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CARBON AT THE BORDER: THE EFFECT OF THE EU'S CARBON BORDER ADJUSTMENT MECHANISM ON INDIA'S EXPORT COMPETITIVENESS

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I. ABSTRACT

The European Union's Carbon Border Adjustment Mechanism (henceforth referred to as CBAM), introduced as part of the European Green Deal is one of the most ambitious attempts at combining trade and climate regulations. While the EU has implemented CBAM to prevent carbon leakage, its implication for developing economies like India has not only been legally contentious, but also of economic importance. The article critically analyses the question of whether CBAM is compatible with the principles of the World Trade Organization (WTO) framework and, in particular, with the General Agreement on Tariffs and Trade (GATT) and its exceptions under Article XX of GATT. It further analyses the implications of CBAM on the Indian steel sector, the aluminium and iron sectors, which make up a large portion of Indian exports into EU, focussing on compliance challenges in the area of emissions reporting, infrastructure and institution readiness. Through a doctrinal and comparative analysis of the law, the article examines India's current carbon regulatory framework and Carbon Credit Trading Scheme and the absence of a national carbon tax. It contends that India faces both a trade risk and an opportunity- either to have a passive reaction to the cost structures caused by CBAM, or to introduce a proactive carbon pricing strategy that could place national interests in consonance with the structure of global climate-trade governance.

II. KEYWORDS

Carbon leakage, Carbon tax, GATT Regulations, Carbon Credit Trading Scheme, Environment protection, WTO law, Trade regulations

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III. INTRODUCTION

Climate change has become a significant issue of the twenty-first century. The rising concern about climate change has caused the reconfiguration of not only environmental policy but also of international trade law. The EU's CBAM represents a turning point between these disciplines, in which a tentative effort has been made to advance environmental protection through trade policies. CBAM is framed as a tool to help mitigate "carbon leakage" a phenomenon where business transfers production to locations, which have less stringent emissions laws and thereby undermines the global goals. The mechanism aims at levelling the playing fields for domestic EU industries under the Emissions Trading System (ETS) and those for export from exporters outside the EU and thereby sustains a credible European climate ambition that does not cost European industries competitiveness in a more liberalised global market.

It is recommended that this be revised to "For India, which is one of the largest exporters of steel and aluminium to the European Union, the implementation of CBAM has immense legal, economic and policy implications. The mechanism is aimed directly at some of India's key export sectors and forces the country to come to grips not only with issues of compliance and competitiveness but also the normative issue of whether CBAM is legitimate legislation to regulate climate or is it a new form of trade protectionism. From a legal standpoint, India is therefore faced with the twin challenge of both challenging the compatibility of CBAM in the context of WTO rules and rethinking its domestic regulatory framework which at present does not have an all-encompassing carbon pricing mechanism in place.

Consequently, CBAM raises significant questions on India's trade policy, industrial competitiveness, and India's overall climate governance strategy. It places India in the centre of a new debate, whether the body of international trade law can allow for climate imperatives without perpetuating the inequalities between developed and developing economies.

A. Research Objective

1. To examine whether CBAM is legally consistent with WTO principles, or do they constitute a form of trade protectionism.
2. To analyse the impact of CBAM on key Indian export sectors including Steel, Aluminium & Iron and identify the compliance challenges faced by Indian exporters.
3. To evaluate the current regulatory and carbon pricing landscape in India and compare to that in the rest of the world.
4. To evaluate the potential benefits and challenges of implementing domestic carbon tax legislation in India.

B. Research Questions

1. Is CBAM consistent with WTO principles from a legal perspective, or is it a type of trade protectionism?
2. What is the effect of CBAM on major sectors of Indian exports such as steel, aluminium, and iron and what are some of the compliance challenges for Indian exporters?
3. How does the current regulatory and carbon pricing landscape in India compared to that in the rest of the world?
4. What are the benefits and challenges of implementing domestic carbon tax legislation in India?

C. Research Hypotheses

Carbon Border Adjustment Mechanism (CBAM) is a major trade related challenge for Indian exporters as imposition of Carbon associated cost has already had negative impact on performance of exports and still affects competitiveness of Indian exports in European Market.

D. Research Methodology

This paper has adopted a doctrinal and qualitative research methodology with the aid of comparative and analytical methods to analyze the legal, economic and policy

implications of the European Union's Carbon Border Adjustment Mechanism on the export competitiveness of India. A doctrinal legal analysis is carried out as to the compatibility between CBAM and the WTO framework, especially GATT 1994, through an analysis of the WTO agreements, EU regulations and relevant jurisprudence, included in US-Gasoline and US-Shrimp/Turtle cases.

The study is further based on secondary empirical data from policy reports, government publications and industry studies for analysing the sector-specific impact of CBAM in Indian iron, steel and aluminium export. Finally, an analytical policy approach is taken to assess India's strategic responses: primarily on two fronts, domestic carbon pricing, emissions trading and institutional capacity building, which does not involve primary data collection.

E. Survey of Literature

The current literature dealing with the CBAM offers a multidimensional understanding of the carbon pricing, trade and developmental asymmetries as well as reflects analytical underpinnings that the present paper is addressing. As analysed by Trishant & Goswami (2024) the primary goal of CBAM is to ensure a levelled platform for European companies, which are required to pay for their carbon emissions, and non-EU companies importing products into the EU territory.²

Woerdman, Aruri & Clo (2008) discuss about the emission trading schemes and its evolution in the global market. The concept of emission trading sprouted from the United States sulphur dioxide emissions trading program, which has hugely influenced the European Union's carbon trading mechanism.³ Rumble & Gidler (2024) provide the idea that although CBAM is designed to provide incentives to global climate ambition, it can disproportionately impact developing economies who have less capacity to measure emissions and implement carbon pricing. Referring to

² Trishant Dev & Avantika Goswami, The Carbon Border Adjustment Mechanism (CBAM), The Global South's Response to a Changing Trade Regime in the Era of Climate Change. Centre for Science and Environment, 2024. <http://www.jstor.org/stable/resrep61638.5>.

³ Edwin Woerdman, Alessandra Aruri & Stefano Clo, Emissions Trading and the Polluter-Pays Principle: Do Polluters Pay under Grandfathering, 4 REV. L & ECON. 565 (2008). <https://heinonline.org-christuniversity.knimbus.com/HOL/Page?handle=hein.journals/rvleco4&id=565&collection=journals&index=>

secondary data the article shows that CBAM is expected to reduce the exports of Africa to the EU by 5.7% and lower the GDP by 0.91%. Among the sectors that would be hit the hardest is aluminium, which is likely to see a decline in exports to the EU of 13.9%, and iron and steel in which there could be a decline of 8.2%.⁴

Similarly empirical data (2025) suggests that among the goods covered under CBAM, Aluminium (26%) and Iron & Steel (28%) form a major part of the exports to EU. JSW Steel (representing the steel sector) and Hindalco (representing aluminium) have proactively adopted sustainability initiatives such as investments in renewable energy and energy efficiency and exploration of alternative fuels.⁵ Chaturvedi (2016) provides an important perspective on India's carbon tax package, called as the Clean Environment Cess.

While cess is intended to encourage clean energy and provide separate funds for renewable energy projects, Chaturvedi points out some of the structural flaws in the paper. The narrow focus of Cess on coal, the fact that it is non-revenue-neutral, and some operational loopholes such as exemptions and low degree of deductibility that make it less effective as a true Pigouvian tax. Chaturvedi suggests that considering the economy of India it is better to provide tax exemptions/incentives not disincentives.⁶

In 2025, emission intensity was notified by India for nine sectors under Carbon Credit Trading Scheme (CCTS) and this is the move towards market-based climate governance. The proposed Indian Carbon Market, which is supposed to come into operational mode by mid-2026, is a sign of policy evolving, with a greater reliance on incentives and gradual transition as opposed to punitive disincentives.⁷

⁴ Olivia Rumble & Andrew Gidler, "The Impact of the CBAM on African Economies and the Role of the AfCFTA." South African Institute of International Affairs, 2024.

<http://www.jstor.org/stable/resrep67544>

⁵ Rajat Kathuria, Neha Gupta & Navya Kumar, India's Carbon Border Adjustment Mechanism (CBAM) Challenge: Strategic Response and Policy Options (CSEP Working Paper 90). New Delhi: Centre for Social and Economic Progress. <https://csep.org/wp-content/uploads/2025/02/Indias-Carbon-Border-Adjustment-Mechanism-CBAM-Challenge-1.pdf> (2025)

⁶ Chaturvedi, Ipsita. "The 'Carbon Tax Package': An Appraisal of Its Efficiency in India's Clean Energy Future." Carbon & Climate Law Review 10, no. 4 (2016): 194–201.

<http://www.jstor.org/stable/44134899>.

⁷ India Notifies Emission Intensity Targets for Nine Sectors under Carbon Credit Trading Scheme, International Carbon Action Partnership (Nov. 17, 2025), available at

IV. THE WTO LEGALITY OF THE CARBON BORDER ADJUSTMENT MECHANISM (CBAM)

On December 11, 2019, the European Commission launched its comprehensive climate initiative, the “European Green Deal” among the goals of which was to make the European Union carbon-neutral by 2050. The strategy is focused on a substantial reduction of the EU’s greenhouse gas (“GHG”) emissions. As one of the main pillars of this structure, the Commission released a legislative proposal on July 14, 2021, introducing CBAM. The CBAM is intended to ensure that imported goods are subject to a carbon cost equivalent to that applied to products manufactured within the territory of EU.⁸

The concept of emission trading sprouted from the United States sulphur dioxide emissions trading program (*Acid Rain Program*)⁹ and has hugely influenced the European Union’s carbon trading mechanism. The tradable emission rights (also called allowances) let entities emit a certain amount of pollution. Governments across the globe give these out for free (called grandfathering) or sell them in an auction. Prior to the implementation of CBAM the European Union had Emissions Trading System (ETS) to help entities transition to carbon trading.

Under ETS free carbon allowances were granted to entities within the territory of EU. When companies receive allowances for free, there is still an opportunity cost to them because they could sell the allowances instead of using them. This means that the cost of using the allowance still has an impact on their prices and profits, which means that the cost of pollution is incorporated into the price of what they sell. Consequently, the allocation certificates can be viewed as consistent with the polluter-pays principle.¹⁰

<https://icapcarbonaction.com/en/news/india-notifies-emission-intensity-targets-nine-sectors-under-carbon-credit-trading-scheme>

⁸ “Press Corner” (European Commission – European Commission, https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_3661 (last visited Sep 1, 2025)).

⁹ Pub. L. No. 101-549, U.S. Clean Air Act Amendments of 1990.

¹⁰ Edwin Woerdman, Alessandra Aruri & Stefano Clo, *Emissions Trading and the Polluter-Pays Principle: Do Polluters Pay under Grandfathering*, 4 REV. L & ECON. 565 (2008). <https://heinonline.org-christuniversity.knimbus.com/HOL/Page?handle=hein.journals/rvleco4&id=565&collection=journals&index=>

The CBAM in essence, requires importers of designated carbon-intensive products—currently covering iron and steel, cement, aluminium, fertilisers, electricity and hydrogen—arriving from outside the EU to purchase CBAM certificates reflecting the carbon emissions embedded in these products.

In December 2025, the European Commission further proposed an expansion of the CBAM's scope to include selected downstream products from 2028, particularly those that are carbon-intensive and closely linked to CBAM-covered basic materials. This proposed extension signals a gradual broadening of CBAM compliance beyond primary commodities to value-added products, with significant implications for exporting countries such as India, whose exposure to EU markets extends across downstream steel, aluminium and manufacturing supply chains.¹¹

The value of such certificates is based on the price of carbon within the EU Emissions Trading System (ETS), and in this way imposes on foreign producers a comparable cost of carbon to that imposed on domestic industries.¹² Running from 1 October 2023 to 31 December 2025, a transitional period was designed mainly intended as a preparatory time for the implementation of the project focusing on data collection, technical adaptation and capacity building.

During this stage, importers were not subjected to the obligation to buy or surrender CBAM certificates and, thus, no financial liability was incurred by them. Instead, they were only obliged to report quarterly to the European Commission the amount of imported goods, the embedded emissions of direct emissions and, where applicable, indirect emissions and any carbon pricing mechanisms that already apply in the exporting jurisdiction.¹³

In October 2025, the European Union adopted major amendments of the Carbon Border Adjustment Mechanism (CBAM) by Regulation (EU) 2025/2083 as component

¹¹ Camille Charluel, Which Goods Are Covered Under CBAM? (Sector Breakdown Guide), Coolset (Jan. 1, 2026), <https://www.coolset.com/academy/goods-covered-under-cbam-sector-breakdown-guide>

¹² Trishant Dev & Avantika Goswami, *The Carbon Border Adjustment Mechanism (CBAM), The Global South's Response to a Changing Trade Regime in the Era of Climate Change*, Centre for Science and Environment 11, 15 (2024).

¹³ European Commission, https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en (last visited Sep. 10, 2025).

of the EU's 'Omnibus I' simplification package. One of the most significant changes was the adoption of a de minimis exemption: Importers who do not import more than 50 tonnes of goods covered by the CBAM in a given calendar year are exempt from all obligations under the CBAM (registration, reporting, and surrendering the CBAM certificates).

This mass-based threshold substitutes the previous narrow exemption for goods of negligible value and is expected to exempt the overwhelming majority of mainly small and medium-sized enterprises from going to the hassle and achieve coverage of at least 99% of embedded emissions in the imported CBAM goods. By addressing the administrative and financial barriers of low volume importers, the regulation's de minimis rule is intended to balance concern for environmental aims while also taking into account trade-related considerations.¹⁴

The European Union's decision to incorporate the European Emissions Trading Scheme (EU ETS) with CBAM has led to a lot of controversy on its compatibility to the World Trade Organization (WTO) Rules, more specifically, the General Agreement on Tariffs and Trade (GATT). While the EU believes that the combined system reflects the core principles of non-discrimination, others believe that the system risks compromising its most-favoured-nation (MFN) and national treatment obligations.

The legal question is not just theoretical: a number of WTO members have already signalled their opposition, including Russia, and have requested consultations. In order to examine the robustness of the EU's approach, it is necessary to consider CBAM's relationship with the GATT Articles I and III, as well as its potential defence under Article XX, to consider the implications of free allowances from an agreement under the Subsidies and Countervailing Measures (SCM) Agreement.

Article I of the GATT requires that any "advantage, favour, privilege or immunity" granted by one member to the products of another must be "accorded immediately and unconditionally" to all like products originating from other WTO members.¹⁵ The

¹⁴ Regulation (EU) 2025/2083, Simplifying the Carbon Border Adjustment Mechanism (CBAM), PwC (Nov. 3, 2025), <https://www.pwc.com/mt/en/publications/tax-legal/regulation-eu-2025-2083-simplifying-the-carbon-border-adjustment-mechanism-cbam.html>

¹⁵ General Agreement on Tariffs and Trade (GATT) 1994, Article I.

essential issue is whether CBAM might potentially provide an inadvertent gain to exports of some countries and a loss to others.

This risk mainly arises if the EU recognises carbon pricing or regulatory systems of some trading partners to reduce their powers of CBAM, but not for others. When a Border Carbon Adjustment (BCA) is followed by a carbon tax, it can fall under the definition of trade law as Border Tax Adjustment (BTA) that is allowed as long as it meets certain criteria. A primary requirement is that it must pass the "like products" test that checks the level of competition between imported and domestic products.¹⁶ BTAs are allowed for products that are 'like' but must also be complied with the national treatment obligations under the General Agreement on Tariffs and Trade (GATT).

This principle of non-discrimination means that imported goods shall not be treated less favourably than are equivalent national goods. In this context, imposition of a heavier carbon penalty on carbon-intensive imports than on domestically produced, cleaner goods do not seem to be in breach of national treatment rules (provided the discrimination is based just on carbon intensity, and not on goods-origin).¹⁷

In addition, BCA mechanism must observe the Most-Favoured Nation (MFN) principle, which forbids discrimination between "like products" based on the exporting country. Potential conflicts could arise if a BCA were to offer preferential treatment to specific countries, such as less developed nations or treaty signatories, or if differences in the assumed carbon content of imports were determined by the country of export rather than the individual producer. Some preferential measures favouring less developed countries are permissible under the WTO's Enabling Clause, but only if they are specifically designed to support development in those countries a goal that is outside the scope of a BCA.¹⁸

¹⁶ US-Clove Cigarettes (AB), paras. 103-120.

¹⁷ J. Pauwelyn, *Carbon leakage measures and border tax adjustments under WTO law*, In Research handbook on environment, health and the WTO, ed. G. van Calster and D. Prevost, 448-506 (2013).

¹⁸ Aaron Cosbey, Carolyn Fischer & Susanne Droege, *Developing Guidance for Implementing Border Carbon Adjustments: Lessons, Cautions, and Research Needs from the Literature*, Review of Environmental Economics and Policy, 7-8 (2019).

Violations of the General Agreement on Tariffs and Trade (GATT) principles of non-discrimination are not absolutely forbidden but are allowed under certain circumstances as listed in Article XX of the Agreement. This provision has been widely recognised as the ultimate legal test for the permissibility of measures such as a Border Carbon Adjustment (BCA). Of the various clauses of Article XX, two are especially relevant to evaluation of BCAs. The first relates to measures necessary to protect human, animal or plant life or health. The second includes measures that are aimed at the conservation of exhaustible natural resources, provided that such measures are applied in a manner consistent with restrictions on domestic production or consumption. These two clauses establish the principal legal frameworks within which a BCA may be evaluated under WTO law.¹⁹

Legal scholarship and analytical literature generally indicate that conditions that demonstrate compliance under the second clause conservation of exhaustible natural resources tend to present less of a challenge than the requirement for necessity associated with protection of life or health. The necessity test is that the measure must be strictly essential to the achievement of the stated objective, which may be difficult to prove. By contrast, the conservation clause admits a wider reading, especially in the light of previous WTO panel and Appellate Body jurisprudence.

For example, in the past dispute panels have classified clean air as an exhaustible natural resource.²⁰ Furthermore, these panels have interpreted the phrase "relates to" in Article XX to signify a reasonable and demonstrable connection between the policy measure and the conservation objective it seeks to achieve.²¹

In a practical sense this interpretation implies that the measure in question like a BCA must establish a substantive connection between the instrument being employed and the environmental goal being pursued i.e. the mitigation of carbon emissions and the prevention of carbon leakage. As a result, any differential treatment applied to

¹⁹ General Agreement on Tariffs and Trade (GATT) 1994, Article XX.

²⁰ US - Gasoline (para. 6.37).

²¹ US - Shrimp (AB) (para. 141).

imports from different countries must have a clear and defensible environmental rationale and not be arbitrary or designed for protectionist purposes.

If a BCA is found to fall within the scope of an Article XX exception, it must also satisfy the so-called chapeau of Article XX. The chapeau provides an extra level of scrutiny as any measure contrary to the obligations of the GATT is subject to justification by the objectives set out under the concerned clause. In the context of a BCA, this means that the main objective of the measure should be to combat climate change and avoid carbon leakage. The chapeau also provides that the measure should not be implemented in such a way that the measure is arbitrary or a disguised restriction on international trade. Legal precedents emphasize, however, that the application of the standard means that the design and implementation of this measure are considered and that the measure is regularly applied, not as a form of discrimination in favour of domestic producers and to the detriment of foreign competitors.²²

V. EVALUATING THE IMPACT OF THE CBAM ON INDIA'S EXPORT COMPETITIVENESS

In India, there is a significant shift in the pattern of energy use favouring mostly commercial sources of energy like coal, petroleum products, natural gas and electricity. Over the past four decades the use of these commercial forms of energy has increased at a higher rate than the energy demand. By 1990-91, coal accounted for over 37 percent of total energy consumption, whereas petroleum products and natural gas accounted for some 18 percent and 5 percent, respectively. In comparison, non-fossil energy sources had a relatively small share, with hydroelectricity contributing about 6.2 per cent, with the non-conventional energy sources contributing negligible share of 0.6 per cent comprising nuclear, wind and solar energy.²³

Through the introduction of the *Carbon Credit Trading Scheme (CCTS)*²⁴ India is attempting to progress towards a rate-based Emissions Trading System (ETS).

²² Cosbey, *supra* note 11, at 9.

²³ Ojha, Vijay P. "Carbon Emissions Reduction Strategies and Poverty Alleviation in India." *Environment and Development Economics* 14 323, 324 (2009).

²⁴ Carbon Credit Trading Scheme, S.O. 2825(E), 2023 (India).

Established by the Energy Conservation (Amendment) Act, 2022 as recently as 2023, CCTS is a replacement of various types of Perform, Achieve, and Trade (PAT) Scheme²⁵ and forms the basis of the Indian Carbon Market (ICM). The scheme is in consonance with the climate pledges of India under the Paris Agreement in which India had committed itself to a structured approach to carbon taxation and carbon reduction.

The national ETS as part of the CCTS is designed for initially nine energy-intensive industrial sectors to be covered. Unlike cap-and-trade schemes, the scheme focuses on emission intensity rather than absolute emission limits. Facilities that achieve emissions performance up to levels higher than the prescribed benchmark levels are eligible for receipt of Carbon Credit Certificates thereby creating an incentive structure which rewards superior environmental performance.²⁶

The CCTS works through two main mechanisms: a compliance mechanism that targets obligated industrial entities, and an offset mechanism that aims to enable voluntary participation by other entities. By combining these elements, the entire scheme is to help support and incentivized decarbonization efforts happening in the industrial world, all while creating the institutional framework for the rest of the Indian Carbon Market. This way, this dual approach not only reinforces the regulatory oversight system, it also encourages the market-driven mix on Greenhouse Gas (GHG) reduction measures.²⁷

On the 28th of March 2025, the Ministry of Power gave a final nod of approval to the eight crediting methodologies for the generation of voluntary carbon credits with the CCTS. These methodologies include Renewable Energy, Green Hydrogen Production, Industrial Energy Efficiency, Mangrove Afforestation and Reforestation.²⁸ Each

²⁵ Perform, Achieve, and Trade (PAT) 2012, Bureau of Energy Efficiency (BEE).

²⁶ Press information Bureau, Government of India,

[https://www.pib.gov.in/PressNoteDetails.aspx?id=154721&NoteId=154721&ModuleId=3#:~:text=The%20Carbon%20Credit%20Trading%20Scheme%20\(CCTS\)%20in%20India%20is%20a,GHG\)%20emissions%20through%20carbon%20pricing](https://www.pib.gov.in/PressNoteDetails.aspx?id=154721&NoteId=154721&ModuleId=3#:~:text=The%20Carbon%20Credit%20Trading%20Scheme%20(CCTS)%20in%20India%20is%20a,GHG)%20emissions%20through%20carbon%20pricing) (last visited Sep. 1, 2025).

²⁷ Ministry of Power, Government of India,

https://beeindia.gov.in/sites/default/files/Detailed%20Procedure%20for%20Offset%20Mechanism_CCTS.pdf (last visited Sep.1, 2025).

²⁸ *Id.* at 7.

methodology establishes clear guidelines for issuance of carbon credits so that voluntary reductions are measurable, verifiable, and additional to regulatory obligations.

In January 2026, India added four further high-emitting industries secondary aluminium, petroleum refining, petrochemicals and textiles to its compliance-based carbon market by notifying legally binding emission-intensity targets for these sectors. With this expansion, the Carbon Credit Trading Scheme (CCTS) compliance mechanism now covers approximately 740 obligated entities, a significant increase from the initial 282 entities, collectively accounting for over 700 million tonnes of CO₂-equivalent emissions.

The scheme is implemented across two compliance cycles, namely 2025–26 and 2026–27. Companies that go above and beyond the targets may earn tradable carbon credits, while those that fail to meet the targets face financial penalties. However, implementation snags have led to weaker targets and that would likely result in lower emission reductions.²⁹ The establishment of the CCTS is a critical step towards the formalization of the Indian carbon market, with integration of legal and regulatory frameworks for carbon trading in place and for meeting the global climate commitments.

According to estimates by Eurometal, the carbon-related taxes levied as part of the European Union's CBAM are estimated to range from USD 102 to USD 190 per tonne of steel, representing around 15–28% of current prices for hot rolled coils. These estimates are based on assumed EU Emissions Trading System (EU ETS) carbon price scenarios of approximately €80–100 per tonne of CO₂ and may vary depending on fluctuations in actual EU ETS prices.

The benchmark for free allocation was set for the period from 2021 to 2025 as 1.288 tCO₂/tonne (hot metal). With the assumption that under the EU ETS Carbon price of US\$ 100/tonne there is no equivalent carbon price being applied in India and

²⁹ Simrin Sirur, Four More Industries Face Emissions Reduction Targets, Mongabay-India (Jan. 22, 2026), <https://india.mongabay.com/short-article/2026/01/four-more-industries-face-emissions-reduction-targets/>

inputting a value, we can approximate the factor of 2.3 tCO₂/tonne of hot rolled steel in terms of taxable emission. This figure shows the potential financial burden the CBAM has on Indian steel exporters if there were no domestic carbon pricing.

For aluminium, ICRA expects that the CBAM-related taxes would be in the range of approximately US\$ 50 and US\$ 140, for the period 2026-2034, and equivalent to 2-6% of current aluminium prices.³⁰ The free allowances benchmark on aluminium for the 2021-2025 period was 1.464 tCO₂ per each ton of aluminium. Under the assumption of an EU ETS carbon price of US\$ 100 per tonne and without an Indian carbon price the taxable emissions are estimated at about 2 tCO₂ per tonne of aluminium.

Based on survey data, it can be seen that some Chinese aluminium producers state GHG emissions of only 5-6 tCO₂/tonne.³¹ If these figures are correct, this would indicate either widespread recycling or the use of only renewable electricity in the smelting process. Consequently, the longer-term effect of CBAM on Chinese aluminium exports goes to be considerably less, which translate into about 25% of Indian aluminium emissions, irrespective of any doubts about the trustworthiness of such emissions announcements.

Industry participants and legal experts note that even the implementation of a fully operational Carbon Credit Trading Scheme (CCTS) in India, if applied as a deduction from the CBAM carbon price, is unlikely to substantially reduce the effective carbon liability for exporters. This is because of the huge gap between the carbon price in the EU, and the anticipated value of the CCTS in India, potentially less than US\$10 per tonne.³² Accordingly, the unpaid carbon cost of about US\$90 per tonne would be the carbon cost that would be imposed on the Indian exporter at the border.

³⁰ AL Circle, <https://www.alcircle.com/news/icra-forecasts-limited-impact-of-eu-carbon-tax-on-indian-aluminium-producers-110458?srsltid=AfmBOooqDiiHRTJm4XBB6NVkSAKkE1o1C3oIck3NcPghdsOYmdLlxYIF> (last visited Aug. 25, 2025).

³¹ Kathuria, Rajat, Neha Gupta & Navya Kumar, India's Carbon Border Adjustment Mechanism (CBAM) Challenge: Strategic Response and Policy Options 46 (CSEP Working Paper No. 90, Feb. 17, 2025).

³² Global Trade Research Initiative, *The Carbon Border Adjustment Mechanism: EU's Climate Trojan Horse to Obstruct Imports*, Flagship Report No. 3 (Mar. 2023).

A key question in India is therefore the time and effectiveness of the functioning of the CCTS. The lack of a clear regulatory framework for the path of India achieving net-zero emissions by 2070 adds to the difficulty in justifying the imposition of a carbon price of US\$100 per tonne domestically. Without a corresponding carbon price domestically, commensurate with international benchmarks, there shall continue to remain CBAM-related liabilities for Indian export.

One avenue that may be targeted to fix this void may be through the introduction of a sector-specific emissions reduction allowance under the wider structure of the ETS. Ultimately the success of either a CCTS or a domestic carbon tax will hang on the adoption of a coherent and enforceable carbon pricing system, much to the models seen in other jurisdictions, tied to (direct) long-term national decarbonization targets, such as those adopted for 2030 and 2070.³³

Among the goods covered under CBAM, Aluminium, Iron & Steel form the major part of the exports to EU. About 27% of iron, steel, and aluminium exports from India were destined for the EU market (2022).³⁴ Thus, the European Union represents a key market for India's heavy industry exports, placing the country in a challenging position with the introduction of the CBAM. India's steel sector, in particular, faces significant implications due to this mechanism. According to official data, India's exports of finished steel to the EU were valued at approximately INR 29,534 crores in 2024.³⁵ Italy and Belgium are the principal importers of Indian steel, accounting for roughly 22.3% and 11.2% of total exports, respectively.³⁶

Under the framework of CBAM, it is foreseen that import quotas have to permit the import of steel within a certain quota to enter the EU with zero or reduced tariffs. Imports above these quotas would be subject to a 25% tariff. Given the EU is a

³³ Rajat Kathuria, Neha Gupta, and Navya Kumar, *India's Carbon Border Adjustment Mechanism (CBAM) Challenge: Strategic Response and Policy Options* (CSEP Working Paper 90), New Delhi: Centre for Social and Economic Progress, 35 (2025).

³⁴ SPRF, <https://sprf.in/india-vs-eus-cbam-trade-wars-green-tariffs/> (last visited Aug. 25, 2025).

³⁵ Press Information Bureau, Government of India,

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=2085233> (last visited Aug. 25, 2025).

³⁶ The Economic Times, <https://economictimes.indiatimes.com/news/economy/foreign-trade/big-impact-on-indias-steel-exports-eu-begins-review-of-safeguards-measures/articleshow/116448684.cms?from=mdr> (last visited Sep. 2, 2025).

significant portion of India's steel exports, this is a small window and any decrement could affect the export volumes negatively. The CBAM has been fully operational from 2026, and applies a carbon-based tax on imports, with estimates being that it could amount to up to a EUR173.8 per tonne, which is equivalent to 16.06% of the unit value of steel exports in 2022.³⁷³⁸

While CBAM is intended to incentivise global climate ambition, it may disproportionately affect developing economies with limited capacity to measure emissions or implement carbon pricing.³⁹ CBAM is expected to reduce Africa's exports to the EU by 5.7% and 0.91% of the GDP. Among the most affected sectors would be aluminium, for which an on the export path toward the EU she expects a drop of 13, 9%, and iron and steel, with a potential decrease of 8.2%.⁴⁰ The implementation of the CBAM has, particularly on developing economies, the consequence of decline of their energy intensive exports to the European Union as opposed to their developed counterparts.

The study projects that if carbon price reach USD 44 per tonne of carbon dioxide, developing countries could be facing an average drop of 1.4 per cent in such exports, increasing to 2.4 per cent if the carbon price reaches USD 88 per tonne. Developed economies, by contrast, are not expected to experience similar losses.⁴¹

Another problem that would be faced by developing countries including India is the lack of efficient emission collection data infrastructure.⁴² In its fourth Biennial Update Report (2024) to the UNFCCC India had sighted lack of technology transfer, high costs

³⁷ Eco Business, <https://www.eco-business.com/news/indian-steel-exports-could-suffer-as-the-eu-enforces-carbon-border-rules/>, (last visited Sep. 2, 2025).

³⁸ *Supra* note 23.

³⁹ Development Aid, <https://www.developmentaid.org/news-stream/post/197416/challenges-and-opportunities-of-the-eus-carbon-border-adjustment-mechanism>, (last visited Sep. 2, 2025).

⁴⁰ Rumble. Olivia & Andrew Gidler, "The Impact of the CBAM on African Economies and the Role of the AfCFTA." South African Institute of International Affairs, 5 (2024).

⁴¹ A European Union Carbon Border Adjustment Mechanism: Implications for developing countries, UNCTAD, https://unctad.org/system/files/official-document/osginf2021d2_en.pdf (last visited Sep. 10, 2025).

⁴² ORF, <https://www.orfonline.org/expert-speak/can-we-make-the-cbam-work-for-india> (last visited Sep. 10, 2025).

and regulatory barriers as the major challenges prevailing to fight climate change.⁴³ An exporter's capacity to comply with the CBAM's emissions reporting requirements is a critical determinant of competitiveness in the EU market.

Since the ability of firms in CBAM-affected countries to measure and disclose carbon emissions is closely tied to national infrastructure and statistical capacity, factors such as the availability of trained personnel in data processing and reporting, as well as the overall strength of the domestic data ecosystem, will play a decisive role in determining the pricing of exports.⁴⁴

Indian micro, small and medium enterprises (MSMEs) suffer huge compliance costs under the EU's CBAM because of their high presence in India's steel value chain and low capacity to absorb new regulatory costs. Secondary steel producers (which are highly reliant on scrap-based induction furnaces and comprise almost 47% of the crude steel capacity of the country) are mainly MSMEs and hence highly sensitive to the cost implications of CBAM.

These smaller firms frequently do not have the technical expertise, verified emissions data or capital available to meet the emission reporting and verification and certification requirements of CBAM, increasing their effective compliance costs when compared to larger integrated producers. Moreover, CBAM would raise the export costs of high emission products like steel by up to 25% which would destroy price competitiveness in European market. Without targeted support or capacity building, MSME steel exporters risk being squeezed out from EU supply chains which impacts on the export performance of their goods, as well as the resilience of domestic industrial.⁴⁵

Where available data to provide accurate emissions data are absent among exporters, the CBAM framework instead uses default values to calculate the carbon intensity of

⁴³ India, Fourth Biennial Update Report (BUR-4) to the United Nations Framework Convention on Climate Change, (Dec. 30, 2024) Page 16

<https://unfccc.int/sites/default/files/resource/India%20BUR-4.pdf>

⁴⁴ Carnegie endowment for International Peace,

<https://carnegieendowment.org/research/2023/05/a-political-economy-perspective-on-the-eus-carbon-border-tax?lang=en> (last visited Sep. 10, 2025).

⁴⁵ Manini, The CBAM Challenge for India's Steel MSMEs, Observer Research Foundation (July 8, 2025), <https://www.orfonline.org/expert-speak/the-cbam-challenge-for-india-s-steel-msmes>

goods. These values are based on the most available secondary data on an emissions profile of CBAM-covered products. During the transitional phase, uniform values of defaults are used regardless of the country of origin. From 2026 onwards, however, default values have been calculated on the basis of the average emissions intensity of each of the exporting countries, adjusted upwards by way of a pre-determined markup. Data collected for the transitional period will form the basis for the calculation of these values. In the case that reliable data are not yet available, as the default benchmark, the average emissions intensity of a segment of the least efficient EU ETS installations producing the relevant good will be taken.

Although administratively convenient, it is likely that using default values would lead to substantial distortions because actual emissions levels can vary to quite large degrees depending on the technologies of production and national energy mixes. Inaccurate default values may add extra costs to the importer, and in effect erode costs that are greater than what the actual carbon content in the goods justify. As a result, importers are expected to prioritize trade relationships with exporters capable of supplying credible and timely emissions data, thereby reinforcing the competitive disadvantage of those unable to do so.⁴⁶

VI. SUGGESTIONS AND RECOMMENDATIONS

Two Indian giants, JSW Steel (from the steel sector) and Hindalco (from the aluminium segment) have taken active steps towards sustainability activities involving investments in renewable energy, in improving energy efficiency initiatives and also exploring alternative fuels. India needs to be proactive, for say explore alternative clean energy solutions such as wind, solar or hydropower to increase their decarbonisation initiatives. India holds the fourth position in the world in terms of total installed renewable energy capacity, stands at fourth position in wind energy generation capacity and stands third position in the world in terms of installed solar power capacity.

⁴⁶ Anandita Gupta, Radhika Pandey & Sanhita Sapatnekar, *Potential implications of the EU's Carbon Border Adjustment Mechanism*, No. 408, NIPFP Working Paper Series 1, 15-16 (2024).

India's renewable energy sector is poised for massive growth with the support of innovation in technology as well as in the policy framework. To effectively negotiate in the emerging global climate regime India needs to build up its institutional preparedness, especially in sectors which are most exposed to European markets. The tightening of international carbon regulations means that passive adaptation will no longer suffice and instead India must create powerful emissions-monitoring frameworks, enhance transparency of the available data as well as embed carbon accounting practices throughout its industrial value systems.

The domestic carbon governance needs to be strengthened with a phased emissions trading system, efficiency mandates on particular sectors or with carbon pricing. Equally important is the need to align national decarbonisation strategies with global trade standards, through promoting technological innovation, increasing the renewable infrastructure and ensuring that the micro, small and medium enterprises are not left behind in the process of the transition. India's challenge, therefore, is to move from a scenario where CBAM is seen as an external constraint to one that realises the need not to accept CBAM as a constraint but as a catalyst for structural reform. In fact, by using this moment as the window of opportunity to industrialise and promote low-carbon growth, India can strengthen its position in international markets with significant progress towards a more sustainable and resilient growth route.

There also exists a need of integrating the CBAM and the Carbon Credit Trading Scheme (CCTS) to avoid exporters being charged twice for the same carbon emissions. Under the CBAM framework, including the amendments adopted in October 2025, carbon prices effectively paid in third countries may be deducted from the CBAM obligation, provided such prices are properly verified, quantified and certified in accordance with EU requirements.

In practice, this requires exporters to demonstrate that a carbon price has been paid domestically, that it corresponds to the embedded emissions of the exported goods, and that the underlying emissions data have been verified by accredited bodies recognised under the CBAM regime.

For Indian exporters, this deduction mechanism poses significant procedural and institutional challenges. While India's CCTS represents a move towards market-based carbon governance, it is not yet fully operational as a compliance trading system with a transparent and robust carbon price comparable to the EU ETS. In the absence of an established market-clearing price and EU-recognised verification standards, Indian exporters may find it difficult to substantiate claims for carbon price deductions under CBAM.

Consequently, exporters risk facing residual CBAM liabilities at the EU border even where domestic carbon obligations exist, leading to de facto double carbon pricing. This underscores the importance of strengthening verification frameworks, accreditation mechanisms and international recognition of India's carbon market architecture to ensure that CCTS payments can be credibly credited against CBAM obligations. The CCTS payments shall be verified against CBAM obligations, which would cause only single taxation. This would ensure the protection of exporters from double taxation and promote carbon market harmonization across the globe.

VII. CONCLUSION

Climate change has become a factor for global power dynamics, as the world's major economies including China, the US and EU are increasingly judged by their commitment towards sustainable development. In a race where leading economies are behind to win the title of the "Green Leader", India should not be falling back. The foregoing analysis suggests that CBAM's implementation stands to flash existing inequalities in trade and could potentially be a cause for concern under international climate governance regimes as to differing levels of equity.

Notwithstanding these challenges, the primary reason for CBAM is to have a level playing field between domestic and foreign producers in the European Union. By expanding the scope of the EU ETS which requires domestic industries to be subject to carbon pricing CBAM extends the polluter-pays principle to imports, ensuring that international suppliers are subject to standards similar to those even whilst EU based producers are subject to as well. This alignment strengthens the same consistency of

the carbon price across the borders while hunting for cutting down the competitive distortions due to disproportionate costs of environmental compliance.

For India, CBAM comes at a time when the national carbon governance regime is still in the developmental stage. The transition from PAT mechanism to CCTS marks a significant institutional change. The Government of India has made the Scope of the Carbon Credit Trading Scheme broader by notifying Greenhouse Gas Emission Intensity for four additional carbon Intensive sectors including petroleum refineries, petrochemicals, textiles and secondary aluminium in January 2026. This notification brings an additional 208 new obligated entities under the compliance mechanism of Indian Carbon Market.

Previously, the government had notified emission intensity targets in October 2025 for 282 entities, representing the aluminium, cement, chlor-alkali and pulp and paper sectors. With the more recent expansion, the compliance regime of the Indian Carbon Market now covers 490 obligated entities from some of India's highest emitting industries, greatly enhancing India's carbon pricing regulatory regime.⁴⁷ However, an important disconnect still exists between the emerging carbon market in India and EU leaving exporters with significant cost burdens. The financial implications for important sectors especially those of iron, steel and aluminium are huge and the absence of a similar domestic carbon tax reduces the ability of India to offset these liabilities at the border. Added to this is the challenge of inadequate emissions data infrastructure promising to increase the CBAM-related costs.

Viewed strategically, CBAM should not be considered an external constraint and rather a catalyst for structural reform that will help India to pursue low-carbon industrialisation and to improve its competitiveness on global markets. India's good global position in terms of renewable energy capacity's potential means it's in a good position to further decarbonise via an expanded use of wind, solar, and hydropower. This also needs to be accompanied with an institutional restructuring, including better

⁴⁷ Government Notifies Greenhouse Gas Emission Intensity Targets for Additional Carbon-Intensive Industries, Press Info. Bureau, Govt. of India (Jan. 22, 2026), <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2217239&lang=1®=3>

emissions monitoring, transparent data systems and gradual introduction of domestic carbon governance tools.

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