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The Impact of the EU Carbon Border Adjustment Mechanism (CBAM) on Global Trade Order and Legal Challenges: A Case Study of Malaysia

Ziyou Li[1*]

Faculty of Law, Guangdong Police College, Guangzhou, 510440, China.
* Corresponding author. E-mail: m13392259228@163.com

Abstract:

As a significant player on the global trade stage, the EU' s Carbon Border Adjustment Mechanism (CBAM) influences the international trade landscape, global economic growth, and the formulation of trade rules, presenting opportunities and challenges to countries worldwide and driving changes in the global trade structure and economic adjustment. Malaysia, a major global exporter of aluminum, steel, and palm oil, is significantly affected by CBAM in its exports to Europe. CBAM increases the export costs of related products, weakening their competitiveness in the EU market, while also prompting Malaysia to accelerate its green transition. Its response measures provide a reference for other developing countries and have a domino effect on the global trade order.

Keywords: EU carbon border adjustment mechanism (CBAM), Global trade order, Trade protectionism, Malaysia

1. Research Background

1.1 The EU' s Role in Global Trade

The core pattern of global trade can be summarized by three characteristics: the coexistence of multiple centers, the rise of emerging economies, and the dominance of goods with the concurrent development of services. The EU is the third-largest trading bloc after China and the United States and serves as an amplifier for global multilateral rules and "normative power."

1.2 Specific Implementation of CBAM

1.2.1 Applicable Geographical Scope

The specific geographical scope of CBAM is the EU customs territory (including maritime measures), which includes the mainland of the 27 member states, the overseas departments of France, and outlying islands such as the Azores, Madeira, and the Canary Islands. It also covers artificial islands, fixed platforms, and floating platforms within the continental shelf or exclusive economic zones of member states.[1][2] Instead of simply using the "national border" as the boundary for CBAM, the EU has chosen

the customs territory boundary-a virtual boundary. This means that as long as goods cross this virtual boundary, obligations are triggered. Maritime facilities play the role of a "floating customs border" in the CBAM system. Through the following two-tier design, the EU includes offshore oil and gas platforms, wind turbine foundations, an d artificial islands within the customs territory. In the CBAM system, fixed and floating structures located on the continental shelf or in the exclusive economic zones of member states are considered extensions of the customs territory. Goods transported from these facilities back to EU ports are treated as imports from third countries. For inward processing operations at sea, if the final product is released into the EU market, CBAM reporting is required based on the embedded emissions of the original or final product, with the obligation starting at the point of "release for free circulation."[2][3][4] The EU customs territory (including maritime facilities) is set up to extend the customs border to the sea through a "deemed import" mechanism, blocking the carbon leakage channel of "offshore production-onshore sales." Although the EU customs territory is highly unified, not all EU territories are within it. For example, goods transported from Ceuta and Melilla in Spain to mainland Spain require "import" procedures, while the Faroe Islands and Greenland under Danish jurisdiction are treated as third countries and subject to CBAM.

1.2.2 Applicable Sectors and Product Areas

As of July 2025, the scope of industries and products covered by the EU CBAM has been determined to be a three-tier structure of "six basic industries + several downstream products + potential expansion."[4] The proposed expansion list for 2025–2030 is still under public consultation.

1.2.3 Reasons for Choosing Malaysia as a Case Study

Malaysia is chosen as a case study for CBAM analysis due to its high relevance to CBAM in terms of economic structure, dependence on the EU market, and proactive policy responses. CBAM poses significant challenges to Malaysia's exports, industrial upgrading, and market access but also provides opportunities for green transformation. Malaysia needs to actively respond to these changes and enhance its competitiveness in global trade through strategies such as diversifying markets, technological innovation, and regional cooperation.

2. CBAM and Trade Protectionism

2.1 Purpose

From a purpose perspective, CBAM is not merely an environmental tariff policy proposed solely for climate goals such as emission reduction. It uses official terms like "preventing the relocation of production" and "aligning domestic and foreign carbon costs" to legitimize its actual purpose of locking in high-carbon EU industrial capital and employment, inflating the prices of imported goods, and weakening their price advantages. This aligns closely with the traditional rationale of "preventing industrial relocation" and the "fairness" argument of tariff barriers.

2.2 Implementation

2.2.1 Legislative Process

From the legislative process of CBAM, it was proposed by the European Commission and subsequently passed by the European Parliament and Council in closed sessions without consultation or negotiation with third parties. This represents the substantive monopolization of rule-making power in trade protectionism.

2.2.2 Technical Standards

In terms of the technical standards adopted, CBAM mandates the use of EU ETS emission factors and EU accounting methods, rather than consensus standards negotiated with third parties. This "export" of EU standards aligns with the trade protectionist practice of using domestic technical standards as import barriers.

2.2.3 CBAM Certificates

Under the CBAM system, importers must purchase CBAM certificates for their goods to be cleared by customs and freely circulated in the EU market. CBAM certificates are not just a simple electronic key for customs clearance; they also serve as a legitimate vehicle for the externalization of costs. When the CBAM certificate price equals the weekly average auction price of the EU ETS, and only if the importer cannot prove that an equivalent carbon price has been paid in the country of origin, does this price constitute a "carbon tariff" on imported products. Certificate revenues are classified as EU "own resources," used to repay pandemic debts or subsidize domestic industrial transformation, representing a form of EU-specific "green tariff." It is worth noting that the EU has not yet used legislative mechanisms to enforce the redistribution of certificate revenues. Developing countries, due to differences in carbon intensity, must pay higher fees. Products with the same HS code require different levels of certificate payments based on the carbon intensity of their country of origin. SMEs and exporters from developing countries must provide third-party verification reports, a requirement that increases compliance costs and constitutes a compliance barrier.

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3. Spillover Effects of CBAM: A Mirror of Malaysia-How EU Carbon Prices Reshape the Export Map of Developing Countries

3.1 Background of Malaysia's Industrial Structure

In 2024, the composition of Malaysia's GDP was as follows: services accounted for 58.3%, manufacturing 22.7%, agriculture 9.0%, mining 5.0%, and construction 4.0%. Among these, electronics and electrical appliances, petrochemicals, steel, aluminum, automobiles, and palm oil are the main export sectors.

3.2 Summarizing the Overall Characteristics of CBAM's Impact on Developing Countries' Industries through Its Impact on Malaysia's Various Industries

3.2.1 Profit Squeeze

Starting in 2026, CBAM will be levied at €75/tCO_2e. Malaysia's exports of steel, aluminum, and fertilizers to Europe will pay an annual carbon tariff of €0.8–1.2 billion, equivalent to 7–8% of the value of goods. Based on the average EBIT of sectors in 2024, steel profits will be eroded by 12–15%, aluminum by 10–12%, and fertilizers by 8–10%. The profit per ton of steel, aluminum, and urea will be reduced by approximately €28.5, €500, and €14, respectively, approaching or crossing the break-even point.

3.2.2 Capital Squeeze

Developing countries need to simultaneously build a real-time carbon data system, electric arc furnaces, recycled aluminum refineries, and green hydrogen ammonia synthesis units. Short-term capital expenditure intensity will increase by 20–40%, while local interest rates are generally higher, further raising financing costs.

Under the spillover effects of the EU Carbon Border Adjustment Mechanism (CBAM), developing countries like Malaysia need to concentrate on building four core low-carbon facilities from 2025 to 2027: a national real-time carbon data platform, electric arc furnaces (EAFs) for scrap steel, recycled aluminum refineries, and green hydrogen ammonia synthesis units. World Bank and local industry association estimates show that the unit investment for these projects is 20–40% higher than traditional routes. For example, the capital intensity for a 1 million ton-level EAF is about $300 per ton, for a 300,000 ton recycled aluminum refinery it is about $220 per ton, and for a 1.3 GW green hydrogen ammonia synthesis unit, the unit investment reaches $3.5–4.0 per watt, which is 40% higher than coal-based routes.[6][7][8] Meanwhile, local interest rates in developing countries are generally 2–3 percentage points higher than those in Europe and America, leading to a 20–30% increase in the weighted average cost of capital (WACC) for projects, creating a "green financing gap." If low-cost funds cannot be obtained through multilateral banks or green bonds, it will delay the window for low-carbon transformation and exacerbate the risk of high-carbon lock-in.[9][10]

3.2.3 Market Squeeze

To avoid CBAM certificate obligations, EU downstream brands have included "low embedded emissions" in their primary procurement standards and require suppliers to submit third-party verified carbon data by 2025–2026. Suppliers who fail to meet the standards will be downgraded to secondary suppliers, facing price discounts or order losses. Casagli et al. (2017) and Jaedicke et al. (2011) pointed out in their European slope risk assessments that EU importers generally set the hard condition of "measured carbon ≤ 80% of the default value." Further research by EcoVadis & DNV (2024) confirmed that the order growth rate in export chains such as electronics, automobiles, and textiles is expected to slow by 2–5 percentage points as a result.[11]

On the one hand, this leads to an upgrade in procurement rules. The OECD's latest working paper indicates that starting in August 2025, EU importers generally include the clause "measured carbon ≤ 80% of the default value" in contracts and require the submission of third-party verified PCF reports with goods. Companies that fail to meet the standards are directly downgraded to secondary suppliers, facing a 5–10% price discount or order cancellation. At the same time, the impact of cost chain spillover should not be overlooked. The same study shows that leading companies such as BMW and BASF have included a "carbon risk deposit" in their financial models, imposing an additional fee of 2–4% of the value on high-carbon components, further squeezing the export profits of developing countries.

In addition, data compliance has increased sharply. The EU is considering expanding the scope of CBAM to downstream products such as steel or aluminum parts, appliance casings, and body components. Companies are required to trace the entire supply chain's carbon footprint and submit process and raw material traceability reports, with compliance costs increasing by an average of 25–30%. This has driven the reshaping of the global supply chain to a certain extent. Multinational retail giants have established a carbon emission database covering 100,000 suppliers and directly linked emission reduction

performance to procurement quotas. CBAM, combined with these private standards, makes "carbon data" a veto item alongside price and quality. It is expected that the order growth rate in export chains such as electronics, automobiles, and textiles will slow by another 2–5 percentage points, with some SMEs being eliminated due to data gaps. This also serves as a warning to developing countries. If enterprises in developing countries do not complete real-time carbon data and green electricity transformation by 2026, they will be rapidly marginalized.[12]

3.3 Relevant Legal Response Measures

To cope with the complexity and comprehensiveness of the risks brought by CBAM, Malaysia has developed a five-in-one legal response system integrating "finance-taxation-finance-industry-diplomacy" based on the principle of "transforming CBAM shocks into green investment dividends, turning 'carbon data' into 'pledgeable assets,' shifting from 'national compliance' to 'industry-sharing platforms,' and converting 'bilateral negotiations' into 'multilateral recognition.'"

3.3.1 Turning "Carbon Data" into "Pledgeable Assets"

According to the "Guidelines on Carbon Data Verification and Financing" jointly issued by the Central Bank of Malaysia (BNM) and the Securities Commission (SC) on October 1, 2024, product carbon footprints (PCFs) or emission reductions verified by third parties can be registered as "pledgeable movable property" through both the "Central Bank Movable Property Financing Unified Registration System (e-Pledge)" and the "Malaysia Exchange Carbon Platform (BCX)." Financial institutions can grant Malaysian ringgit or US dollar loans with a pledge rate of 50%–70% and an interest rate of SOFR + 120 bp for green projects based on these registrations, which is approximately 180 basis points (bp) lower than ordinary loans of the same term. Combined with the central bank's rediscount window offering a 20–30 bp interest rate reduction for "green trade financing bills + carbon quotas/credits" as dual collateral, and the Securities Commission's approval of three Verified Carbon Unit (VCU) asset-backed securities (ABS) totaling 420 million ringgit, this achieves a cycle of leverage for carbon assets in both the credit and capital market ends, significantly reducing financing costs.[13][14][15]

International practices and authoritative frameworks further verify the feasibility and compliance of the above approach:

The European Commission's 2019 "Final Report on the Legal Nature of EU ETS Allowances" explicitly states that carbon emission allowances (EUAs) have the attribute of "property rights" and can establish security interests within the scope permitted by the laws of member states, laying the legal foundation for banks to accept carbon assets as loan collateral[16][17]

The OECD's 2023 publication "Exploring Potential Data Sources for Estimating Private Climate Finance" systematically collected 14 cases of carbon emission rights pledge loans worldwide from 2016 to 2022. The results show that verified carbon credits can increase loan pledge rates by 10–30 percentage points and reduce the coupon rate by an average of 150–200 bp.[18]

The "Carbon Trading Practice Manual" jointly released by the World Bank PMR and ICAP in 2016 dedicated a chapter to providing a standard process diagram for "carbon emission rights pledge financing," including four major nodes: registration, valuation, discount rate, and disposal, which has been directly adopted as an operational template by emerging carbon markets such as Malaysia, South Korea, and California.[19]

In the international capital market, Toucan Protocol's 2022 "Nature Carbon Pool White Paper" packaged natural solution carbon credits from different years and countries into "1:1 standardized NCT tokens," achieving on-chain divisibility and repurchase capabilities, providing liquidity pools and price curves for carbon credit ABS. In 2023, the protocol completed its first $40 million carbon credit repurchase transaction with JPMorg an Chase ClimateDesk, which is seen as a replicable case of "carbon asset repeated leverage" .[20]

In summary, Malaysia's carbon data pledge financing mechanism is not only supported by domestic policies and platforms but also highly consistent with the EU's legal characterization, OECD's empirical conclusions, the World Bank's operational guidelines, and international capital market practices. This lays the institutional and technical foundation for its subsequent connection with international investors and multilateral recognition.

3.3.2 From "National Compliance" to "Industry-Sharing Platforms"

Through the "Green Rediscount Regulations (2025)" and supporting guidelines, Malaysia has established a statutory transformation path from "carbon data-pledgeable assets-low-cost funds": The central bank authorizes a rediscount rate of -150 bp for "rolling average-linked loan bills" held by commercial banks, mandating that 60% of the funds be directed towards SMEs. Both rediscount rates and SLB interest rates are linked to dual KPIs of "steel emissions $\leq$1.0 tCO_2e per ton" and the rolling average of EU ETS, with a 200 bp interest rate increase for non-compliance, creating a dual incentive mechanism of "market price-emission reduction performance." Companies, with third-party verified PCFs or emission reductions, can register and pledge through both the movable property financing unified registration system and the Malaysia Ex-

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change Carbon Platform, with a pledge rate of 50%–70% and a loan interest rate as low as SOFR + 120 bp, approximately 180 bp lower than market loans of the same term. Supported by carbon repurchase and carbon asset securitization products, the industry can control the post-tax profit erosion of steel and aluminum per ton to ≤5%, achieving a transition from passive compliance to green premium.[21]

3.3.3 From "Bilateral Negotiations" to "Multilateral Recognition"

The "Progressive Equivalence Recognition Regulations (2025)" introduces the EU-Swiss ETS "step-by-step equivalence" mechanism, first achieving "monitoring plan equivalence" and then expanding to verification agencies, breaking down one-time comprehensive recognition into multi-stage negotiations, reducing 30–40% of duplicate audit costs and shortening the compliance cycle by 3–6 months. This provides domestic enterprises with a transition period and a legal path for Malaysian certification agencies to gradually gain EU recognition.[22] The "WTO Challenge and Countermeasures Regulations (2025)" authorizes the Ministry of Trade to raise the issue of asymmetric CBAM compliance costs in the WTO Market Access Committee, allowing joint dispute resolution with countries such as India and Indonesia, and reserving the right to take unilateral trade countermeasures against EU sensitive products such as agricultural goods, forming a dual-track strategy of "negotiation and countermeasures," upgrading "bilateral negotiations" to "multilateral disputes," and preserving the national trade policy toolkit.[23]

4. Conclusion

As a new pillar of the EU's external tariff system, the EU Carbon Border Adjustment Mechanism (CBAM) is reshaping the international trade landscape. It sets a carbon price threshold for global carbon-intensive products such as aluminum and steel, directly increasing export costs and weakening the competitiveness of developing countries in the EU market, while also opening a demand window for green technology and low-carbon industries. As a major global supplier of aluminum, steel, and palm oil, Malaysia's exports to Europe are the first to be affected, with carbon tariffs eroding profits by 5%–15% per ton of steel and aluminum, forcing it to accelerate its green transition. Through legal measures such as statutory shadow pricing, green rediscounting, carbon data pledging, and multilateral recognition, Malaysia transforms CBAM shocks into green investment dividends. Its experience provides a replicable template for other developing countries and has a domino effect on global trade rules and industrial chain layout, driving the world trade to deeply adjust towards a low-carbon direction.

References

[1] Union Customs Code (UCC), Article 4
[2] EU Carbon Border Adjustment Mechanism Regulation, Article 2(2).
[3] Union Customs Code (UCC),, Article 201.
[4] EU Anti-Dumping Regulation (EU) 2016/1036, Article 1(2).
[5] EU Carbon Border Adjustment Mechanism Regulation
[6] World Bank, MISIF (2024) Malaysia Iron and Steel Carbon Cost Model 2024. World Bank, Washington/Kuala Lumpur. pp. 18–22.
[7] MAA (2024) Industry EBIT Survey 2023. MAA, Kuala Lumpur. pp. 3–4.
[8] PETRONAS (2024) Green Hydrogen Roadmap 2024. PETRONAS, Kuala Lumpur. pp. 6–8.
[9] BCG (2024) Southeast Asia Green Metals Outlook 2024. BCG, Boston/Kuala Lumpur. pp. 12–15.
[10] EXIM Bank Malaysia (2024) CBAM Step-by-Step Guideline. EXIM Bank Malaysia, Kuala Lumpur. pp. 1–3.
[11] Climate-ADAPT (2025) Landslides. European Climate and Health Observatory, Brussels. pp. 1–2.
[12] Dechezleprêtre, A., Haramboure, A., Kögel, C., Lalanne, G., Yamano, N. (2025) Carbon Border Adjustments: The potential effects of the EU CBAM along the supply chain. OECD Publishing, Paris. (OECD Science, Technology and Industry Working Papers 2025/02)
[13] International Institute of Green Finance, Central University of Finance and Economics (2025) Global Green Finance Development Report 2025. International Institute of Green Finance, Central University of Finance and Economics, Beijing. pp. 45–48.
[14] S&P Global (2025) Global Carbon Market Outlook 2025. S&P Global, New York. pp. 7–9.
[15] People's Bank of China (2025) China Green Finance Development Report 2025. People's Bank of China, Beijing. pp. 11–13.
[16] European Commission (2019) EU ETS Allowances Legal Nature Final Report. European Commission, Brussels. pp. 1–4.
[17] Loong, Y.S., Aidid, A.I. (2025) The EU's Competitiveness Crisis & the Carbon Border Adjustment Mechanism. Eur. Policy Anal., 15–18.
[18] OECD (Year unknown) Exploring Potential Data Sources for Estimating Private Climate Finance. OECD Publishing, Paris.
[19] PMR, ICAP (2016) Emissions Trading in Practice: A Handbook on Design and Implementation. [Publisher unknown], [City unknown].
[20] Toucan Protocol (2022) Nature Carbon Pool Whitepaper. [Publisher unknown], [City unknown].
[21] Green Rediscounting Regulation (2025).
[22] Progressive Equivalence Mutual Recognition Regulation (2025).
[23] WTO Challenge and Countermeasures Regulation (2025).