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POLICY PAPER

CARBON CONDITIONALITY AND MARKET ACCESS

HOW DECARBONIZATION POLICIES ARE RESHAPING GLOBAL TRADE

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Climate policy is increasingly reshaping the conditions under which firms participate in international markets. As some jurisdictions introduce carbon border adjustments, lifecycle emissions standards, and supply-chain traceability requirements, market access is starting to be made conditional on verifiable characteristics of production processes, such as carbon intensity, embedded emissions, and input sourcing, rather than solely on product characteristics or prices. This paper examines how these emerging climate-linked measures operate as eligibility regimes that require firms to measure, document, and verify embedded emissions and supply-chain attributes, using standardized methodologies.

To clarify the economic logic of these mechanisms, the paper first makes a functional comparison with rules of origin, highlighting common features related to eligibility criteria, documentation, and supply-chain tracing. It then analyzes the European Union Batteries Regulation, which links market participation to lifecycle carbon-footprint disclosure and traceability, and the United States Inflation Reduction Act, which aimed to reshape supply chains through localization incentives and manufacturing subsidies. The paper finally examines the strategic responses available to economies outside the main standard-setting blocs, including regulatory alignment, dual compliance across regulatory regimes, and market reorientation toward less-demanding jurisdictions.

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1. INTRODUCTION

Trade policy is becoming increasingly complex. Tariffs have re-emerged as an active instrument deployed by major economies, but they operate alongside a growing set of regulatory and non-tariff measures used to pursue industrial, security, and environmental objectives (UNCTAD, 2025). Consequently, market access, in some cases, is increasingly mediated not only by border duties, but by compliance with technical, environmental, and strategic requirements that are embedded in domestic frameworks.

Climate policy intersects with this transformation in a specific way. Carbon constraints differ across jurisdictions in coverage, stringency, and instrument design. Such heterogeneity generates competitiveness tensions that spill into trade (Abbas, 2020). Carbon border adjustments, emissions standards, and related measures thus emerge as mechanisms through which jurisdictions attempt to manage these asymmetries, while pursuing domestic decarbonization strategies. These instruments do not simply alter relative prices; they change the eligibility criteria for sale of goods in regulated markets.

The central issue addressed in this paper is how climate policy is reshaping market access through eligibility conditions tied to characteristics of production processes. In several emerging policy frameworks, market access depends increasingly on whether firms can measure, document, and verify specific characteristics of the production process, such as embedded emissions, lifecycle environmental performance, or supply-chain traceability. In this sense, competitiveness is determined not only by cost and productivity, but also by the capacity to demonstrate compliance with regulatory methodologies defined by importing jurisdictions.

This Policy Brief first makes a functional comparison with rules of origin, highlighting how production characteristics increasingly condition market treatment. The paper then examines how this logic operates in practice through two cases that illustrate different forms of climate-linked trade conditionality: the European Union's Batteries Regulation and the United States Inflation Reduction Act (IRA). The paper concludes by discussing the strategic implications of these developments for economies that do not shape these regulatory frameworks. Taken together, these developments suggest that climate policy is gradually altering the governance of international trade. For economies outside the main standard-setting blocs, the main challenge is therefore not only decarbonization, but also establishing the institutional capacity required to demonstrate compliance with emerging climate-linked eligibility regimes.

2. CARBON CONDITIONALITY AND RULES OF ORIGIN: A FUNCTIONAL COMPARISON

2.1. What Rules of Origin Actually Do

Rules of origin (RoO) are criteria used to determine where a product comes from. They matter because duties, trade remedies, safeguards, and certain restrictions depend on that determination (WTO, 2025). In practice, a product is considered to originate in a country if it has undergone substantial transformation there, meaning that sufficient processing has taken place to meet criteria such as change in tariff classification, a minimum domestic value-added threshold, or the completion of specified manufacturing operations. Economically, access to preferential or specific trade treatment through administratively verifiable production criteria depends on rules of origin.

A large body of economic literature shows that RoO generate compliance costs and influence firms' sourcing decisions. To qualify for preferential tariffs, firms must document the origin of inputs, calculate value-added shares, obtain certificates and sometimes adjust their sourcing to meet required thresholds. Cadot *et al* (2006), examining EU and U.S. trade agreements, estimated that these compliance costs can reach 3% to 5% of product value. Firms compare these costs with the tariff preference margin. When compliance costs absorb a substantial share of the tariff advantage, firms may choose not to claim preferential treatment. As a result, the actual benefits of tariff liberalization depend not only on statutory tariff reductions, but also on the ease of complying with RoO.

For example, under the North American Free Trade Agreement (NAFTA), automobiles were required to meet a 62.5% regional value-content rule to qualify for preferential tariffs. This high threshold created incentives to source components within North America in order to meet the requirement, even when global suppliers might have been more cost-efficient (Krishna, 2005; de Melo *et al*, 2009). Further empirical evidence shows that when value-added thresholds are high, firms are more likely to adjust their sourcing patterns toward suppliers located within jurisdictions covered by free trade agreements (FTAs), in order to meet origin requirements. Stricter RoO can thus reshape value chains by influencing input selection, even when non-FTA suppliers might be more cost-efficient (de Melo *et al*, 2009). The magnitude of this effect depends on the tariff margin and relative input costs.

From an economic perspective, three RoO features are particularly relevant for the comparison developed in this paper:

1. **Eligibility logic:** RoO determine whether a product qualifies for preferential treatment under a given trade regime (e.g. preferential tariff access under an FTA).
2. **Documentation and compliance:** Eligibility depends on certificates, declarations, and audits. Compliance generates fixed costs that may disproportionately affect smaller firms or fragmented supply chains.
3. **Supply chain tracing:** RoO require tracing of input content or transformation stages across production processes, in order to establish originating status.

These characteristics illustrate how trade access can hinge on administratively verifiable production characteristics, rather than solely on product price.

2.2. Carbon Conditionality as an Eligibility Regime

Carbon-related trade instruments, including border carbon adjustments (BCAs), lifecycle greenhouse gas standards, and emissions reporting requirements, are not RoO in legal terms. However, where applied, they operate through a comparable economic logic: they make market participation and competitive treatment dependent on quantified production characteristics, and require those characteristics to be documented using standardized methodologies. While carbon-related trade instruments differ in design and policy objectives, they share this common operational feature.

As a result, trade outcomes increasingly depend on how a product was produced, not only on what it is or where it originates. In BCAs, for instance, the relevant criterion is the product's embedded greenhouse gas emissions, while fuel and transport standards typically rely on lifecycle emissions intensity. As highlighted by Moïsé and Steenblik (2011), such process-and-production-methods (PPMs) differentiate otherwise similar goods based on their production processes, rather than their physical characteristics.

The BCA literature reinforces this point. Keen *et al* (2022) showed that the economic impact of BCAs depends critically on accounting design, including sectoral coverage, emissions measurement, and the benchmarks applied when firm-level data are unavailable or contested. Administrative feasibility often requires limiting coverage to energy-intensive, trade-exposed industries at an initial stage, and relying on standardized benchmarks or default values when firm-specific emissions data are unavailable. In practice, market treatment increasingly depends on whether emissions can be measured, documented, and verified, according to the importing jurisdiction's methodology.

The European Union's carbon border adjustment mechanism (CBAM) provides an illustration. Importers of covered products (including cement, iron and steel, aluminum, and fertilizers) must report the greenhouse gas emissions embedded in each shipment. If firm-level data are not provided and verified under the prescribed methodology, default values apply (European Commission, 2023). Because these default values may exceed the exporter's actual emissions intensity, firms face incentives to invest in measurement, reporting, and verification systems.

A comparable logic appears in other regulatory contexts. Under California's Low Carbon Fuel Standard (LCFS), transport fuels are assigned a carbon-intensity score based on lifecycle emissions, including feedstock production, processing, and transport (California Air Resources Board, 2025). Producers must document their production pathways to obtain a certified carbon-intensity value. Fuels with lower certified intensities generate tradable credits, while fuels with higher intensities generate compliance deficits. Two fuels that are physically similar can, therefore, receive different regulatory treatment, depending on their documented production processes.

The economic consequences of this structure are consistent with the literature on regulatory standards. Empirical literature shows that compliance with technical requirements imposes fixed costs that affect export participation. Using firm-level data, Fontagné *et al* (2015) found that documentation, certification, and conformity assessment requirements reduce entry into export markets when compliance costs are high.

Carbon-related instruments share this characteristic. Participation in markets governed by embedded-emissions accounting or lifecycle standards requires firms to invest in monitoring, reporting, and verification systems. They must also coordinate upstream data collection and ensure that methodologies align with regulatory requirements. These costs are largely fixed at the firm-market level. As a result, larger firms and more productive exporters are better positioned to comply, while smaller firms or fragmented supply chains face disproportionately higher burdens.

2.3. Supply-Chain Tracing and Value-Chain Positioning

As indicated in the previous sections, carbon-based trade measures operate generally on embedded emissions or lifecycle standards. As a result, their impacts propagate through supply chains, rather than remaining confined to directly covered sectors (Dechezleprêtre *et al*, 2025; Amendola, 2024).

Input-output modeling of the EU CBAM illustrates this mechanism clearly. Although CBAM's current scope is limited (about 0.37% of EU's global trade and 3% of EU imports), it interacts with the phase-out of free allowances for upstream carbon-intensive sectors under the EU's emissions trading system (ETS). This increases effective carbon costs in sectors such as basic metals and non-metallic minerals, for which value-added losses may reach up to 2.8%. By raising marginal production costs, the removal of free allowances compresses value added and generates upstream price pressures that are transmitted to downstream industries relying on these inputs, even when they are not directly covered. Downstream sectors, such as construction, electrical equipment, machinery and motor vehicles, tend to experience more modest percentage declines in value added, driven by higher input costs. However, because of their greater economic weight, they account for the majority of aggregate losses (about 83%). This reflects a composition effect: downstream sectors are not the most affected in relative terms, but their scale dominates aggregate outcomes (Dechezleprêtre *et al*, 2025).

At the international level, simulation results point to small but heterogeneous value-added effects across non-EU economies (roughly between -0.25% and 0.40%), correlated with emissions intensity and the ability to demonstrate lower-carbon production. Some economies, such as Türkiye, may experience relative gains from comparatively lower emissions intensity in major sectors, while others specializing in carbon-intensive activities, such as basic metals, face negative impacts (Dechezleprêtre *et al*, 2025).

Computable General Equilibrium (CGE)-based assessments are consistent with these findings: aggregate GDP effects remain limited, but sectoral reallocation and competitiveness shifts occur in energy-intensive and downstream industries. The European Commission's (2021) impact assessment highlighted modest macroeconomic effects alongside significant sectoral incidence, while Swiss CGE work (Ecoplan, 2023) confirmed the transmission of input-cost increases along value chains. More broadly, the literature shows that BCAs affect relative demand and relocation incentives through design features, such as coverage, benchmarks, and export treatment, and through value-chain adjustments, rather than through tariff-like shocks (Böhringer *et al*, 2022).

For non-aligned economies, the implication is that competitiveness increasingly depends on value-chain positioning (exposure to carbon-intensive inputs and regulated buyers), and on regulatory capacity (the ability to measure, report, and credibly document embedded emissions across tiers). Exposure is therefore not limited to direct sectoral coverage, but reflects the interaction between production structure, supply-chain integration, and verification capacity.

Taken together, these dynamics suggest that carbon-related trade measures are reshaping the basis of competitiveness in regulated markets. Where participation depends on embedded emissions and verifiable documentation, firms compete not only on price and productivity, but also on their ability to demonstrate compliance with emission-based criteria. Because emissions are traced across supply chains, exposure extends beyond directly covered sectors and reflects upstream carbon intensity and value-chain positioning. In this context, carbon conditionality operates as a selection mechanism: firms and jurisdictions able to measure, certify, and align with prevailing methodologies are better positioned to access higher-value segments, while others face indirect cost pressures, or constraints related to recognition and verification.

3. CARBON ELIGIBILITY IN PRACTICE: TWO INSTITUTIONAL CASES

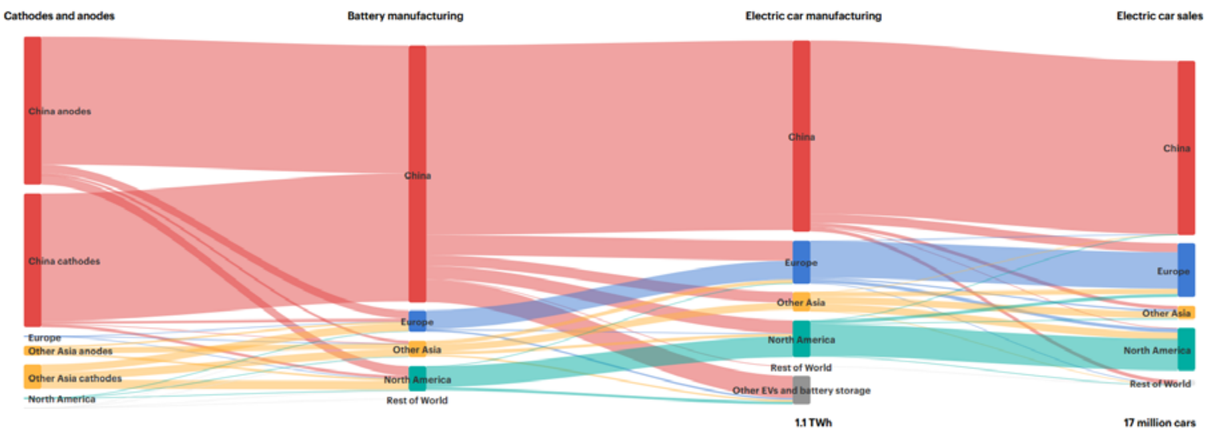
3.1. The European Union Batteries Regulation: Carbon Footprint Disclosure as a Condition of Market Participation

The EU Batteries Regulation (Regulation EU 2023/1542) illustrates how carbon-related eligibility criteria are increasingly embedded in product regulation. The rule applies to batteries placed on the EU market, regardless of whether they are produced domestically or imported. It progressively introduces sustainability requirements tied to documented production characteristics. These include lifecycle carbon footprint reporting, traceability obligations, and recycled material content (European Union, 2023).

The economic significance of this framework lies in the scale and structure of Europe's battery market. In 2023, the EU imported approximately €27 billion worth of batteries, with around 90% of these imports originating from three Asian countries, of which China alone accounted for roughly 87% (ACEA, 2024). Europe is one of the largest global demand centers for electric vehicles and battery storage technologies. However, upstream stages of the battery value chain remain highly concentrated geographically, with China dominating battery cell manufacturing and several key processing activities (IEA, 2025). In this context, regulatory requirements applied within the EU market effectively shape the conditions under which a significant share of global battery production can access the European market.

Figure 1:

Global Manufacturing and Trade Flows of Electric Cars, Lithium-ion Batteries, and Key Components, 2024



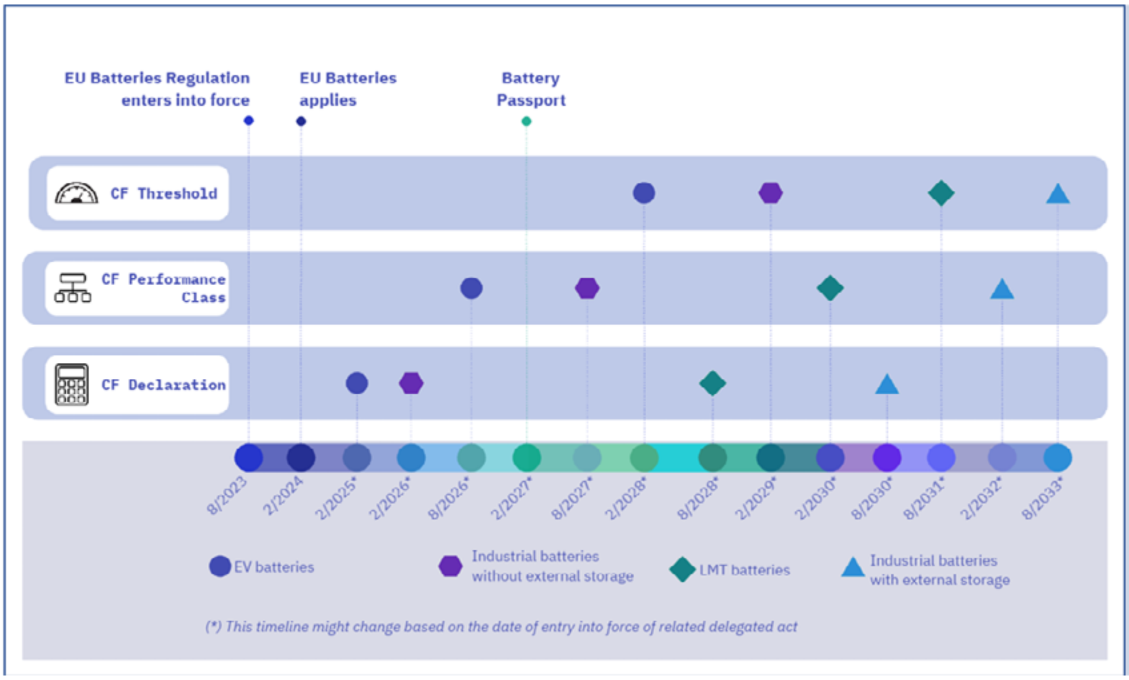
Source: IEA analysis based on EV Volumes, Benchmark Mineral Intelligence, and Bloomberg New Energy Finance.

Carbon-footprint disclosure is the central mechanism through which the Batteries Regulation links market participation to production characteristics. For electric vehicles and industrial batteries, manufacturers are required to calculate and declare the lifecycle carbon footprint of each battery model placed on the EU market. The methodology follows a standardized lifecycle assessment framework aligned with the EU's Product Environmental Footprint approach, and is specified through delegated acts by the European Commission (European Union, 2023). In practical terms, this requires producers to quantify greenhouse gas emissions across the entire production chain, from raw material extraction and refining, to cell manufacturing and battery assembly.

This requirement transforms product compliance reporting into a condition for market participation. In its initial phase, the Regulation requires disclosure of the carbon footprint for relevant battery categories. In subsequent phases, batteries will be classified according to their carbon intensity, and maximum carbon footprint thresholds may be introduced, potentially excluding the most carbon-intensive products from the EU market. Market participation, therefore, depends not only on the technical characteristics of the battery but also on the ability to measure, document, and verify lifecycle emissions in line with EU methodologies. The implementation timeline in Figure 2 illustrates the progressive tightening of these requirements.

Figure 2:

Timeline of the EU's Rules on Carbon Footprints of Batteries



Source: Rizos and Vu, 2024.

Beyond carbon-footprint disclosure, the Regulation established a traceability architecture designed to capture sustainability information across the battery lifecycle. From February 2027, a digital battery passport will become obligatory for several battery categories, including electric vehicle batteries and certain industrial batteries above defined capacity thresholds. The passport will include standardized information on battery composition, origin of materials, lifecycle carbon footprint, and broader sustainability indicators. The Regulation also introduces minimum recycled content requirements for key battery materials from 2031, alongside documentation requirements to verify recycled inputs.

Empirical assessments of the emerging European battery ecosystem suggest that these regulatory requirements are beginning to influence industrial strategies. Analyses of battery supply chains indicate that manufacturers are increasingly incorporating lifecycle emissions accounting into procurement and production planning, in anticipation of the Regulation's requirements. Because electricity is a major component of lifecycle emissions in battery production, access to low-carbon power systems is becoming an important factor in location decisions for new battery cell manufacturing plants in Europe (IEA, 2025). Meanwhile, traceability provisions are accelerating the deployment of digital monitoring systems for battery materials and upstream supply chains, particularly for lithium, cobalt, and nickel inputs (European Commission, 2023b). These developments illustrate how disclosure-based regulation can propagate upstream through production networks, affecting sourcing strategies, plant location decisions, and the organization of battery value chains.

Compliance, therefore, requires coordination across multiple stages of production, including mining, refining, component manufacturing, and battery assembly. Firms embedded in supply chains with traceable materials, documented emissions data, and access to low-carbon electricity systems are structurally better positioned to comply with the Regulation's requirements. Conversely, suppliers operating in jurisdictions with limited emissions accounting infrastructure, or fragmented supply chains, may face higher compliance costs or uncertainty in demonstrating conformity. In this sense, the Batteries Regulation reflects the broader shift discussed in section 2: participation in regulated markets increasingly depends on the ability to measure, document, and verify production characteristics across value chains, using externally defined methodologies.

3.2. The US Inflation Reduction Act: Industrial Policy Conditionality and Supply Chain Eligibility

If the EU Batteries Regulation illustrates carbon conditionality through lifecycle emissions accounting and disclosure, the U.S. Inflation Reduction Act (IRA) reflects a different mechanism through which climate policy reshapes trade and production networks. Rather than making market participation conditional on verified environmental characteristics, the IRA operates primarily through industrial incentives tied to the geographic configuration of supply chains. Eligibility for fiscal incentives depends on where components and materials are produced, linking climate policy with supply-chain localization and industrial policy.

While the IRA has become politically contested since the change in U.S. administration in 2025, most analysts expect modification rather than full repeal, partly because a large share of IRA-supported manufacturing investment is already underway across multiple states, creating a form of industrial lock-in that complicates reversal. Indeed, many of its provisions continue to be implemented through ongoing eligibility and application mechanisms tied to domestic manufacturing and input sourcing (Bermel *et al*, 2024; Cetin, 2025). Two complementary mechanisms structure the IRA's influence on clean-energy supply chains: demand-side incentives for electric vehicles, and supply-side subsidies for domestic manufacturing.

The demand-side mechanism is centered on the Clean Vehicle Tax Credit (CVTC) (IRA Section 30D), which can reduce the effective purchase price of an eligible electric vehicle by up to $7,500. As a consumer tax credit, the CVTC functions as a demand subsidy for electric vehicles adoption.

Eligibility for the credit is divided into two equal components of $3,750 each. One portion requires that a minimum share of battery components is manufactured or assembled in North America, while the other requires that a minimum share of critical minerals used in the battery be extracted, processed, or recycled in the U.S., or in countries that have an FTA with the U.S. These thresholds increase progressively over time: for example, the required share of qualifying battery components will rise from 50% in 2023 to 100% in 2029, while the share of qualifying critical minerals will rise from 40% in 2023 to 80% by 2027 (Zhang and Shi, 2025). Vehicles that fail to meet these requirements lose eligibility for the credit, effectively raising their relative price in the U.S. market.

Table 1:

Eligible Requirements for a Total Tax Credit of $7,500

Year	Critical Minerals Minimum Percent Value Requirement	Year	Battery Components Minimum Percent Value Requirement
2023	40%	2023	50%
2024	50%	2024 and 2025	60%
2025	60%	2026	70%
2026	70%	2027	80%
2027 and later	80%	2028	90%
		2029 and later	100%

Source: Zhang and Shi, 2025

An important but often overlooked feature concerns vehicle leasing. Under the IRA, leased electric vehicles can qualify for a separate commercial vehicle credit that does not impose the same strict domestic content requirements as the consumer purchase credit (Levasseur, 2024). This has created an adjustment channel for manufacturers whose vehicles do not meet the localization requirements. Empirical evidence confirms that firms have responded to this loophole. Using vehicle registration data, Allcott *et al* (2024) showed a sharp increase in leasing for electric vehicles assembled outside North America. Leasing rose from around 15% of new electric vehicle registrations in December 2022, to approximately 30% by December 2023, with the largest increases concentrated among vehicles that were not eligible for the consumer tax credit. This illustrates how eligibility conditions embedded in fiscal incentives can influence market outcomes, even when product characteristics remain unchanged.

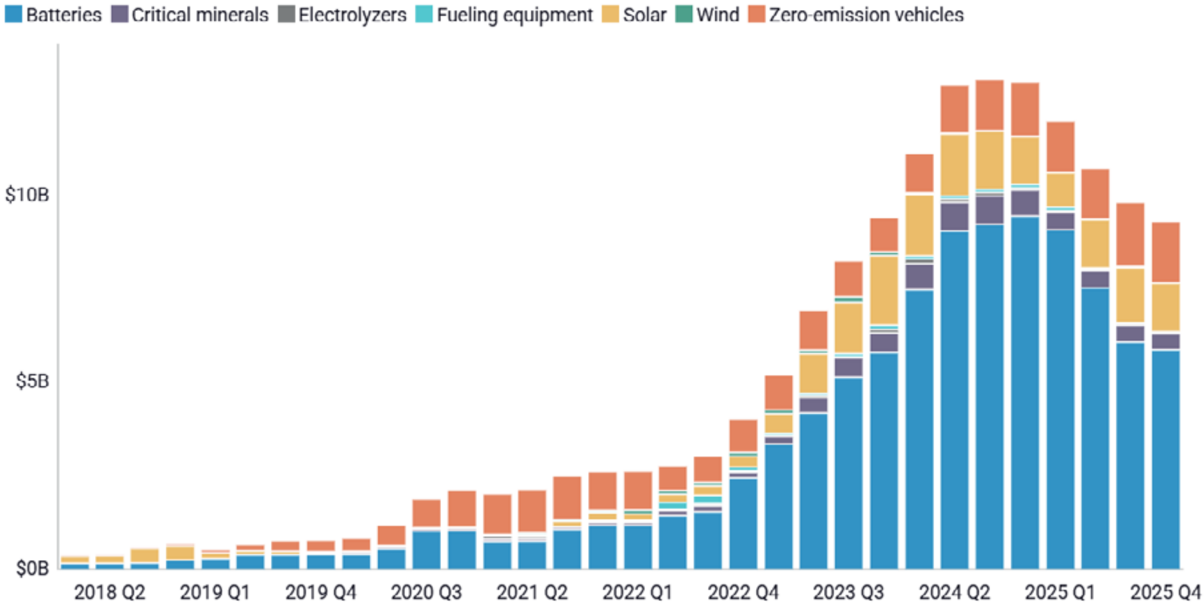
Evidence also suggests that the IRA's demand-side provisions have had more limited effects on electric-vehicle adoption than initially expected. Levasseur's (2024) two-year assessment showed that the electric vehicle tax credit accounts for, at most, around 10% of monthly new light-vehicle sales since the IRA's enactment, indicating that the demand stimulus alone does not explain the rapid expansion of battery manufacturing investments in the United States. Instead, the most significant effects appear on the supply side of the value chain.

The supply-side mechanism is primarily driven by the Advanced Manufacturing Production Credit (Section 45X), which provides direct production subsidies for domestic manufacturing of clean-energy technologies, including battery cells, battery modules, and critical mineral processing.

The credit provides approximately $35 per kilowatt-hour for battery cells and $10 per kilowatt-hour for battery modules produced in the Unites States, significantly reducing the effective cost of domestic battery manufacturing (Levasseur, 2024). These production subsidies complement the electric vehicles consumer credit by incentivizing firms to locate battery manufacturing within the United States, while encouraging automakers to source batteries from those U.S. facilities to maintain eligibility for the electric vehicle tax credit.

Figure 3:

Actual Manufacturing Investments by Technology, Billion 2024 USD



Source: Rhodium Group/MIT-CEEPR Clean Investment Monitor.

Investment data reflect this shift. Estimates by Rhodium Group and MIT CEEPR (2025) indicate that firms announced more than $300 billion in new clean energy and manufacturing investments in the U.S. between 2022 and 2024, with battery manufacturing representing one of the largest shares. However, the rapid expansion of production capacity has, in some cases, outpaced short-term growth in electric-vehicle demand. As a result, some manufacturers have begun redirecting part of this capacity toward stationary energy-storage systems for power grids and data-center infrastructure. Panday (2026) documented how automakers and battery suppliers are increasingly repurposing electric vehicle-oriented battery production to absorb excess capacity and diversify demand. This suggests that IRA-driven industrial policy is primarily reshaping the geography and scale of battery manufacturing, while final demand may adjust more gradually.

These developments occur within a global battery industry that remains highly concentrated geographically. China continues to dominate lithium-ion battery manufacturing and key upstream processing stages for critical minerals (IEA, 2025). In this context, the IRA's combination of domestic content requirements and production subsidies is designed to promote the regionalization of battery supply chains around North America. By linking consumer incentives to local sourcing while subsidizing domestic production, the policy encourages firms to restructure procurement and manufacturing decisions toward compliant jurisdictions. However, it has raised concerns among trade partners about potential trade diversion and subsidy-driven competition, since localization requirements embedded in the electric vehicle credit can disadvantage foreign producers that cannot easily reconfigure supply chains toward North America.

4. STRATEGIC POSITIONING UNDER FRAGMENTED REGIMES

For economies that do not shape emerging climate-related trade standards, the issue is how to position themselves in the context of competing regulatory regimes. Section 3 showed that market participation increasingly depends on meeting eligibility conditions tied to carbon content, traceability, and compliance with external methodologies. When those rules differ across major markets, exporters face a fragmented landscape in which adaptation becomes a strategic trade-off.

4.1. Alignment With the Dominant Regime in a Key Export Market

A first strategic response is alignment with the dominant regime in a key export market. The objective is to reduce exclusion risk by making domestic monitoring, reporting, and verification systems interoperable with the standards of the main destination market. This strategy is already evident in countries with strong export dependence on the EU. Türkiye is a clear example. The EU is Türkiye's largest trading partner, accounting for about 41% of Turkish exports in 2024 (Beaufils and Gallé, 2026). Turkish authorities have, therefore, increasingly framed the EU CBAM as a competitiveness challenge for export-oriented industries.

Estimates based on UN COMTRADE-WITS data indicate that Türkiye exported roughly €12 billion worth of CBAM-covered goods (iron and steel, aluminum, cement, and fertilizers) to the EU in 2024, representing close to 9% of its total exports to the European market. This concentration implies that carbon-pricing at the EU border could affect a non-negligible share of Turkish industrial exports.

Quantitative modelling confirms that the effects are likely to be uneven across sectors, rather than uniformly negative. Using a multi-country general-equilibrium framework, Beaufils and Gallé (2026) found that the aggregate macroeconomic impact of CBAM on Türkiye remains relatively modest, but concentrated in energy-intensive industries. In the simulations, iron and steel production increases roughly by 13%, reflecting the relatively lower carbon intensity of Türkiye's scrap-based electric-arc furnace steel production, while other emissions-intensive sectors, such as non-metallic minerals, experience moderate output declines. These results show that the competitiveness implications of CBAM depend heavily on production technologies and sectoral emissions intensity.

In response to this exposure, Turkish policymakers have increasingly linked climate policy reforms to trade competitiveness. Türkiye adopted a comprehensive climate law in 2025 that lays the institutional foundation for a national emission trading system (ETS) (ICAP, 2025) and strengthens monitoring, reporting, and verification requirements for industrial emitters. Policy discussions explicitly emphasize the need to prepare domestic industry for CBAM and maintain access to EU markets (Sawal, 2025). Industry representatives have also noted that, while Turkish steel producers may be relatively well positioned in the short term, deeper decarbonization will be required under a more stringent carbon-pricing regime (Can, 2026).

By developing an ETS and strengthening emissions accounting systems, Türkiye is attempting to reduce the risk that its exporters face higher carbon adjustment costs in the EU market. More broadly, this strategy illustrates a central trade-off for non-standard-setting economies: regulatory alignment can preserve market access and competitiveness, but it also implies adapting domestic production systems to externally defined rules, with associated adjustment costs and policy constraints.

4.2. Dual Compliance Across Regulatory Blocks

A second response is dual compliance across regulatory blocs. Rather than aligning with a single regulatory regime, some firms absorb the cost of operating across markets that attach different eligibility conditions to market access. This strategy is most visible in globally integrated industries, such as batteries and automotive manufacturing. As illustrated in section 3, firms supplying the European market increasingly face lifecycle carbon-footprint disclosure, digital battery passport requirements, and traceability obligations under the EU Batteries Regulation. Meanwhile, access to fiscal incentives in the U.S. under the IRA depends on the geographic configuration of supply chains, including North American battery manufacturing, and sourcing of critical minerals from the U.S. or its free-trade partners.

Large multinational battery producers illustrate how firms navigate these competing requirements. South Korean manufacturers, including LG Energy Solution, SK ON, and Samsung SDI, have announced roughly $28 billion in battery-manufacturing investments in the United States, through joint ventures with major automakers including General Motors, Ford, and Stellantis, ensuring that electric vehicles using their batteries remain eligible for IRA incentives (LG, 2023; Sung and Kim, 2025; Mihalascu, 2023). At the same time, these firms remain deeply integrated into the European electric-vehicle market, and are developing traceability systems and lifecycle-emissions accounting frameworks to comply with the EU Batteries Regulation. Recent industry analysis also shows that manufacturers are relocating part of their battery production toward stationary energy-storage systems as demand for electric vehicles evolves. This illustrates the flexibility required to operate across multiple regulatory and market environments (Panday, 2026).

These developments underscore the uneven feasibility of dual compliance. Large multinational firms can reorganize production networks, allocate investments across jurisdictions, and internalize the fixed costs associated with multiple compliance systems. But smaller suppliers face greater difficulty in absorbing these administrative and certification burdens. As a result, dual compliance tends to reinforce market concentration by favoring firms with the scale and organizational capacity to operate across regulatory regimes.

4.3. Market Reorientation Toward Less Demanding Jurisdictions

A third response is market reorientation toward less-demanding jurisdictions. This strategy allows firms to preserve short-term export access when compliance with high-standard markets becomes too costly or institutionally demanding. However, it often comes at the expense of technological and organizational upgrading. When standards tighten in one market, part of trade may be redirected toward destinations with weaker requirements. The risk, however, is that firms become concentrated in lower-value segments, while higher-value chains increasingly organize around stricter environmental and traceability standards.

This concern is explicitly reflected in the CBAM debate. Policy analyses highlight how carbon border measures can shift demand toward lower-emission or more compliant producers, while less-compliant exporters may redirect flows to alternative markets (European Commission, 2026). In practice, the issue is not only geographic reallocation, but also positional change within global value chains. Firms that exit high-standard markets may maintain export volumes, but risk losing access to markets that drive process upgrading, technological diffusion, and standard-setting. Avoiding carbon-accounting requirements may preserve sales in the short term, but can weaken long-term competitiveness if firms are excluded from value chains in which low-carbon production becomes a necessity.

These three patterns, alignment, dual compliance, and reorientation, are not mutually exclusive. They may coexist across sectors within the same economy, or even across firms within the same industry. Their feasibility depends on structural factors, including sectoral exposure, export-market concentration, and domestic institutional capacity. What matters is whether a country exports carbon-intensive goods, and also whether those exports are concentrated in markets in which climate-related eligibility rules are tightening, and whether firms can develop the monitoring, reporting, and verification systems required to remain competitive in those markets.

5. CONCLUSION

Climate policy is increasingly reshaping the conditions under which firms participate in international markets. As jurisdictions implement decarbonization strategies through border adjustments, lifecycle standards, and supply-chain requirements, trade governance is progressively incorporating eligibility criteria linked to production processes. Participation in international markets is therefore determined not only by tariffs or product characteristics, but also by the capacity to measure, document, and verify how goods are produced.

This paper argued that these instruments can be understood as eligibility regimes. Although carbon-related trade measures differ in legal design and policy objective, they share a common operational structure: trade treatment depends on quantifiable production attributes, and on the ability to demonstrate compliance through standardized monitoring, reporting, and verification. In this respect, carbon-related trade measures are functionally similar to rules of origin, which also make trade treatment conditional on verifiable production criteria and supply-chain tracing.

The two institutional cases examined illustrate how these mechanisms operate in practice. The EU Batteries Regulation embeds environmental disclosure and traceability requirements directly into product regulation, making lifecycle carbon accounting and digital supply-chain documentation essential to participate in the European market. The U.S. Inflation Reduction Act reflects a different approach, combining industrial policy and climate objectives through localization incentives and production subsidies that reshape the geography of clean energy supply chains. In both cases, firms must adapt production systems, sourcing strategies, and compliance infrastructures to remain competitive in major markets.

These developments have significant implications for economies that do not shape these regulatory frameworks. Exporters increasingly face a fragmented landscape, in which different markets impose distinct eligibility conditions. Countries may align with dominant regulatory regimes to preserve access, operate across multiple frameworks through dual compliance, or redirect trade toward less demanding jurisdictions. Each strategy involves trade-offs between market access, administrative capacity, and long-term upgrading.

More fundamentally, the emergence of climate-linked eligibility regimes signals a shift in the governance of international trade toward process-based regulation embedded in domestic policy frameworks. While aggregate macroeconomic effects may remain limited in the short term, the longer-term implications for supply-chain organization, investment decisions, and industrial geography are likely to be substantial. Firms able to demonstrate low-carbon production and reliable traceability gain preferential access to regulated markets, while others face increasing constraints linked less to tariffs than to verification capacity.

For policymakers in non-standard-setting economies, the challenge extends beyond emissions reduction. It involves building the institutional and technical capacity required to measure, certify, and document production processes according to internationally recognized methodologies. In this context, regulatory infrastructure and compliance systems become strategic assets, shaping not only market access, but also the positions of firms and countries within global value chains.

REFERENCES

- Abbas, M. (2020). *Decarbonizing trade policy options towards a European decarbonized trade policy*. Centre d'étude sur l'intégration et la mondialisation (CEIM). https://www.ieim.uqam.ca/IMG/pdf/mehdi_abbas_decarbonizing_trade_policy.pdf
- ACEA. (2024). *EU battery supply chain & import reliance: Factsheet*. https://www.acea.auto/fact/fact-sheet-eu-battery-supply-chain-and-import-reliance/
- Allcott, H., Kane, R., Maydanchik, M., Shapiro, J. S., & Tintelnot, F. (2026). *The effects of "Buy American": Electric vehicles and the Inflation Reduction Act* (Energy Institute Working Paper No. 350R). https://haas.berkeley.edu/wp-content/uploads/WP350.pdf
- Amendola, M. (2025). Winners and losers of the EU carbon border adjustment mechanism: An intra-EU issue? *Energy Economics, 142*, 108139. https://doi.org/10.1016/j.eneco.2024.108139
- Beaufils, T., & Gallé, J. (2026). *Between challenges and opportunities: The impacts of the EU CBAM in Türkiye* (IPC–Mercator Policy Brief). https://ipc.sabanciuniv.edu/Content/Images/CKeditorImages/20260227-10022261.pdf
- Bermel, L., Chen, J., Deese, B., Delgado, M., English, L., Garcia, Y., Houser, T., Khan, A., Larsen, J., Stewart, N., & Tavarez, H. (2023). *The clean investment monitor: Tracking decarbonization technology in the United States*. Rhodium Group. https://rhg.com/research/clean-investment-monitor/
- Böhringer, C., Fischer, C., Rosendahl, K. E., & Rutherford, T. F. (2022). Potential impacts and challenges of border carbon adjustments. *Nature Climate Change, 12*(1), 22–29. https://doi.org/10.1038/s41558-021-01250-z
- California Air Resources Board. (2025). *Low carbon fuel standard*. https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard
- Cadot, O., Carrère, C., de Melo, J., & Tumurchudur, B. (2006). Product-specific rules of origin in EU and US preferential trading arrangements: An assessment. *World Trade Review, 5*(2), 199–224.
- Carrère, C., & de Melo, J. (2006). Are different rules of origin equally costly? Estimates from NAFTA. In O. Cadot, A. Estevadeordal, A. Suwa-Eisenmann, & T. Verdier (Eds.), *The origin of goods: Rules of origin in regional trade agreements* (pp. 191–212). Oxford University Press. https://doi.org/10.1093/0199290482.003.0008
- Can, C. (2026). Interview: EU safeguard measures, CBAM expansion threaten Turkish steel industry – TCUD. *S&P Global*. https://www.spglobal.com/energy/en/news-research/latest-news/metals/011326-interview-eu-safeguard-measures-cbam-expansion-threaten-turkish-steel-industry---tcud

- Cetin, M. C. (2025). *The precarious future of the Inflation Reduction Act*. Natixis. https://gsh.cib.natixis.com/our-center-of-expertise/articles/the-precarious-future-of-the-inflation-reduction-act

- Dechezleprêtre, A., et al. (2025). *Carbon border adjustments: The potential effects of the EU CBAM along the supply chain* (OECD Science, Technology and Industry Working Papers No. 2025/02). OECD Publishing. https://doi.org/10.1787/e8c3d060-en

- ECOPLAN. (2023). *Einnahmen aus CO_2-Grenzausgleichsmechanismen: Analyse mit einem Mehrländer-Gleichgewichtsmodell*. https://www.newsd.admin.ch/newsd/message/attachments/79657.pdf

- European Commission. (2021). *Impact assessment report accompanying the proposal for a regulation establishing a carbon border adjustment mechanism* (SWD(2021) 643). https://ec.europa.eu/transparency/documents-register/detail?ref=swd(2021)643

- European Commission. (2023a). *Commission publishes default values for determining embedded emissions during the CBAM transitional period*. https://taxation-customs.ec.europa.eu/news/commission-publishes-default-values-determining-embedded-emissions-during-cbam-transitional-period-2023-12-22_en

- European Commission. (2023b). *Regulation (EU) 2023/1542 concerning batteries and waste batteries*. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32023R1542

- European Commission. (2026). *Carbon border adjustment mechanism*. https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en

- European Union. (2023). *Sustainability rules for batteries and waste batteries*. https://eur-lex.europa.eu/EN/legal-content/summary/sustainability-rules-for-batteries-and-waste-batteries.html

- Fontagné, L., Orefice, G., Piermartini, R., & Rocha, N. (2015). Product standards and margins of trade: Firm-level evidence. *Journal of International Economics, 97*(1), 29–44. https://doi.org/10.1016/j.jinteco.2015.04.008

- ICAP. (2025). *Türkiye adopts landmark climate law, paving the way for national ETS*. https://icapcarbonaction.com/en/news/turkiye-adopts-landmark-climate-law-paving-way-national-ets

- IEA. (2025). *Global EV outlook 2025*. International Energy Agency. https://www.iea.org/reports/global-ev-outlook-2025

- Keen, M., Parry, I., & Roaf, J. (2022). Border carbon adjustments: Rationale, design and impact. *Fiscal Studies, 43*(2), 209–234. https://doi.org/10.1111/1475-5890.12307

- Krishna, K. (2005). *Understanding rules of origin* (NBER Working Paper No. 11150). https://www.nber.org/system/files/working_papers/w11150/w11150.pdf

- Levasseur, S. (2025). A two-year assessment of the IRA's subsidies to electric vehicles in the US. *Asia and the Global Economy, 5*(1), 100102. https://doi.org/10.1016/j.aglobe.2024.100102

- LG Energy Solution. (2023). *LG Energy Solution to invest KRW 7.2 trillion to build battery manufacturing complex in Arizona*. https://www.lgcorp.com/media/release/26057

- Mihalascu, D. (2023). UAW demands may jeopardize Detroit and Korea's $28B battery plants. *InsideEVs*. https://insideevs.com/news/693384/uaw-demands-may-jeopardize-detroit-korea-28-billion-usd-battery-plants/
- Moïsé, E., & Steenblik, R. (2011). *Trade-related measures based on processes and production methods in the context of climate-change mitigation* (OECD Trade and Environment Working Paper No. 2011/04). https://doi.org/10.1787/5kg6xssz26jg-en
- Panday, A. (2026). Course correction: OEMs and battery suppliers in the US pivot capacity from EVs to energy storage systems. *S&P Global*. https://www.spglobal.com/automotive-insights/en/blogs/2026/03/capacity-pivot-to-energy-storage-systems
- Rhodium Group & MIT CEEPR. (2025). *Clean investment monitor*. https://www.cleaninvestmentmonitor.org/
- Rizos, V., & Vu, H. (2024). *Compliance with the EU's carbon footprint requirements for electric vehicle batteries: An overview of challenges* (CEPS In-Depth Analysis No. 2024-15). https://cdn.ceps.eu/2026/02/IDA-2024-15_ERCC_BATRAW-2-1.pdf
- Sawal, B. (2025). Preparing for Türkiye's ETS and CBAM: How the new climate law sets the stage for carbon pricing. *Redshaw Advisors*. https://redshawadvisors.com/preparing-for-turkiyes-ets-and-cbam-how-the-new-climate-law-sets-the-stage-for-carbon-pricing-and-border-adjustments/
- Sung, S.-H., & Kim, W.-S. (2025). LG Energy, Samsung SDI to build first US LFP battery plants with GM. *KED Global*. https://www.kedglobal.com/batteries/newsView/ked202505270006
- UNCTAD. (2025). *Trade policy uncertainty looms over global markets*. https://unctad.org/system/files/official-document/ditcinf2025d7_en.pdf
- WTO. (2026). *Technical information on rules of origin*. https://www.wto.org/english/tratop_e/roi_e/roi_info_e.htm
- Zhang, L., & Shi, W. (2025). The impacts of the US Inflation Reduction Act on EV supply chains. *Sustainability, 17*(2), 653. https://doi.org/10.3390/su17020653

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