Report

The EU CBAM’s real impact on India

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About Sandbag

We are a **think tank** that promotes more effective climate policies from an environmental and economical point of view. We believe that, for some sectors, carbon pricing can be very effective if designed correctly. We are dedicated to advancing **data-driven, evidence-based climate policies** that drive rapid and effective emissions reductions in Europe and beyond. With deep expertise in carbon markets, industrial decarbonisation, and energy transition, we leverage our in-house research capacity, data modelling and visualisation tools to design and advocate for viable climate policies.

Executive Summary

India's exposure to the CBAM is substantial with regards to the size of its iron and steel exports to the EU and the high emission intensity of its steelmaking industry.

However, the picture changes markedly once the country's heterogeneity, likely industry response, and price effects in EU markets are taken into account. Although in a "business-as-usual" scenario where CBAM fees are calculated based on national average emission intensities, Indian exports are charged **€762 million in CBAM fees** in 2034, applying national average emission intensities makes little sense in a country with such a heterogeneous steelmaking industry.

This report therefore makes a more granular assessment of India's ability to remain competitive in the EU market under the CBAM, considering the types of goods exported, the capacity available of each production route, their suitability for exports based on geographical location, and their likely ability to meet MRV requirements.

We found that India's exposure is mostly due to steel products. In 2025, the country's **4.00 million tonnes of CBAM-covered steel exports** were mostly comprised of flat products (2.59 million tonnes), followed by long products (0.83 million tonnes) and other products (0.57 million tonnes) such as ferro-alloys or pig iron.

The country's 2.6 million tonnes of flat steel exports would easily be matched by its low-emission production capacity using iron produced from natural gas. However, not all the plants using this technology are suitable for exporting to the EU under the CBAM regime. Geographical location matters, and so do the newly introduced anti-circumvention rules, which ban factories with multiple production lines from reporting emissions solely from one process.

But India's ArcelorMittal's NS Hazira plant fares well according to these criteria. The plant has sufficient manufacturing capacity of relatively low-carbon steel.

If the CBAM was extended to downstream products (as has been proposed by the European Commission starting in 2028), the plant's capacity could also produce enough steel to cover exports of those downstream goods. The plant's activity would require some small adjustments to make the most of CBAM reporting rules, as it has both blast furnace and DRI capacity.

The picture for long steel exports is less positive, as those exports face tougher competition with an EU market already dominated by scrap-based metallurgy which will face lower carbon costs. Regarding other steel products, the main expected change is a shift of exports from pig iron to DRI.

Taking into account the above adjustments, we estimate that a more realistic, "expected" scenario will **reduce CBAM fees down to €407 million**, and net CBAM costs to as little as **€79 million** under the scheme's current scope, once extra revenues from higher EU prices are taken into account. This scenario does not assume any new investment or technological change.

In the longer term, our "ambitious" scenario assumes that dedicated installations such as JSW Steel's Salav planned expansion using natural-gas based DRI only will supplant the Hazira hybrid plant as a departure point for Indian exports, with even lower emission intensity. Our ambitious scenario incorporates projects in other sectors, such as AM Green's green ammonia project. Under this scenario, net annual costs under the current CBAM scope turn into a **net profit of €44 million**.

The structure of India's CBAM-goods exports to the EU, which are dominated by basic steel products, rather than highly transformed ones, means that downstream extensions of the CBAM would not materially increase its impact on the country's competitiveness. However, if India wanted to increase its exports of finished goods to the EU, a deeper transformation of its steelmaking would be necessary. This is because remaining competitive requires only exporting products made from low-carbon crude steel, which is more difficult to ensure in a heterogenous industry, as goods incorporate multiple parts from various sources.

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1 CBAM impacts using average method

The EU's Carbon Border Adjustment Mechanism (CBAM) was designed to equalise the carbon cost paid for goods produced within the EU, under the EU Emissions Trading System (EU ETS), with that of selected carbon-intensive goods imported into the EU from third countries.

With that aim, the CBAM temporarily entered into force on 1 October 2023 in a transitional phase, aimed at familiarising stakeholders with emissions reporting and compliance requirements.[1] **As of 1 January 2026**, the CBAM has been applying a financial obligation to EU importers within the scope of the regulation.

Globally, the EU's CBAM has raised concerns about its fairness for international trade. Several developing countries have criticised the mechanism, calling it discriminatory and arguing that it shifts part of the burden of EU decarbonisation costs onto external trading partners. India, in particular, has raised objections in WTO discussions, pointing to inconsistencies with the principle of Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC) under the Paris Agreement.[2]

However, Indian political opposition to the EU's CBAM has been increasingly accompanied by pragmatic engagement. In the context of EU–India free trade negotiations, both sides have agreed to advance technical cooperation on the CBAM's implementation, including exchanges on reporting requirements and methodological aspects.[3] In the trade agreement between India and the EU, the EU committed to provide 500 million euros in support to help India reduce emissions. In addition, India will receive 1.6 million metric tons of duty-free steel exports to the EU, about half of its annual shipments to the bloc. Notably, CBAM duties are not comprised and must be paid for this quota as well.[4] However, despite technical collaboration, the mechanism itself remains unchanged.

1.1 The current scope

Covered products are defined according to the EU's Combined Nomenclature (CN), the customs classification system used for international trade. In total, CBAM applies to 576 product categories out of approximately 9,500 eight-digit CN codes used in EU trade statistics.

The CBAM currently covers goods in the **cement, iron and steel, aluminium, fertilisers, electricity**, and **hydrogen** sectors. Exemptions apply for goods intended for military use and for firms whose annual imports of CBAM goods are less than 50 tonnes.

The scope of goods covered is summarised in Table 1.

Table 1. Goods covered by the CBAM[5]

Product category	Products
Aluminium	Unwrought aluminium, aluminium powders and flakes, and all kinds of aluminium products (including bars, rods, wires, plates, sheets, foils, tubes and pipes, tube and pipe fittings, structures, reservoirs, tanks, casks, drums, cans, boxes, other containers, and cables)
Chemicals	Hydrogen

[1] European Commission (2026), Carbon Border Adjustment Mechanism (CBAM)
[2] FT, India denounces 'stifling' EU carbon tax on imports
[3] European Commission (2026) CIRCABC
[4] Reuters (2026), EU-India trade deal leaves bloc's carbon border tariff intact
[5] Sandbag, summarised from European Commission (Annex I of the CBAM Regulation (EU) 2023/956)

Cement	Cement clinkers, white Portland cements, other Portland cements, aluminous cements, other hydraulic cements, other kaolinic clays
Electricity	Electrical energy
Fertilisers	Nitric acid, sulphonitric acids, urea, ammonia (anhydrous or in aqueous solutions), nitrates of potassium, mixed fertilisers (nitrogenous mineral and chemical fertilisers, and other fertilisers containing nitrogen, phosphorus and/or potassium)
Iron and Steel	Agglomerated iron ores and concentrates (other than roasted iron pyrites), pig iron, ferrous products obtained by DRI and other spongy ferrous products, crude steel, and all kinds of iron and steel products* (including bars, rods, rails, wires, tubes, pipes, sheets and other flat-rolled products, reservoirs, tanks, casks, drums, cans, boxes, containers, as well as screws, bolts, nuts, hooks, and rivets) – *except certain ferro-alloys (only ferro-manganese, ferro-chromium, and ferro-nickel are covered), and ferrous waste and scrap (including remelting scrap ingots and steel)

The CBAM covers GHG emitted by the manufacturing plants of the products listed in Table 1, as well as those embedded in selected inputs of CBAM-covered goods, as summarised in Table 2.

Table 2. Precursors covered by the EU ETS[6]

CBAM-covered product	Precursors in CBAM scope	Precursors not in CBAM scope
Steel (BF-BOF[7])	Hot metal, sintered ore, ferro-nickel, ferro-manganese, ferro-chromium	Coke, lime, all other ferro-alloys, aluminium as steel alloy, **scrap**
Steel (EAF[8])	Direct reduced iron, hydrogen, ferro-nickel, ferro-manganese, ferro-chromium	Lime, other ferro-alloys, **scrap**
Aluminium	Aluminium	Alumina, pre-bake anode, **scrap**
Fertilisers	Ammonia, nitric acid, hydrogen	
Cement and clinker	Grey and white clinker, calcined clay	Alumina

In 2025, India exported **€5.09 billion** worth of CBAM-covered goods to the EU.[9] This covers 8% of its €62.4 billion total exports to the EU. These mostly comprised steel products (**4.00 million tonnes)**, as well as aluminium (252,000 tonnes) and cement (84,000 tonnes). Within the steel sector, exports were mostly **flat products (2.59 million tonnes)**, followed by **long products (0.83 million tonnes)** and **other products** (**0.57 million tonnes**) such as ferro-alloys or pig iron.

1.2 Extension scenarios

Although the scope of the CBAM has remained unchanged since the Regulation entered into force in 2023, several policy discussions are currently underway on possible future expansions of the

[6] Sandbag, summarised from the CBAM regulation
[7] Made through the production route based on blast furnace and basic oxygen furnace
[8] Made using electric arc furnaces
[9] Eurostat database (2025), International trade in goods database

mechanism, both **vertically** along supply chains and **horizontally** across sectors that are not yet covered. We have therefore created five extension scenarios described below:

Downstream: the European Commission has proposed an amendment to the CBAM Regulation,[10] detailing a vertical extension to **180 downstream products made from steel and aluminium products**. On 12 June, the European Council proposed to extend that list by 200 products, and the Parliament's ENVI Committee proposed to extend the list by 277 products. However, our extension scenario only takes into account the Commission's proposed list.

Pre-consumer scrap: the same abovementioned amendment would cover pre-consumer scrap into the scope of emissions to prevent circumvention and ensure environmental integrity.[11] Pre-consumer scrap refers to scrap generated during industrial production processes before goods reach final consumers.

Precursors: An impact assessment published by the European Commission in December 2025 listed several upstream products as potential candidates for a vertical extension, to be further assessed in 2027. Our extension scenario includes coke, lime, ferro-silicon, alumina, pre-bake anode.

Indirect Emissions: Under the current CBAM framework, reporting obligations cover both direct and indirect emissions across all sectors, but financial obligations currently apply only to direct emissions for steel, aluminium, and hydrogen. A proposal is expected by 2027 for a future extension, so we added a scenario of extension to indirect emissions to all sectors.

New sectors: Our scenario includes: 9 categories of refinery products (naphtha, gasoline, kerosene, diesel, HO marine DSL, DMF RMF, LPG, HSFO, Others), 15 chemicals (ethylene, propylene, butadiene, butene, benzene, toluene, xylenes, styrenes, vinyl chloride monomer, methanol, monoethylene glycol, ethylene oxide), and 7 polymers (polyethylene (low density), polyethylene (high density), polypropylene, polystyrene, plolyvinylchloride, poliurethane, polyethylene terephthalate).

1.3 Previous impact studies

Several studies have attempted to quantify the potential impact of the CBAM on India's exports. The World Bank developed a series of indexes measuring the impact of CBAM on countries. One of them, the CBAM Trade Exposure Index (TEI), rates a country's exposure as the product of its "relative carbon cost intensity" with its quantity of exports to the EU.[12] The CBAM output exposure index (OEI) measures exposure in each sector per unit of output in that sector. Under the first metric, India ranks second after Egypt, and third for the second indicator after Egypt and Ukraine in the iron and steel sector.

Early quantitative estimates suggested a relatively small impact of the CBAM for India. For instance, Simola (2021) estimated total annual CBAM costs for India at around €220 million by 2035, assuming a carbon price of €60/tCO_2 and relying on emission values of the average of bottom decile (worst-performing 10 %) of EU producers according to EU ETS benchmark curves, available in 2021.[13]

Similarly, Marcu (2021) estimated costs of approximately €190 million annually from 2035 for Iron and steel, cement, and aluminum when considering average emissions values of EU producers and a carbon price of 40 euros, with a deductible foreign carbon price of €10.[14] Expanding the scope to include indirect emissions and additional sectors such as refinery increases these estimates to around €430–470 million.

[10] European Commission (2023), REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
[11] European Commission (2023) IMPACT ASSESSMENT REPORT
[12] World bank group (July 2025), CBAM Exposure Indexes
[13] Bank of Finland, BOFIT (2021), CBAM! – Assessing potential costs of the EU carbon border adjustement mechanism for emerging economies.
[14] ERCST (May 2021), Preliminary Study on the economic impact that EU CBAM could potentially impose on foreign exporters of products to the EU market – Thailand, India, and Vietnam

More recent analyses, however, point to significantly higher potential costs. Hoenig (2024) estimates total annual CBAM costs for India at around $2.9 billion in 2035, with an EU carbon price at $120 per tonne.[15]

This wide range of estimates suggest that caution should be used when comparing estimates, as the set of assumptions used can make a large difference. However, a simplifying assumption has been used quite consistently throughout this analysis: the use of average emissions intensities at country level.

1.4 Impact based on constant trade

Similar to the studies cited above, we calculated the CBAM's impact on India's products using the country's average emission intensity values.

This "business-as-usual" (BAU) scenario is not very favourable for India, as the country's national average emission intensity is quite high. According to World steel, in 2023–24, the average emissions intensity of the steel sector was **2.54 tCO_2 per tonne of crude steel**, 33% above the global average of **1.92 tCO_2**,[16] even though these values were not calculated using the CBAM's methodology.

Unlike in most studies, our analysis assumes that India's exports to the EU will remain at their level of 2025 in future years. Our analysis also assumes a carbon price of €80/tCO_2.

This BAU scenario ranks India as the 5th most exposed trading partner in terms of expected CBAM fees, with **€762 million**. Türkiye ranks first with €1.26 billion, followed by China, Ukraine, and Russia. India's exposure is dominated by **Iron and steel (€734m), followed by aluminium (€25m).** The ranking has changed compared to our 2024 report which was based on 2023 trade volume data.[17] Back then, India ranked first with €1.3 billion CBAM fees, ahead of Russia, China, Ukraine, and Türkiye. Türkiye's rise to the top of the ranking is largely due to the country's export growth: its CBAM-covered exports increased by 66% in volume between 2023 and 2025, with flat steel, its largest and a relatively emission-intensive category, growing by 74% over the period. In contrast, India's CBAM-covered exports dropped by 17% between 2023 and 2025. In addition, we significantly lowered our estimate of India's emission intensity, as our previous values used emission factors from JRC (2022), whereas this analysis uses estimates from India's Ministry of Steel data.[18] This resulted in a reduction for crude steel (pre-rolling) from 3.75 tCO_2[19] to 2.13 tCO_2 per tonne produced under the revised approach.

Within the iron and steel sector, India's exposure is primarily driven by flat products, which account for **€461 million** in CBAM fees. Long products account for around **€162 million**, while other iron or steel products account for the remaining **€112 million**.

Figure 1 ranks countries by CBAM fees in the iron & steel and aluminum sectors. India ranks fourth for iron and steel, and eighth for aluminium.

[15] Climate leadership Council (April 2024), Projecting CBAM Impacts on U.S. and Foreign Industry
[16] Word of steel (2025) Sustainability indicators report 2025
[17] Sandbag (2025), "The EU CBAM: A Two-Way Street to Climate Integrity?"
[18] Ministry of steel, Greening the Steel Sector in India
[19] Sandbag calculation based on the "Integrated route" data from JRC 2022 for India, less coking, lime, and blast furnace gas.

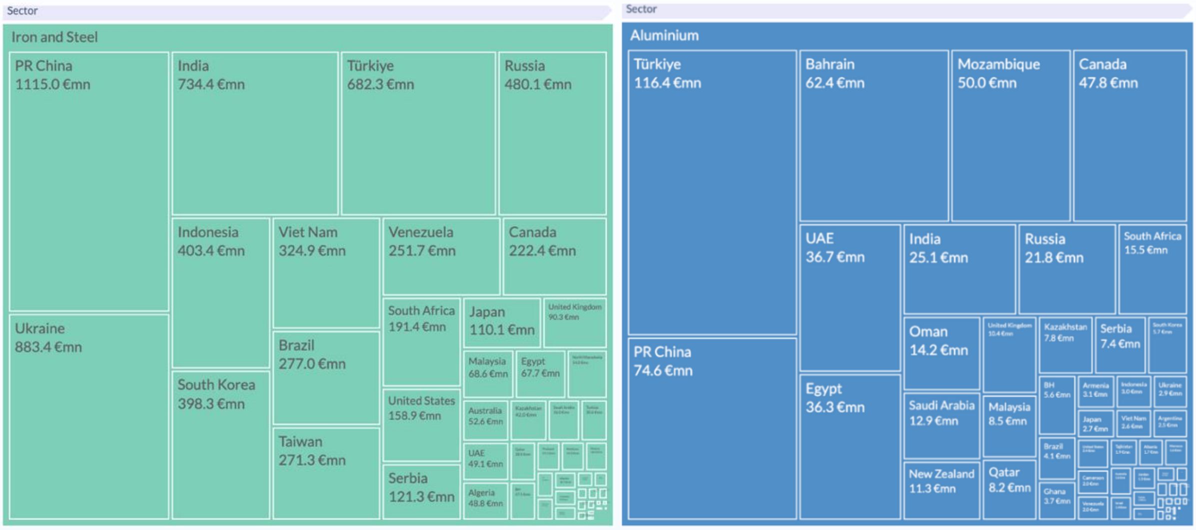

Figure 1. Estimated CBAM fees in 2034 in the Iron and Steel sector (left) and in the aluminum sector (right)[20]

1.5 Net costs: accounting for EU price increases

An important but often overlooked aspect of the CBAM is that it is ramping up in parallel with the gradual phase-out of free allocation under the EU ETS, which raises the carbon cost borne by EU producers as well. EU market prices are therefore adjusting upwards as both imported and domestic supply become more expensive.

Figure 2 illustrates this mechanism. The initial price **P0** is set by the intersection of the demand and supply curves while EU producers still receive free emission allowances. Once the CBAM is introduced, EU producers face increased production costs as free allowances are removed under the EU ETS. This shifts the supply curve upward.

The new equilibrium emerges at a higher price level, **P1**, and a lower traded quantity, **Q1**, which reflects reduced demand when prices are higher.

Higher EU selling prices allow exporters to recover part of their CBAM costs through higher revenues. If the additional revenues from higher prices exceed the CBAM fees paid, **exporters may enjoy a net benefit**.

[20] Sandbag, CBAM simulator

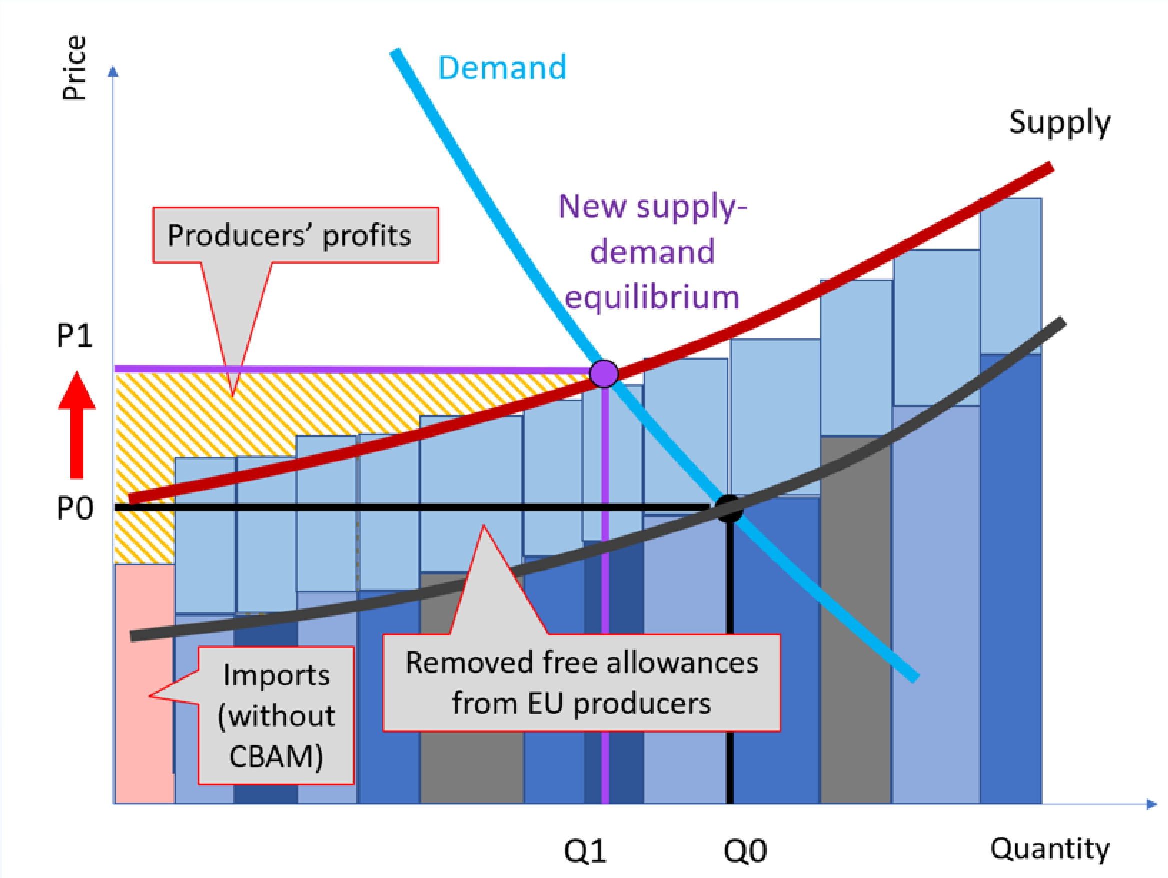

Figure 2. Cost curve for of EU products and imports

2 More likely impacts on iron and steel

2.1 Emissions Intensity of production

The estimates given so far lack granularity, as they are based on average emissions intensity data. While India's overall production structure is relatively emission-intensive, its industrial base is highly heterogeneous. Steel production in India relies on four main technological pathways: the blast furnace-basic oxygen furnace (BF-BOF) route, the coal-based DRI route (typically coupled with electric or induction furnaces), the gas-based DRI route (coupled with electric arc furnaces, EAF) and the scrap-based route.

Blast Furnace–Basic Oxygen Furnace (BF–BOF)

The **BF–BOF route** is typically operated by large industrial players with integrated facilities that include coke ovens, blast furnaces, and rolling mills. The country currently operates 55 large blast furnaces.

In India, scrap utilisation is limited to 10-12% in the BF-BOF route. Based on the Ministry of Steel, Government of India (2024) value for the BF-BOF route.[21]

[21] Ministry of steel, Greening the Steel Sector in India

Coal-based DRI production

A distinctive feature of the Indian steel sector is the extensive use of **coal-based direct reduced iron (DRI)** production. India is currently the largest global producer of coal-based sponge iron, with approximately 80% of DRI production relying on coal-fired rotary kilns. Coal-based DRI plants reduce iron ore using non-coking coal in rotary kilns, producing sponge iron that is subsequently melted in **induction furnaces (IF)** or **electric arc furnaces (EAF)** to produce crude steel.

This production route is particularly common among small and medium-sized steel producers, which operate smaller, modular facilities requiring lower capital investments compared to large integrated steel plants. The sector is characterised by a large number of dispersed production units. India currently hosts more than 300 sponge iron plants, alongside over 1000 induction furnaces, many of which supply semi-finished steel to downstream rolling mills producing long steel products.

The coal-based DRI route is also associated with very high emissions intensity. One factor contributing to these high emissions is the quality of domestic coal. Indian coal typically contains a high ash content, often ranging between 35% and 45%, compared to around 10–20% for imported coal. As a result, larger quantities of coal are required to produce each tonne of sponge iron, increasing both fuel consumption and emissions intensity. Although imported coal could improve efficiency, its higher cost makes it unappealing.

Gas-based DRI and the role of natural gas

A third steelmaking route present in India is **gas-based DRI production using shaft furnaces**, where iron ore is reduced using natural gas or syngas before being melted in electric arc furnaces. This pathway is significantly less carbon-intensive than coal-based production. As shown in Table 3, the Ministry estimates that steel production based on natural gas DRI emits between 1.40–1.60 tCO_2 per tonne of crude steel, but the exact assumptions for this figure are not provided. Since this number is unusually high, includes scope 2 emissions, and since there are no Indian steel plants using only natural gas-based DRI, we believe that the Ministry's figure might not reflect 100% of the natural gas-based DRI input. We therefore chose not to use this figure, but instead, we used estimates from the European Commission's JRC,[22] which estimates gas-based DRI emission intensity at 0.63 tCO_2 for the US, which is the only foreign country for which the JRC gives a value for natural-gas DRI.

The scaling of natural gas-based steel production remains constrained by limited access to affordable natural gas. With the existing natural gas pipeline network, only 21% of the existing BF capacity and 5% of the coal-based DRI capacity have access to gas pipelines, but these numbers will rise to 80% and 77% respectively (within 25 km of a gas transmission pipeline) with the addition of the planned and under-construction pipeline capacity.[23]

Scrap-based steelmaking

Scrap-based steel production is relevant in India, but it plays a less important role compared to some international peers, due to lack of scrap in scale. Scrap is typically melted in **electric arc furnaces or induction furnaces**, offering a significantly lower emissions pathway. Steel produced from 100% scrap through EAF routes emits as little as **0.07 tCO_2 per tonne of crude steel.**[24]

Indian scrap supply has remained relatively stable at around **25–30 million tonnes in recent years**. As a result, India relies partly on **scrap imports**, with approximately **25% of scrap used in steelmaking sourced from international markets**.

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[22] JRC (2023), Greenhouse gas emission intensities of the steel, fertilisers, aluminium and cement industries in the EU and its main trading partners
[23] Ministry of steel, Greening the Steel Sector in India
[24] From JRC (2022), Greenhouse gas intensities of the EU steel industry and its trading partners

Table 3 shows the emission intensity of each of the above technologies based on figures from India's Ministry of Steel, which we adjusted to fit with the CBAM scope (e.g., subtracting indirect emissions from electricity use, lime production, and coking).

Table 3. Emission intensity of crude steel production by different process routes (in tCO_2 per tonne of crude steel)[25]

Process Route	Ministry of Steel (Scope 1 and scope 2)	CBAM scope (Sandbag)
BF-BOF	2.20-2.60	2.20
100% scrap-based steel making through the EAF route	0.55-0.65	0.07[26]
Natural Gas-based DRI-EAF route	1.4-1.6	0.7[27] (0% scrap)
Coal-based DRI – EIF route	2.70-3.00	2.34
SynGas (Coal Gasification) based DRI-EAF route	2.50-2.90	2.28

Please note that this list is neither comprehensive nor granular enough. For example, it misses the BF-EAF route, and mixed routes such as BF-BOF alongside DRI/IF with shared intermediate material flows. Table 3 values should thus be read as bounds for "pure" routes, with actual site-level intensity depending on actual input mixes.

2.2 Impact on competitiveness in EU markets under selected production routes

Each of the production routes described in section 2.1 is associated with a distinct emissions intensity per tonne of steel produced, as shown in Table 3. These differences in production routes lead to different CBAM costs, as more carbon-intensive processes face higher carbon-related cost increases.

Figure 3 and Figure 4 illustrate this by showing very different expected CBAM costs for flat and long steel products depending on production routes: coal-based DRI with EAF, gas-based DRI with EAF, 100% scrap with EAF, and BF–BOF, using the emissions intensities set out in Table 3. Each route is considered separately rather than in the hybrid configurations commonly found in India: the two DRI routes assume 100% DRI feedstock, and the scrap route assumes 100% scrap input. The figures compare individual routes with India's current average emissions intensity. The horizontal black line marks the expected selling price increase driven by higher carbon costs in the EU: where the CBAM cost exceeds this line, producers face net losses; where it falls below, they make net profits.

[25] Source: Sandbag calculation based on average Ministry of Steel (India, 2024) reported ranges for Scope 1 and 2 and some scope 3 Emissions: CBAM scope excludes indirect emissions derived from JRC, (2022), Greenhouse Gas Intensities of the EU Steel Industry and its Trading Partners and Ember carbon intensity data; coking and lime emissions are additionally excluded for BF-BOF routes, and pellet for Coal-based DRI and SynGas DRI-EAF.

[26] JRC (2022), Greenhouse gas intensities of the EU steel industry and its trading partners

[27] Based on JRC (2023), Greenhouse gas emission intensities of the steel, fertilisers, aluminium and cement industries in the EU and its main trading partners, using the US DRI value (0.63 tCO_2/t) combined with the Indian EAF emissions value.

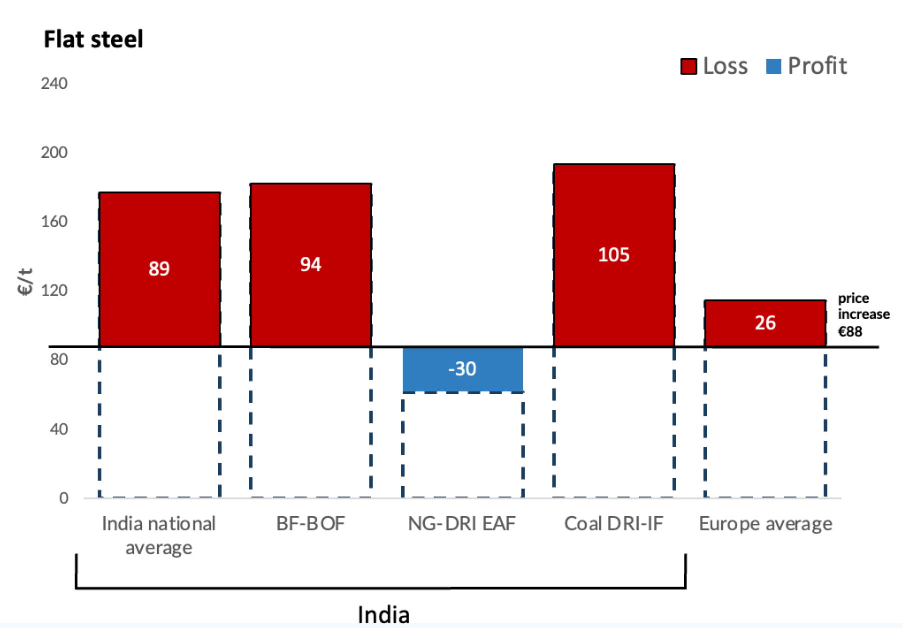

Figure 3. Unitary cost for flat steel products (CN 7208[28]).

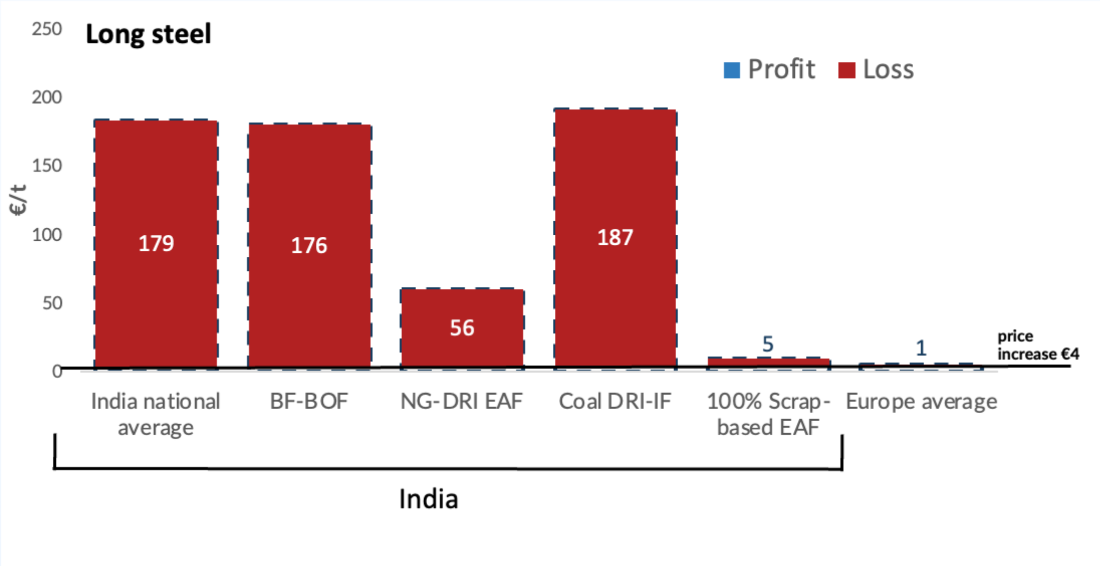

Figure 4. Unitary cost for long steel products (CN 72071111[29]).

Between these selected routes, the EAF route fed by natural gas-based DRI is the clear winner for flat steel, with a **net gain of €30/tonne**, compared to net losses of €94/tonne for BF–BOF and €105/tonne for coal DRI. For long steel products, the 100% scrap-based EAF route wins, with a net cost of only €5/tonne, compared to natural gas-based DRI (€56/tonne), BF–BOF (€176/tonne), and coal-DRI (€187/tonne).

It is worth noting that these are theoretical benchmarks: For example, as section 2.3 will show, fully integrated 100% gas-based DRI facilities don't really exist in India, where most EAFs using gas-based DRI also use some proportion of pig iron.

[28] Flat-rolled products of iron or non-alloy steel, of a width >= 600 mm, hot-rolled, not clad, plated or coated.
[29] Semi-finished products, of non-alloy free-cutting steel, containing by weight < 0,25% carbon, of square or rectangular cross-section, the width < twice the thickness, rolled or obtained by continuous casting.

2.3 How the CBAM may reshape exports

Having identified technologies available in India that will be competitive under the CBAM, the next question is how available those technologies are in India to supply the EU market.

2.3.1 Existing low-carbon steel

Concerning steel, India exported **4.00 million tonnes of CBAM-covered goods** to the EU in 2025 (2.60m tonnes flat products, 0.83m tonnes long products and 0.57m tonnes other products), and **0.41 million tonnes of (potentially CBAM-covered) downstream goods** (iron and steel and combined metal products) equivalent to only about 2.5% of its finished steel production of 168.4 MT in FY 2025-26.[30] For aluminium, exports to the EU amounted to around 252,000 tonnes and 40,000 tonnes of downstream goods, or roughly 4.9% of India's total aluminum capacity, of about 6 MTPA.[31]

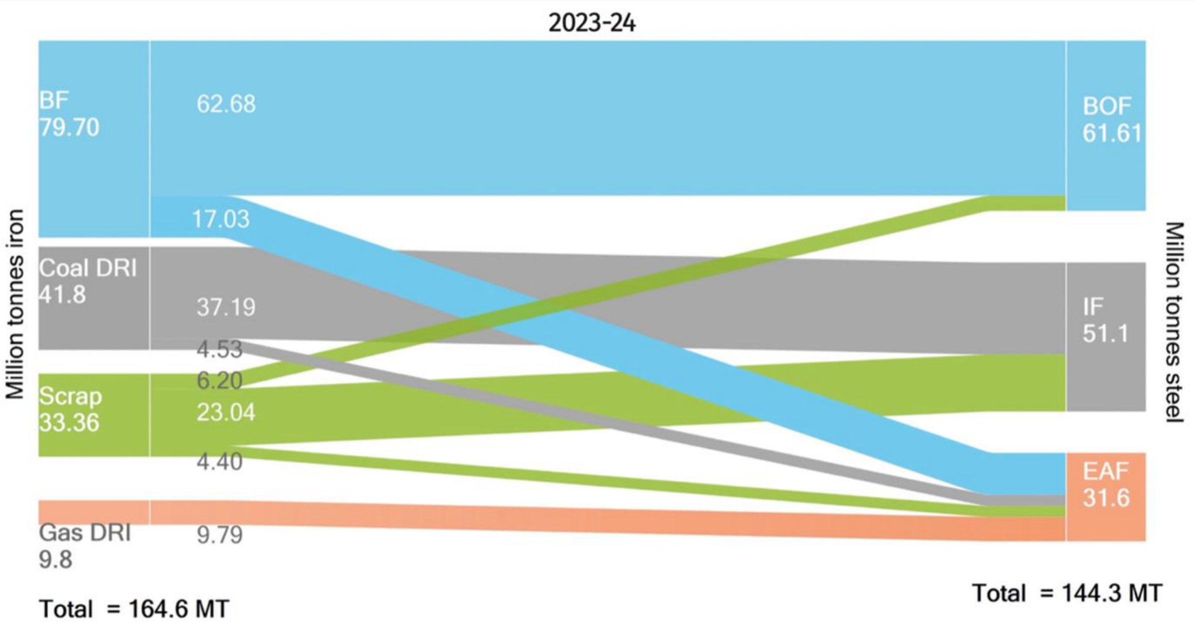

Figure 5. Route-wise share of iron production, steel production and input for steel production in India[32].

As illustrated in Figure 5, in 2023–24, India's electric arc furnaces (EAF) produced 31.6 million tonnes of steel fed with 4.4 million tonnes of scrap (12.3% of inputs) and 9.8 million tonnes of gas-based DRI (27.4%). However, not all gas-fuelled DRI is low carbon.

Gas-based DRI capacity amounts to around 12.3 million tonnes per year.[33] Three plants account for more than 80% of this capacity: AM/NS Hazira (6.8 Mtpa of NG-DRI, Gujarat), JSPL Angul (1.8 Mtpa of NG-DRI, Odisha), and JSW Dolvi (1.6 Mtpa of NG-DRI, Maharashtra).[34] Of these, AM/NS Hazira and JSW Dolvi are genuine low-carbon gas-based DRI facilities, relying respectively on natural gas via the MIDREX process and on a combination of natural gas and coke oven gas in their DRI–EAF operations. In contrast, JSPL Angul uses syngas derived from coal gasification, resulting in substantially higher emissions despite its "gas-based DRI" classification.

[30] Monthly Economic Report for the month of March 2026, Steel Ministry
[31] ALUMEX India 2025
[32] Ministry of steel (2024), Greening the Steel Sector in India
[33] Ministry of steel (2024), Greening the Steel Sector in India
[34] Ministry of steel (2024), Greening the Steel Sector in India

AM/NS Hazira produces flat steel goods,[35] in a large-scale integrated DRI-EAF setup, and JSW Dolvi also produces flat goods,[36] in a hybrid production system combining blast furnace hot metal with in-house gas-based DRI and scrap. Under the reporting rules set out in the CBAM implementing regulation 2025/2547, if the same goods are produced in the **same installation** through **different routes**, their emission intensity must be reported as the **weighted average** of all routes.

This rule makes JSW Dolvi a less competitive installation with regards to CBAM costs, as its blast furnace output substantially exceeds DRI capacity.

In contrast, AM/NS Hazira has a larger gas-based DRI capacity (6.8 Mtpa) compared to BF capacity (3.4 Mtpa). Since the iron feedstock is produced by the plant exceed its EAF capacity (8.6 Mtpa of finished steel) the likely response to minimise CBAM costs is to prioritise the use of DRI and scrap, filling the remaining capacity with pig iron from the blast furnace. The resulting carbon intensity of finished flat steel (CN code 7208)[37] is **1.10 tCO_2/t**. This is a conservatively high estimate, as an even more likely response would be to use the EAF slightly below full capacity (most EAFs do not run full time) and sell more excess pig iron separately.

With 8.6 Mtpa of finished steel capacity, Hazira could therefore supply substantial volumes of relatively low-carbon flat steel to the EU market[38] that remain competitive under the CBAM, largely exceeding the 2.6 million tonnes of flat steel currently exported from India to the EU.

For long products, although scrap-based EAF production exists in India, much of the secondary steel sector is fragmented and composed of smaller producers, including micro, small, and medium enterprises (MSMEs),[39] making its overall contribution to low-emission export-oriented steel production more difficult to assess. Tata Steel's Ludhiana EAF (**0.75m tonnes per annum**) is the only identified large-scale facility operating on 100% scrap. However, its output falls slightly short of the 0.9m tonnes exported to the EU (including current scope and downstream products).

For other steel-related products outside the long and flat segments, export volumes are 0.57 million tonnes, but the category is more heterogeneous. It includes ferro-alloys (0.17 Mt, with an average intensity of 1.52 tCO_2/t), iron and non-alloy steel in ingots or other primary forms (0.28 Mt, 2.86 tCO_2/t based on JRC data), and pig iron and spiegeleisen in primary forms (0.12 Mt, 2.74 tCO_2/t).

2.3.2 Geographical location

Having identified steel production capacity able to compete in CBAM good markets, the question arises of how much of this lower-carbon steel production can realistically reach the EU market.

Iron and steel facilities are particularly present in resource-rich eastern states such as Odisha, Jharkhand, Chhattisgarh, Karnataka and West Bengal.[40] These regions host large integrated steel plants and have become the backbone of India's primary steel production. As shown in Figure 6, primary ironmaking units (blast furnace and DRI plants) are heavily concentrated in the eastern and north-eastern mineral belt, particularly in the states of Odisha, Jharkhand and Chhattisgarh. Together, these three states account for around 43% of total steel production in India.[41] This geographic concentration reflects the proximity of steel plants to iron ore deposits, coking coal supply chains, and established industrial infrastructure.[42]

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35 AM/NS India (2026), Infrastructure
36 JSW Hot rolled
37 Flat-rolled products of iron or non-alloy steel, of a width of 600 mm or more, hot-rolled, not clad, plated or coated
38 AM/NS (2026), Your Partner for End-to-End Infrastructure Solutions.
39 National Portal of India (2017)
40 Ministry of steel (2024), Greening the Steel Sector in India
41 Ministry of steel (2024), Greening the Steel Sector in India
42 Ministry of steel (2024), Greening the Steel Sector in India

Beyond this eastern industrial corridor, Karnataka is another important production hub, due to its large iron ore reserves. In contrast, states such as Maharashtra and Gujarat host several coastal steel facilities located near major export ports, facilitating access to international markets and imported raw materials.[43]

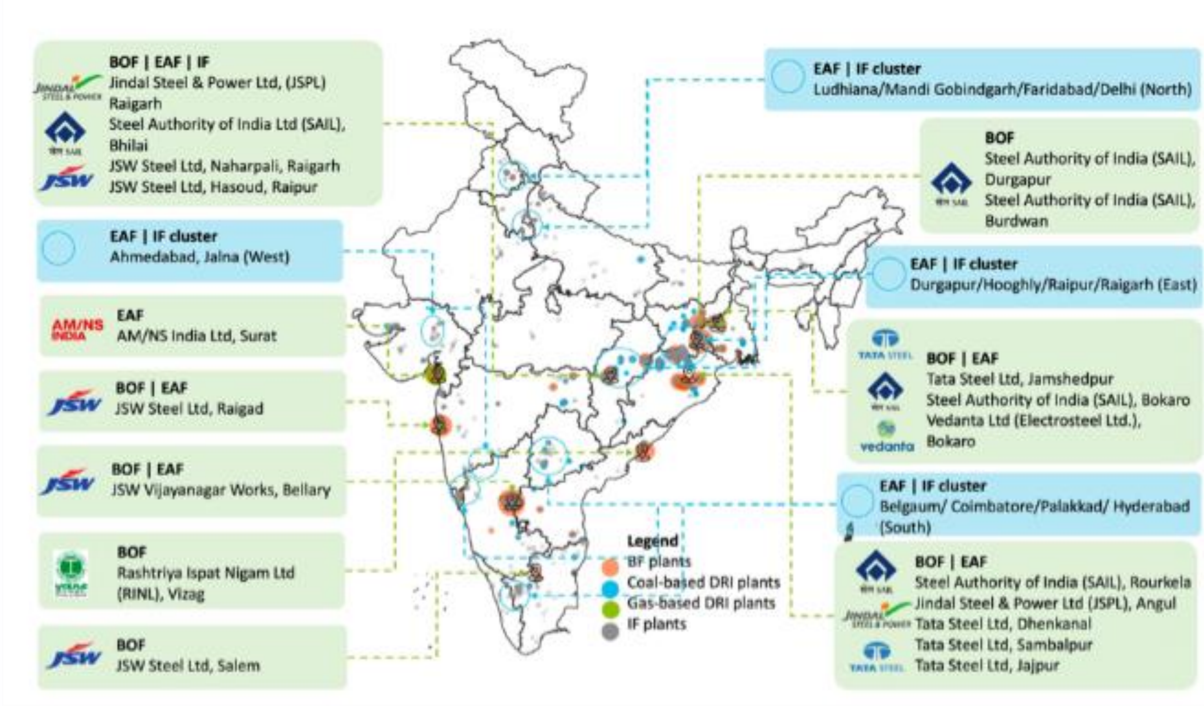

Figure 6. India installed iron & steel capacities[44].

Similar to steel production, a significant number of alumina refining and aluminium smelting facilities are concentrated in the eastern part of the country, due to the proximity of mines that produce crucial raw materials such as bauxite and coal. A majority of the alumina and aluminium production facilities are located in Odisha (77% and 67%, respectively). In addition, a large number of alumina refineries lie in close proximity to natural gas (NG) pipelines, and therefore, a large proportion of their thermal energy needs are met by NG.

To export to the EU, proximity to major commercial ports and shipping routes is another critical factor to consider. For example, plants located near major ports, such as Paradip and Dhamra in Odisha, and plants close also to Jharkhand, will be favored for logistical reasons. Plants in the west coast, closer to large ports such as Mundra in Gujarat and Mumbai are structurally better positioned to serve EU markets due to their closer location. CBAM exposure is therefore likely to be concentrated in installations integrated into coastal export corridors.

Notably, key steel facilities are closely connected to these export corridors. **AM/NS Hazira** is directly integrated with the Hazira port complex and located within Gujarat's broader western **export corridor**, including proximity to Mundra, India's largest commercial port. **JSW Dolvi** benefits from direct access to the **Mumbai–JNPT maritime cluster**, one of India's principal gateways for steel exports to Europe. Their location close to ports and LNG infrastructure is not incidental: it reflects how some of **India's lowest-emission steel assets are also among those structurally best positioned to serve international markets**, including the EU.

[43] Ministry of steel (2024), Greening the Steel Sector in India
[44] Ministry of steel (2024), Greening the Steel Sector in India

Tata Steel's Ludhiana facility is landlocked in northern India (Punjab), far from major export ports, but benefits from the Eastern Dedicated Freight Corridor starting from Sahnewal, connecting to western gateway ports including Mundra and JNPT, as well as planned industrial corridors such as the Amritsar-Kolkata Industrial Corridor.[45] This makes export integration operationally feasible despite its inland location.

A government initiative reinforcing this trend is the development of coastal steel clusters under the Sagarmala programme, aimed at strengthening port-led industrialisation. Coastal steel plants are intended to facilitate imports of scarce raw materials and exports of finished steel products, lowering logistics costs and improving integration into international markets.[46]

2.3.3 MRV capacity

Beyond emission intensity and geography, the ability to lower CBAM costs also depends on the ability to undergo the **monitoring, reporting, and verification (MRV)** process. Producers that get their emissions verified will avoid using punitive default values and achieve lower CBAM liabilities.

Indian steel production can be divided among two main categories of producers: Integrated Steel Plants (ISPs) and Secondary Steel Industries. ISPs typically operate large-scale facilities using the blast furnace–basic oxygen furnace (BF–BOF) or DRI–EAF production routes. Due to their scale and vertical integration, ISPs tend to employ a large workforce and dominate primary steel production.[21] Overall, integrated steel producers (ISPs) account for 56% of India's steel production capacity, while secondary steel producers (SSIs) account for 44%.[47]

AM/NS Hazira, JSW Dolvi and Tata Steel Ludhiana, share another common feature beyond their lower-emission production routes: they are all large-scale installations with the organisational and financial capacity to implement robust MRV systems. This is particularly relevant given that EU imports from India are concentrated in flat products, which are capital-intensive, quality-sensitive, and typically produced by large integrated plants, and thus precisely best positioned to compete in the EU market under the CBAM.

By contrast, a large part of the secondary steel sector is characterised by fragmentation and a large number of smaller producers, including micro, small and medium enterprises (MSMEs). While these firms contribute to domestic production, their limited administrative capacity and weaker integration into formal reporting systems may make robust MRV implementation more challenging. As a result, the coverage and accuracy of emissions data in these segments may be lower, increasing reliance on default values under CBAM.

The sector is also characterised by the predominance of private firms. Eight Central Public Sector Enterprises overseen by the Ministry of Steel contributed around 17% of the total crude steel production in 2023 and 2024, with the remainder produced by private companies. This matters for India's response to the CBAM. Although public sector firms represent a minority of total output, they are more directly aligned with government priorities and may therefore be better placed to act as instruments of a coordinated national response. In practice, this could make them more likely to adopt standardised MRV systems, participate in pilot reporting frameworks, align investment decisions with broader industrial policy goals, and respond more quickly to government guidance on export strategy or decarbonisation planning.

Overall, the data confirm that India's steel industry is characterised by a regional clustering of primary production alongside a more dispersed network of secondary steelmaking facilities. This structural feature has important implications for both emissions intensity and the sector's capacity to transition. In

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[45] Invest Punjab Blogs (2025)
[46] Ministry of steel (2024), Greening the Steel Sector in India
[47] Ministry of steel (2024), Greening the Steel Sector in India

particular, a significant share of electric arc furnace (EAF) production is carried out by smaller, often informal operators, for whom compliance with robust monitoring, reporting, and verification (MRV) requirements is likely to represent a systemic challenge.

These constraints could be further exacerbated by potential changes in the CBAM's scope. The inclusion of pre-consumer scrap under the CBAM would not favour these producers, as such scrap is typically generated from emission-intensive primary production routes and may therefore carry attributed emissions. At the same time, the already limited MRV capacity of smaller plants would make it more difficult to accurately track and verify these embedded emissions, further increasing compliance complexity and costs. The previous section has identified that 8.6m tonnes of flat production capacity is well positioned to compete with EU producers under the CBAM: large, integrated producers operating gas-based DRI–EAF routes, whose low-carbon profile and organisational scale make MRV compliance straightforward. On the other hand, for long products, most exports could remain competitive if covered by Tata Steel's Ludhiana scrap-based EAF. Considering its capacity (0.75 mt) falls slightly short of total exports (0.9 mt, including 0.83 mt in the current scope and 0.07 in downstream products), a small share of long steel exports will likely become less competitive. Building on this, the following scenarios explore how Indian exporters could respond to CBAM incentives, from an expected reallocation of existing production to a more ambitious industrial repositioning.

2.4 Expected impact

Our *expected scenario* builds on the observed structure of India's steel industry, where a limited number of large integrated producers concentrate most of the lower-emission production capacity. Like the business-as-usual scenario, it assumes no change in India's overall production capacity or technology mix. Instead, firms optimise their export strategy in response to the CBAM by redirecting existing lower-carbon output toward the EU market while serving domestic demand with more carbon-intensive production. This scenario therefore captures a near-term, commercially feasible response that does not require new investment or technological change.

Overall, the scenario captures a partial reallocation of existing low-emission capacity rather than a technological shift, illustrating the potential for CBAM-driven resource optimisation within the current production system.

For flat steel, EU-bound exports are assumed to be supplied by AM/NS India Hazira, with emissions based on a production mix that maximises DRI and scrap inputs (1.10 tCO_2/t steel). For long products, the scenario assumes that scrap-based EAF capacity (0.75 Mtpa) is prioritised for EU exports, with remaining volumes supplied via the BF-BOF route, with an emissions intensity of 2.2 tCO_2/t steel. This assumption may be affected in an extension to pre-consumer scrap, where scrap is assumed to originate from the same production system and therefore reflects the average carbon intensity of the facility. In this case, scrap-based output would inherit the plant's emissions profile (e.g., 2.4 tCO_2/t for Tata Steel), rather than being treated as scrap-EAF emission.

Pig iron exports (119 kt) to the EU are removed in this scenario, with the equivalent tonnage substituted by gas-based DRI exports (and not coal-based DRI), as the demand for DRI already exists in the EU and is likely to increase further.

Figure 7 shows that with reduced emissions under the *expected scenario*, the net cost per tonne for flat steel (7208) is reduced to €5/tonne loss, whereas under the national average it stood at a €97/tonne. This shows that optimising the use of existing resources significantly reduces CBAM liability.

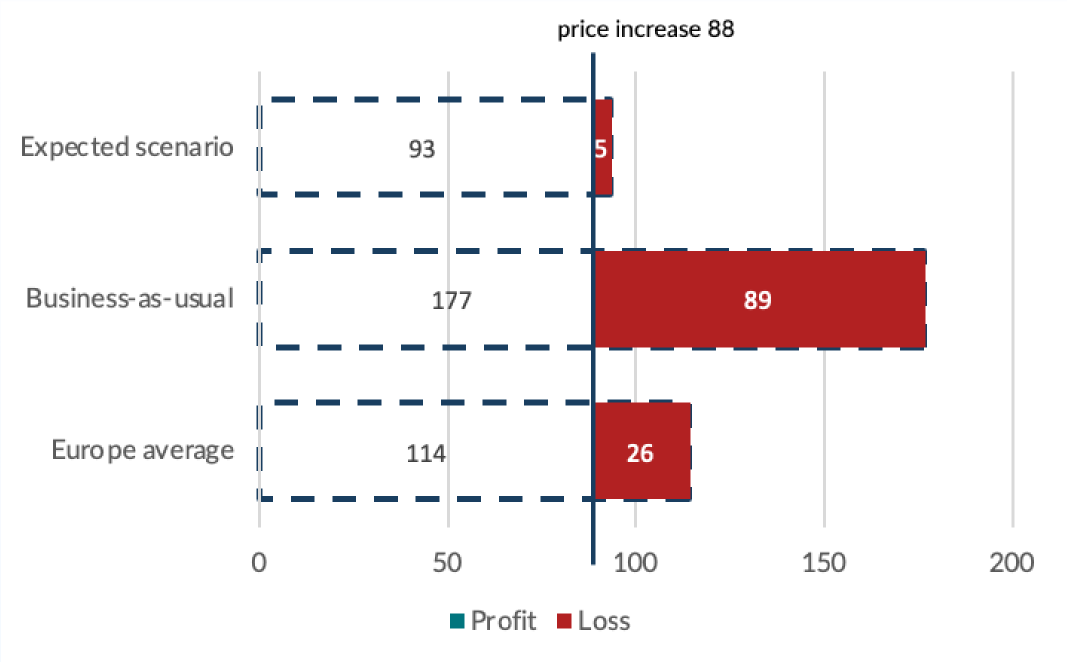

Figure 7. Unitary carbon costs for flat-rolled products of iron or non-alloy steel, of a width of 600 mm or more, hot-rolled, not clad, plated or coated (CN code 7208) for India under two scenarios and the EU average.

Figure 8 shows CBAM fees under the *expected scenario*. In the current CBAM scope, total CBAM fees on Indian goods would fall to **€407 million** (down from €762 in the business-as-usual scenario), and net costs would fall to just **€79 million**. A downstream extension would have a modest impact, adding €35m in CBAM fees and €10m in net costs.

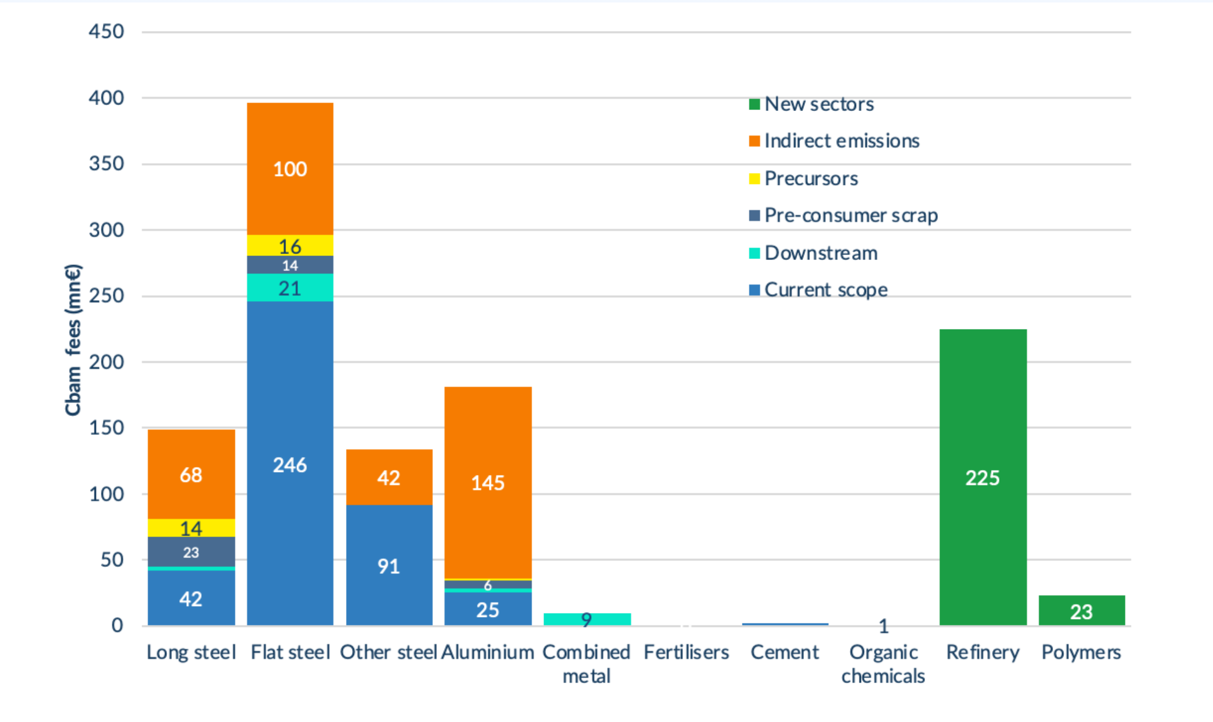

Figure 8. Estimated CBAM fees per products and scopes in 2034 in €m under the *expected* scenario

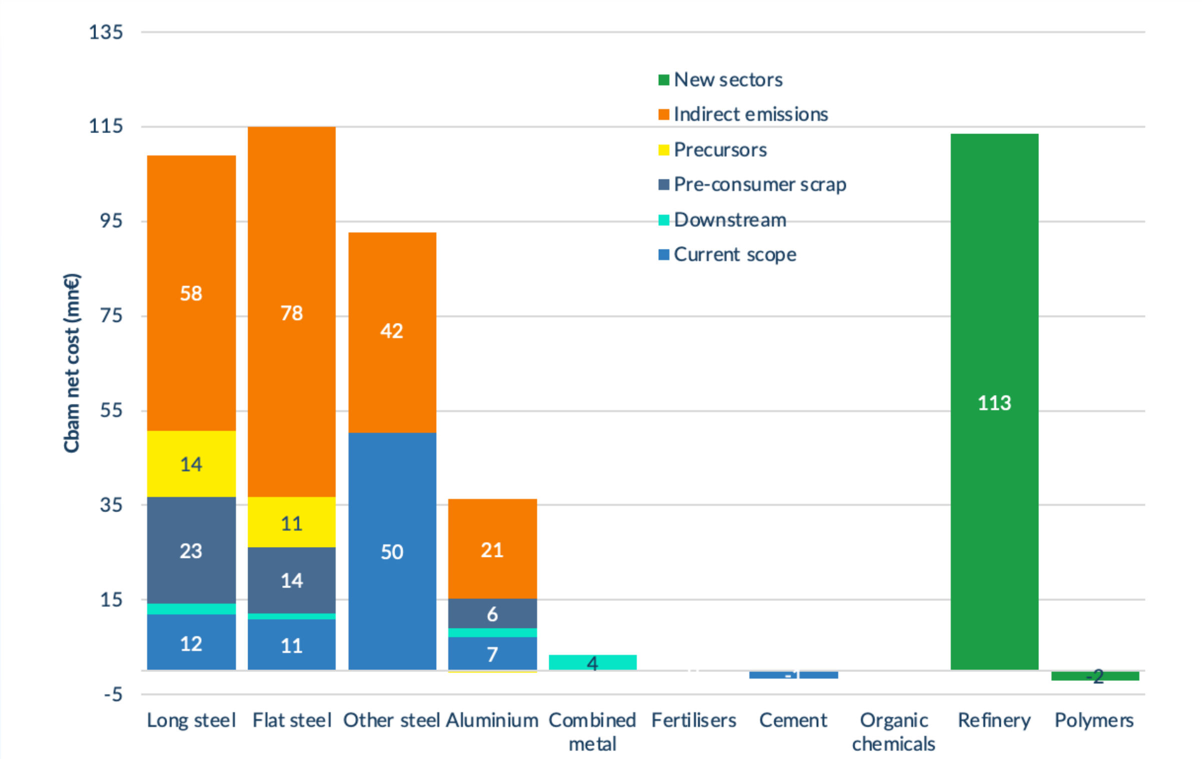

Figure 9. Estimated CBAM net costs per products and scopes in 2034 in €m under the *expected* scenario.

Figure 9 shows net CBAM costs split between product categories. Under the current CBAM scope the net cost is €79 million, and flat steel becomes more competitive than under the BAU scenario with a net cost of €50 million. Figure 7 shows that, for product 7208 the net CBAM cost is €5 per tonne, compared with €89 per tonne under the BAU scenario for the current scope.

Long steel exports also experience a strong reduction in net CBAM costs due to the reallocation toward scrap-based EAF production. However, export volumes are constrained by the limited availability of scrap-EAF capacity (0.75 Mt).

Should refinery products be included under the CBAM (which is a distant possibility), those would bear the highest residual CBAM burden for India.

Other steel products also benefit from the reallocation of goods. Replacing pig iron exports with gas-based DRI reduces CBAM fees for this category from €112 million (net cost €64 million) under the *business-as-usual scenario* to €91 million (net cost €50 million) in the *expected scenario*.

Aluminium's net exposure is more limited and more narrowly concentrated. Combined metal products (in the case of downstream extension) would contribute only around €2 million. Fertilisers, and organic chemicals do not contribute materially in net terms in this scenario.

Table 4 presents the 20 products imported from India most impacted by the CBAM in terms of fees due, under the current scope and potential extensions to downstream products and new sectors, but keeping the current emissions scope (no pre-consumer scrap, no new precursors and no indirect emissions).

The 20 products represent about 94% of total CBAM fees when also taking into account new sectors and downstream goods included in the scope. Of these, 2 are the result of the downstream extension (represented **in bold**) and 2 new sectors products (in orange).

Table 4. Indian exports ranked by highest CBAM gross fees under the *expected* scenario

CN code	Descriptions CN4	CBAM fees (€mn)	% product value	Product type
2710	Petroleum oils and oils obtained from bituminous minerals, other than crude; preparations not elsewhere specified or included, containing by weight 70 % or more of petroleum oils or of oils obtained from bituminous minerals, these oils being the basic constituents of the preparations; waste oils	225	4%	Refinery
7210	Flat-rolled products of iron or non-alloy steel, of a width of 600 mm or more, clad, plated or coated	78	11%	Flat steel
7208	Flat-rolled products of iron or non-alloy steel, of a width of 600 mm or more, hot-rolled, not clad, plated or coated	74	16%	Flat steel
7206	Iron and non-alloy steel in ingots or other primary forms (excluding iron of heading 7203)	64	39%	Other steel
7209	Flat-rolled products of iron or non-alloy steel, of a width of 600 mm or more, cold-rolled (cold-reduced), not clad, plated or coated	44	15%	Flat steel
7202	Ferro-alloys	21	12%	Other steel
3907	Polyacetals, other polyethers and epoxide resins, in primary forms; polycarbonates, alkyd resins, polyallyl esters and other polyesters, in primary forms	18	29%	Polymers
7601	Unwrought aluminium	18	4%	Aluminium
7222	Other bars and rods of stainless steel; angles, shapes and sections of stainless steel	14	3%	Long steel
7325	**Other cast articles of iron or steel**	**13**	**5%**	**Flat steel**
7219	Flat-rolled products of stainless steel, of a width of 600 mm or more	12	6%	Flat steel
7306	Other tubes, pipes and hollow profiles (for example, open seam or welded, riveted or similarly closed), of iron or steel	12	10%	Flat steel
7207	Semi-finished products of iron or non-alloy steel	10	9%	Long steel
8708	**Parts and accessories of the motor vehicles of headings 8701 to 8705**	**7**	**1%**	**Combined metal**
7303	Tubes and pipes of a kind used in pressure systems	7	11%	Flat steel
7326	Other articles of iron or steel	7	2%	Flat steel
7203	Ferrous products obtained by direct reduction of iron ore and other spongy ferrous products, in lumps, pellets or similar forms; iron having a minimum purity by weight of 99,94 %, in lumps, pellets or similar forms	6	1%	Other steel
7305	Other tubes and pipes (for example, welded, riveted or similarly closed), having circular cross-sections, the external diameter of which exceeds 406,4 mm, of iron or steel	5	9%	Flat steel
7225	Flat-rolled products of other alloy steel, of a width of 600 mm or more	5	9%	Flat steel
7223	Wire of stainless steel	4	3%	Long steel

2.5 Impact during the ramp-up phase (2026-34)

Figure 10 shows the amount of CBAM fees collected year by year, per product type, over the 2026-34 ramp up period, and in the current scope of the CBAM. It is based on the above-described *expected scenario*.

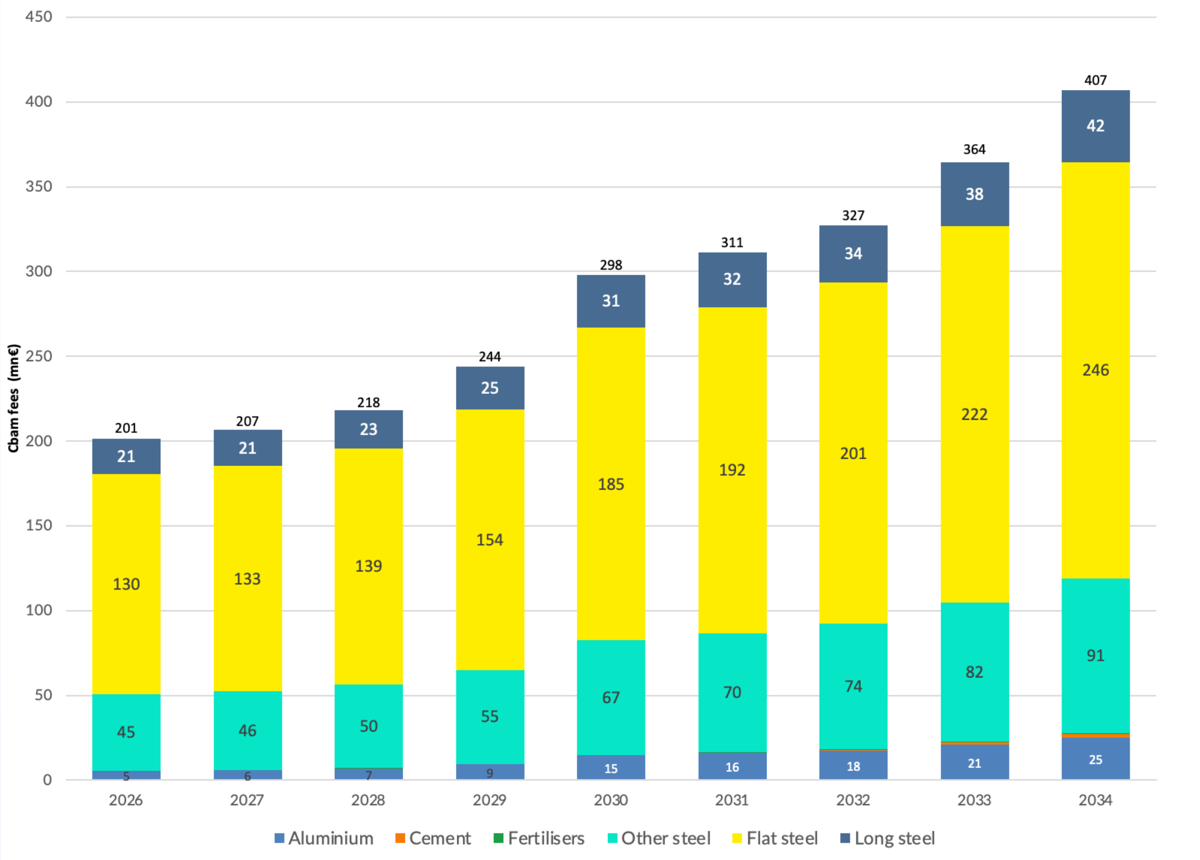

Figure 10. Estimated CBAM fees per products in the ramp up phase (2026-2034) under the expected scenario

In the early years (2026–2029), the impact remains relatively limited, as a significant share of emissions continues to be covered by free allowances, with expected fees ranging from €201 million in 2026 to €218 million in 2028 and €244 million in 2029. From 2030 onwards, a marked acceleration is observed, reflecting a significant step change in benchmark reductions (77.5% to 51.5%). Expected fees surpass the threshold of €311 million in 2031 and of €364 million in 2033 up to the expected €407 million in fees in 2034.

3 Ambitious scenario

While our *expected scenario* captures what Indian exporters could achieve by reallocating existing production, our *ambitious scenario* goes slightly further. It builds on the same reallocation logic but adds the deployment of new low emission production capacity through announced industrial projects, and further shifts in export volumes to the EU.

In this scenario, long steel product exports are fully made from post-consumer scrap. Exports of uncompetitive downstream long goods (0.07 Mt) are discontinued. Exports of long products under the current CBAM scope are slightly reduced from 0.83m to 0.75m tonnes. Conversely, flat steel exports are increased by 0.15m tonnes, leaving the total export volume unchanged.

In this *ambitious scenario*, all EU-bound flat steel exports are assumed to originate from a plant such as AM/NS India Hazira, but the plant would no longer use BF-derived pig iron in its EAF, and the scrap share would increase to 10% (from 5.7% currently),[48] which is in line with AM/NS India's decarbonisation strategy, which aims to reach this percentage by 2030.

Like in the *expected scenario*, pig iron exports to the EU are removed in the *ambitious scenario*, with the equivalent tonnage substituted by natural gas-based DRI exports (119kt).

The above assumptions are relatively conservative. **JSW Steel**, one of India's largest steel producers, has announced the development of up to 4 MTPA of steel production capacity based on scrap and natural gas-based DRI. The plant is meant to have built-in flexibility to transition to green hydrogen, with 2 MTPA targeted by 2028 and a further 2 MTPA by 2030, although our scenario only considers natural gas. This strategic positioning was explicitly acknowledged by Sajjan Jindal, Chairman of the JSW Group, who announced the green steel plant during the Indian Chamber of Commerce centenary celebrations, highlighting that it is **designed with the EU's CBAM in mind**.[49] He further indicated that the longer-term ambition is to scale the project up to 10 MTPA of green steel production, explicitly targeting exports to Europe.

In the fertiliser sector, our *ambitious scenario* assumes a shift toward green ammonia based on renewable electricity and electrolysis. This is supported by large-scale projects such as AM Green's Kakinada initiative,[50] which is designed to produce renewable ammonia for export markets, including Europe, at industrial scale (Ammonia Energy, 2024). This analysis assumes zero embedded emissions per tonne of ammonia produced.

For aluminium, producers such as Vedanta Aluminium and Hindalco Industries have been progressively integrating renewable electricity and efficiency improvements, supporting a gradual reduction in emissions intensity. We therefore assume a zero emissions intensity for the electricity consumed by export-oriented aluminium production.

This scenario assumes that 50% of the steel plant's electricity consumption is sourced from renewable power purchase agreements (PPAs). For the remaining grid-connected share of electricity consumption, this scenario assumes a grid emission factor of 400 gCO_2/kWh by 2034.[51]

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48 AM/NS ArcelorMittal Nippon Steel India targets a reduction in emissions intensity by 20% by 2030
49 Manufacturing Today, 2025
50 AM Green: production nears at India's first renewable ammonia mega-project
51 Based on the NNP/AP scenario trajectories reported by WRI India

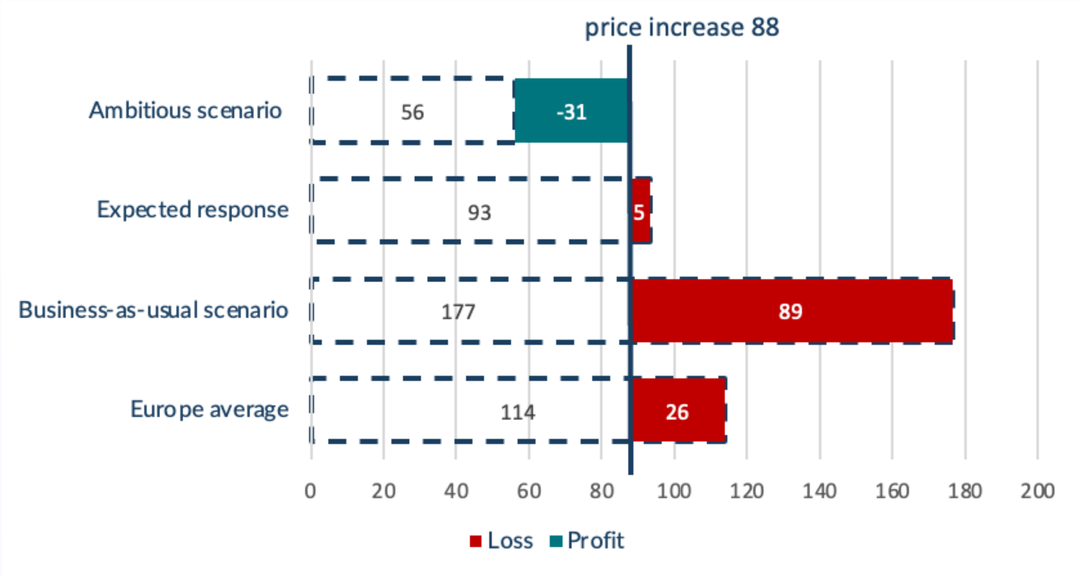

Figure 11. Average unitary Carbon Costs for Flat-rolled products of iron or non-alloy steel, of a width of 600 mm or more, hot-rolled, not clad, plated or coated (CN code 7208) for India and Europe.

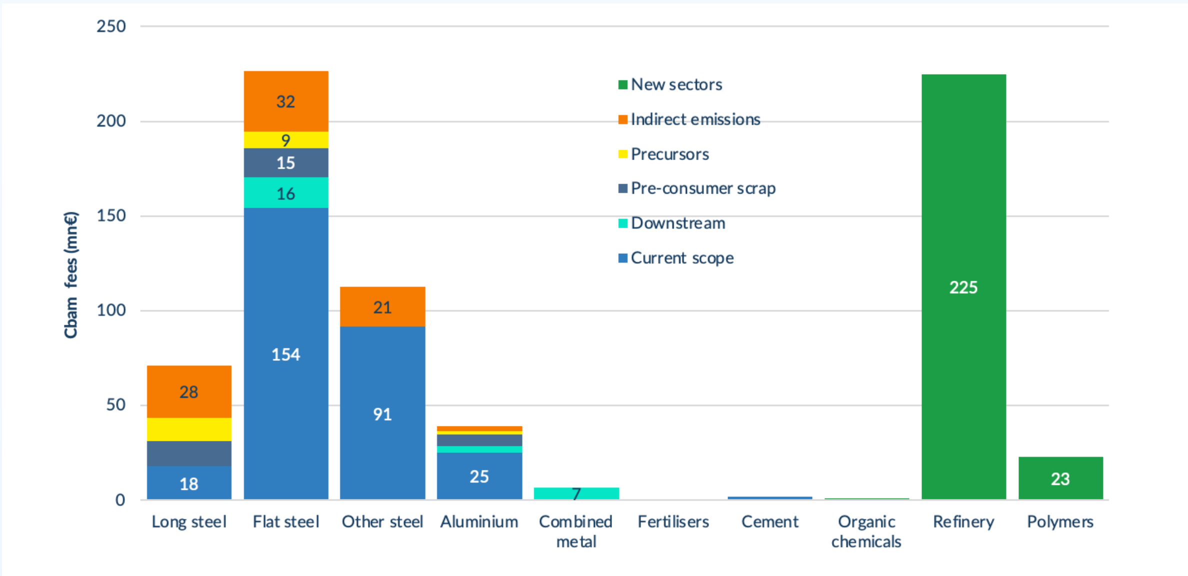

Figure 12. Estimated CBAM fees per products and scopes in 2034 in €m under the ambitious scenario

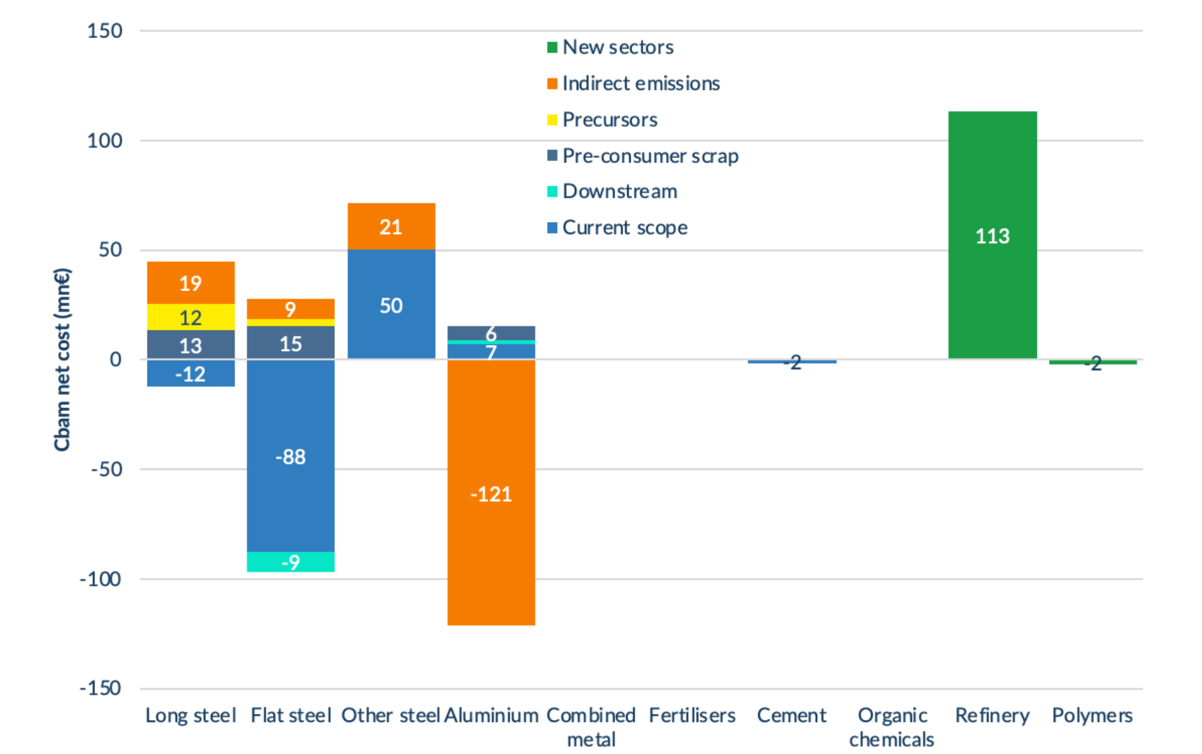

Figure 13. Estimated CBAM net costs per products and scopes in 2034 in €m under the ambitious scenario.

Figure 12 shows estimated CBAM fees under the *ambitious scenario*, which incorporates both the deployment of low-carbon production capacity and a reorientation of export flows toward lower-emission production routes. Total CBAM fees reach **€706 million** across all scopes, of which **€290 million** stems from the current scope. Scope extensions add €26 million for downstream products, €35 million for pre-consumer scrap, €22 million for the extension to precursors, €84 million for indirect emissions, and €248 million for new sectors.

Net CBAM cost are substantially reduced, thanks to EU market price effects, see Figure 13. Under the current scope, net cost are negative at **€-44 million (i.e. profits)**, compared to €79 million in the *expected scenario*. Scope extensions add €-7 million for downstream products, €35 million for pre-consumer scrap, €15 million for the extension to precursors, €-71 million for indirect emissions, and €111 million for new sectors. The high negative figure for indirect emissions is due to the high level of subsidies in Europe given to producers (especially of aluminium), to compensate for their indirect carbon costs. We assumed these subsidies to be completely abolished when the CBAM starts covering those emissions, which should raise aluminium prices in the EU market.

The most striking change concerns flat steel, explained by the sharp decline in unit costs, which fall from €97/t with the national average emission intensity to €-32/t in the *ambitious scenario* (see Figure 11), whereas long steel products show a more moderate reduction of €5/t, reflecting the more limited scope for low-carbon reallocation in these segments.

Taken together, the figure shows that under a very achievable *ambitious scenario*, **the real economic impact of the CBAM on India would be significantly lower than gross exposure alone would suggest**. This reinforces the importance of assessing net, rather than gross, CBAM exposure when evaluating competitiveness effects and the likely distribution of adjustment pressures across sectors.

The structure of India's CBAM-goods exports to the EU, which are dominated by basic steel products, rather than highly transformed ones, means that downstream extensions of the CBAM would not materially increase its impact on the country's competitiveness. However, if India wanted to export more finished goods to the EU, it would need to transform its steelmaking industry more deeply. This is because, to remain competitive would require only exporting goods that are made from low-carbon crude steel, which is more difficult to ensure as goods incorporate multiple parts from various sources.

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