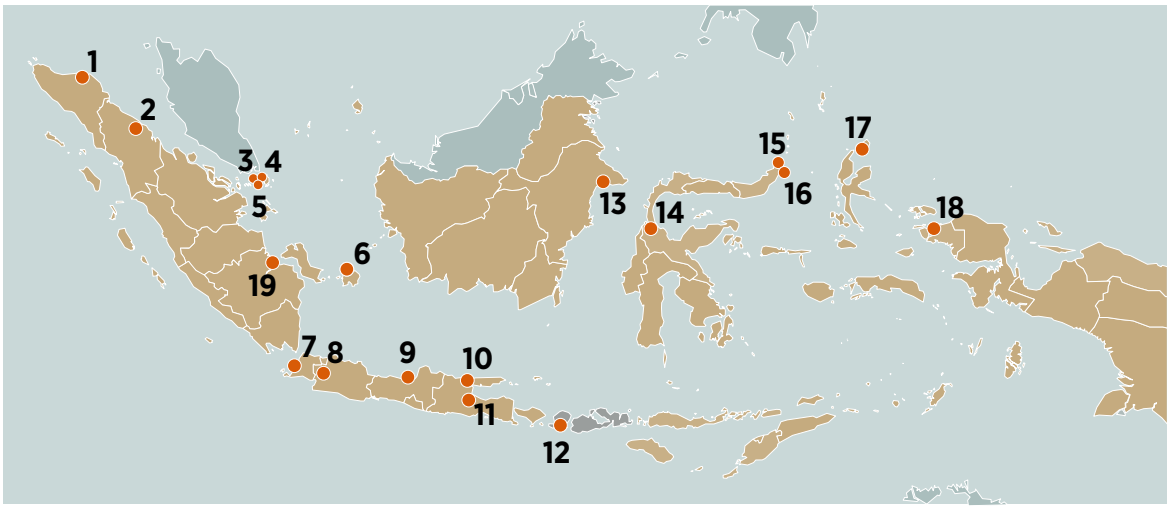
[55] *"SEI Mangkei SEZ," accessed April 23, 2026, https://seimangkeisez.com/.*

[56] *"Galang Batang SEZ," https://kek.go.id/investment/distribution/kek-galang-batang.*

Some provinces also host major industrial clusters outside the SEZ framework, including cement and steel production in specific Industrial Estates. For instance, in Gresik (East Java), there are two industrial zones, which are Gresik SEZ[57] and Gresik Industrial Estate[58]. Gresik SEZ include industries such as nickel and steel smelter, electronics, petrochemical, and energy while, Gresik Industrial Estate specialises in cement and petrochemicals. The Kendal Industrial Park SEZ[59] and other sites, such as the Batang Integrated Industrial Estate[60] in Central Java, have also attracted a wide range of industries and continue growing as manufacturing hubs. In addition, the Krakatau Industrial Estate[61] (KIE) in Cilegon, Banten (northwest Java) is a major hub for upstream and downstream steel industries, along with petrochemicals, chemicals, and energy-related manufacturing.

As CBAM is implemented, zones like these could face losses in CBAM-covered sectors. Across Indonesia, the provinces hosting the highest concentrations of CBAM-exposed industrial facilities, notably Banten (iron and steel), East Java (steel, nickel, and cement), North Sumatra (mineral downstream and chemicals), and Riau Islands (bauxite processing), are disproportionately exposed to economic pressures as CBAM obligations take effect. Another indirect impact of CBAM is falling coal exports in two provinces, East and South Kalimantan, reflecting a notable drop in coal consumption in India which is an exporter of iron and steel to the EU.[62]

Figure 2. Indonesian industrial zones[63] associated with CBAM-targeted products



* Not classified as an SEZ from 2022

1 Arun Lhokseumawe SEZ
2 Sei Mangkei SEZ
3 Nongsa SEZ
4 Batam Aero Technic SEZ
5 Galang Batang SEZ
6 Tanjung Kelayang SEZ
7 Tanjung Lesung SEZ
8 Lido SEZ
9 Kendal SEZ
10 Gresik SEZ
11 Singhasari SEZ
12 Mandalika SEZ
13 Maloy Batuta Trans Kalimantan SEZ
14 Palu SEZ
15 Likupang SEZ
16 Bitung SEZ
17 Morotai SEZ
18 Sorong SEZ
19 Tanjung Api-Api SEZ*

[57] *"Gresik SEZ," https://kek.go.id/id/investment/distribution/kek-gresik.*

[58] *"Gresik Industrial Estates," https://kig.co.id/EN/home/.*

[59] *"Kendal Industrial Park SEZ," https://www.kendalindustrialpark.co.id/page/index/17/special-economic-zone.*

[60] *"Batang Integrated Industrial Zone," https://www.batangindustrialpark.com/en/.*

[61] *"Krakatau Industrial Estate," https://ptksi.id/id/kawasan-industri.*

[62] *Ricardo AEA Ltd., Leveraging Industrial Decarbonisation Options in Indonesia by Anticipating International Carbon Tariff (UNOPS, 2025), https://www.energytransitionpartnership.org/wp-content/uploads/2025/07/20250529_D3-Report-final.pdf.*

[63] *Dewan Nasional Kawasan Ekonomi Khusus. (n.d.). Kawasan Ekonomi Khusus. Retrieved May 2026, from https://kek.go.id/*

4

Institutional and technical readiness for CBAM implementation

For an effective CBAM response, Indonesia needs a coherent set of policies that address institutional, technological and market readiness across key sectors, balancing environmental aims with economic resilience.

The effectiveness of Indonesia's CBAM response will depend on institutional, regulatory, and technical systems, along with the actual transition to low-carbon industrial processes. Carbon-market frameworks and reporting platforms are taking shape, yet they remain highly fragmented, falling into different governmental portfolios. Current MRV and data-collection arrangements do not yet provide the unified, verifiable emissions information needed for CBAM compliance or even broad recognition of domestic efforts. Private sector preparedness also varies widely, with smaller firms left at a distinct disadvantage.

This section examines Indonesia's institutional and technical foundations for across-the-board CBAM adaptation and compliance.

4.1 Regulatory and institutional responsibilities

Indonesia's CBAM response will necessarily require co-operation between a range of government institutions, industry stakeholders and other players. Government ministries, in designing the regulatory framework in their respective sectors, are positioned to address different CBAM requirements, govern compliance and mitigate various impacts. The key government bodies involved are the Ministry of Finance (Kemen Keuangan), Ministry of Environment (Kementerian Lingkungan Hidup), Ministry of Industry (Kementerian Perindustrian), Ministry of Trade (Kementerian Perdagangan), Ministry of Energy and Mineral Resources (Kementerian Energi dan Sumber Daya Manusia) and National Energy Council (Dewan Energi Nasional).

CBAM mitigation strategies will also require input from the affected industries. Key stakeholders in the iron and steel industry, for example, include private manufacturers (*e.g.* PT Gunung Raja Paksi), state-owned enterprises (*e.g.* PT Krakatau Steel) and industry associations. All these entities must build up their technical readiness, reporting capabilities, capacity to identify decarbonisation pathways, and ability to respond to evolving trade risks.

Table 6. Governmental roles and responsibilities in CBAM preparation and readiness

Government institution	Key CBAM-related function
Ministry of Industry (Kementerian Perindustrian)	Support decarbonisation in manufacturing
Ministry of Finance (Kementerian Keuangan)	Adopt CBAM-aligned fiscal policy tools (e.g. carbon taxes or levies on domestic industry emissions) to prevent carbon leakage; guide industry stakeholders on CBAM compliance (e.g. reporting embedded emissions in exports); and design cap-and-trade mechanisms or tax incentives to support industrial decarbonisation.
Ministry of Environment (Kementerian Lingkungan Hidup)	Set national climate pledge (NDC under the Paris Agreement) and emissions-reduction targets; establish MRV system for GHG emissions
Ministry of Trade (Kementerian Perdagangan)	Ensure export report compliance for CBAM-affected products
Ministry of Energy and Mineral Resources (Kementerian Energi dan Sumber Daya Manusia)	Accelerate decarbonisation of the power sector
National Energy Council (Dewan Energi Nasional)	Help achieve national energy transition goals, such as new and renewable energy targets

Source: Author analysis

Indonesia's broader policy response is also linked to Carbon Economic Value (Nilai Ekonomi Karbon –NEK), the umbrella framework for domestic carbon pricing. In the CBAM context, NEK shapes how carbon prices, trading, and crediting schemes can drive emission reductions and ensure reporting readiness in export-facing sectors.

The Ministry of Industry is integrating CBAM concerns into key policies, such as national carbon market regulations (via Presidential Regulation No. 110/2025), the rollout of Indonesia's emissions trading system (ETS, launched in 2023 and targeting full operation by June 2026 with coverage expanded to captive coal/gas plants),[64] and enhanced national emissions reporting aligned with international standards. The ministry is also exploring benchmark ETS examples from comparable non-EU countries, such as China, to guide the design of an Indonesian system covering all industry sectors.

The Ministry of Industry has also been designing the National Industrial Development Master Plan (RIPIN 2025-2045) to integrate sustainable and green targets alongside other long-term goals. The ministry's industrial decarbonisation roadmap sets a more ambitious target for the industrial sector, aiming for net-zero emissions by 2050.[65] A circular letter distributed among industry associations and the private sector asks companies to voluntarily report their emissions. Technical consultations and capacity-building sessions are expected to provide guidance on carbon-footprint calculations and MRV requirements. National emission reporting systems – in addition to accelerating progress on long-term decarbonisation targets – can help Indonesia adapt faster CBAM in the short term.

[64] *ANTARA News, "Indonesia Targets Full-Scale Carbon Market Launch by Mid-2026," Antara News, February 3, 2026, https://en.antaranews.com/news/402758/indonesia-targets-full-scale-carbon-market-launch-by-mid-2026.*

[65] *The 2nd Annual Indonesia Green Industry Summit AIGIS 2025, August 20-22, 2025, https://iesr.or.id/en/indonesian-government-prepares-roadmap-for-clean-net-zero-industry-by-2050/.*

Government institutions, especially the ministries of industry, finance, and environment, have taken notice of the CBAM, recognising its potential impact on Indonesia's industrial exports. Some industry associations, particularly in the iron and steel, aluminium and fertilisers sectors, have also become more engaged in CBAM-related discussions facilitated by ministries and non-governmental organisations.

Government Regulation No. 40 of 2025, adopted on 15 September 2025, stipulates the National Energy Policy (KEN), replacing Government Regulation No. 79 of 2014.[66] The new regulation outlines Indonesia's energy transition targets until 2060, including those for new and renewable energy sources, decarbonisation, and energy reserve management. With this regulation, the government has started steering energy development to achieve net-zero emissions by 2060. The government has stepped up efforts to promote electric vehicles and renewables, alongside the nascent carbon market.

As these regulatory frameworks take shape, stakeholder engagement has become increasingly important to guide implementation, with the Government of Indonesia taking meaningful steps to understand what CBAM implementation means for the national economy and industrial sector. The Ministry of Industry and Ministry of Finance have held constructive dialogues with EU representatives in Indonesia. Bilateral meetings and multi-stakeholder forums with the private sector and civil-society organisations have helped clarify CBAM technical requirements, assess potential impact on Indonesian exports, and identify pathways for national preparation. Expanding these discussions to reach a wider set of industrial stakeholders can bolster CBAM preparation and help develop a domestic carbon market.

Indonesia's carbon market involves two tracks: voluntary and mandatory. The Voluntary Carbon Market (VCM) is emerging through platforms such as IDX Carbon[67] launched by the Indonesia Stock Exchange to help meet national climate goals and the readiness of companies to participate. In parallel, the government is preparing a compliance-based approach that is often described as a Mandatory Carbon Market (MCM) for industrial subsectors. Over time, this mandatory direction could shape sector benchmarks, emissions caps, reporting routines, and domestic carbon cost signals, making it highly relevant for CBAM adaptation.

4.2 Carbon accounting, MRV systems and product traceability

A credible carbon adjustment mechanism relies on robust emissions data. Yet Indonesia currently lacks an integrated measurement, reporting and verification (MRV) system aligned with international standards. Two existing platforms, namely the National Industrial Information System (SIINas) from the industry ministry[68] and the National Registry System for Climate Change Control (SRN-PPI) from the ministries of finance and environment[69] offer foundational tools to cultivate the MRV ecosystem, but they both face significant limitations. The two systems also link to Indonesia's carbon market infrastructure under the NEK system.

The SRN-PPI (Sistem Registri Nasional Pengendalian Perubahan Iklim) tabulates carbon units and issues the GHG Emission Reduction Certificate (SPE-GRK), recognised within Indonesia's emerging carbon market. For CBAM readiness, however, a practical gap remains between facility-level emissions data and registry-based carbon accounting, limiting the viability of domestic instruments for export reporting and, in turn, reducing carbon-related trade costs.

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[66] *ESDM, "Peraturan Pemerintah Nomor 40 Tahun 2025 Tentang Kebijakan Energi Nasional [Government Regulation No. 40 of 2025 on National Energy Policy]," September 15, 2025, https://jdih.esdm.go.id/dokumen/view?id=186.*

[67] *IDX Carbon, "Indonesia Carbon Exchange," accessed April 23, 2026, https://idxcarbon.co.id/.*

[68] *Ministry of Industry of Indonesia, "Sistem Informasi Industri Nasional (SIINAS)," 2025, https://www.siinas.kemenperin.go.id/index.php.*

[69] *Ministry of Environment of Indonesia, "Sistem Registri Nasional Perubahan Iklim (SRN-PPI)," 2025, https://srn.menlhk.go.id/index.php?r=home%2Findex.*

The SIINas (Sistem Informasi Industri Nasional), meanwhile, collects industrial data in a digital database, recording metrics such as production output, energy consumption, raw material inputs, and infrastructure utilisation from various manufacturing sectors. However, SIINas indicators lack carbon intensity metrics, and user accessibility, particularly for small and medium-sized enterprises (SMEs). A more developed database could help monitor carbon intensity and determine emission allowances for Indonesia's ETS or expanded cap-and-trade mechanisms.

On the registry side, the SRN-PPI allows industrial projects to follow reporting methodologies issued by the Ministry of Environment's Directorate General of Climate Change (Ditjen PPI) or national standard-setting bodies, as well as international approaches recognised by the United Nations Framework Convention on Climate Change (UNFCCC). Thus, the registry is tied to Indonesia's Nationally Determined Contribution (NDC) under the Paris Agreement. In practice, however, the registry offers only limited public access to core project documents, which weakens transparency and can make green-minded or CBAM-wary investors hesitate.

At present, an exporter may submit activity or performance information details via the SIINas, concurrently register mitigation actions or carbon units in the SRN-PPI, and still not have a verified emissions file that can travel with a shipment. Independent checks are still limited, and calculation choices can differ across plants and programmes.

Thus, when EU importers ask for figures that can be traced back to meters, invoices, and production logs, many firms struggle to provide a complete and consistent package. That gap also weakens Indonesia's position when it seeks recognition of domestic instruments or domestic carbon payments as a basis to reduce CBAM liabilities.

To support effective CBAM compliance and participation in global carbon markets, Indonesia will need stronger MRV infrastructure, methodologies aligned with international standards, and more accessible data, along with robust institutional engagement.

4.3 Readiness of the private sector

The CBAM is still a new topic for much of Indonesia's private sector, especially SMEs. Larger corporations in export-oriented sectors such as steel and aluminium are more aware and have started preparing before the mechanism took effect. Still, many manufacturers remain unfamiliar with practical requirements for CBAM compliance. Some firms, even outside the main CBAM-covered sectors, have requested targeted capacity building to better understand the new risks and reporting expectations, as well as the direction of the government's response.

Most companies are more concerned about immediate domestic pressures, including high energy costs and regulatory uncertainty. Access to clean technologies remains limited, and CBAM issues are far from the top of the agenda. Although awareness is growing, preparedness across the country's wider industrial base remains uneven, constrained by domestic competitiveness challenges. Capacity building, technical transfer and other international support could help to strengthen commitments to CBAM compliance, both within the government and among manufacturers.

Some companies are asking how the voluntary and mandatory carbon markets (VCM and MCM) will relate to each other and how national carbon-pricing (NEK) instruments will apply in practice. Aside from CBAM adaptation, national rules need to provide credible reporting and predictable signals for low-carbon investment.

In response to growing environmental concerns, the domestic steel industry has begun shifting from traditional blast furnace operations to electric arc furnace (EAF) technology, which offers greater energy efficiency and lower emissions. For example, PT Gunung Raja Paksi (GRP), Indonesia's largest private steel producer, has announced a potential investment of up to USD 600 million to upgrade its EAF facilities and reduce energy intensity.

Beyond awareness and policy engagement, many firms face practical barriers that affect their ability to prepare for CBAM.

4.3.1 Practical barriers and financing constraints

While Indonesia has begun laying the necessary foundations, the overall system remains too uneven to achieve consistent CBAM compliance. Many policy and market initiatives are only partly operational, with little influence on routine practices at the company level. A few firms, including several state-owned enterprises, have started improving their emissions measurement and energy efficiency. Still, domestic carbon data is mostly scattered, informal, and not yet ready for verification, reporting or trading.

Some large firms have set up dedicated teams to track emissions and improve energy efficiency, often in response to export pressure. Major industrial companies, conscious of international competitiveness, may aim to match EU benchmarks. Yet most Indonesian manufacturing firms have no staff member responsible for carbon data and keep their energy and production records in separate places, sometimes in basic spreadsheets. Many plants continue relying on fossil fuels and established production processes. SMEs are usually the most constrained in emissions tracking and process upgrades.

Financing for upgrades is difficult to obtain, especially for retrofits that do not fit standard lending models. Clean electricity and low-carbon equipment are not always available at the scale firms need, and the cost of upgrades can be hard to absorb. These issues affect export competitiveness even before CBAM-related costs are added.

In responding to the new EU measure, companies want clarity on the domestic side. Even with the CBAM in effect, they do not know how Indonesia's carbon tax will be treated or if they could face overlapping domestic and EU charges.

4.3.2 Cross-cutting industrial and data-collection challenges

Several stakeholders described the CBAM as arriving before domestic transition support was fully in place. This Ministry of Industry's initial industrial decarbonisation roadmap, released in August 2025 at the 2nd Annual Indonesia Green Industry Summit AIGIS 2025[70], offered an important signal of intent to adapt. However, reactions have been mixed, particularly among industry associations. Some stakeholders noted that the suggested sector-level pathways, timelines, and implementation instruments were not detailed enough to guide investment decisions or clarify what "compliance" would look like in practice.

Most big players have demanded additional policy support to facilitate their shift to greener industrial processes. Consistent requests include a clear ETS and carbon-market roadmap, fiscal incentives, carbon offset support, subsidies for energy-efficiency and emissions audits, and technical support for calculating product carbon footprints. Firms also seek government facilitated access to international green financing and low-interest transition loans.

Companies are also complaining about the lack of a standard MRV approach or clean institutional responsibility for industrial emissions data. Instead, responsibilities and datasets are split across different systems with different purposes. The SIINas database, as an industry reporting and performance platform under the Ministry of Industry, is not built to work as a full emissions verification system at the product level. The SRN-PPI, on the other hand, only records progress on climate mitigation, without providing comprehensive, verified emissions data for all export products. As a result, Indonesian emissions information is scattered, collected for different objectives, and not automatically comparable across sectors or facilities.

Many companies report their own emissions figures without third-party checks. Given the varying approaches by firms and even between different government programmes, the numbers do not line up neatly for comparison from one site to another. Such inconsistency presents growing challenges for exporters, particularly with CBAM rules in full effect. EU buyers and verifiers need emissions data they can trace and validate, not just estimates. Furthermore, domestic data inconsistency leaves Indonesian exporters with less room to argue that domestic carbon payments should be counted against CBAM charges.

[70] *The 2nd Annual Indonesia Green Industry Summit AIGIS 2025, August 20-22, 2025, https://iesr.or.id/en/indonesian-government-prepares-roadmap-for-clean-net-zero-industry-by-2050/.*

4.4 Priorities to strengthen CBAM readiness

As border carbon measures gain momentum, Indonesia needs to strengthen its climate governance framework and prepare its industries. While EU carbon pricing poses challenges for Indonesian export competitiveness, it also presents an opportunity to accelerate domestic decarbonisation, modernise industrial practices, and align national climate objectives with global targets.

For an effective CBAM response, Indonesia needs a coherent set of policies that address institutional, technological and market readiness across key sectors, balancing environmental aims with economic resilience. A dual-track response, based on decarbonising industries and developing credible domestic carbon pricing, could demonstrate international leadership on climate issues while reducing CBAM certificate obligations. Systematic tracking and verification of emissions could start with firms and sectors selling to the EU and be built up from there.

Rather than the current jumble of SIINas and SRN-PPI emissions data, exporters need one clear MRV pathway under clear leadership, with a baseline method and known audit cycle for affected sectors. The process needs to be repeatable, with the goal of providing one set of numbers that can be checked whenever needed.

Rather than conceptual training, companies need to be taught how to measure emissions, store data, prepare evidence, and complete reports in required formats. Sector-specific sessions could offer real plant examples. In addition, verifiers provided through international or governmental support programmes could provide early input and help firms understand what EU counterparts can accept.

SMEs will need collective support through clusters and supply chains. Industrial parks and other clusters could receive shared services, audits and training, while large buyers could bring SMEs into a common reporting format based on relatively simple tools and templates. Low-cost options are key to avoid excluding SMEs from low-carbon supply chains.

Low-carbon upgrades require electricity, equipment and money. Industrial hubs will need more access to clean power, along with practical channels to finance efficiency upgrades and fuel switching. Unless the transition is bankable, progress on Indonesia's industrial decarbonisation progress will not happen.

Exporters, verifiers and regulators would benefit from technical dialogues with the EU in each sector, exploring how data is being checked, what methods are accepted, and how domestic carbon payments could be counted or not counted in the CBAM framework. Rather than broad statements of support, companies need to know what to submit, how numbers will be checked, and what evidence will be accepted.

Indonesia's CBAM readiness is not only shaped by domestic reforms. It also depends on how CBAM is applied in practice, especially around emissions calculation methods, verification requirements, default values, and the treatment of any carbon price paid in the country of origin. A structured technical dialogue with the EU, organised by sector, can reduce uncertainty for exporters and help avoid avoidable trade frictions during the definitive phase.

Moreover, Indonesia is open, albeit cautiously, to engagement with the EU on how to make the CBAM work for both ends. The country wants fairness, clearer rules, and EU support that matches the scale of the required transition. CBAM compliance requires technology support and financing, as well as recognition for credible domestic mitigation efforts.

Without those, the CBAM could be perceived as a penalty. With them, the country can aim for, and achieve, faster decarbonisation and industrial modernisation.

5 Conclusions

For now, Indonesia's direct exposure to the EU CBAM is limited. Exports of CBAM-covered goods to the EU remain relatively low, and the impact on GDP at the macro level appears minor, estimated at just 0.006% by 2050. That said, CBAM impact matters for specific products and exporters. Prior to CBAM implementation, the EU took a 9.4% share of Indonesia's aluminium exports and 6.6% for iron and steel, signalling vulnerabilities that can grow.

Indonesia has started to respond. The Ministry of Industry's initial industrial decarbonisation roadmap indicates the direction of the country's response, even if the details still need work. The government is also preparing a mandatory carbon market, aiming to apply this to iron and steel, cement, fertilisers, and pulp and paper in a phased rollout through 2028. Other sectors are expected to follow, including textiles, chemicals, glass and ceramics, food and beverages, and automotive by around 2030.

The carbon-market rollout sequence can help, but only if reporting and verification keep pace. For now, regardless of data submission via SIINas and mitigation evidence in the SRN-PPI, Indonesian exporters cannot obtain a unified, verifiable emissions record to attach to international shipments. Nor can the government bolster its case for domestic carbon payments to offset CBAM liabilities with the EU.

Industry readiness is also uneven. A few large firms track their emissions and aim to boost energy efficiency, but most are unable to do so systematically. Financing for upgrades is difficult to obtain, especially for retrofits, clean power is in short supply, and low-carbon equipment can be hard to obtain.

Indonesia is cautiously open to working with the EU on CBAM implementation, but the country needs clearer rules, fair treatment, and adequate transition support. Effective compliance will depend on access to technology, financing, and recognition of credible domestic mitigation efforts, without which EU carbon pricing is likely to be perceived as a penalty rather than an opportunity.

If Indonesia can strengthen its MRV systems, expand affordable clean energy, and mobilise investment for industrial upgrades, the CBAM challenge should remain manageable. If not, international carbon-adjustment requirements are likely to become growing drag on national export competitiveness.

In summary, CBAM is unlikely to shift Indonesia's macroeconomic outlook in the near term, but it will matter for specific export products and for firms exposed to EU markets. Indonesia has begun to prepare through early policy steps and carbon market planning, yet gaps remain in MRV integration, access to clean energy, and financing for upgrades. Closing these gaps will determine whether CBAM becomes a manageable compliance requirement or a longer-term competitiveness constraint.

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