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The EU's Carbon Border Adjustment Mechanism

Considerations for Colombia

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Abbreviations

AFOLU	Agriculture, Forestry, and Other Land Use
ANDI	National Business Association of Colombia
CBAM	Carbon Border Adjustment Mechanism
CPI	Consumer Price Index
E2050	Colombia's Long-Term Climate Strategy
ECCN	Carbon Neutrality Strategy
ECDBC	Colombian Strategy for Low-Carbon and Climate-Resilient Development
ETS	Emissions Trading System
EU	European Union
EU-ETS	European Union Emissions Trading System
GCCA	Global Cement and Concrete Association
GDP	Gross Domestic Product
GHG	Greenhouse gas
GIZ	German Cooperation Agency
IPPU	Industrial Processes and Product Use
LULUCF	Land Use, Land-Use Change, and Forestry
MADS	Ministry of Environment and Sustainable Development
NDC	Nationally Determined Contributions
ONAC	National Accreditation Body of Colombia
PIGCC	Integrated Climate Change Management Plans
PNCC	National Climate Change Policy
PNCN	National Carbon Neutrality Programme
PNCTE	National Emissions Trading System
ROE	Mandatory Emissions Registry
SME	Small and medium-sized enterprises

Executive summary

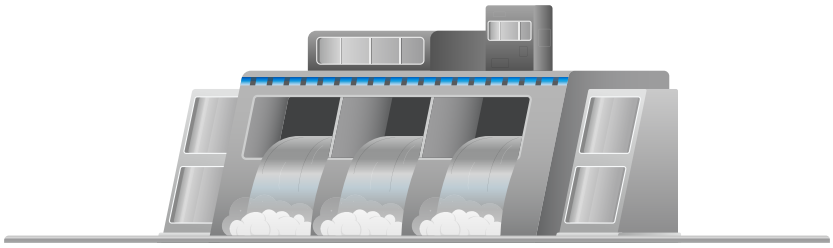
This brief examines the impact of the European Union's Carbon Border Adjustment Mechanism (CBAM) on Colombia.

The main findings suggest the following:

- The EU accounts for a modest share of 3.4% of total Colombian CBAM-covered goods exports and has a limited impact. However, Colombia would face a greater impact if similar Border Carbon Adjustment (BCA) mechanisms are to be implemented in other countries like the US.
- Iron and steel, accounting for 21.7% of Colombia's exports to the EU and the EU being the second largest export market for Colombian iron and steel, is likely to be most impacted by the CBAM. Aluminium, cement, fertiliser and hydrogen sectors are negligibly impacted and account for less than 1% of exports to the EU.
- More than half of Colombia's exports to the EU is linked to oil and coal and should CBAM expand to these sectors, the impact will likely be larger.
- The impact of the CBAM is limited at the national level but concentrated in specific sectors and regions. Córdoba is the most exposed department with the largest iron ore reserves in Colombia. Montelíbano municipality in Córdoba will likely face the most impact on its local economy and value chain. Other significantly less impacted regions include Antioquia, Atlantico, Bolivar, Cundinamarca and Magdalena.
- The capacity to comply with carbon pricing such as the CBAM differs significantly between large companies and small and medium businesses (SMEs). Large companies are likely to have resources to set concrete strategies and road maps for energy efficiency goals whereas SMEs, mostly lack financial, technical, and institutional capacities for complying. Hence, a coordinated effort to equip businesses with the right policy and resources is key for Colombia's industrial development and decarbonisation goals.

This case study on Colombia explores the potential consequences of CBAM implementation, both positive and negative, along with the country's preparedness and possible responses.

- Colombia's reliance on hydropower is a competitive clean energy asset but vulnerable to droughts, which can increase fossil fuel use and Scope 2 emissions, raising CBAM costs.
- Colombia has robust national climate policies to achieve carbon neutrality by mid-century. Carbon tax was introduced in 2017 and National Emissions Trading System is to be implemented by 2027. The standardisation and harmonisation of its emission accounting system and carbon tax with the EU CBAM along with acceleration of its climate strategies as well as measurable and transparent targets are needed to be prioritised for enhancing Colombia's readiness for CBAM implementation.
- The full potential from such climate policies can only be fully realised with strategic planning, coordination, and sustained investments. In addition, transition consideration should involve support from international cooperation based on "common but differentiated responsibility" and/or recycling of CBAM revenue.



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 from Colombia explores the potential consequences of CBAM implementation, both positive and negative, 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, Transforma Global – considers exporting-country perspectives and highlights the nuances of CBAM impact at both the national and sub-national levels.

1

Implications of the EU CBAM

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 currency (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 Colombia 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]

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.[8] 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.[9] This has raised concerns about equity and the way the CBAM influences exporting countries' own industrial climate strategies.[10] 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.[11] 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.[12]

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.[13]

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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] *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.*

[9] *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.*

[10] *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.*

[11] *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.*

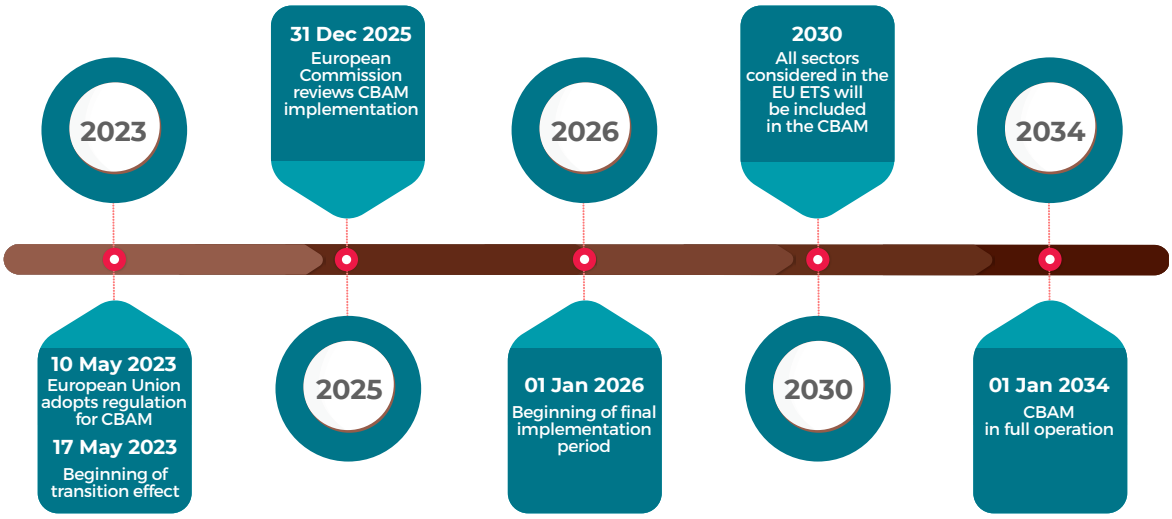
[12] *European Commission, Carbon Border Adjustment Mechanism.*

[13] *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.[14] 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.[15]

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.[16], [17] 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.[18]

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

[15] *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.*

[16] *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.*

[17] *European Commission, Officially Published.*

[18] *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

Any reduction in EU-bound production is unlikely to translate into a significant change in Colombia's overall emissions profile, unless the CBAM leads to a broader contraction of industrial output or induces economy-wide decarbonisation shifts.

Colombia's trade structure remains relatively concentrated, in terms of both products and destinations: The United States absorbed 26.7% of exports in 2023, while the European Union, though not the top market, consistently accounted for 10% to 15% between 2013 and 2023. Most of Colombia's exports are concentrated in emission-intensive sectors, such as oil and coal. Together, these accounted for 56.5% of total exports to the EU in 2023, leaving the country vulnerable to the rise of climate-linked trade policies and changing international environmental regulations.[19]

Given this exposure, the CBAM is a particular concern for Colombia. CBAM-covered goods, though comprising a modest share of Colombia's exports, have grown from 1.9% (USD 1.1 billion of a total USD 59 billion of exports) to about 3.4% (or more than USD 1.7 billion of USD 50 billion) between 2013 and 2023.[20]

The CBAM-covered sector with the highest export volume from Colombia is iron and steel. In 2023, Colombia exported a total of about USD 900 million worth of iron and steel, or roughly 51% of all CBAM-covered product exports. Aluminium followed at approximately 45%. Iron and steel exports to the EU consisted of nearly all CBAM-covered products – worth around USD 190 million, or more than 99% of the sector's EU-bound exports.[21]

A major ferronickel mining operation, Cerro Matoso, has adopted an export-diversification strategy, specifically targeting Asian markets. A recent online meeting on business strategies for carbon regulation[22] mentioned this diversification strategy as an example of a Colombian supplier transforming challenges into opportunities for sustainable competitiveness. Although the CBAM is not the only factor, it has reinforced Colombia's need to seek markets outside the EU.

According to the national Biennial Transparency Report (2024), Colombia's greenhouse gas (GHG) emissions are concentrated in land use, land use change and forestry, accounting for 34.5%; agriculture, forestry and other land use, 33.7%; and energy, 20.7%.[23]

Industrial processes and product use (IPPU), accounts for only 4.2% of the country's total GHG emissions. Cement, iron and steel, and ferroalloy production industries are the main contributors to IPPU-related emissions, as reported in the country's biennial reports. Cement production consistently contributed over 40% of the country's GHG emissions associated with the IPPU sector. Iron and steel production, along with ferroalloy production, added 14% to IPPU-related carbon-dioxide (CO_2) and 8% to IPPU-related GHG emissions in 2021.[24, 25]

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[19] *MinCIT- Ministerio de Comercio, Industria y Turismo, "OEE MA Exportaciones 2010 Dic 2023," March 2025, https://www.nube-mcit.gov.co/public.php?service=files&t=3040a9a7106f89ad382a71dd9993e4ba&path=%2FREPORTES%2FExportaciones%2FBase%20de%20consulta%20r%C3%A1pida.*

[20] *Ibid.*

[21] *Ibid.*

[22] *Asociación Nacional de Industriales, Estrategias Empresariales Frente a La Regulación Del Carbono - Transformando Desafíos En Oportunidades Para La Competitividad Sostenible (Bogotá D.C., Colombia, 2025).*

[23] *Ideam et al., Primer Informe Bienal de Transparencia de Colombia (Bogotá D.C., Colombia, 2024), https://www.andi.com.co/Uploads/1.%20BTR1_Colombia.pdf.*

[24] *Ideam et al., Primer Informe Bienal de Transparencia de Colombia.*

[25] *Colombia, Colombia. Biennial Update Report (BUR). BUR 3. National Inventory Report (UNFCC, 2022), https://unfccc.int/documents/510821.*

Colombia already has a comprehensive long-term roadmap for decarbonising its economy: the Low-Carbon Development and Climate Resilience Strategy.[26] This framework encompasses National Development Plans (Planes Nacionales de Desarrollo – PND), Nationally Determined Contributions (NDCs) under the Paris Agreement, the Long-Term Climate Strategy (E2050), and a range of other national and sector-specific policy instruments.

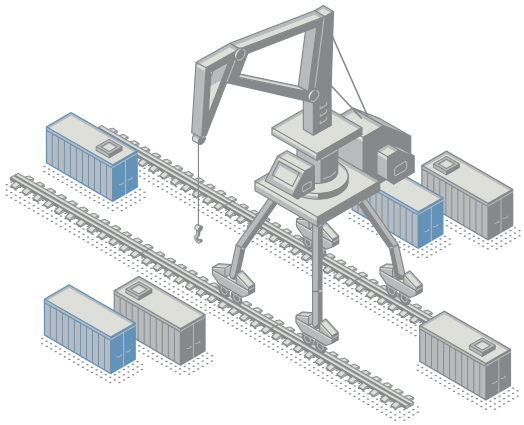
The overall roadmap sets an intermediate goal of reducing 51% of GHG emissions by 2030,[27] supported by a legal framework and policy instruments aligned with international climate commitments. It also establishes specific emissions-reduction targets for sectors such as agriculture and land use, energy and industry, among others.

Consequently, the impact of CBAM implementation on Colombia's exports appears limited, whether in terms of products or destinations. CBAM-covered products represent relatively low shares of exports to the EU. While ferroalloy production, as the source of current ferronickel exports to the EU, might decline, this would affect a relatively small emissions segment within the IPPU sector, which itself represents only 4.2% of Colombia's total GHG emissions. As a result, any reduction in EU-bound production is unlikely to translate into a significant change in the country's overall emissions profile, unless CBAM leads to a broader contraction of industrial output or induces economy-wide decarbonisation shifts.

This reflects limited aggregate impact with minimal exposure in most sectors. Yet the CBAM will undoubtedly affect the iron and steel value chain and the Montelíbano area in the northwestern department of Córdoba.

This case study examines Colombia's CBAM exposure at the national and sub-national levels, identifies the sectors at greatest risk, and assesses mixed institutional and private-sector readiness. Notably, it will highlight gaps in monitoring, reporting and verification (MRV), traceability, and the capabilities of small and medium-sized enterprises (SMEs).

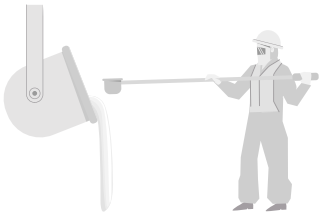
At the same time, however, adaptation to the CBAM could unlock opportunities for Colombia. Compliance would accelerate firm-level decarbonisation, improve domestic data and verification systems, and reposition exports into climate-aligned value chains. However, the country also faces major downside risks should the CBAM expand to more downstream industries or indeed to oil and coal. This case study also considers policy measures that could mitigate distributional impacts.



[26] *Ministerio de Ambiente y Desarrollo Sostenible, Estrategia Colombiana de Desarrollo Bajo En Carbono y Resiliente al Clima (ECDBC) (Bogota, 2024), https://www.minambiente.gov.co/wp-content/uploads/2024/05/ECDBC.pdf.*

[27] *Ministerio de Ambiente y Desarrollo Sostenible, "Política Nacional de Cambio Climático, PNCC," 2020, https://accionclimatica.minambiente.gov.co/pncc/.*

3 Impact of the EU CBAM on Colombia



The CBAM will affect employment, production, and the fiscal resilience of local economies. Export-dependent departments and municipalities will need to consider alternative scenarios and incorporate these new external policies into their planning processes.

According to the World Bank's Economic Exposure Index, Colombia is ranked 28th out of 70 countries in terms of CBAM exposure. National-level exposure is 0.003% (compared to 1.908% for the most affected country and -0.211% for the least affected), indicating limited CBAM impact on Colombia under current conditions.[28] Nonetheless, exposure would be substantially higher in specific regions and firms with a high concentration of CBAM-covered products. Meanwhile, affected exporters in the country will face additional 15% costs due to CBAM certificates.[29]

National-level studies, such as those by the United Nations (2021)[30] and French development agency (AFD) and World Bank macroeconomists Magacho, Godin & Espagne, (2022),[31] have highlighted uneven CBAM impacts. Preparedness for the CBAM, therefore, requires a targeted policy response.

Colombia's CBAM-related exports, furthermore, have grown in recent years, driven by several economic factors. One was a surge in global commodity prices amid pandemic-related supply chain disruption, followed by a sharp demand rebound for industrial materials like steel, aluminium, and fertilisers. Steel prices more than doubled in 2021, while aluminium and fertiliser prices reached decade-high levels.[32, 33]

International price hikes mainly reflect improved terms of trade, with better profit margins prompting firms to redirect existing output from domestic markets to more lucrative export destinations.[34] At the same time, shortages from major producers like China and Russia pushed buyers in Europe and the Americas to diversify suppliers, boosting demand for Colombian exports.[35]

3.1. Exports to the EU

The EU has been a consistent buyer of Colombian iron and steel, even in the years when exports diversified. The bloc accounted for 21.7% of Colombia's total iron and steel exports in 2023, leaving the sector more exposed than any other to CBAM implementation. In contrast, the EU market for aluminium, cement, fertilisers and hydrogen remains minor, accounting for less than 1% of Colombia's exports of those products in 2023.[36]

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[28] *Chepeliev Maryla M. ,Fischer, Carolyn,Jung, Euijin,Maliszewska, Carbon Border Adjustment Mechanism (CBAM) Exposure Indices Methodological Note (English), Text/HTML (World Bank Group, 2025), https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099062625130529813.*

[29] *Maryla, Carbon Border Adjustment Mechanism (CBAM) Exposure Indices Methodological Note (English).*

[30] *Isabelle Durant et al., A European Union Carbon Border Adjustment Mechanism: Implications for Developing Countries (UNCTAD, 2021).*

[31] *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.*

[32] *World Bank, Commodity Markets Outlook, April 2024 (Washington, D.C., 2024), https://openknowledge.worldbank.org/server/api/core/bitstreams/9e84a1ca-8a6b-45c1-8693-01edc068408d/content.*

[33] *International Monetary Fund, World Economic Outlook: Countering the Cost-of-Living Crisis (International Monetary Fund, 2022), https://doi.org/10.5089/9798400218439.081.*

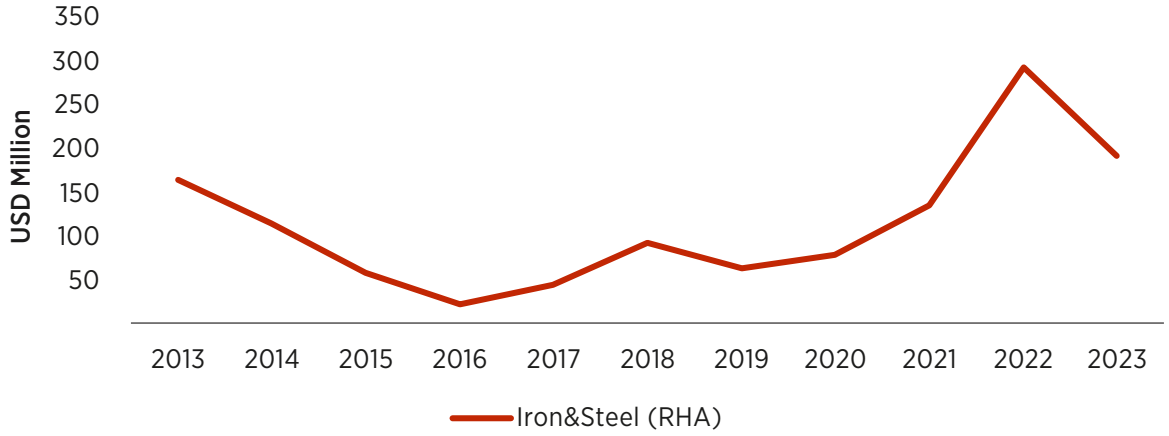
[34] *World Bank, Global Economic Prospects, Commodity Price Cycles: Drivers and Policies (2022), https://thedocs.worldbank.org/en/doc/cb15f6d7442eadedf75bb95c4fdec1b3-0350012022/original/Global-Economic-Prospects-January-2022.pdf.*

[35] *Paolo Giordano et al., Trade and Integration Monitor 2022: Shockwaves: Latin America and the Caribbean Facing Global Trade Turmoil. (2022), publications.iadb.org/publications/english/document/Trade-and-Integration-Monitor-2022-Shockwaves-Latin-America-and-the-Caribbean-Facing-Global-Trade-Turmoil.pdf.*

[36] *Authors, based on MinCIT data. MinCIT- Ministerio de Comercio, Industria y Turismo, "OEE MA Exportaciones 2010 Dic 2023."*

Figure 2 shows the evolution of Colombia's exports of iron and steel to the EU between 2013 and 2023, expressed in millions of U.S. dollars. It illustrates a downward trend until 2016, followed by a gradual recovery that peaked in 2022 before declining again in 2023.[37]

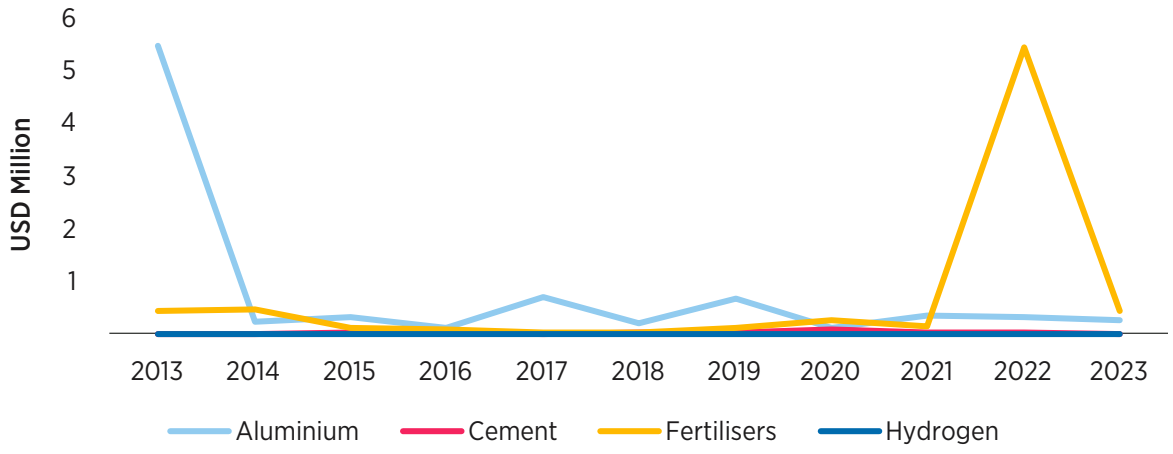
Figure 2. Colombian exports of iron and steel (2013-2023) to the EU



Source: Based on Ministerio de Comercio, Industria y Turismo (2025) data[38]

Aluminium, cement, fertilisers, and hydrogen are far less prominent among Colombia's CBAM-related exports to the EU, as shown in Figure 3. Aluminium fell sharply from USD 5.46 million in 2013 to less than USD 1 million in subsequent years, stabilising at USD 0.29 million in 2022 and USD 0.26 million in 2023. Cement, historically a low-export sector to Europe, peaked in 2016 at USD 0.35 million and then nearly disappeared from Colombia-EU exports in 2023. Fertilisers, on the other hand, surged from just USD 140,000 in 2021 to USD 5.43 million in 2022, reflecting a global agricultural input crisis, before dropping back to USD 420,000 in 2023. Lastly, hydrogen has thus far remained almost absent from exports to the EU, with Colombia instead concentrating on Latin American and Caribbean markets.[39]

Figure 3. Colombian exports of aluminium, cement, fertilisers and hydrogen (2013-2023) to the EU



Source: Based on Ministerio de Comercio, Industria y Turismo (2025) data[40]

[37] *Authors, based on MinCIT data. MinCIT- Ministerio de Comercio, Industria y Turismo, "OEE MA Exportaciones 2010 Dic 2023."*

[38] *MinCIT- Ministerio de Comercio, Industria y Turismo, "OEE MA Exportaciones 2010 Dic 2023."*

[39] *Ibid.*

[40] *Ibid.*

On the national scale, therefore, initial CBAM economic impacts are not substantial. CBAM-covered goods represent just 3.4% of Colombia's total exports in 2023.[41] Nevertheless, the concentration of production for those exports in specific municipalities raises concerns about localised disruptions and impacts.

3.2. Expected CBAM expansion

A recent EU review states that other goods covered by the EU ETS could be phased into the CBAM by 2030.[42] A World Bank assessment[43] indicates that future rounds may extend to "petroleum and other fossil fuels," implicitly including coal and natural gas, while the European Parliament has endorsed a roadmap to cover all ETS sectors by 2030.[44]

Looking ahead, the EU could expand the CBAM to cover additional carbon-intensive goods, in which case Colombia's exposure could significantly increase, particularly in sectors linked to fossil fuels and downstream chemical production.

Moreover, the EU is not alone: the United Kingdom plans to introduce its own BCA mechanism in 2027,[45] and several draft bills in the United States also propose such mechanisms.[46] Scenarios of wider carbon pricing, although uncertain at this stage, are highly plausible. Even if the precise scope and timing are still under preliminary discussion, exporting countries need to prepare for multiple, evolving BCAs.

The Colombian economy relies heavily on the exploitation of oil and coal, which together accounted for 56% of Colombian exports to the EU in 2023.[47] If CBAM were to be extended to cover these fossil fuels in the future, it would likely disrupt the country's international trade, reduce the government's revenues from the tax and royalty, and depress economic activity in production areas. Historically, oil and coal have played a significant role in Colombia's public finances. Together, these sectors contributed roughly 3% of GDP in fiscal revenues, including taxes, royalties, and Ecopetrol (Colombian Petroleum Co.) dividends between 2011 and 2022, accounting for up to 14% of total national government income during boom years.[48]

Royalties from extractive activities represented about 1.1% of GDP in 2022, concentrated in oil and coal. In production terms, oil and coal together generated 3.2% of GDP and sustained close to 100,000 formal jobs, primarily in the departments of Meta, Casanare, La Guajira, and Cesar. High dependence underscores Colombia's fiscal and territorial vulnerability to fossil-fuel market fluctuations, as well as to the global energy transition.[49]

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[41] *MinCIT- Ministerio de Comercio, Industria y Turismo, "OEE MA Exportaciones 2010 Dic 2023.*

[42] *Regulation (EU) 2023/956 of the European Parliament and of the Council of 10 May 2023 Establishing a Carbon Border Adjustment Mechanism (CBAM), 130 (2023), http://data.europa.eu/eli/reg/2023/956/oj.*

[43] *World Bank Group, Country Climate and Development Report: Kazakhstan (2022), https://openknowledge.worldbank.org/server/api/core/bitstreams/80bdfcf8-73b1-42b3-b107-1629f64a1f0c/content.*

[44] *European Parliament, EU Carbon Border Adjustment Mechanism (CBAM): Key Issues, European Parliamentary Research Service (EPRS), At a Glance, No. 754626, 2023, https://www.europarl.europa.eu/RegData/etudes/ATAG/2023/754626/EPRS_ATA(2023)754626_EN.pdf*

[45] *HM Treasury, "Factsheet: Carbon Border Adjustment Mechanism," 2025, https://www.gov.uk/government/publications/factsheet-carbon-border-adjustment-mechanism-cbam/factsheet-carbon-border-adjustment-mechanism.*

[46] *Centro de Estudos de Integração e Desenvolvimento (CINDES), Global Dialogue on Border Carbon Adjustments: The Case of Brazil.*

[47] *Authors, based on MinCIT data. MinCIT- Ministerio de Comercio, Industria y Turismo, "OEE MA Exportaciones 2010 Dic 2023."*

[48] *Astrid Martínez, La Dependencia Del País y de Los Territorios de Los Hidrocarburos y El Carbón En Colombia y La Necesidad de La Diversificación de Las Exportaciones y de La Producción Ante La Transición Energética (Programa de las Naciones Unidas para el Desarrollo (PNUD), 2024), https://indh2024.pnud.org.co/hd/papers/13-La-dependencia-del-pais-y-de-los-territorios-de-los-hidrocarburos-y-el-carbon-en-Colombia.pdf.*

[49] *Ibid*

3.3. Subnational CBAM impact

While the current scope of the CBAM represents a modest share of total exports and GDP at the national level, this perspective may hide important sub-national dynamics. Export dependence on CBAM-covered goods is concentrated in specific parts of the country. Politically and administratively, Colombia is divided into 32 departments, each with varying degrees of economic specialisation and exposure to international markets. Thus, while national-level impact appears limited, the CBAM's sub-national effects are far more significant – particularly in departments whose economies depend heavily on exporting carbon-intensive goods.

The department of Córdoba (see Figure 4) is the most exposed to CBAM-related risks, with cumulative iron and steel exports totalling USD 1.2 billion between 2013 and 2023. [50] Located in northwestern Colombia on the Caribbean coast, this area has historically relied on mining and metal production. The department hosts a major concentration of industrial infrastructure, including steel-processing facilities and mining operations, particularly around the municipality of Montelibano, with some of the country's largest iron ore reserves. The resulting concentration of carbon-intensive exports makes Córdoba particularly vulnerable to potential trade disruptions and rising compliance costs under the EU's carbon pricing framework.

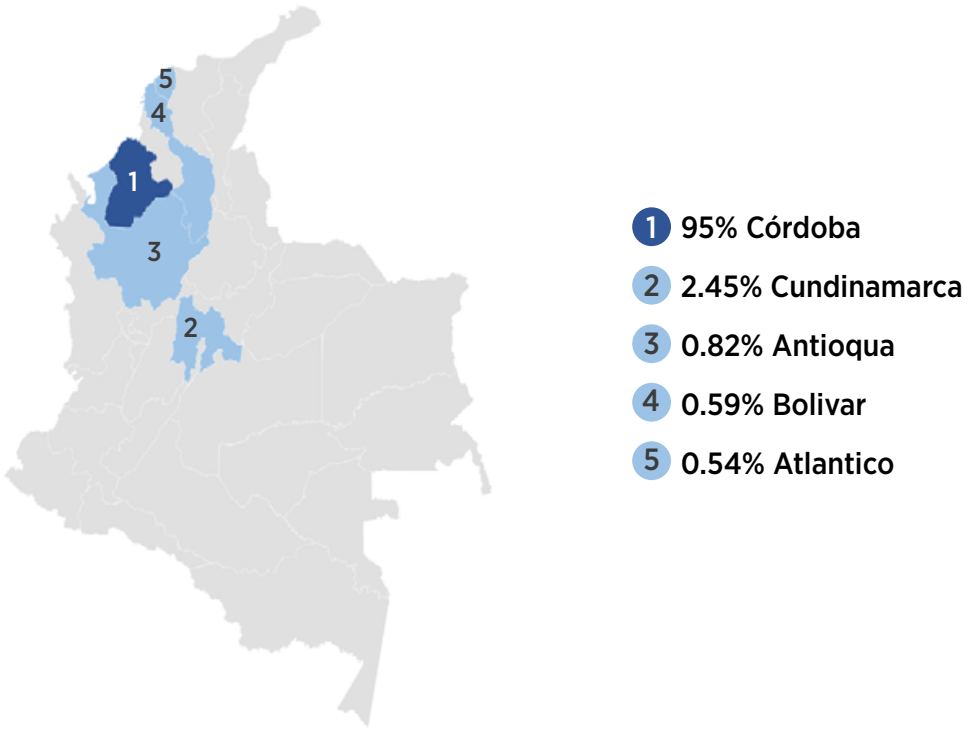
In comparison, other departments have exported lower – though in some cases notable – volumes of CBAM-covered products over the same period: Magdalena exported USD 5.03 million in aluminium, Antioquia USD 0.13 million in cement, and Cundinamarca USD 0.07 million in fertilisers. To contextualise these figures, Córdoba's GDP in 2023 was only about USD 6.43 billion, meaning CBAM-covered exports represent a meaningful share of the department's economic output. In contrast, Antioquia (USD 53.49 billion), Cundinamarca (USD 23.01 billion), and Magdalena (USD 5.05 billion) show much lower CBAM-related export volumes relative to the size of their economies.[51]

Figure 4 shows the geographic distribution of CBAM-covered exports from each department as a share of Colombia's national total between 2013 and 2023. As the breakdown confirms, the exposure of different areas is highly asymmetrical. Córdoba alone accounts for 95% of Colombia's total CBAM-covered exports during those years, primarily due to its large-scale iron and steel production.

[50] *Authors, based on MinCIT data. MinCIT- Ministerio de Comercio, Industria y Turismo, "OEE MA Exportaciones 2010 Dic 2023."*

[51] *Author's own calculation based on DANE. DANE, PIB Total Por Departamentos (2024), https://www.dane.gov.co/index.php/estadisticas-por-tema/cuentas-nacionales/cuentas-nacionales-departamentales.*

Figure 4. CBAM-covered exports by Colombian departments (2013-2023)



Source: Based on information from MinCIT (2024).[52]

Dependence on iron and steel exports places Córdoba at the centre of Colombia's CBAM vulnerability. While other departments may be less directly affected, they could experience supply-chain disruptions, shifts in market competitiveness, and regulatory spillovers. These indirect impacts could widen as CBAM implementation advances, while direct impacts could increase as it expands to other sectors.

Iron and steel dependence

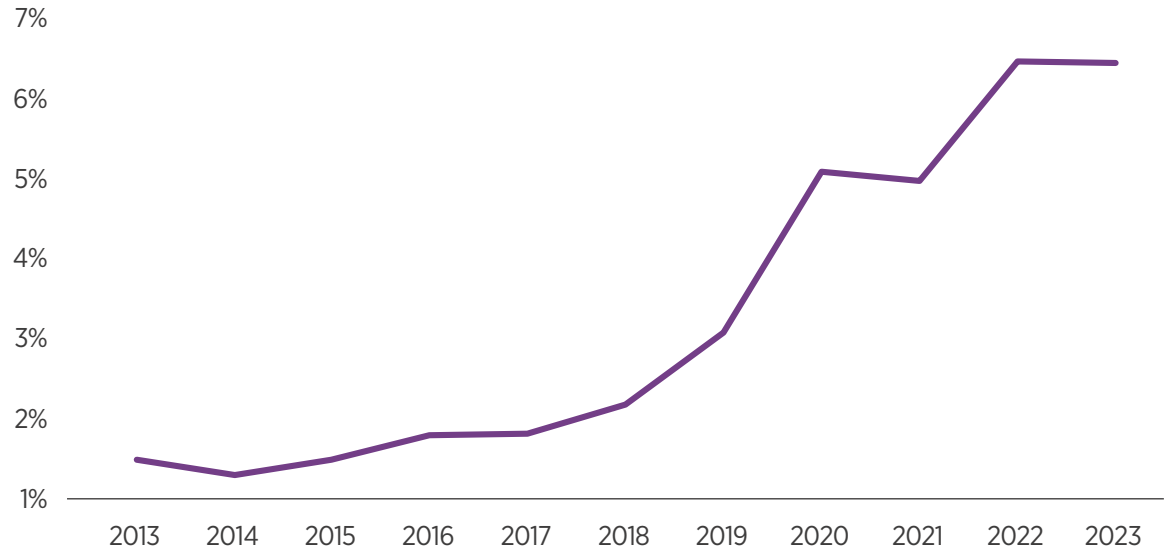
Historically, iron and steel-related operations have been a key driver of industrial output and employment for Córdoba. However, the sector's contribution to departmental GDP has varied over the years. As shown in Figure 5, mining rose from 1.3% of Córdoba's GDP in 2014 to 6.44% in 2023, including a sharp rise in 2019, a slight pandemic-related dip, and a peak of 6.45% in 2022.[53] Steady overall growth reflects increasing production and favourable market conditions, though recent signs of plateauing may signal emerging constraints such as declining mineral reserves.[54]

[52] *MinCIT- Ministerio de Comercio, Industria y Turismo, "OEE MA Exportaciones 2010 Dic 2023."*

[53] *Data on departmental GDP contribution is only disaggregated by broad economic sectors; as such, the mining sector category was used as a proxy.*

[54] *Asociación Nacional de Industriales, Estrategias Empresariales Frente a La Regulación Del Carbono - Transformando Desafíos En Oportunidades Para La Competitividad Sostenible.*

Figure 5. Contribution of the mining sector to Córdoba's GDP (%)



Source: Based on information from DANE (2024).[55]

According to trade reports, Colombia's iron and steel exports have risen with demand from Latin American and global markets, particularly in the wake of supply chain disruptions caused by the COVID-19 pandemic and trade tensions between the United States and China.[56] Additionally, the government's industrial policies and investment in mining-related industries have strengthened local production capacities, enabling Córdoba to regain its position as a key player in the national iron and steel industry.

Localised impact / Impact at the municipal level

Understanding how the CBAM will affect local economies also requires analysing municipal GDP contributions. Some municipalities are heavily reliant on a single industrial activity – making them particularly vulnerable to global regulatory and market shifts. A prime example is, Montelibano, home to Cerro Matoso S.A., one of the world's largest ferronickel producers.

According to Cerro Matoso, the company employed 2,386 people – 956 directly and 1,430 through contractors – as of 2022.[57, 58] Its economic reach extends well beyond direct employment, sustaining local businesses, services, and supply chains. The company paid 465.7 billion Colombian pesos (COP) in royalties in 2022 and COP 262.7 billion in other payments (Cerro Matoso, 2025)[59] – equivalent to approximately USD 109.4 million and USD 61.7 million (at the average exchange rate of 2022), reaffirming its role as a key fiscal contributor for both the municipality and the broader department. As illustrated in Figure 6, the municipality's contribution to Córdoba's GDP increased from just above 11% in 2013 to over 17% in 2021–2022.

[55] *DANE, Resultados Por Actividad Económica (2024), https://www.dane.gov.co/index.php/estadisticas-por-tema/cuentas-nacionales/cuentas-nacionales-departamentales.*

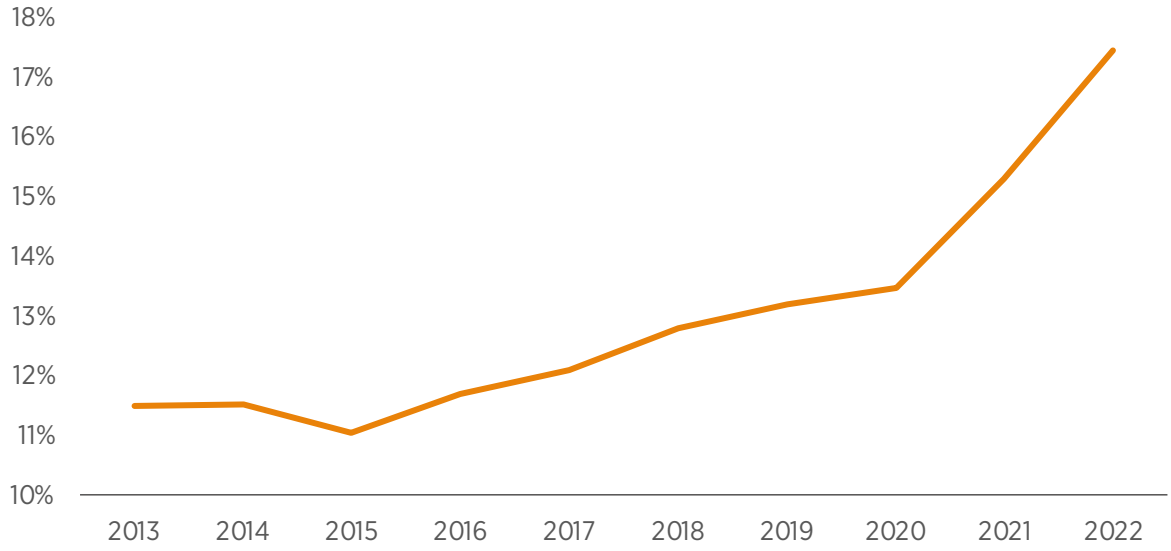
[56] *Economic Commission for Latin America and the Caribbean (ECLAC), Foreign Direct Investment in Latin America and the Caribbean, 2023 (UNITED NATIONS, 2023), https://repositorio.cepal.org/server/api/core/bitstreams/fd2ce029-2846-4900-a0e6-14818f6191b3/content.*

[57] *This accounts for the 2,8% of the local population (DANE, 2023).*

[58] *Cerro Matoso, Informe de Sostenibilidad 2023 (2025), https://heyzine.com/flip-book/45afb5e1c9.html#page/25.*

[59] *Ibid*

Figure 6. Contribution of Montelíbano municipality to Córdoba's departmental GDP



Source: Based on information from DANE (2024).[60]

For the moment, Cerro Matoso does not regard the CBAM as an immediate threat. However, the situation is being closely monitored, and the firm is actively complying with emissions reporting requirements, a Cerro Matoso representative said at a public event organised by the National Business Association of Colombia (ANDI) in April 2025.[61] This stance reflects the evolving nature of CBAM requirements. Though limited in scope during the transition phase, the mechanism is expected to become stricter, with far-reaching effects in years to come.Cerro Matoso's case illustrates the broader uncertainty faced by carbon-intensive exporters amid evolving international climate regulations. As one of Colombia's main producers of ferronickel and exporters to the EU, the company is currently complying with the reporting requirements under the mechanism. However, the commercial impact of these regulations will become more tangible with the obligation to purchase CBAM certificates coming into effect on 1 January 2026. While Cerro Matoso also faces structural challenges, such as declining mineral reserves and a gradual reduction in production volumes (from 40,000 to 35,000 tonnes, with further decreases anticipated), these issues appear less pressing than emerging regulatory shifts.[62]

Wider CBAM reverberations

For the Montelibano municipality, CBAM implications go beyond the mine. For a local economy so dependent on ferronickel exports, any trade frictions or cost increases stemming from the CBAM could reverberate across employment, local consumption, and public revenues. Even without a production shutdown, a tightening carbon border regime could compound existing structural vulnerabilities. Preparing for the new policy landscape is essential – not only for large exporters like Cerro Matoso but also for the local economies that rely on them.

The new EU measures will affect employment, production, and the fiscal resilience of local economies. Consequently, export-dependent departments and municipalities will need to consider alternative scenarios and incorporate these new external policies into their planning processes.

Even if wider economic impacts are initially limited, CBAM application holds unique implications for Colombia. Furthermore, sub-national economic disruptions may only be the beginning.

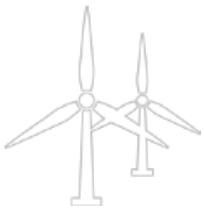
[60] *DANE, Valor Agregado Por Municipio (2024), https://www.dane.gov.co/index.php/estadisticas-por-tema/cuentas-nacionales/cuentas-nacionales-departamentales.*

[61] *Asociación Nacional de Industriales, Estrategias Empresariales Frente a La Regulación Del Carbono - Transformando Desafíos En Oportunidades Para La Competitividad Sostenible.*

[62] *Asociación Nacional de Industriales, Estrategias Empresariales Frente a La Regulación Del Carbono - Transformando Desafíos En Oportunidades Para La Competitividad Sostenible.*

4

Institutional and technical readiness for CBAM implementation



CBAM compliance demands major institutional and technical adjustments, including detailed facility-level data collection, new monitoring systems, and improved supply chain traceability – all of which involve time, training, and investment.

Colombia has laid a strong policy foundation for climate action, but translating those commitments into CBAM compliance presents significant challenges. Despite ambitious national and sectoral decarbonisation plans, gaps remain in emissions reporting, data traceability, and technical capacity, especially among small and medium-sized enterprises (SMEs). This section examines the country's climate and energy governance framework, carbon accounting systems, and sector-level preparedness, aiming to assess Colombia's readiness to meet the EU's stringent CBAM requirements.

4.1. Climate and energy governance

Colombia is active in global climate cooperation, adopting decarbonisation strategies and seeking funds and implementation partners from the private sector, the public sector, civil society and academia. The government, together with sectoral associations, has promoted industrial policies aimed at accelerating emissions reduction.[63] The associations still need clearer objectives from the government, according to sustainability expert at the National Business Association of Colombia. Challenges remain in linking sectoral climate strategies to defined goals, such as Nationally Determined Contributions (NDCs) under the Paris Agreement. Moreover, Colombian industries struggle to keep pace with innovation and technological changes in advanced economies.

The country has implemented an integrated policy framework to support its transition to a low-carbon economy. The National Climate Change Policy (PNCC) sets out long-term guidelines for climate action and integrates adaptation and mitigation into national planning. Law 1931 of 2018 provides the legal foundation for climate governance, setting out guidelines for managing climate change and calling for the formulation of territorial and sectoral climate plans. Additionally, Law 2169 of 2021 sets minimum targets and measures for Colombia to reach carbon neutrality. The country's Long-Term Climate Strategy (E2050) outlines a strategic vision and pathways to achieve carbon neutrality by 2050. Complementing this, Colombia's NDC adopted in 2020 committed the country to reducing GHG emissions by 51% by 2030 compared to business-as-usual levels,[64] a commitment reaffirmed in the new NDC for 2035.

To achieve these aims, the country has adopted an Integrated Climate Change Management Plan (PIGCC) series designed to address vulnerabilities and climate risks in specified territories and sectors.

The PIGCC for Commerce, Industry and Tourism, for instance, outlines sector-specific mitigation targets, along with strategies for sustainable production, energy efficiency, and integrating circular economies. The industrial sector has committed to reducing 7.7 megatonne of CO_2 equivalent ($MtCO_2eq$) by 2030, with a heavy emphasis on energy efficiency and waste management, especially in emissions-intensive sub-sectors like cement, iron and steel, and chemicals. However, challenges remain in standardising emissions reporting, particularly for SMEs.[65]

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[63] *According to a meeting with representatives of the Climate Change and Risk Management department of the Ministry of Environment and Sustainable development.*

[64] *Ministerio de Ambiente y Desarrollo Sostenible, "Política Nacional de Cambio Climático, PNCC."*

[65] *MinCIT- Ministerio de Comercio, Industria y Turismo, Plan Integral de Gestión Del Cambio Climático Sector Comercio, Industria y Turismo (2021), https://www.mincit.gov.co/normatividad/proyectos-de-normatividad/proyectos-de-resolucion-2021/24-05-2021-pigccs-2021-05-02.aspx.*

The PIGCC for the Mining and Energy sector addresses decarbonisation pathways in fossil fuel industries, including coal, and promotes long-term emissions reduction through clean energy, operational efficiency, and the use of technologies like carbon capture and storage (CCS). The plan sets out a target to reduces the sector's GHG emissions by 11.2 $MtCO_2eq$ by 2030 in line with to Colombia's climate goals.[66]

Building on this regulatory and strategic foundation, the government launched the National Carbon Neutrality Programme (PNCN) as a pillar of the Carbon Neutrality Strategy (ECCN). This programme provides technical guidance for public and private organisations to measure, manage and reduce their emissions. Over 500 organisations have joined the "#ColombiaCarbonoNeutral" Alliance, including major industrial companies from key sectors such as cement (Holcim Colombia, Eternit Colombiana), iron and steel (Diaco, Grupo Siderúrgico Reyna), aluminium (Tecnoglass), and fertilisers (Monómeros, Yara Colombia), positioning these companies as leaders in climate action promoting best practices for decarbonisation.[67] Under a pilot project described by a Ministry of Environment and Sustainable Development (MADS) representative, some companies have started voluntarily reporting their emissions, as well as sharing their processes for setting decarbonisation targets.[68]

Colombia's energy system may further complicate CBAM implementation. Heavy reliance on hydropower results in one of the world's cleanest electricity mixes. However, it also introduces climate-related risks, such as rising vulnerability to droughts, which can be triggered by the El Niño phenomenon and exacerbated by climate change. As a representative from the National Business Association of Colombia noted, periods of reduced hydric resources could drive up electricity consumption from fossil-based sources, increasing Scope 2 (indirect, energy-related) GHG emissions. This represents an added risk factor for exporters striving to meet CBAM requirements, as higher emissions during drought periods in turn increase carbon certificate payments due to the EU.

4.2. Carbon accounting and product traceability

Colombia's Low-Carbon and Climate-Resilient Development Strategy (ECDBC) aims to decarbonise its economy through a coordinated intersectoral planning and implementation process,[69] supported by policy instruments that align with international climate commitments. The country has made progress in developing tools for GHG emissions reporting and measurement. However, achieving more ambitious, complex goals – such as sector-specific NDC targets – remains a significant challenge. The latest NDC targets must be enhanced with clear definitions and metrics to facilitate coordination among government agencies, track progress, and enable effective verification.

CBAM implementation will also affect company-level operations. Larger companies are generally better positioned to align with new requirements. However, the ability of different firms to adapt will also depend on their access to funds for decarbonisation and MRV implementation. The CBAM introduces unprecedented requirements for standardised emissions reporting. According to MADS officials, Colombia aims to establish a Mandatory Emissions Registry (ROE)[70] as the basis for a national emissions trading system. Although projected to start operating in 2027, the registry is not yet fully aligned with CBAM-requirements.

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[66] *Ministro de Minas y Energía, Plan Integral de Gestión del Cambio Climático del Sector Minero Energético 2050 (PIGCCme 2050) (Bogotá D.C., Colombia, 2021), https://www.minenergia.gov.co/documents/6393/PIGCCme_2050_vf.pdf.*

[67] *Ministerio de Ambiente y Desarrollo Sostenible, "Política Nacional de Cambio Climático, PNCC."*

[68] *According to a meeting with representatives of the Climate Change and Risk Management department of the Ministry of Environment and Sustainable development.*

[69] *Ministerio de Ambiente y Desarrollo Sostenible, Estrategia Colombiana de Desarrollo Bajo En Carbono y Resiliente al Clima (ECDBC).*

[70] *The mandatory Greenhouse Gas Emissions Registry (ROE) was established under Law 2169 of 2021, which provides the legal framework for climate change management in Colombia.*

Implementation of the CBAM and potentially other new BCA mechanisms is generally expected to affect international trade opportunities for Colombian companies. Recognising this, companies from GHG emissions-intensive sectors have begun incorporating anticipated CBAM impact into their risk assessments. Some have also stepped up short-, medium-, and long-term decarbonisation and adaptation plans. For example, Cerro Matoso aims to comply with transitional CBAM requirements while diversifying its export markets[71]; Cementos Argos has adopted a GHG emissions reduction strategy[72] and Ecopetrol is developing a system for carbon credits.[73]

CBAM compliance also necessitates stringent data collection and the adoption of advanced measurement and verification methodologies, which add to each company's operating costs.

The Ministry of Environment and Sustainable Development (MADS), the National Business Association of Colombia (ANDI) and some company representatives acknowledge varying capacities among different companies to respond to and comply with CBAM regulations. While compliance with abatement-related policies have driven some progress, comprehensive decarbonisation strategies are at early stages, according to ANDI officials interviewed for this study. The country is still developing the instruments and mechanisms needed to track progress in relation to precise goals.

CBAM impact will also vary depending on the characteristics of each industry. Companies and industry associations have recognised the CBAM as an additional factor to consider in their market analyses, monitoring its implications where the EU is an important trade partner. Some carbon-intensive companies are also tracking complementary environmental measures in the EU, including a potential expansion of CBAM to cover other goods such as fossil energy and non-EU markets adopting BCA mechanisms.[74,75]

From the perspective of affected companies, the CBAM represents additional costs, the need to adopt new tools, and potential restrictions on production processes. While risks and opportunities are evident at various levels, the ability to meet CBAM requirements often hinges on each company's financial means.

Key challenges stem from the EU's stringent GHG accounting requirements, which exceed Colombia's current voluntary reporting practices. CBAM compliance demands major institutional and technical adjustments, including detailed facility-level data collection, new monitoring systems, and improved supply chain traceability – all of which involve time, training, and investment. The steep learning curve and added reporting burden can be especially demanding for smaller firms. While the use of default values can temporarily ease compliance, reliance on these risks higher reported emissions and costs. This reinforces the need for companies to strengthen their carbon accounting capacity over time.

CBAM compliance will require companies to navigate a series of technical and regulatory complexities. For instance, integrating advanced MRV systems will entail major human and technological investments. Companies will also have to rely on third-party verifications, potentially through organisations vetted by Colombia's National Accreditation Body (ONAC). For Colombian industries to meet CBAM standards and stay internationally competitive, ONAC-accredited organisations must learn how to interpret and apply EU-recognised methodologies.

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[71] Asociación Nacional de Industriales, "Estrategias Empresariales Frente a La Regulación Del Carbono - Transformando Desafíos En Oportunidades Para La Competitividad Sostenible," 2025.

[72] Cementos Argos y El Reto de Los USD2.000 Millones | Visión Davivienda, directed by Visión Davivienda, 2025, 1:04:14, https://www.youtube.com/watch?v=o35HOasWkGA.

[73] Ecopetrol, "Compensación de Emisiones de GEI," 2025, https://www.ecopetrol.com.co/wps/portal/Home/sostecnibilidad/ambiental/accion-por-el-clima/compensacion-emisiones-gei.

[74] Ecopetrol, Capítulo dedicado a las prácticas, políticas, procesos e indicadores en relación con los asuntos sociales y ambientales, incluidos los climáticos (2024), https://files.ecopetrol.com.co/web/esp/financiera/resultados2023/Capitulo%20ESG%202023%20Circular%20031.pdf.

[75] Cementos Argos, Informe de Clima y Naturaleza (2025), https://argos.co/wp-content/uploads/2025/02/Infome-Clima-y-Naturaleza-2024.pdf.

4.3. Climate policy and CBAM alignment

Colombia has adopted a comprehensive policy framework aligned with international climate goals. The country remains committed to a 51% reduction in GHG emissions by 2030, compared to current business-as-usual levels, and to achieving carbon neutrality by mid-century. Its latest NDC, submitted in September 2025, reaffirms this pledge from December 2020, with additional targets capping GHG emissions at 155–161 $MtCO_2eq$ by 2035.[76]

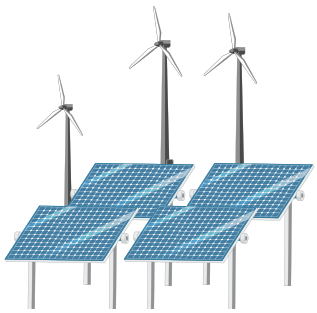
These high-level commitments guide the decarbonisation of key economic sectors. Likewise, they could shape Colombia's response to new climate measures, including the CBAM. The same decarbonisation framework underpins national instruments and sector-level roadmaps for emissions reduction.

One such instrument is the carbon tax, introduced in 2017 through Law 1819 and later strengthened by Law 2277 of 2022.[77, 78] This tax applies to the carbon content of fossil fuels in Colombia, providing a price signal to encourage lower emissions. Rates are calculated based on CO_2-equivalent amounts per unit of fuel, with values updated annually based on the Consumer Price Index (CPI) plus one additional percentage point. This adjustment mechanism keeps the tax broadly in line with inflation while applying a modest annual increase to further incentivise carbon reductions.

As of 2024, carbon prices in Colombia remained significantly lower than in the EU, which determines them through market-based approach under the EU Emissions Trading System (ETS). Furthermore, EU carbon prices fluctuate with supply and demand for emission allowances, resulting in higher costs per tonne of CO_2. The gap in carbon pricing between the two jurisdictions could become more acute with full CBAM implementation, when EU-based importers will have to pay the difference between the EU carbon price and the price already paid in the country of origin.

Colombia's National Emissions Trading System (PNCTE) aims to further advance market-based climate mitigation. Currently under design and set for launch in 2027, the PNCTE will serve as a cap-and-trade mechanism, establishing emissions caps for regulated sectors and allowing for the trading of emission allowances. The government's planned Mandatory Emissions Registry (ROE) will support robust MRV processes. [79]

These mechanisms mirror some of the operational features of the European ETS underpinning the CBAM. More broadly, they reflect Colombia's commitment to transparent, market-aligned climate governance.



[76] *República de Colombia, Contribución Determinada a Nivel Nacional (NDC 3.0) de Colombia - Transformaciones Para La Vida (Bogotá, Colombia, n.d.), accessed December 16, 2025, https://unfccc.int/sites/default/files/2025-09/NDC%203.0%20Declarativa%20Colombia%20Transformaciones%20para%20la%20Vida%20V.25.09.2025%20Gob.%20Nacional.pdf.*

[77] *Ley 1819 de 2016 Por Medio de La Cual Se Adopta Una Reforma Tributaria Estructural, Se Fortalecen Los Mecanismos Para La Lucha Contra La Evasión y La Elusión Fiscal, y Se Dictan Otras Disposiciones, Pub. L. No. Diario Oficial (Gaceta Oficial) N° 50.101 del 29 de diciembre de 2016 (2016), http://www.secretariasenado.gov.co/senado/basedoc/ley_1819_2016.html.*

[78] *Ley 1819 de 2016 Por Medio de La Cual Se Adopta Una Reforma Tributaria Para La Igualdad y La Justicia Social y Se Dictan Otras Disposiciones, Pub. L. No. Diario Oficial (Gaceta Oficial) N° 52.247 del 13 de diciembre de 2022 (2022), http://www.secretariasenado.gov.co/senado/basedoc/ley_2277_2022.html.*

[79] *According to a meeting with representatives of the Climate Change and Risk Management department of the Ministry of Environment and Sustainable development.*

4.4. Preparedness across sectors and companies

While Colombia's government and private sector have started addressing broader climate adaptation and mitigation, the CBAM adds another layer of complexity to these efforts. Company budgets increasingly include compliance-driven costs to improve production processes and integrate innovative technologies. While such steps may be framed as competitiveness strategies or tied to broader sustainability goals, investments in climate action are ultimately constrained by profitability.

Even when companies plan for decarbonisation, costly projects such as carbon capture remain out of reach for many industries. Cement companies, for instance, cannot afford negative cash flows. Consequently, companies tend to prioritise carbon-footprint reduction that matches their financial capabilities, ensuring business sustainability while helping to meet national and international climate goals.

Regardless of any specific BCA mechanisms, industries must prepare for a global market reconfiguration. Embracing sustainable development and preparing for carbon pricing will be essential to maintain competitiveness and resilience in the evolving low-carbon economy.

This study analyses the challenges companies can expect to face in known CBAM-affected sectors in Colombia. CBAM impacts will also vary with company size. Furthermore, any comparison of GHG emissions data by sector or company must be handled with care, as the underlying measurement units and methodologies may differ.

Cement

Strategies and reports of the country's leading cement companies indicate a growing commitment to sustainability. At the national level, the industry has outlined a roadmap – produced in 2020 with MinCIT and MADS – to achieve carbon neutrality by 2050. The roadmap sets specific GHG reduction targets and provides an emissions inventory for the Colombian cement sector. It aligns with climate ambitions outlined by the Global Cement and Concrete Association (GCCA) ahead of COP26 in 2021 and supports global industry efforts to meet increasingly strict emission standards, including CBAM requirements.

Similar public–private collaboration could help other emissions-intensive sectors, such as steel and aluminium, accelerate their decarbonisation.

Iron and steel

Colombia's iron and steel sector has increasingly adopted circular economy practices, positioning itself as a national leader in recycling. About 1 million tonnes of steel are recycled annually, reducing CO_2 emissions per tonne of steel by 17% in five years.[80,81] However, detailed sustainability reports for the sector remain scarce. Unlike in the relatively transparent cement industry, emissions reporting by Colombia's iron and steel companies remains limited.

The Colombian Chamber of Steel (Camacero) has promoted financial mechanisms for decarbonisation, noted the key role of the steel industry in large-scale recycling processes and the adoption of carbon-capture.[82] Still, no comprehensive report is available on the decarbonisation status of the Colombian steel industry or any associated sector-level targets.

[80] *Comité Colombiano de Productores de Acero, Informe Del Sector Siderúrgico 2019-2020 (2021), https://www.andi.com.co/Uploads/ISS%202019%20-2020%20(2)_637707766668934393.pdf.*

[81] *Asociación Colombiana del Acero (AndiAceros), Informe de Sostenibilidad (2022), https://www.multi-alambres.com/blog/acero-en-colombia-desarrollo-sostenibl/#_edn3.*

[82] *Cámara Colombiana de Productores de Acero, Industria Siderúrgica Colombiana Fortalece La Competitividad y Sostenibilidad Del Sector (2025), https://www.andi.com.co/Uploads/Industria%20sider%C3%BArgica%20colombiana%20fortalece%20la%20competitividad%20y%20sostenibilidad%20del%20sector.pdf.*

Colombian iron and steel producers have, in fact, made progress in measuring their emissions and setting goals for energy efficiency. Still, preparation for the CBAM remains uneven across the sector. Large companies such as Acerías Paz del Río and Diaco have published strategies and goals for emissions reduction, complete with concrete roadmaps and GHG inventory certifications. SMEs in the iron and steel sector, however, present a more uncertain outlook. Even those improving their energy efficiency and production processes tend to lack detailed sustainability reports and clear decarbonisation goals. The limited availability of information could challenge the competitiveness of such companies in markets with increasingly strict environmental regulations.

Table 1 shows estimated potential costs for CBAM implementation across Colombia's iron and steel sector. This industry stands out for its immediate exposure to the mechanism: in 2023, Colombia exported nearly USD 190 million worth of iron and steel products to the EU, with an estimated emissions intensity of 5.88 tCO_2 per tonne of product, taken as a reference for the EU ferronickel sector. Even so, the expected cost of CBAM certificates for these exports, with a carbon price of USD 70 per tCO_2, exceeds USD 18 million, or about 9.5% of total export value.

Table 1. Potential costs of CBAM implementation for Colombian iron and steel exporters

CBAM products	Value of exports to the EU in USD	CO_2 emission intensity of the exports in tonnes (2023)	Exports to the EU in tonnes	Tonnes Co_2eq	Total carbon price cost (TCPC) (USD)	% TCPC / Value of exports
• Iron and steel	190,217,187	5.88	43,905	258,161	18,071,245	9.5%

Source: Based on information from MinCIT (2024), and Vidovic (2023)[83].

Aluminium

Despite the growing relevance of aluminium for low-carbon infrastructure, energy-efficient transport, electrification, energy transition technologies, the availability of sustainability reporting in Colombia's aluminium sector remains limited. Not all key players publish comprehensive environmental reports or disclose their GHG emissions, making it difficult to assess their alignment with international frameworks.

Rising demand for low-emission aluminium in markets such as the European Union and the United States, therefore, presents both an opportunity and a challenge for Colombian producers. The current lack of verified emissions data, product traceability, and environmental certifications could become significant barriers to market access.

The EU's current CBAM design, notably, only covers direct emissions for aluminium products, leaving out indirect emissions from electricity use that represent nearly 80% of the sector's footprint. While this could limit immediate CBAM-related costs for Colombian exporters, ongoing EU discussions could soon expand the mechanism to cover indirect emissions. Moreover, without third-party validation and certification, Colombian aluminium exporters risk losing access to EU markets as buyers increasingly shift to verified low-carbon materials.

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

Although Colombia's aluminium sector is taking steps toward greater sustainability, it still faces critical challenges in terms of transparency, emissions verification, and alignment with global trade and climate regulations. Enhancing the availability and quality of sustainability reporting will be essential to respond effectively to mechanisms like the CBAM and capitalise on growing international market opportunities.

Fertilisers

Colombia's fertiliser sector faces major sustainability challenges, particularly due to its heavy reliance on imported inputs. External factors such as the COVID-19 pandemic and international conflicts have increased production costs, with a heave impact on small-scale farmers. The INCASBONO+ initiative, led by the Solidaridad Network and the German International Cooperation Agency (GIZ), is setting up biofactories to help replace chemical fertilisers with organic, sustainable, locally sourced alternatives.

CBAM implementation requires high-carbon-intensity industries, including fertiliser production, to demonstrate traceability and transparently report carbon content. Still direct trade implications for Colombia remain relatively limited, with the European Union accounting for less than 1% of Colombia's fertiliser exports between 2013 and 2023 This makes the EU a marginal market compared nearby Venezuela, Brazil, and Ecuador, which together absorb the majority of Colombia's fertiliser exports. Nonetheless, aligning with international carbon reporting and sustainability standards could strengthen the sector's competitiveness and credibility in broader global markets.

While some companies, like Yara Colombia and Monómeros, have started producing low-carbon fertilisers and advancing decarbonisation projects, the sector still lags in key areas, such as renewable energy adoption, input diversification, and cost transparency. Colombia's fertiliser sector still lacks widely available sustainability reports and robust verification systems, which are essential to comply with international carbon regulations and gain wider credibility in export markets.

Challenges for SMEs

Information remains scarce on Colombian SMEs, making their readiness for CBAM compliance difficult to assess. While large companies may publish well defined strategies, SMEs are less likely to report their carbon footprints or decarbonisation plans. The resulting information gap could hinder the ability of export-oriented SMEs to compete internationally, particularly in markets requiring detailed emissions reporting and adding carbon costs onto imports.

To stay competitive, SMEs will need to engage actively in planning and consultations for sector-level decarbonisation. By noting economic risks related to reducing GHG emissions in their own management plans, SMEs could start turning CBAM compliance challenges into new business opportunities.[84]

[84] *Asociación Nacional de Industriales, "Estrategias Empresariales Frente a La Regulación Del Carbono - Transformando Desafíos En Oportunidades Para La Competitividad Sostenible," 2025.*

5 Conclusions

While the EU is a key trade partner, the industries covered by initial CBAM implementation will account for a small share of Colombia's overall exports. As a result, CBAM impact on macroeconomic indicators such as employment is expected to be low, at least in the short term, However, compliance would accelerate industrial decarbonisation and strengthen the country's alignment with global low-carbon trade standards.

Iron and steel, with the EU as Colombia's second largest export destination, is the most exposed sector as CBAM rules take effect. Compliance, notably through the purchase of CBAM certificates, could increase export costs by almost 10% according to the author's calculations or 15% according to the World Bank index, potentially reducing Colombian competitiveness in the European market.

At the subnational level, CBAM implementation could result in significant local impacts. Córdoba is the department most exposed to CBAM implementation. The municipality of Montelibano alone accounts for about 95% of Colombia's CBAM-related exports to the EU between 2013 to 2023 and about 12% of departmental GDP for Córdoba. Moreover, the iron and steel industry, primarily in Montelibano municipality, has contributed between 3% and 7% of annual departmental GDP since 2021. Thus, CBAM implementation potentially entails serious local socio-economic impact, with implications for employment, socio-economic development and industrial resilience at the departmental and municipal levels.

Potential CBAM extension to additional sectors, particularly oil and coal, by 2030 could have nationwide impacts. These sectors are critical to Colombia's national economy, accounting for nearly half of total exports.

Financial allocations will be critical to accelerate Colombia's progress on its climate targets. National, sub-national, and municipal governments will need short-, medium-, and long-term government budgets to effectively implementation decarbonisation strategies. These allocations must account for the new dynamics introduced by BCA mechanisms, alignment with climate goals, and ongoing updates to NDC targets.

A company-level analysis further underscores disparities, with the capacity to meet CBAM requirements and comply with broader climate policies varies widely between firms with different production models, technologies, and degrees of integration into global value chains. Export-oriented SMEs face additional challenges, further reflecting gaps in technical, financial and institutional capacities. CBAM requirements could place a major financial, administrative and informational burden on SMEs.

The Colombian government, working with the private sector, has started developing tools to facilitate CBAM implementation for key exporters to the EU. However, the country needs to accelerate decarbonisation across the public and private sectors. Positioning the CBAM as an opportunity for industrial modernisation could strengthen collaboration between the government, industry, and financial institutions. It could also help channel investments into cleaner technologies and boost Colombia's competitiveness in global value chains.

To address the asymmetry in CBAM preparedness, sectoral associations in Colombia need to advance targeted support strategies, particularly to ensure financial and technical support for SMEs in carbon-intensive industries. Technical expertise, human, and financial constraints may otherwise keep smaller companies from adopting international sustainability standards, reporting their progress on emissions reduction, and meeting new trade and continually evolving requirements.

As Colombia reviews its NDCs, it could introduce differentiated regulatory frameworks to reflect varying capacities among companies. Such frameworks should incentivise compliance with CBAM information requirements and help meet company and sector-level goals. Companies with capacity limitations could benefit from longer transition periods or simplified measurement methodologies and verification processes.

Additionally, the private sector will need clearly defined climate targets as the basis for setting collective and company-specific objectives. As industrial associations have emphasised, national emissions abatement will depend on voluntary initiatives and fragmented regulatory compliance – at least until clear and binding regulations are established and consistently enforced. In the meantime, improving the transparency of company-level sustainability reporting can provide valuable insights on how to reduce emissions and where adjustments may be needed to meet climate mitigation and adaptation goals.

Colombia's energy infrastructure is vulnerable to climate change, with extended dry spells threatening hydropower output. Industries reliant on the national electrical grid are therefore increasingly exposed to extreme weather and droughts. Such events could in turn boost GHG emissions from back-up electricity generation based on fossil fuels.

Colombia must also advance complementary national policies to support decarbonisation. Expanding renewable-based power on the grid must remain a priority, along with promoting local self-generation from non-fossil energy sources, as outlined in the Ministry of Mines and Energy (MME) roadmap. Additionally, the country needs to accelerate economic diversification. This requires opening new export markets, boosting international trade and reducing market concentration. In parallel, it can happen through new production chains based on locally abundant raw materials. Such investments could transform Colombia's industrial capabilities and help achieve national environmental and climate goals.

Finally, Colombia's national strategy to reduce GHG emissions reductions to net-zero by 2050 can simultaneously enhance the country's competitive position for international trade. As key markets like the EU proceed with regulated payments under mechanisms like the CBAM, a proactive approach could give Colombia a strategic advantage over other exporting nations.

While Colombia's legal framework aligns well with international environmental commitments, traceability to specific producers and suppliers is lagging. Even as the government develops MRV instruments, compiling reliable centralised data remains one of the greatest obstacles to ambitious climate action.

Articulated policies and systematic co-ordination would help with centralising key data, facilitate CBAM compliance, enhance wider climate response strategies, and boost the responsiveness of Columbian industry to the evolving global trade landscape.

Finally, support to green industries could also be expected from international cooperation on finance based on the principle of common but differentiated responsibility as well as potential recycling of CBAM revenues.

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