

Seizing the
opportunity:
benefits of embracing
decarbonization

July 2023



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Executive summary

The escalating global carbon emissions and the pressing need to combat climate change are closely interwoven. Current CO₂ emissions are at 36.8 gigatons, and the existing decarbonization commitments by countries are projected to increase emissions by 10.6% by 2030, breaching the 40 gigaton cap. To limit the rise of global temperature to 1.5 degrees Celsius, emissions must be reduced by 45% by 2030 and reach net-zero by 2050. However, sectors such as power, industry, transport, and buildings are not on track to meet these targets, primarily due to slow implementation of decarbonization policy initiatives and insufficient carbon pricing.

Carbon pricing, which involves imposing a price on carbon emissions, is identified as one of the most effective strategies for addressing climate change. There are two primary methods of carbon pricing: carbon taxes and emission trading schemes. Carbon taxation, which internalizes the cost of emissions for companies, is gaining significant momentum globally. In 2022, global revenue from carbon pricing initiatives reached US\$95 billion, a 90% increase from 2020. This revenue growth can be attributed to higher carbon prices, broader coverage of carbon pricing instruments, and increased volume of emissions trading system auctions.

The European Union's carbon border adjustment mechanism (CBAM) and the US's FAIR Transition and Competition Act target "hard-to-abate" sectors, including iron and steel, aluminium, refinery products, and chemicals. Since India exports a significant portion of its products to the EU and the US, which are the leading markets for these sectors, Indian companies must take decarbonization measures to comply with the regulations.

Several factors contribute to the urgency for Indian industries to decarbonize. CBAM certificates will come into effect in January 2026, and industries will need to disclose their emissions to comply with the regulations by October 2023. Carbon markets are being proposed in India, and companies will face increasing pressure from investors and customers to reduce emissions. Governments may also introduce regulatory changes that demand the use of "green/low carbon" products. Many global companies have committed to achieving net-zero emissions, highlighting the need for Indian companies to stay competitive.

Failure to act on decarbonization measures could result in Indian industries losing market share, missing out on premium green product markets, and facing revenue loss. Therefore, the Indian companies should estimate the impact of CBAM on their business, develop detailed greenhouse gas inventories, prepare to comply with regulations, create decarbonization roadmaps, and execute decarbonization initiatives.

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1

The vital need for decarbonization

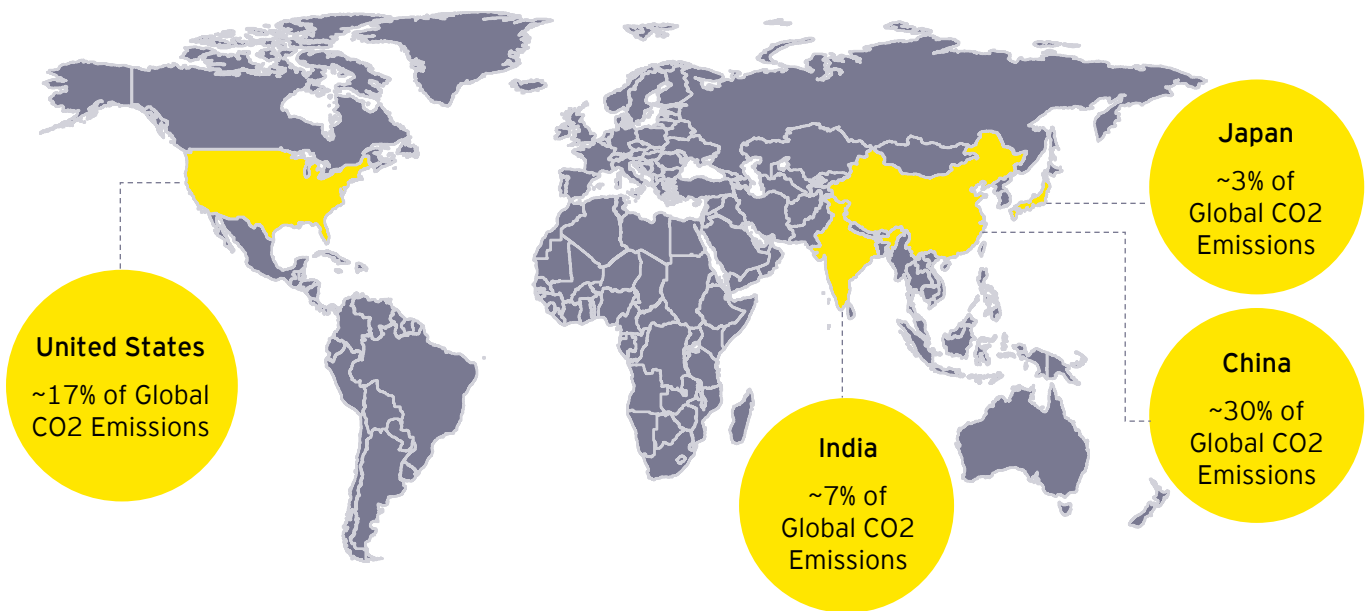


The vital need for decarbonization

World carbon emissions are on the rise, with current CO2 emissions at 36.8 gigatons. UNFCC projects that the current decarbonization commitments made by countries would result in a 10.6% increase in emissions by 2030, surpassing the 40 gigaton cap for Global Greenhouse Gas (GHG) emissions. The major contributors to this increase include the United States, China, and India, which together account for over half of the global emissions. To be able to keep the Global temperatures under 1.5 deg scenario, there is a need to reduce these emissions by 45% by 2030 compared to 2010 levels (33.3 gigaton) and Net-zero by 2050. This is a dire situation to be in considering the impact of climate change in our everyday lives and demands immediate action on the part of the entities involved in these emissions.

Annual share of global co2 emissions 2022

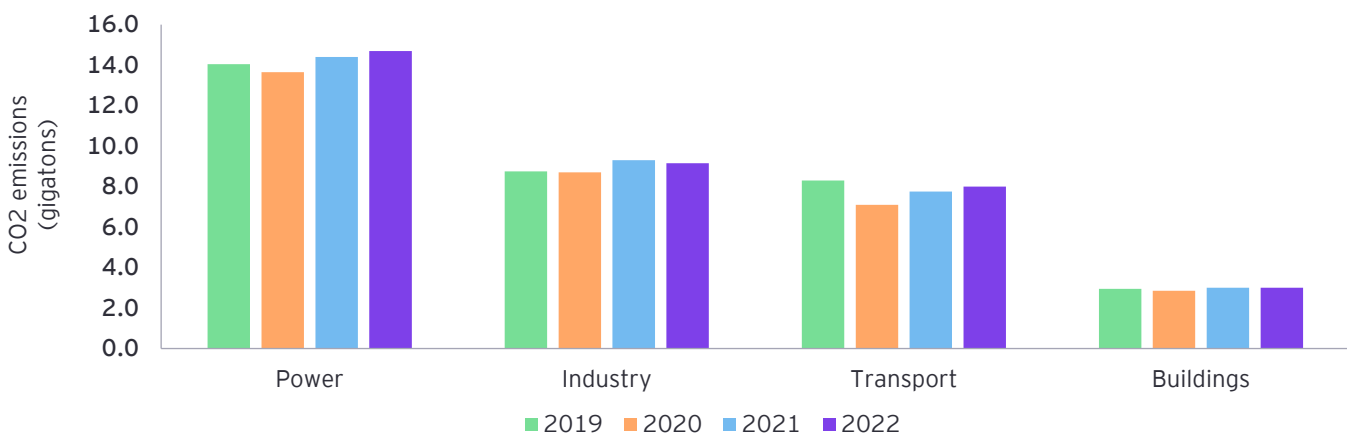
China, US and India contribute to more than 50% global CO2 emissions



Source: 1. [Energy Gap report](#) 2. [Nature](#) 3. [IEA](#)

The power, industry, transport, and buildings sectors in these countries are not on track to decarbonize by 2030, despite their NDC commitments at COP26. A major reason for this has been the slow adoption of carbon pricing and insufficient carbon price that have hindered decarbonization efforts.

Global CO2 emissions by sector, 2019-2022

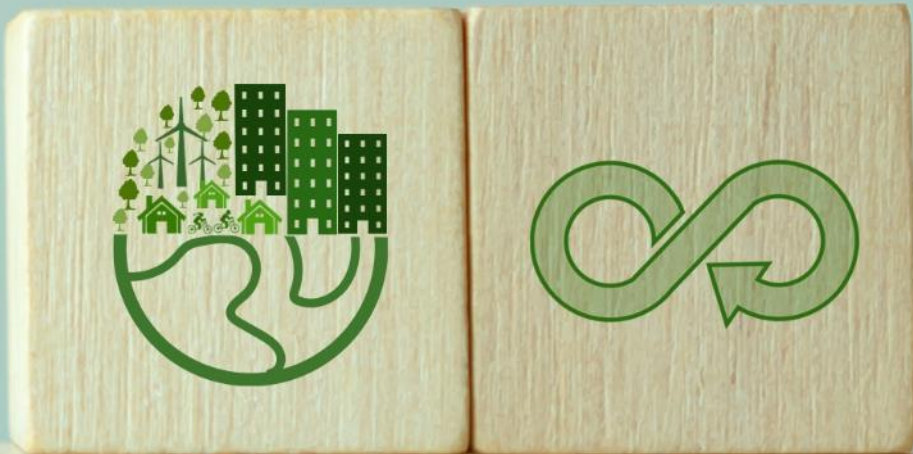


Source: 1. [IEA Report](#)

This rise in emissions continues to be a major concern for the global community, as it exacerbates the effects of climate change.

2

Overview of world carbon reduction measures



Overview of world carbon reduction measures

To help meet these goals, countries are taking steps to reduce their emissions such as implementing carbon pricing, investing in renewable energy, increasing energy efficiency, logistics overhaul, green hydrogen adoption and scaling carbon capture utilization and storage.

Considering these efforts being taken by the major economies around the world, carbon pricing is coming out to be one of the most effective ways toward climate action agenda. Carbon pricing is a method of imposing a price on the carbon emissions to reduce the impact of GHG emissions. There are essentially two ways the carbon pricing mechanism is being enforced:

- 1 Imposition of a carbon tax
- 2 Implementation of an Emission Trading Scheme

However, the core focus is imposition of these carbon taxation regimes as it would force the companies to internalize the cost of their emissions and undertake decarbonization initiatives as part of their operations.

Here is a list of top countries/ regions that are increasingly adopting carbon markets. The key sectors covered under the carbon taxation regime are:



Emissions covered	Billion tons	2.8	6.1	10.8	1.1	0.5	0.4
Carbon Price	US\$/tCO2	100 ¹	40-60 ²	9.2 ³	130 ⁴	50 ⁵	7.4 ⁶
Metals & Mining	Iron & Steel	✓	✓	✓	✗	✓	✓
	Aluminium	✓	✓	✓	✗	✓	✗
Refinery Products		✓	✓	✓	✓	✓	✗
Cement		✓	✓	✓	✗	✓	✗
Petro chemicals		✓	✓	✓	✗	✓	✗
Power		✓	✓	✓	✗	✓	✓
Pharmaceuticals		✗	✗	✗	✗	✓	✗
Others	Automotives	✗	✗	✗	✗	✓	✗
	Transport	✗	✗	✓	✗	✗	✓
	Wood products	✗	✗	✓	✗	✓	✗
	Glass/ Ceramic	✗	✗	✗	✗	✗	✓

Source: 1. <https://tradingeconomics.com/commodity/carbon>, 2. EPA, 3. S&P Global Data 4. Reuters, 5. Canada Govt., 6. IETA

In 2022, the global revenue from carbon pricing initiatives was US\$95 billion which is a 90% increase from that in 2020. This phenomenal increase in revenues can be attributed to three reasons:

- 1 Higher carbon prices
- 2 Revenue from increasing coverage of instruments (Direct and indirect carbon tax)
- 3 Increased volume of auctions in the emissions trading systems around the world

This highlights the importance of carbon pricing toward incentivizing investments toward deep decarbonization and also the reason behind major economies adopting or planning to adopt emissions trading schemes in their economies.

3

*Exposure of
India to carbon
regulations
around the world*



Exposure of India to carbon regulations around the world

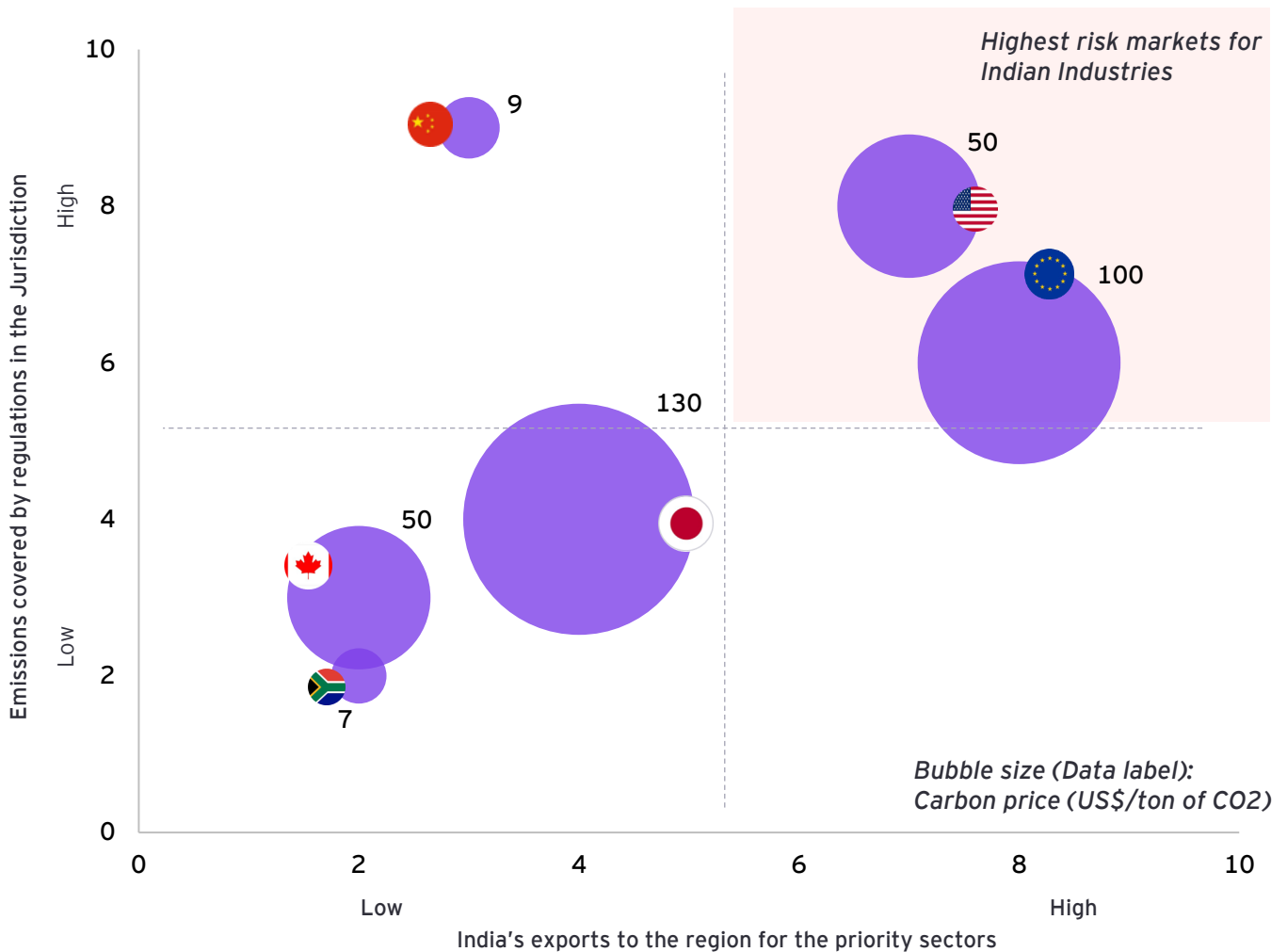
In light of the carbon regulations coming up in multiple geographies, Indian industries must safeguard themselves from the impact of these regulations. The CBAM and US FAIR regulations, for example, have specified focus sectors that would be covered under their carbon taxation purview. These focus sectors are typically the 'hard-to-abate' sectors in majority of these carbon taxation regimes, such as iron and steel, aluminium, refinery products, chemicals. The sectors under purview of these taxation regimes, however, differ across geographies, as we have seen above.

Thus, two factors become important to identify which of these carbon regulations would pose the highest risk to Indian industries:

- 1 Sectors and thus the volume of emissions covered under the policy purview
- 2 India's export to the geography for the sectors covered under the carbon tax

The carbon taxation regimes that would have the highest overlap in the two factors would naturally pose the highest risk to Indian industries.

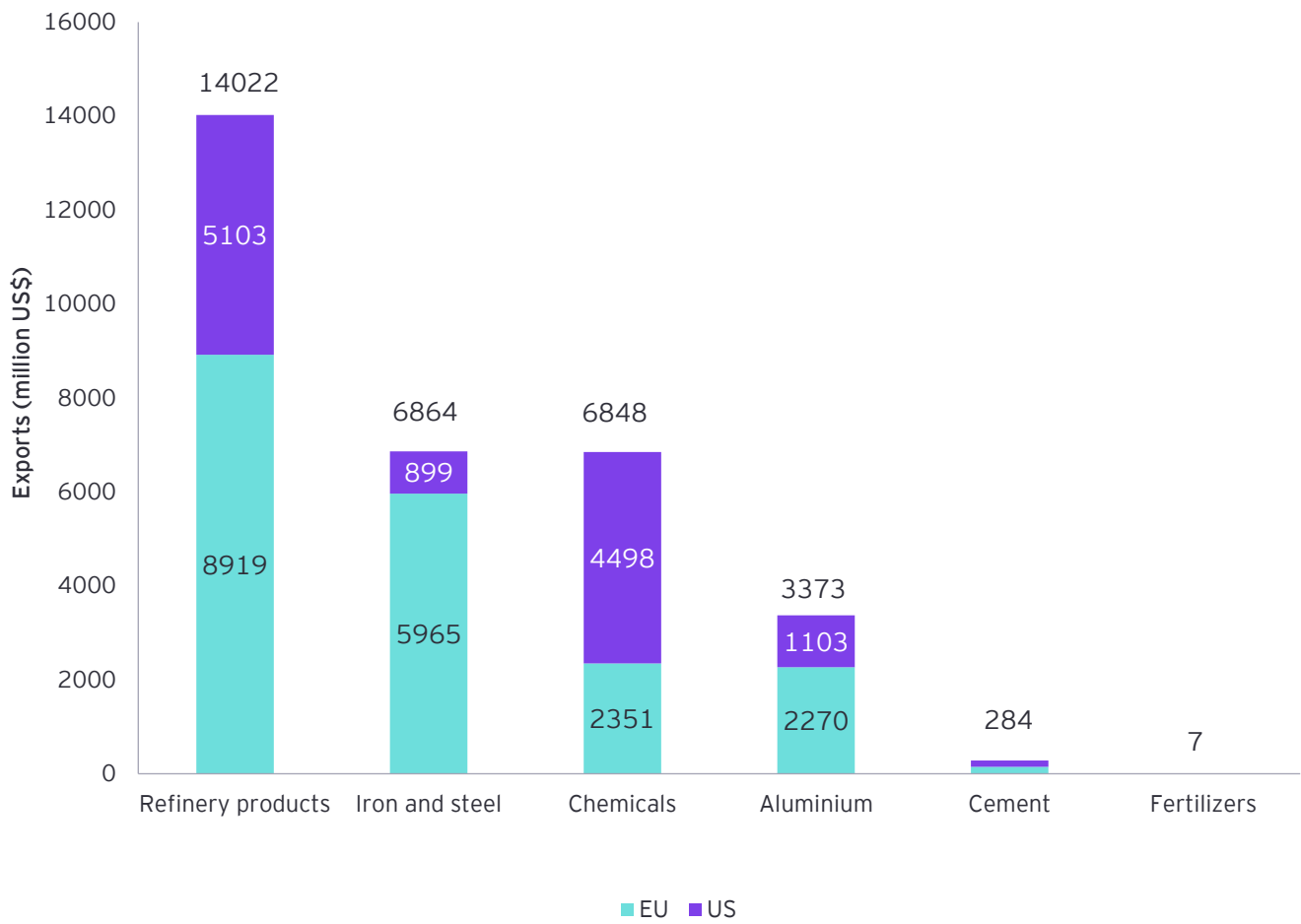
India's exposure to carbon pricing regimes



Source: 1. India Exports Data, 2. EY Analysis

Indian companies have significant exposure to the European Union's carbon border adjustment mechanism and the US' FAIR Transition and Competition Act. This is due to the overlap between focus sectors and India's increasing exports to the EU and US under those sectors, making the EU and the US the highest risk markets for Indian companies in terms of carbon taxation.

Indian exports FY22: the EU and US



Source: 1. [India Exports Data](#)



India exports about 30-35% (US\$150 billion+)¹ of its exports to the EU and US, of which over 20% is the value that is covered under the sectors under the carbon taxation purview. This US\$30 billion worth of exports would further grow as India is undergoing capacity expansion under critical sectors, such as iron and steel, aluminium, etc. Also, 99% of the exports at risk are from the four sectors highlighted for which the European Union and US are the leading market in the world.

Indian industries exporting to or planning to export to these markets would thus need to take up decarbonization measures because of 5 important reasons:

1
CBAM is being implemented, and other carbon regulations are under works. CBAM would start impacting from January 2026 onwards and industries would need to start disclosing their emissions for complying with the CBAM October 2023 onwards. Their customers in EU would have to buy CBAM certificates from 1 January 2026 onwards depending on the embedded product emissions.

2
Carbon markets are being proposed in India with Bureau of Energy Efficiency (BEE) given the lead in implementing the carbon markets in India in the near future. To this effect, BEE has released the draft blueprint on national carbon markets. Once operational, it would enable carbon pricing on sectors in India and industries in turn would have to take up decarbonization as a measure of staying competitive in the market.

3
There will be an increasing pressure from investors and even customers to decarbonize the operations as companies that improve ESG ratings, reduce cost of capital and draw investor interest. The customers would want to source "Green/ Low carbon" products to reduce their own emissions and market their own products as "Green/Low carbon" to command a premium or differentiate in the market. C&I segment would, thus, need to comply with the push from investors as well as maximize revenue through pull from the customers.

5
Over a third of 2000 large globally listed companies have committed to Net Zero emissions by 2050 or before and 4000 companies have taken science-based targets and are thus already ahead of the curve or mature in terms of their decarbonization measures/ strategies. With the advent of carbon taxation regimes, Indian companies should not stay far behind its global counterparts to stay competitive.

4
Governments would also bring in regulatory changes e.g., mandatory obligations like the RPO, that would impact downstream use of products such as Green Building codes, Green Infrastructure etc. This would further increase the demand for these "Green/ Low carbon" products creating a market and early mover premium capitalization opportunity in these products as well which the C&I segment should capitalize.

Source: 1. [India Exports Data](#)

Given these considerations, Indian industries would certainly need to take a note of their Decarbonization journeys at the earliest. The next section in this report deals with the analysis of cost savings through which Indian industries can unlock decarbonization.

4

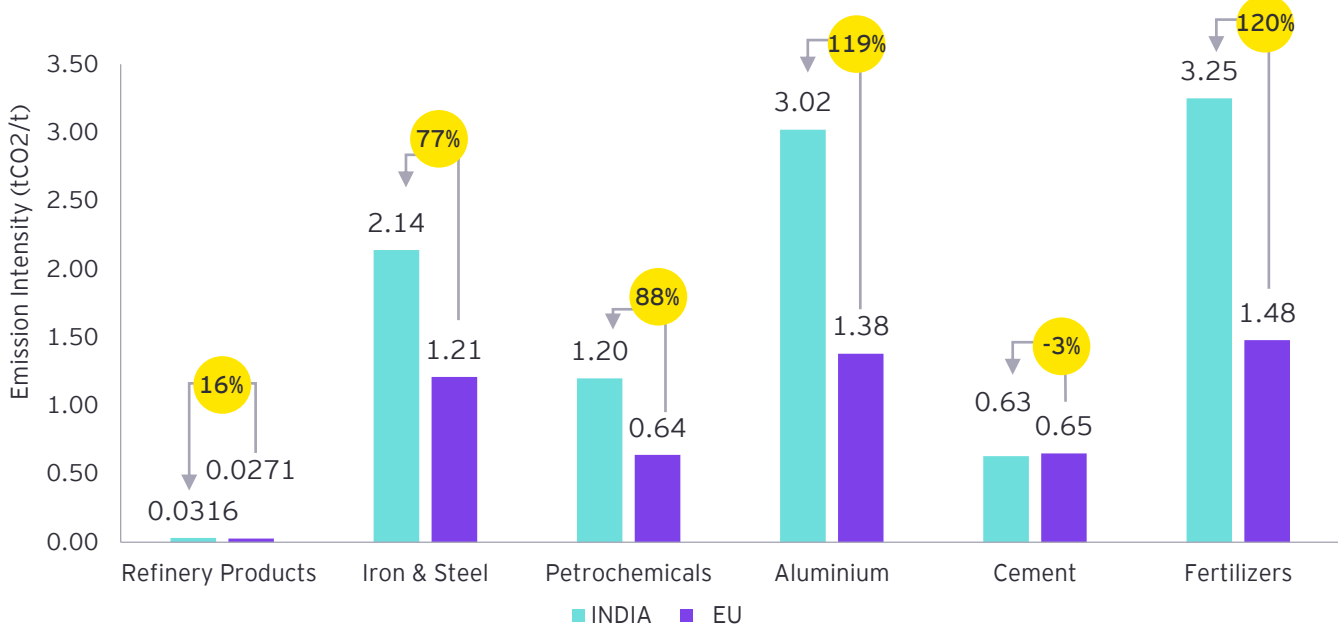
Sectoral emission comparison: India vs. the EU



Sectoral emission comparison: India vs. the EU

Indian companies in the sectors that are exposed to the carbon regulations are more emissive than their EU counterparts except for the cement sector. This gap is even exaggerated when it comes to “hard-to-abate” sectors, such as refinery products, iron and steel, and aluminium. This is also reflective of the fact that Western companies have had a head start in implementing various decarbonization initiatives. Which means they are more mature in their decarbonization journeys and hence more suited to mitigate the impact of financial risks arising from the emissions.

Emission intensity of India and the EU



Assumptions: 1. Refinery products emission intensity benchmark for India is estimated using the emissions intensity (scope 1+2) of top PSU refineries. EU's emissions for the sector have been assumed equivalent to that of Refinery products benchmark 2. Iron & Steel sector emission intensity includes the primary and secondary steel industries and the EU benchmark of Hot metal is chosen as a reference. 3. India's petrochemical industry benchmark is assumed to be equal to ethylene production (steam cracking) and EU's steam cracking benchmark is used as reference. 4. India's Primary aluminium's emission intensity is estimated from the process emission weightage in the smelting operations and EU's primary aluminium benchmark is used for reference. 5. India's cement sectors' clinker emissions are calculated from the average of top companies' emissions and EU's grey cement clinker benchmark is used for reference. 6. Direct emissions from Ammonia production in India are used as benchmark for Fertilizers industry and EU's ammonia benchmark is used for reference.

Sources: 1. Refinery products: EY analysis , 2. Iron & Steel: [GEI Report](#), World Steel, EY Analysis, 3. Petrochemicals: [NITI Aayog](#), 4. aluminium: EY Analysis, 5. Cement: EY Analysis 6. Fertilizers: [CCUS Report](#) 7. EU Benchmarks: [CBAM benchmark list](#)

For Indian companies, this means a higher carbon tax (reduced margins) or a lower offtake priority since the carbon certificates would have to be purchased by the buyers of these commodities in the respective markets which would add to their costs as well as scope 3 emissions while reporting these imports in their boundary.

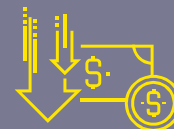
What it means for Indian C&I players exposed to these carbon taxation regimes is subsequent:



Loss of market share



Loss of first mover advantage to avail the “Premium Green Product” market



Loss of revenue maximization through “Green product” diversification

If companies do not act on their decarbonization journeys sooner, they are bound to miss the bus and capitalize on the opportunity pool listed above.

5

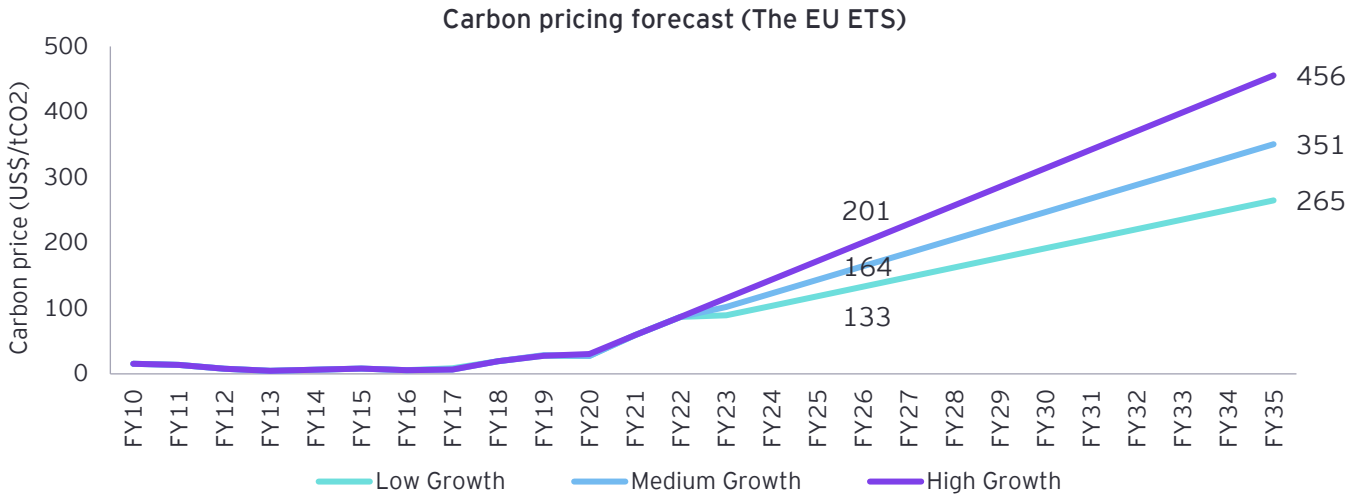
*Carbon pricing
projections*



Carbon pricing projections

Carbon pricing under the carbon taxation regimes such as CBAM and FAIR are a topic of close consideration since this is the penalty that the companies would have to pay for importing the products. However, there is a whole debate on how these carbon pricing would develop in the years to come, as well how these carbon prices will vary across different geographies.

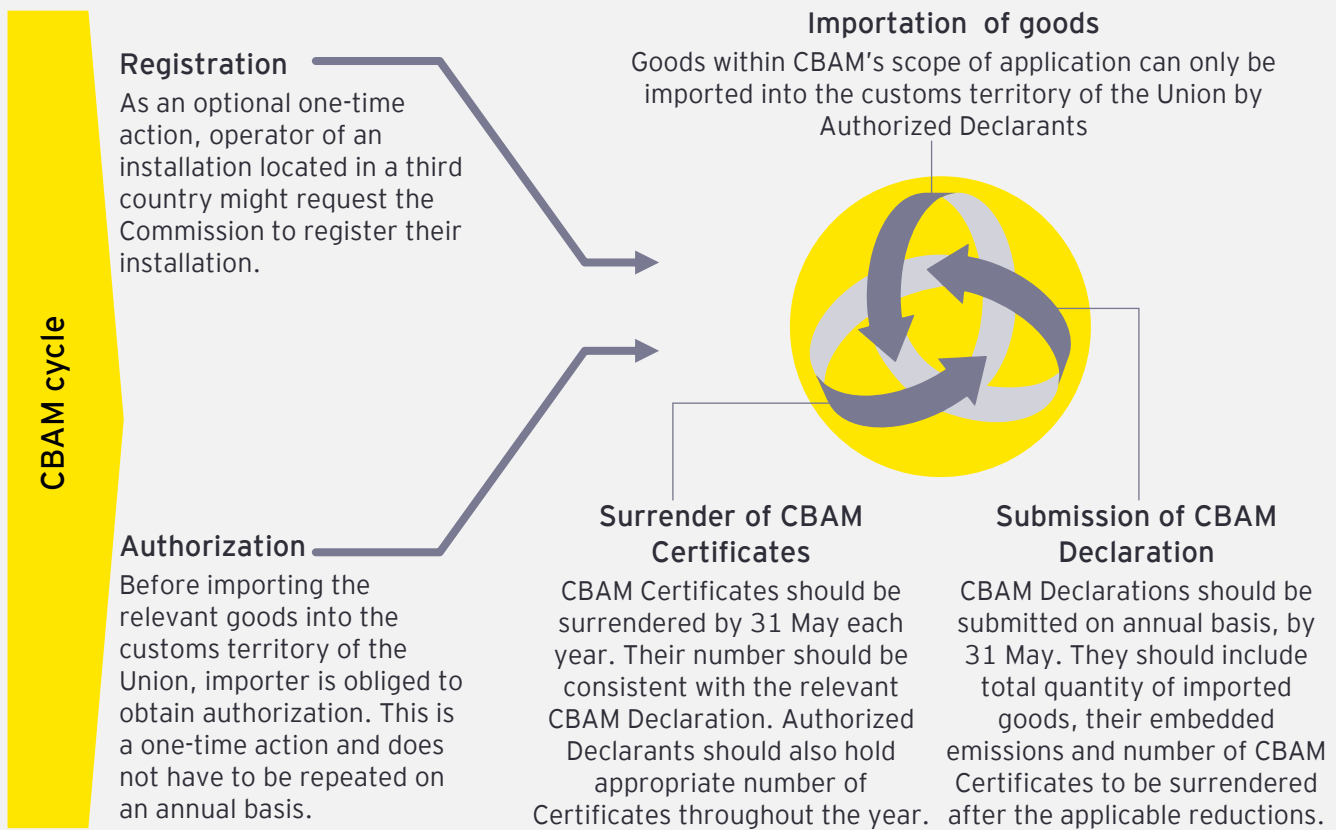
The carbon certificates in the EU markets are also expected to trade at upwards of US\$140/tCO₂ by 2025 and US\$350+/tCO₂ by 2035. Here is a snapshot of developments in the EU ETS carbon prices over the past decade and some projections based on the same.



Assumptions: 1. Regression benchmark point is chosen 2017 for low growth scenario, 2018 for medium growth scenario and 2019 for high growth scenario. 2. High growth scenario is chosen for impact calculations henceforth 3. Carbon prices are assumed to be the same for EU and US markets.

Source: 10 year monthly EU Carbon Permits data

In the case of EU, the modalities for pricing the carbon certificates are much clear than other geographies. The carbon price will be linked to the weekly EU ETS carbon price and the customers in the EU would have to comply with the following cycle for the fully operational CBAM:



Source: EY Analysis

6

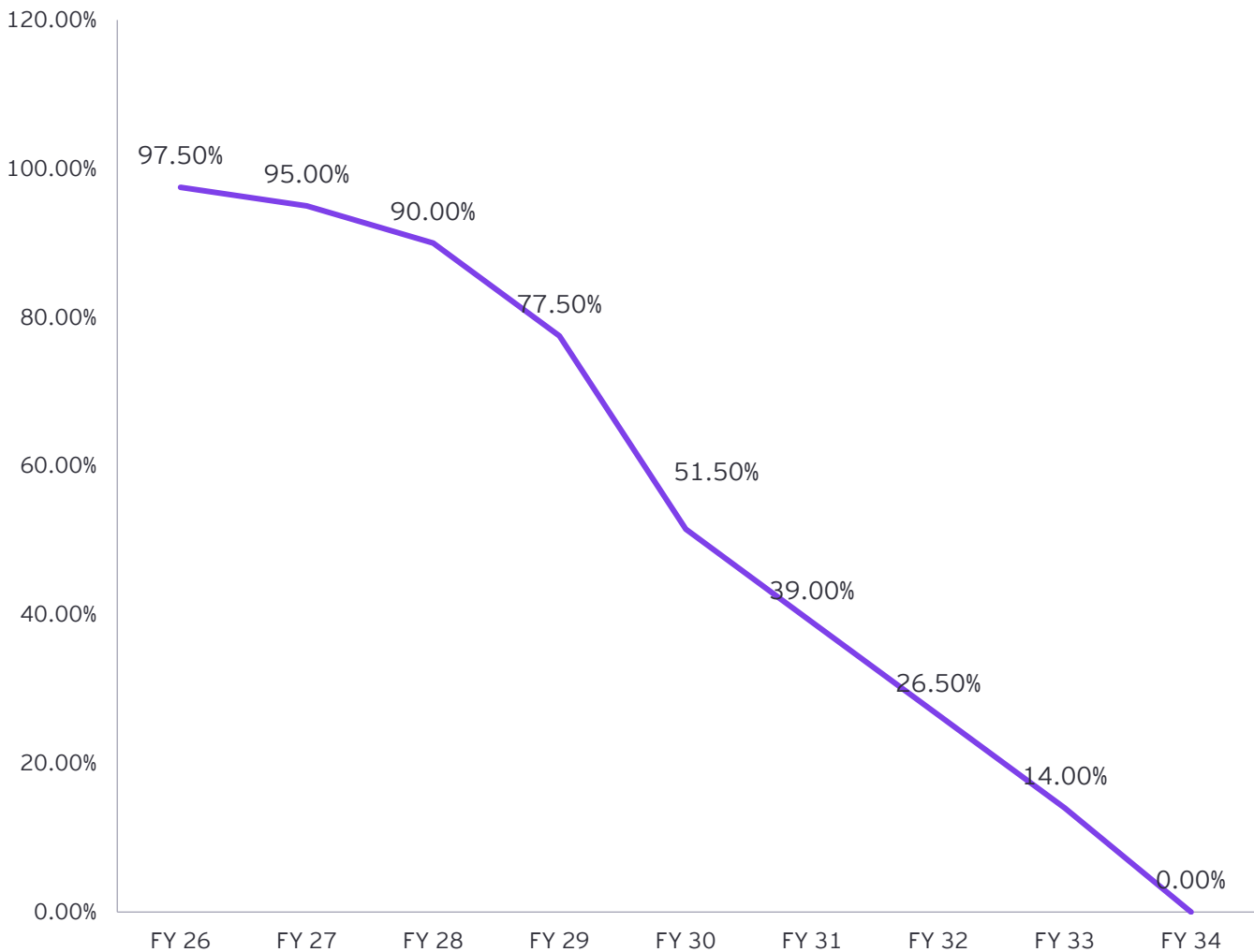
CBAM impact projection on Indian industries



CBAM impact projection on Indian industries

Although the CBAM would start monetarily impacting the sectors 1st January 2026 onwards, the impact would be initially cushioned by the phasing out of free allowances and parallel phasing in of the CBAM. The trajectory for the phasing out of free allowances entails that industries won't face the full brunt of CBAM at least until FY28 where the impact would still be around 10% however, the scenario would change drastically FY30 onwards where the CBAM would start affecting exponentially higher. Thus, industries should use the time from now to FY28 in starting their decarbonization journeys and take up measures to sensitize their operations and measure the impact of CBAM on their business.

Phasing out trajectory of free allowances in CBAM

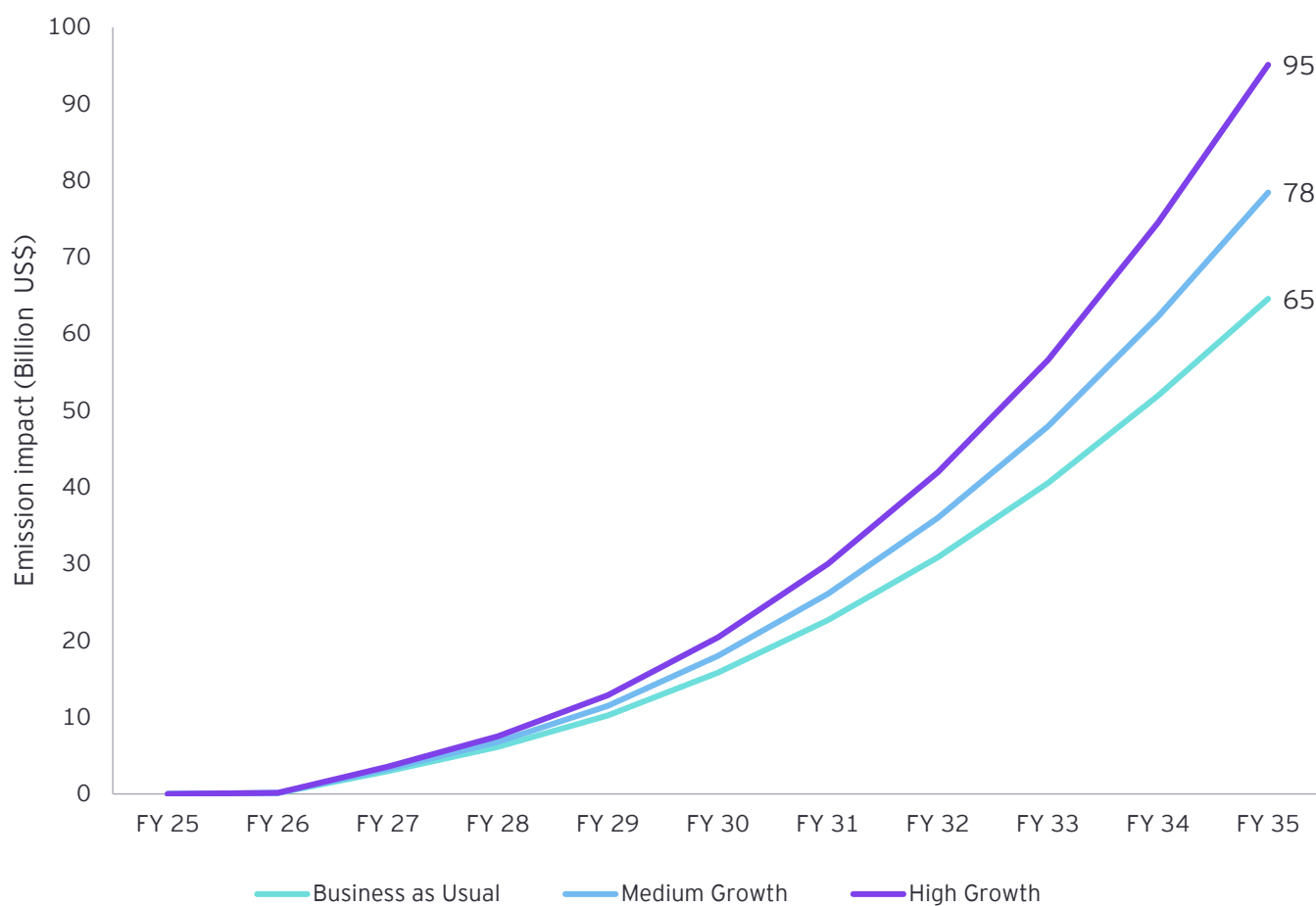


Source: [CBAM impact trajectory](#)

Given the export considerations and growth under the impact sectors as well as the developing carbon prices across geographies, EY foresees a cumulative impact of US\$65 billion to US\$95 billion by 2035 if Indian companies do not decarbonize.

This is the opportunity for Indian industries to avoid the impact that their customers would have to bear, thus resulting in potential loss of market share/ competitiveness and rather gain further market share and premium in the export markets.

Impact on Indian industries (cumulative)



Assumptions: 1. Carbon pricing forecast high growth scenario has been assumed for impact calculations. 2. EU Companies are assumed to decarbonize according to SBTi targets and Indian industries do not take any decarbonization measures 3. Business as usual scenario- assumes 4% growth in exports, Medium growth scenario assumes 6% growth and High growth scenario assumes an 8% growth year on year. 4. Free allowances are factored in to be phased out 2026 onwards up until 2034 according to the EU CBAM impact trajectory. 5. Carbon pricing impact is assumed to come into effect FY '26 onwards. 6. Carbon pricing in EU and US geographies is assumed to be equal. 7. Only Scope 1+2 emissions are accounted for calculating the impact of carbon taxation



The impact would be much higher if industries account for the lost market opportunity of maximizing their revenues through “Green Product Premium” which are niche products picking up speed in each of these sectors.

There is a definite upsurge in the carbon regulations around the world and more sectors are being added to the carbon taxation regimes as we go ahead. Carbon taxation regimes of the EU and US affect Indian industries, especially iron and steel, aluminium, refinery products, and petrochemical sectors. The combined value at risk for these sectors until 2035 is approximately half a trillion dollars. The effects of not decarbonizing these sectors could incur a loss of ~US\$65 to US\$95 billion by 2035. This estimated loss can increase if industries account loss of “Green Product Premium” by not capturing the green product market opportunity that is coming up in the key markets. Now, although the impact of CBAM would be cushioned at first because of the phasing out of free allowances, Indian industries should use the time to embark on their decarbonization journeys, as these would itself take them three to five years to mobilize resources and mature much like their global counterparts. The Indian industries, as a next step to embark on their decarbonization journey, must:

- ◆ Estimate the impact on CBAM on their business with export prices at various levels of carbon pricing
- ◆ Develop a detailed GHG inventory for their operations
- ◆ Get ready to comply with CBAM
- ◆ Develop a detailed decarbonization roadmap
- ◆ Embark on the decarbonization initiatives



7

*Case study:
Iron and steel
sector in India*

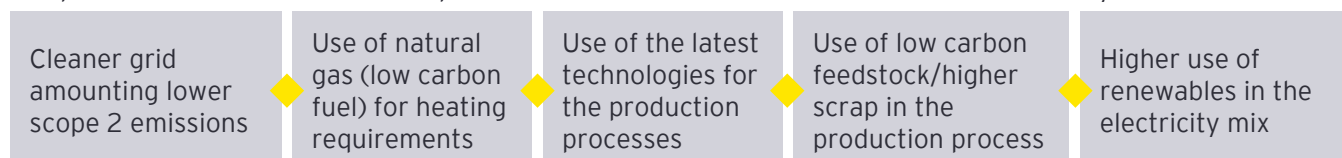


Case study: Iron and steel sector in India

The iron and steel sector is among the hard-to-abate sectors, meaning it is difficult for companies to reduce their carbon footprint given the emissions embedded in their processes.

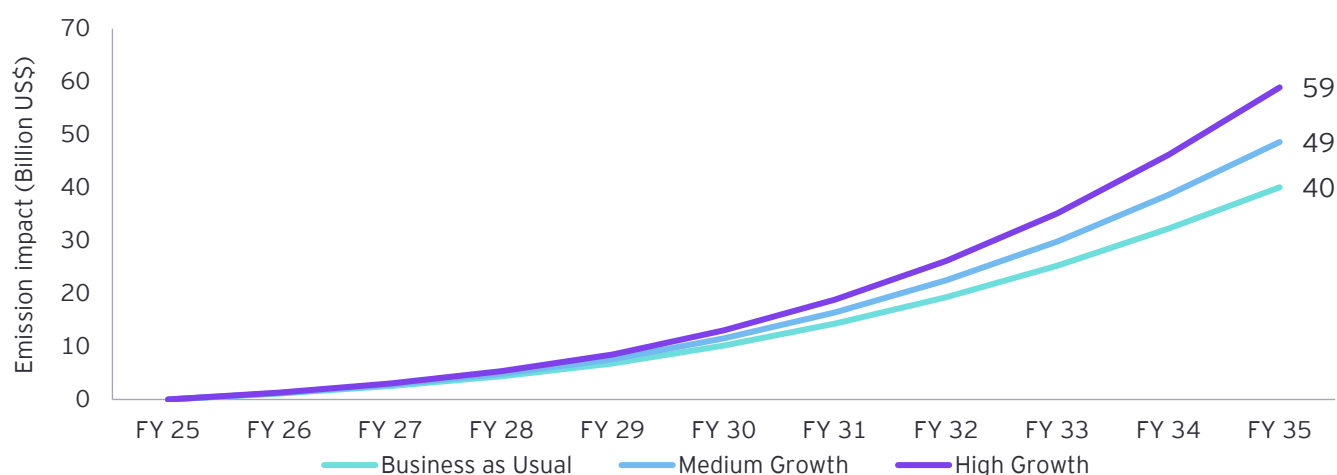
The iron and steel sector in India with a capacity of about 120 million tons of steel, is projected to reach a capacity of 300-500 million tons by 2050¹. Although a significant chunk of this capacity would be used for domestic consumption, industries would also aspire to increase their export portfolio considering a lucrative market.

However, in light of upcoming carbon taxation, Indian steel companies would need to accelerate their decarbonization measures given the steep difference between the emission intensity of Indian companies as compared with their EU/US counterparts. The factors attributed to lower emission intensity are:



Given these differences in the emission intensity and the exposure of Indian players to the EU and US market, the value at risk basis FY22 exports data is ~US\$7 billion, which is projected to increase between US\$15 billion and US\$18 billion by FY35. The cumulative worth of exports from FY26-FY35 is projected to be ~US\$ 100-135 billion.

Impact on Indian iron and steel industry (cumulative)



If CBAM were to be implemented in FY26 considering carbon tax on iron and steel sector, the impact on the sector is projected to be between US\$ 40 billion and US\$60 billion collectively until 2035. The projected cumulative impact is quite high when compared to the value of the sectors export, making it much less competitive if they do not decarbonize.

Here is a case to put things into perspective. An organization operates a secondary steel plant that manufactures 1 million tons of steel annually, with 15% to 20% of their steel production being exported each year. The organization now plans to increase exports between 30% to 40% to key markets such as the EU and US. If the organization does not take any decarbonization measures, increasing the export exposure would bring a projected impact of ~ US\$333 million in 2035 (cumulative impact of US\$1.75 billion+ from FY25-FY35) because of carbon taxation regimes. However, decarbonizing operations requires ~US\$100 million to US\$150 million by 2035 for a 50% to 60% reduction in emissions. If the organization takes up decarbonization initiatives to this tune, the reduced emission intensities could bring in savings of about ~US\$800 million+ cumulative from FY25-FY35. The steel company can also avail "Green Funds" at cheaper rates to fund these decarbonization initiatives. This would "enable" the industries not only to effectively decarbonize their operations but also balance their growth by strategically maximizing their revenues from the "Green Product Premiums" and increasing market shares.

The world is clearly moving toward a decarbonized future. Global companies are rapidly incorporating decarbonization measures into their operations. The larger push for this is coming from the carbon taxation regimes that are propping up in critical geographies for the Indian C&I segment as well. To not get left behind on the decarbonization agenda, it makes economic sense to invest in decarbonization journeys for the Indian C&I segment now more than ever to stay competitive with respect to their global counterparts.

1- TERI report

Our offices

Ahmedabad

22nd Floor, B Wing, Privilon
Ambli BRT Road, Behind Iskcon
Temple, Off SG Highway
Ahmedabad - 380 059
Tel: +91 79 6608 3800

Bengaluru

12th & 13th floor
"UB City", Canberra Block
No. 24, Vittal Mallya Road
Bengaluru - 560 001
Tel: +91 80 6727 5000

Ground Floor, 'A' wing
Divyasree Chambers
11, Langford Gardens
Bengaluru - 560 025
Tel: +91 80 6727 5000

Chandigarh

Elante offices, Unit No. B-613 & 614
6th Floor, Plot No- 178-178A
Industrial & Business Park, Phase-I
Chandigarh - 160 002
Tel: +91 172 6717800

Chennai

Tidel Park, 6th & 7th Floor
A Block, No.4, Rajiv Gandhi Salai
Taramani, Chennai - 600 113
Tel: +91 44 6654 8100

Delhi NCR

Ground Floor
67, Institutional Area
Sector 44, Gurugram - 122 003
Haryana
Tel: +91 124 443 4000

3rd & 6th Floor, Worldmark-1
IGI Airport Hospitality District
Aerocity, New Delhi - 110 037
Tel: +91 11 4731 8000

4th & 5th Floor, Plot No 2B
Tower 2, Sector 126
Gautam Budh Nagar, U.P.
Noida - 201 304
Tel: +91 120 671 7000

Hyderabad

THE SKYVIEW 10
18th Floor, "SOUTH LOBBY"
Survey No 83/1, Raidurgam
Hyderabad - 500 032
Tel: +91 40 6736 2000

Jamshedpur

1st Floor, Shantiniketan
Building, Holding No. 1
SB Shop Area, Bistupur
Jamshedpur - 831 001
Tel: +91 657 663 1000

Kochi

9th Floor, ABAD Nucleus
NH-49, Maradu PO
Kochi - 682 304
Tel: +91 484 433 4000

Kolkata

22 Camac Street
3rd Floor, Block 'C'
Kolkata - 700 016
Tel: +91 33 6615 3400

Mumbai

14th Floor, The Ruby
29 Senapati Bapat Marg
Dadar (W), Mumbai - 400 028
Tel: +91 22 6192 0000

5th Floor, Block B-2
Nirlon Knowledge Park
Off. Western Express Highway
Goregaon (E)
Mumbai - 400 063
Tel: +91 22 6192 0000

Pune

C-401, 4th floor
Panchshil Tech Park, Yerwada
(Near Don Bosco School)
Pune - 411 006
Tel: +91 20 4912 6000

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