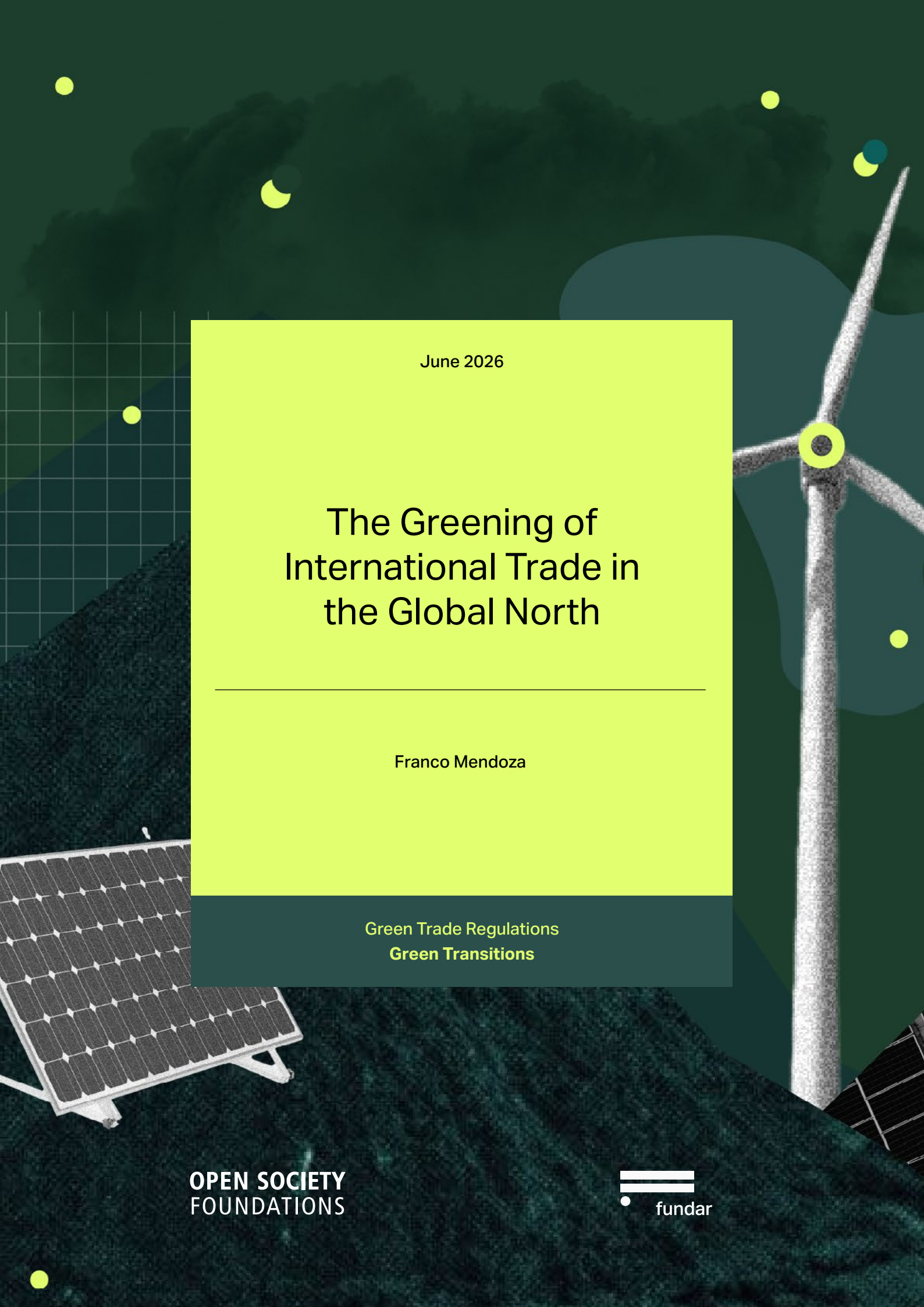


June 2026

The Greening of International Trade in the Global North

Franco Mendoza

Green Trade Regulations
Green Transitions

OPEN SOCIETY FOUNDATIONS

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About the Green transitions project

The Green Transitions project seeks to contribute through information, applied knowledge, methodologies, collaborative networks, and policy recommendations designed to enable the Global South to engage strategically in the global energy transition. Its purpose is clear: to ensure this process does not become a new driver of inequality, but rather a lever for building a fairer, more equitable, and environmentally sustainable model of development.

About the Green trade regulations series

This document is part of the "Green Trade Regulations" series, which also includes three additional papers on: the greening of international trade in the Global North and the mapping of the green regulatory regime; the international strategies of the Global South in response to the CBAM and the EUDR; and the trade diversion effects and misaligned incentives associated with unilateral anti-deforestation regulations. Taken together, the series combines empirical infrastructure, regulatory contextualization, international strategic analysis, assessment of trade impacts, and the study of national responses across the Global South, with the aim of building a comprehensive political economy of environmental trade.

About Fundar

We are an innovation center for development policy, working to drive deep, structural transformations in Argentina and Latin America. For us, innovation means tackling the country's challenges from a big-picture perspective and offering solutions that are not only practical but also rigorously proven. Our ultimate goal is to ensure these solutions help build an Argentina and Latin America where everyone can thrive: productive, sustainable, stable, forward-looking and connected — a nation defined by shared well-being.

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Index

Starting Points 4

Executive Summary 5

Key Messages 6

Policy Recommendations 7

The study 8

Mapping the Green Regulatory Regime and the Cases of the European Union's Carbon Border Adjustment Mechanism and Deforestation Regulation 9

Mapping Methodology 11

Findings 14

Conclusions: Critical Considerations for a Public Policy Agenda in the Global South 30

References 32

About the autor 35

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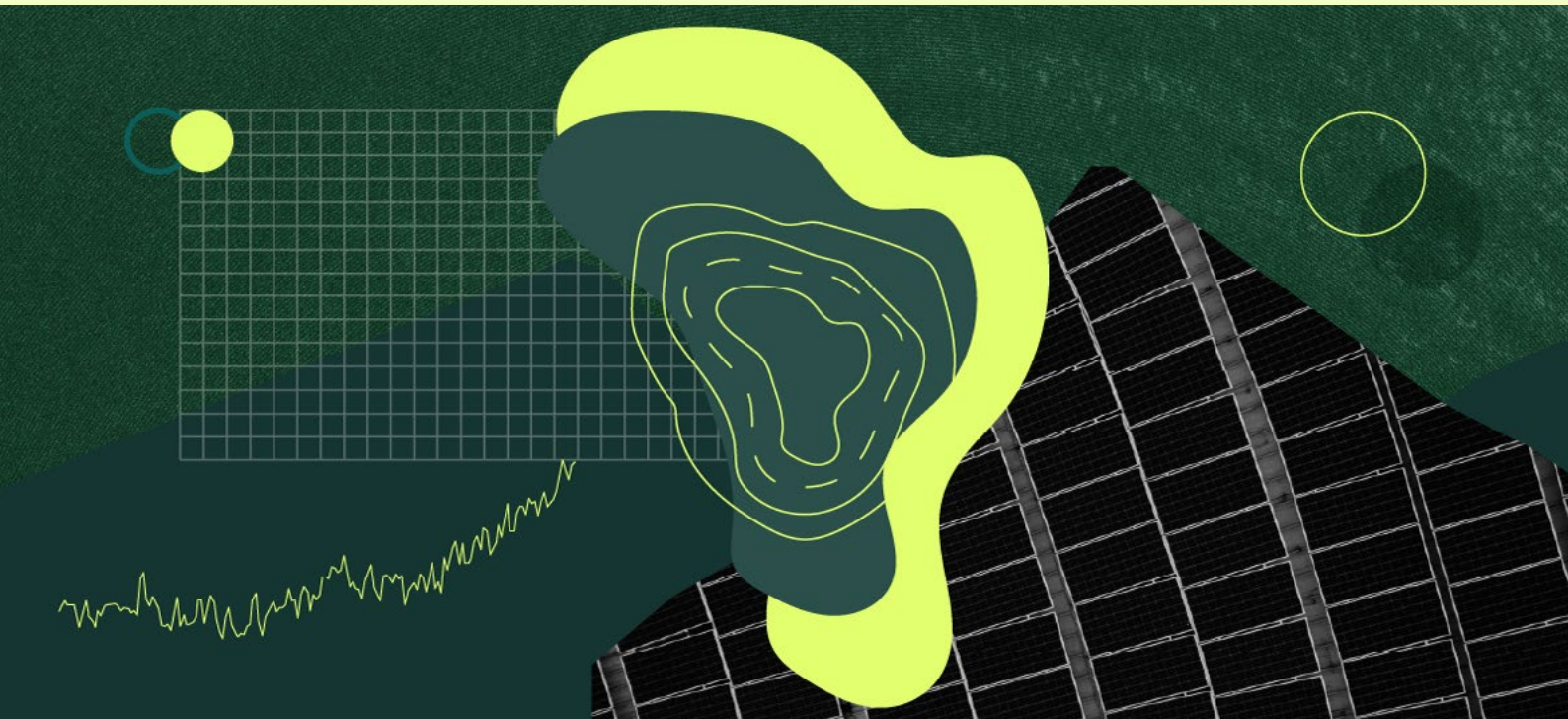
Starting Points

Executive Summary

Environmental governance is no longer organized solely around how countries produce within their own borders; it has increasingly expanded to encompass how their trading partners produce as well. Through environmental standards, regulations, and trade-related requirements, developed economies have transformed environmental performance into an increasingly important condition for market access and, consequently, a central determinant of international competitiveness for countries in the Global South.

Despite the growing relevance of these measures, no study has yet systematically mapped their characteristics and evolution over time. To fill this gap, this paper develops a systematic mapping of the "green" trade measures in force across the Global North between 2009 and 2024, identifying the policy instruments through which they are implemented, the sectors they affect, and the environmental objectives they pursue.

This undertaking is particularly relevant given that governments in numerous international forums have called for greater transparency regarding these measures. The analysis is based on a systematic processing of the World Trade Organization's Environmental Database, complemented with information from Global Trade Alert. The objective is to place recent regulations—such as the Carbon Border Adjustment Mechanism (CBAM) and the Regulation on Deforestation-free Products (EUDR)—into a broader historical perspective and assess the extent to which they represent either a continuation of, or a departure from, pre-existing trends.



Key Messages

1 **Environmental trade regulation is here to stay.**

Between 2009 and 2024, the annual flow of measures increased by 102%, while the cumulative stock of regulations in force grew from 333 to 2,997 measures. This regulatory architecture is highly concentrated in the United States and the European Union. Moreover, the system exhibits a low rate of regulatory exit and a high degree of persistence: regulations rarely disappear. Instead, they accumulate over time.

2 **Trade is increasingly conditioned by technical standards.**

During the period under analysis, direct licensing requirements and prohibitions declined in relative importance, while technical regulations and conformity assessment procedures came to dominate the stock of regulatory instruments. This shift does not necessarily imply a reduction in trade restrictiveness. Rather, it reflects a transformation in the mechanisms through which environmental requirements are imposed.

3 **Environmental protection has shifted toward production processes.**

Whereas earlier regulations primarily focused on protecting flora and fauna, complying with international agreements, or restricting specific products, recent measures increasingly target the way goods are produced. Requirements related to chemical use, energy efficiency, emissions, and production practices have gained prominence. This represents a significant shift: compliance is no longer determined solely by the characteristics of the final product, but also by the conditions under which it was produced.

4 **The regulatory system is becoming increasingly dense, sophisticated, and difficult to challenge through multilateral mechanisms.**

Both the CBAM and the EUDR fit within this broader trajectory of expansion and increasing sophistication in the environmental trade measures adopted by the Global North. At the same time, they introduce specific innovations. The CBAM represents an innovation in terms of regulatory instrument, moving beyond standards-based regulation toward a fiscal adjustment mechanism based on carbon pricing. The EUDR, by contrast, innovates primarily in terms of regulatory objective: while relying on familiar instruments—such as technical regulations, certification schemes, and traceability requirements—it shifts the focus toward land-use change and explicit deforestation concerns.

Policy Recommendations

- **Integrate environmental regulatory considerations into international trade and industrial policy strategies.** The sustained growth of the regulatory stock and its low rate of exit indicate that exporters from the Global South face a permanent and cumulative environmental compliance burden when accessing advanced economies, rather than a temporary or episodic one. Environmental trade regulation should therefore be treated as a structural component of international competitiveness and incorporated into long-term trade and industrial policy planning.
- **Develop domestic certification, monitoring, and verification capacities.** The growing prominence of technical regulations and conformity assessment procedures limits the possibility of outsourcing compliance to external actors, such as importers or foreign certification bodies. As a result, countries in the Global South increasingly require domestic infrastructure for standard-setting, certification, and environmental verification. For economies with export profiles centered on agriculture and the bioeconomy, georeferenced traceability systems are becoming a concrete market access requirement. In the absence of national environmental monitoring systems, compliance depends on the capabilities of individual exporters, generating significant costs and asymmetries.
- **Strategically allocate institutional resources according to export specialization.** Environmental compliance capabilities are neither generic nor equally urgent across countries. Decisions regarding which infrastructure to build, which monitoring systems to develop, and which regulations to track should be guided by each country's export structure. Identifying key destination markets and the specific regulatory requirements associated with them is a necessary first step for the effective allocation of institutional resources.
- **Anticipate carbon-related exposure in export-oriented industrial sectors.** Manufacturing and chemical industries in the Global South that export to the European market face growing decarbonization pressures that originate externally but increasingly shape domestic production conditions. Countries that fail to develop credible transition strategies risk losing competitiveness in markets where carbon footprints are becoming a central determinant of market access.

2

The study

Mapping the Green Regulatory Regime and the Cases of the European Union's Carbon Border Adjustment Mechanism and Deforestation Regulation

The emergence of the Carbon Border Adjustment Mechanism (CBAM) and the Regulation on Deforestation-free Products (EUDR) in the European Union has brought a key question back to the forefront: how do environmental sustainability and trade policy intersect in practice? Rather than representing isolated sectoral measures, these instruments appear to form part of a broader transformation in the regulation of international trade. In particular, they illustrate how environmental objectives are increasingly being incorporated as conditions for market access in advanced economies (WTO, 2022; Guo, 2024). In this context, "green" trade measures are not only proliferating but are also becoming a structural feature of contemporary trade governance, while climate and environmental requirements increasingly challenge development strategies centered exclusively on economic growth (Brenton and Chemutai, 2021; Reid, 2024).

This growing regulatory density is particularly relevant for countries in the Global South. As advanced economies continue to represent strategic export destinations, regulatory changes originating in these markets directly affect the terms of their international integration (Tejeda et al., 2024; De Angelis et al., 2024; Perdana et al., 2023; Brenton and Chemutai, 2021; Park, 2026). Understanding how the Global North's green trade measures operate—what instruments they employ, which sectors they affect, and which environmental objectives they pursue—and doing so from a historical perspective are therefore no longer a purely descriptive exercise. Rather, it constitutes a critical input for governments seeking to design trade strategies aligned with evolving global market trends, as well as for firms adapting their production and export strategies to the regulations and standards established by implementing countries. In numerous international trade forums, governments have called for greater transparency regarding environmentally motivated trade measures, as well as for prior consultations with stakeholders and trading partners during their design and implementation (Deere Birkbeck, 2021).

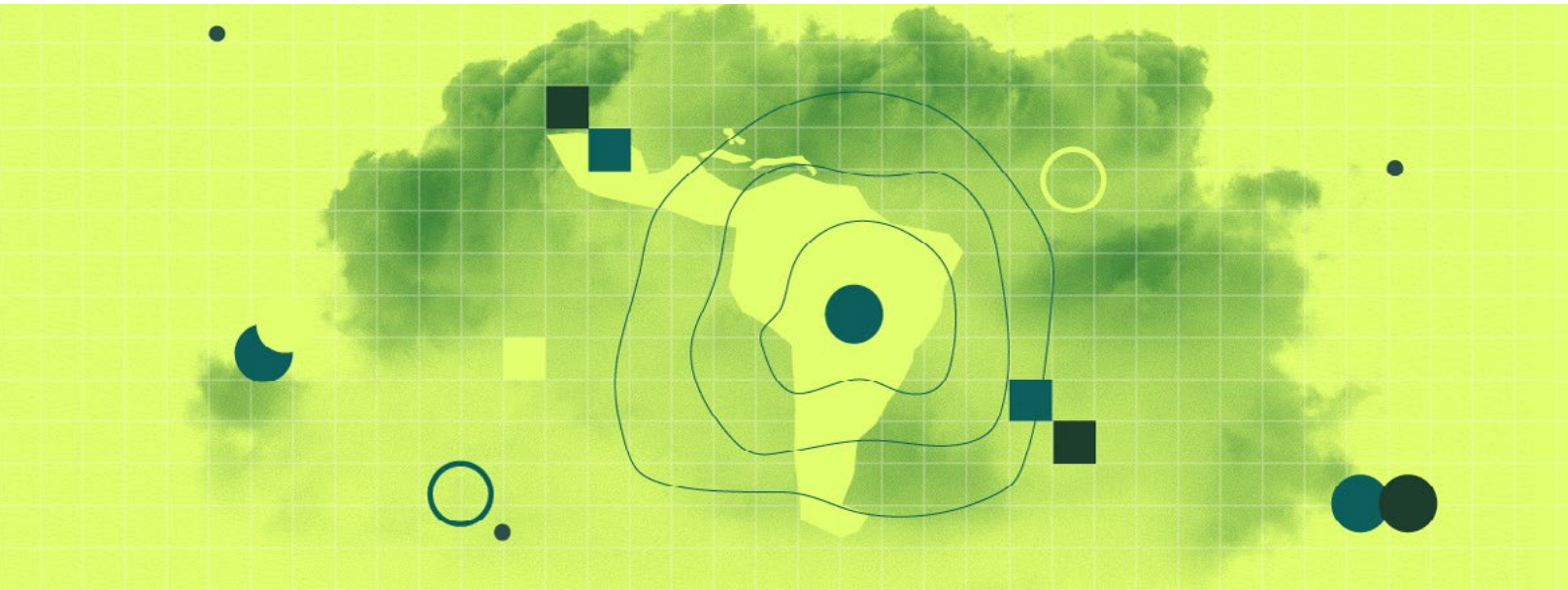
Despite their growing importance, the available data on green trade regulations remain fragmented, partial, and incomplete. Existing studies typically focus on specific sectors, limited time periods, or particular institutional frameworks, and do not provide a comprehensive reconstruction of the stock of measures currently in force or its evolution over time (Frezal and Deuss, 2025; WTO, 2025; APEC, 1998). The absence of comparable datasets that systematically capture regulatory instruments,

environmental objectives, and modes of intervention hampers both longitudinal analysis and cross-jurisdictional comparison, limiting a more structural understanding of green trade measures (Deere Birkbeck, 2021).

Against this backdrop, this paper presents a systematic mapping of trade measures motivated by environmental objectives. Drawing on a novel database, it identifies, classifies, and characterizes import-oriented border measures implemented by countries in the Global North. The resulting dataset makes it possible to reconstruct the stock of measures currently in force and to analyze their expansion, persistence, and transformation over time.

The database also provides an opportunity to assess the extent to which recent instruments such as the CBAM and the EUDR represent a break from, or a continuation of, existing regulatory trajectories. While much of the literature portrays these measures as turning points in environmental trade policy, such characterizations often rely on conceptual arguments rather than systematic evidence or comparative analysis.

Determining how novel these instruments actually are—and in which dimensions that novelty is politically significant—can help governments and firms design more targeted adaptation strategies. When regulatory developments reflect long-term trends, adaptation requires longer planning horizons and often entails structural adjustments (Arias Mahiques, 2026). By contrast, when regulations constitute recent innovations, there may be greater scope for negotiation and multilateral contestation (Zelicovich, 2026). The comparative analysis presented in this paper seeks to provide an empirical foundation for precisely these discussions.



Mapping Methodology

Defining the Universe of Measures

The inventory is based on a strict operational definition of environmental trade measures: government regulations with explicit environmental objectives that affect international trade through border-related instruments. This delimitation makes it possible to isolate those instruments that create legally enforceable obligations at the border and therefore directly influence access to import markets for foreign producers and exporters. As such, the analysis excludes environmental policies of general application, whose effects on trade are indirect (Asia-Pacific Economic Cooperation, 1998), as well as voluntary standards and private certification schemes, which do not constitute formal requirements for market access, regardless of their growing relevance in international trade and the increasing attention they have received in the recent literature (Larrea et al., 2021).

Consistent with this approach, the analysis focuses on measures regulating imports, including import bans, licensing requirements, quotas, authorization procedures, and other forms of border controls. These instruments constitute the primary channel through which environmental policies are translated into effective market access conditions and represent the main mechanism through which countries project regulatory influence onto foreign producers and exporters. Accordingly, the inventory excludes other categories of trade policy, such as export promotion or restriction measures, domestic support policies, and environmental provisions embedded in trade agreements, as these respond to different policy logics and emerge from explicit negotiations between specific parties (Brandi et al., 2025; Monteiro, 2016) (see Annex for a detailed list of the instruments included in the mapping).

From a geographical perspective, the analysis is restricted to countries in the Global North, defined according to UNCTAD's classification of developed economies. In 2025, these economies accounted for 54% of global merchandise trade (UNCTAD, 2026). In the case of the European Union, the inventory distinguishes between measures adopted at the supranational level by EU institutions and those implemented by individual member states within their respective national regulatory frameworks, provided that they affect trade in goods. In total, the analysis covers 35 countries, listed in the Annex.

The inventory includes measures in force between 2009 and 2024, covering both regulations introduced during this period and measures adopted earlier that remained in effect throughout the years analyzed. The choice of 2009 as the starting point is primarily driven by considerations of data availability and consistency. Beginning in 2008, countries started reporting trade-related interventions more systematically through the formal notification mechanisms of the World Trade Organization, making it

possible to reconstruct a comparable stock of environmentally motivated measures. This temporal scope is also analytically relevant, as it coincides with the period following the global financial crisis, which was characterized by a significant expansion of industrial policies, state support measures, and regulatory interventions (Global Trade Alert, 2025).

Data Sources

The mapping developed in this study is built primarily upon the World Trade Organization's Environmental Database (EDB), which serves as the core source of information. The EDB compiles environmental notifications submitted by WTO members, as well as references to environmentally motivated measures identified through Trade Policy Reviews, providing the most comprehensive and systematic source currently available on environmental regulatory interventions linked to international trade.

In this regard, the EDB constitutes the empirical backbone of the mapping exercise, as it enables the identification of the universe of environmental measures formally recognized and notified within multilateral frameworks. However, its use for analytical purposes presents several methodological challenges. The database does not provide a standardized classification of the temporal validity of measures, does not explicitly distinguish between new measures and renewals of pre-existing policies, and contains multiple notifications referring to the same regulatory intervention (Bellelli and Xu, 2022). Consequently, the data were subjected to an extensive cleaning and processing procedure, supported by large language models, aimed at reconstructing the effective periods during which measures remained in force and eliminating duplications generated by successive notifications (see Methodological Annex). As a result of this cleaning and systematization process, a consolidated dataset of 3,148 environmentally motivated trade measures was constructed, forming the principal basis of the analysis.

To complement the EDB, the study also incorporates information from the Global Trade Alert (GTA) database. The GTA records government trade policy interventions based on official announcements, media reports, and other public sources. Unlike the WTO's Environmental Database, it does not systematically map or code commitments and measures embedded in multilateral agreements, but instead focuses on discretionary or unilateral policy changes. The purpose of combining the EDB with the GTA is to identify interventions that are not captured through the WTO's formal notification mechanisms, a limitation frequently highlighted in the literature (Deere Birkbeck, 2021).

Unlike the EDB, the GTA does not directly classify measures according to their environmental objectives. Its incorporation therefore required an ad hoc identification process based on manual review, document analysis, and language-model-assisted classification (see Methodological Annex).

The contribution of this source is relatively modest in quantitative terms, yet significant as a qualitative complement to the mapping exercise. Of the 800 measures reviewed in the GTA database, only 20 were ultimately classified as green trade measures according to the operational criteria adopted in this study. Their inclusion makes it possible to capture unilateral interventions and measures with more contested regulatory foundations that, while not forming part of the multilateral core documented by the WTO, nonetheless contribute to shaping the broader landscape of trade policy instruments that condition international trade in pursuit of environmental objectives.

Structure of the Final Database

The outcome of the processing stage is a set of harmonized and standardized databases documenting environmentally motivated trade measures implemented by countries in the Global North. The core of the system consists of a main table in which each row represents a unique environmental trade measure identified through a unique measure identifier. This central table contains the structural and temporal information associated with each measure—including a standardized description and its period of validity—and is complemented by a set of relational tables that link each measure to multiple relevant attributes, such as implementing countries, policy instruments, environmental objectives, and affected sectors or products. This design avoids data duplication while facilitating disaggregated analysis. The complete list of implementing countries, mapped instruments, and environmental objective categories is provided in the Annex.

This relational structure enables a more precise analysis of the temporal evolution of the regulatory stock, its sectoral distribution, and the regulatory intensity of environmentally motivated trade measures. In particular, it makes it possible to distinguish between the number of measures and the frequency with which specific instruments or environmental objectives are employed.

The final databases, together with their accompanying documentation, are available for download at the following link.

Findings

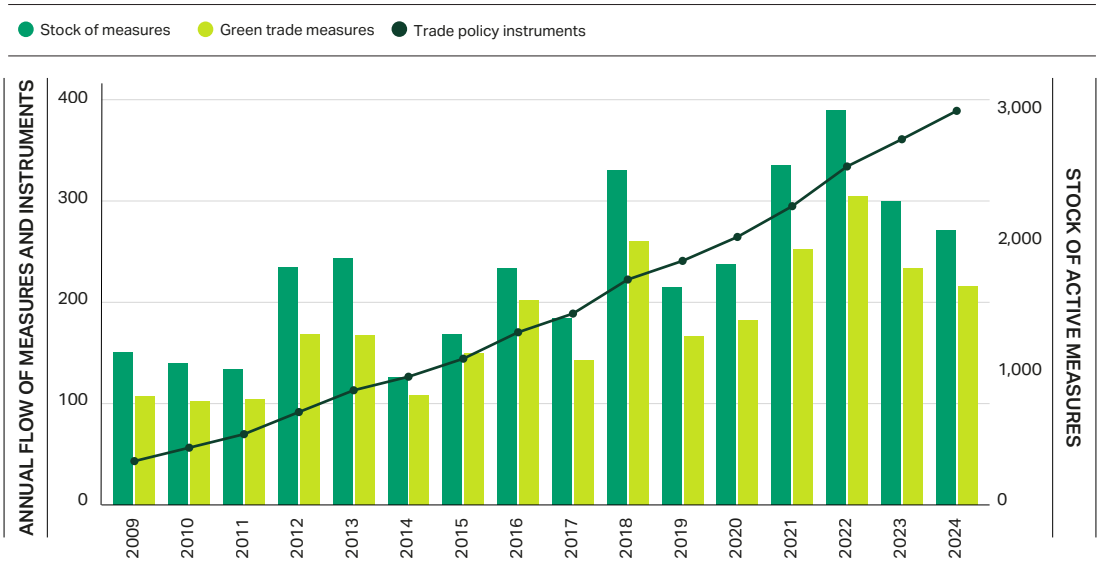
Evolution of Environmental Trade Measures in the Global North

Between 2009 and 2024, the number of green trade measures implemented each year more than doubled, registering cumulative growth of 102%. A similar pattern can be observed in the number of policy instruments employed, which increased by 79% over the same period. The stock of active environmental regulations expanded from 333 measures in 2009 to 2,997 in 2024. The divergence between the growth of the annual flow of new measures and the expansion of the overall regulatory stock suggests that, in addition to the introduction of new regulations, existing measures tend to remain in force for extended periods. In other words, the rate of regulatory exit is low and the system exhibits a clear accumulation dynamic. Taken together, these trends point to a process of progressive densification of the environmental regulatory regime governing international trade.

This trajectory forms part of a broader process that began to emerge in the mid-2000s and became consolidated during the 2010s, as trade policy increasingly incorporated environmental objectives through agreements, regulatory frameworks, and compliance mechanisms promoted by high-income economies (Meyer, 2024; Hsieh, 2025). However, growth was not linear, as it was marked by significant year-to-year fluctuations. The highest number of new measures was recorded in 2022, followed by 2018 (see Figure 1). Since 2022, the pace of new regulatory adoption has slowed, which may reflect a shift from a phase centered on regulatory design and implementation toward one focused on the operational adjustment and enforcement of already approved instruments (Meyer, 2024; Ma, 2024).

FIGURE 1

Green trade measures and policy instruments implemented per year (left axis) and stock of green trade measures (right axis), 2009–2024.



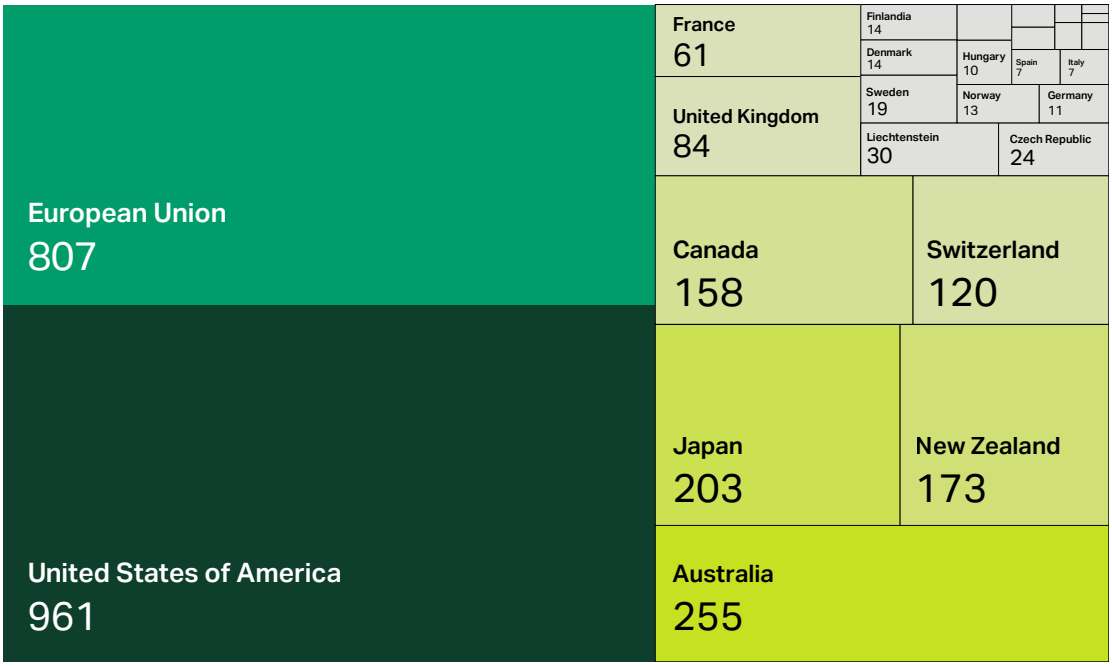
Source: Author's Own Elaboration.

The United States and the European Union clearly stand out as the principal drivers of the global green trade regulatory framework. Together, they account for the largest number of measures in force as of 2024, with 961 measures in the case of the United States and 807 in the European Union. They are followed at some distance by Australia (255 measures), Japan (203), and Canada (158).

Importantly, the leadership of the United States, the European Union, and Australia is not limited to the group of Global North economies. When considering all countries worldwide—including those of the Global South—these actors, together with China, also rank among the leading adopters of environmentally motivated trade measures globally (Bellelli and Xu, 2022).

FIGURE 2

Green trade measures in force in 2024 by implementing country in the Global North



Source: Author's Own Elaboration.

Transformation of Regulatory Instruments

The fourteen instrument categories identified in the mapping exercise were grouped into five broader categories following a functional criterion based on the mechanism through which each instrument affects trade.

While all instrument categories expanded in absolute terms throughout the period, the most significant development lies in the changing composition of the regulatory stock. Between 2009 and 2024, the system underwent a structural transformation in the mechanisms used to operationalize environmental objectives through trade policy.

On the one hand, the regime evolved from a profile dominated by direct restrictions on market access toward one characterized by a stronger regulatory orientation. This shift is reflected in the substantial increase in the share of technical regulations and conformity assessment instruments, which rose from 22.2% of the regulatory stock in 2009 to 67.6% in 2024. Conversely, the share of direct restrictions declined sharply, falling from 64.7% to 22.1% over the same period.

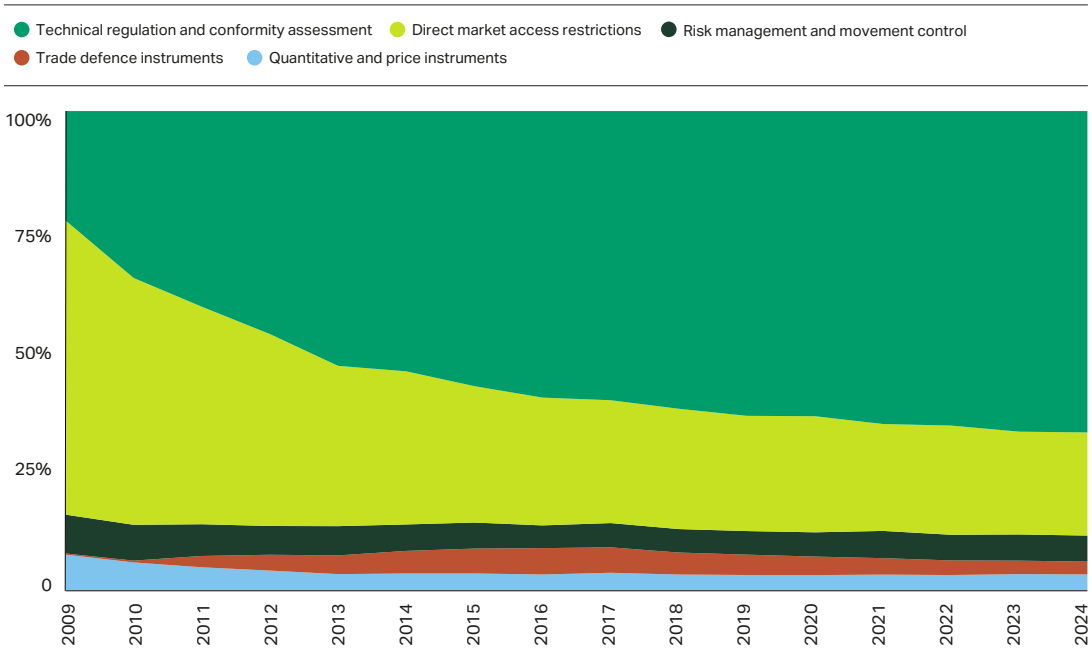
The growing prevalence of environmental technical regulations is also evident in the volume of international trade affected by them. By 2020, such measures covered approximately 16% of global trade, representing an increase of 10 percentage points compared to 2010 (Santeramo et al., 2023).

This increasing "regulatory intensity" of international trade can be interpreted as a shift toward instruments that are more difficult to challenge through multilateral dispute mechanisms and are relatively less exposed to WTO disciplines (Beverelli and Bacchetta, 2012; Herfhelegiu, 2017; UNCTAD, 2026). From this perspective, the growing use of technical and regulatory measures may be associated with indirect forms of market protection.

At the same time, this transition may also reflect the intrinsic requirements of contemporary environmental objectives. Goals such as energy efficiency, chemical management, and climate mitigation often depend on compliance with verifiable technical and production standards, which administrative authorizations or conventional border controls may not be able to operationalize with the same degree of effectiveness.

FIGURE 3

Composition of policy instruments within the stock of environmental trade measures, 2009–2024



Source: Author's Own Elaboration.

Technical regulations and conformity assessment procedures can have trade effects that are comparable to—or even greater than—those associated with instruments that directly restrict market access. Some estimates suggest that green technical regulations have reduced export quantities of affected products by 28% globally and export values by 17% (Santeramo et al., 2023). Likewise, conformity assessment procedures—such as laboratory testing requirements, audits, and inspections—have been among the most

frequent sources of trade concerns raised by WTO members, even more so than technical regulations themselves, due to the substantial compliance costs they impose on exporters (McDaniel and Karttunen, 2016; Galperín, 2024). In this sense, technical regulations and verification requirements can operate in practice in ways that are functionally similar to direct market access restrictions.

Another conclusion that emerges from Figure 3 is the relative stability of risk management and movement control instruments. This category—which includes risk assessments, transit regulations, and quarantine requirements—maintained a small but stable share of the regulatory stock throughout the period, fluctuating between 4.5% and 6.8%. In general, these instruments function as technical inputs that support the adoption of more visible regulatory measures, particularly within the framework of sanitary and phytosanitary disciplines.

At the same time, quantitative and price-based instruments exhibit a relatively small and declining presence. Traditional trade policy instruments have remained largely marginal within the environmental domain, accounting for approximately 2% of the total regulatory stock throughout the period. Their limited use is consistent with the strong disciplines imposed by WTO rules on these types of measures.

Finally, trade defense instruments experienced a notable increase over the period, rising from 0.2% of the regulatory stock in 2009 to 2.3% in 2024, with a temporary peak of 4.3% in 2015. This pattern is likely linked to trade disputes in renewable energy sectors and to efforts by several developed economies to curb the expansion of Chinese renewable energy manufactures in their domestic markets (Yong, 2014).

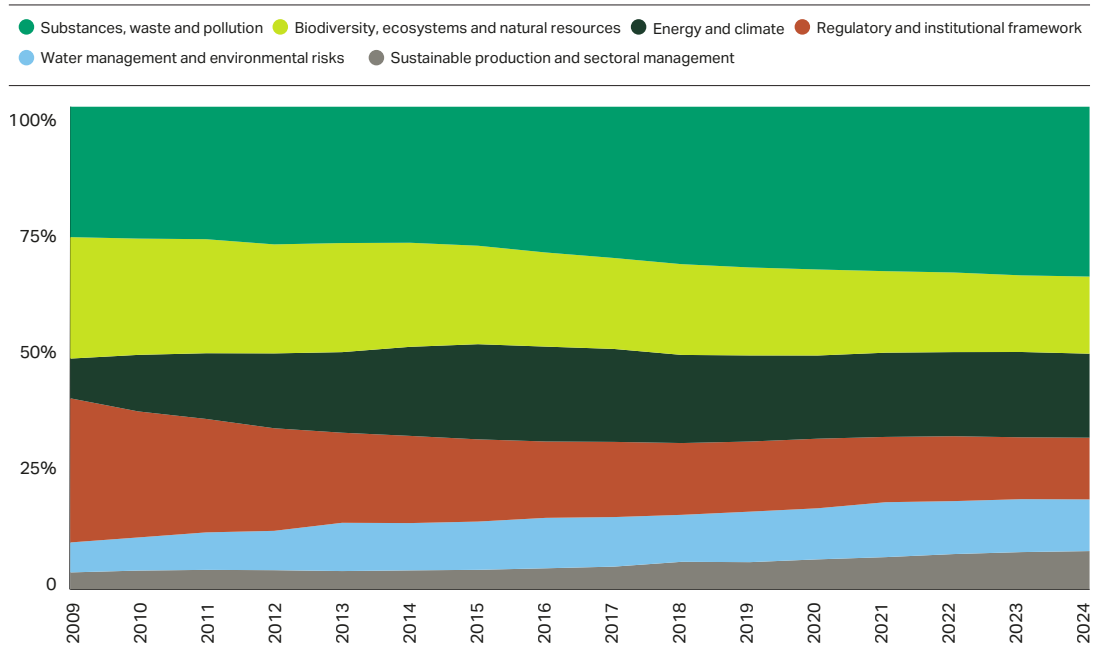
Evolution of Environmental Objectives

As in the previous section, the analysis of environmental objectives relies on grouping the original categories identified in the mapping exercise into broader analytical categories. These macro-categories were constructed based on the nature of each objective and its thematic and functional affinities with related objectives.

Although all categories of environmental objectives increased in absolute terms between 2009 and 2024, the most significant differences emerge when examining changes in their relative share within the overall regulatory stock, as illustrated in Figure 4.

FIGURE 4

Composition of environmental objectives pursued within the stock of environmental trade measures, 2009–2024



Source: Author's Own Elaboration.

The Energy and Climate category exhibits the largest increase in its relative share of the regulatory stock, rising from 8.6% in 2009 to 17.8% in 2024 (+9 percentage points), with an intermediate peak of 21.2% in 2015. This peak coincides with the adoption of the Paris Agreement, which marked a turning point in international climate policy by recognizing the primacy of domestic policymaking and countries' authority to define their own greenhouse gas emission reduction targets (UNCTAD, 2021; Deere Birkbeck, 2021). This framework facilitated a rapid expansion of energy and climate policies with trade-related implications, as reflected in the growth of objectives associated with energy conservation and efficiency (9.4% in 2024 compared to 3.2% in 2009) and climate change mitigation and adaptation (6.0% compared to 4.2%).

The data also reveal a strong consolidation of objectives related to the control of substances, waste, and pollution. This category increased its share from 25.5% in 2009 to 33.5% in 2024 (+7.9 percentage points), becoming the largest environmental objective within the contemporary regulatory regime. Growth has been driven primarily by the expansion of measures targeting the management of chemical, toxic, and hazardous substances, whose share increased from 13.6% to 20.5% of the total. This trajectory is consistent with the highly innovative nature of the chemical industry, where new products—from agricultural fertilizers to industrial inputs—enter the market every year, often before their full environmental impacts have been identified and assessed (Kiriyama, 2010; Bellelli and Xu, 2022).

Objectives associated with Sustainable Production and Sectoral Management also expanded significantly, increasing from 2.7% of the regulatory stock in 2009 to 9.9% in 2024 (+7.2 percentage points). Although this category still accounts for a relatively modest share of the total stock, it represents one of the fastest-growing objective areas during the period. This trend may reflect the increasing emphasis of Global North regulatory policies on production processes—both domestic and foreign—rather than solely on the physical characteristics of imported products (Oeschger and Bonanomi, 2023).

Similarly, objectives related to Water Management and Environmental Risks increased their relative share from 4.6% to 9.0% (+4.4 percentage points). This expansion reflects growing concern over transboundary environmental risks associated with pests, diseases, and other environmental threats that may affect production systems, public health, and ecosystems.

By contrast, the Biodiversity, Ecosystems, and Natural Resources category experienced the largest relative decline over the period, falling from 35.8% in 2009 to 20.8% in 2024 (-15.0 percentage points). This decline should not be interpreted as evidence of a reduced importance of biodiversity within the environmental agenda. Rather, it reflects a transformation in the way biodiversity concerns are addressed. Instead of relying on regulations explicitly focused on species or ecosystems, biodiversity protection is increasingly pursued indirectly through the regulation of inputs, production processes, chemical substances, and environmental risks—the very domains that expanded most rapidly during the period under analysis (UNEP, 2021).

Finally, the Regulatory and Institutional Framework category—largely driven by the implementation of multilateral environmental agreements—saw its relative share decline from 22.9% to 10.7% (-12.2 percentage points). This reduction may reflect a broader transformation in global environmental governance, characterized by a shift away from multilateral approaches toward increasingly unilateral forms of regulatory action led by major trading powers and economic blocs.

Green Regulatory Profiles in the Global North

To better understand the regulatory profiles of Global North countries in terms of environmental objectives and targeted sectors, a Revealed Comparative Advantage (RCA) indicator was constructed. Values above 1 for a given environmental objective or sector indicate a relative specialization in that regulatory domain, whereas values below 1 reflect a comparatively lower level of specialization.

A first observation is the largely intuitive correspondence between the environmental objectives pursued by countries and the sectors most affected by their measures. The United States and Sweden, for example, exhibit a strong specialization in Energy and Climate objectives and, consistent with this orientation, show a high degree of

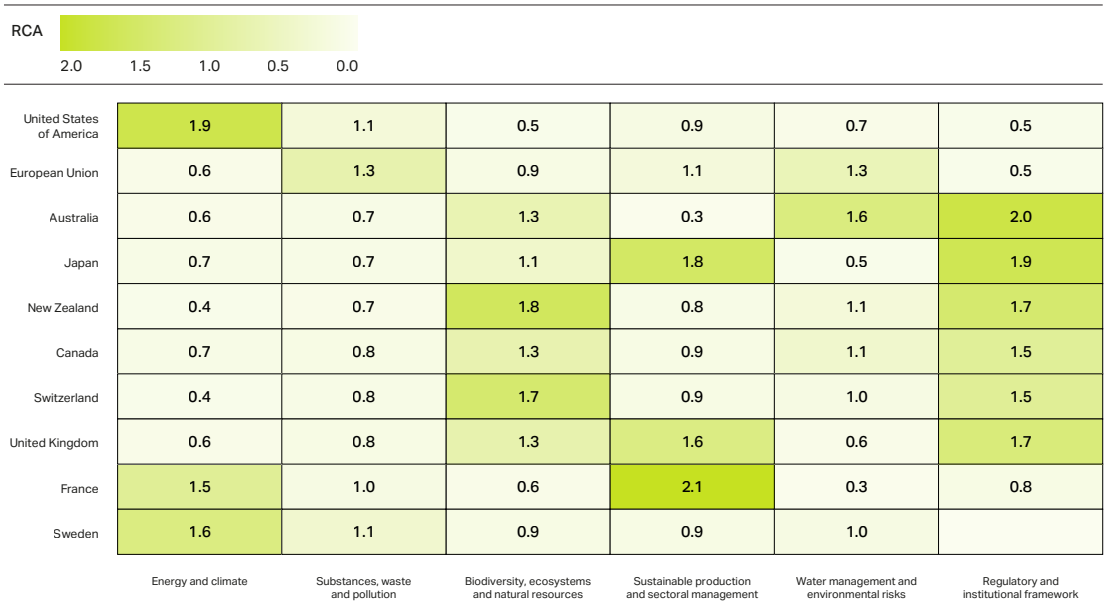
regulatory specialization in the energy sector as the primary target of their measures. A similar pattern can be observed in the European Union, where specialization in objectives related to chemical management is matched by a strong regulatory focus on the chemical industry.

Likewise, countries such as New Zealand, Australia, Switzerland, the United Kingdom, and Canada display specialization in objectives associated with Biodiversity, Ecosystems, and Natural Resources, accompanied by a sectoral focus on activities such as agriculture, fisheries, forestry, and mining. Together, these characteristics define regulatory profiles centered on the governance and management of natural resources.

France provides another noteworthy example. Its green trade measures aimed at regulating production processes exhibit a clear concentration in the manufacturing sector, consistent with the sectors most intensively affected by its regulatory instruments.

FIGURE 5

Revealed Comparative Advantage (RCA) of leading countries implementing green trade measures, by environmental objective



Source: Author's Own Elaboration.

When these regulatory profiles are examined alongside the productive structures of the countries concerned, several noteworthy patterns emerge. On the one hand, there are cases in which economically significant sectors appear to face a relatively high intensity of environmental regulation imposed by foreign markets. This is the case, for example, for the agricultural sector in New Zealand and Australia, and for the mining

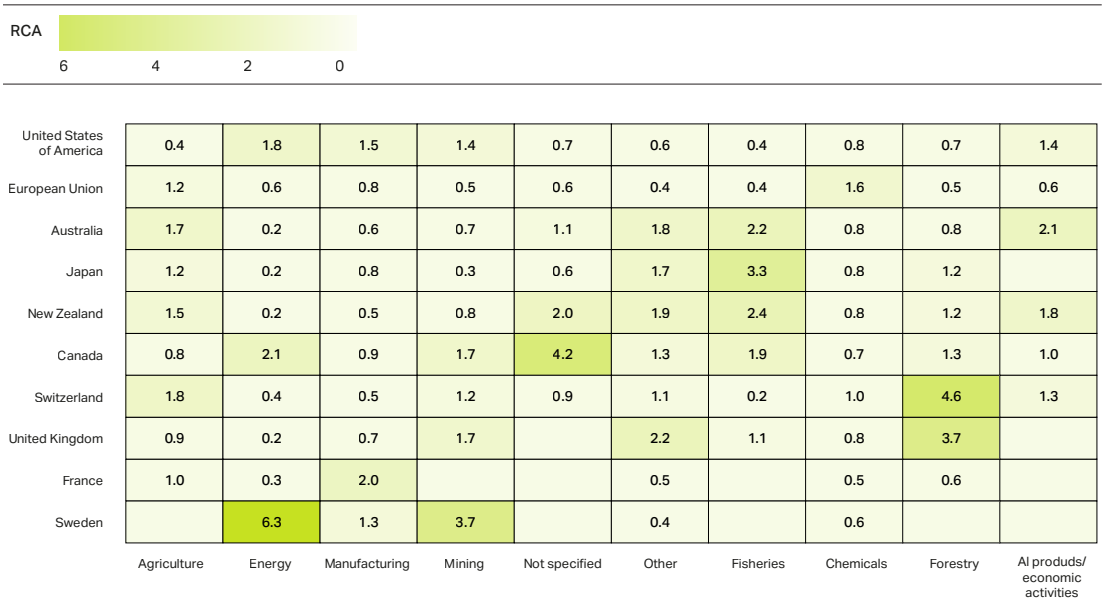
sector in Canada. Such patterns may be interpreted as indicative of the potential use of environmental instruments with indirect protective effects on domestic production.

Conversely, the analysis also identifies countries whose internationally competitive sectors are exposed to a comparatively lower level of external environmental regulatory pressure. These cases suggest areas in which significant regulatory constraints have not emerged through international trade. Examples include forestry in Sweden, mining in Australia, agriculture in France, and fisheries in Japan.

The French case, however, deserves particular attention. The analysis presented here considers only measures adopted at the national level. At the European Union level, there exists a broad set of green trade measures with a strong focus on the agricultural sector, consistent with the historically high level of protection afforded to agriculture within the bloc (Pawlak, 2011).

FIGURE 6

Revealed Comparative Advantage (RCA) of leading countries implementing green trade measures, by regulated sector



Source: Author's Own Elaboration.

Finally, there are cases in which regulatory specialization bears no apparent relationship to the productive structure of the implementing country. Examples include Switzerland and the United Kingdom in forestry, and Canada in fisheries.

The CBAM and the EUDR in Comparative Perspective

The purpose of this section is to describe the CBAM and the EUDR using the analytical categories employed in the mapping of green trade measures developed in this study, and to compare them with the stock of measures in force across the Global North as of 2024 in order to identify both their points of continuity and their elements of novelty.

What are the main characteristics of the CBAM and the EUDR?

Within the European Union's recent environmental trade policy agenda, the Carbon Border Adjustment Mechanism (CBAM) and the Regulation on Deforestation-free Products (EUDR) have emerged as two instruments that have generated intense international debate. Both are embedded within the European Green Deal, launched in 2019, which represents a strategic shift toward prioritizing sustainability and decarbonization commitments across all areas of EU policymaking. Debates surrounding these instruments range from their unilateral nature and their potential systemic implications for global trade, to the ways in which they combine—and potentially create tensions between—environmental objectives and traditional trade policy instruments, shifting the regulatory focus from products to production processes (Zelicovich, 2026; Park, 2026; Cammeo et al., 2025; Sarmiento, 2025).

The CBAM was announced in 2019 and formally adopted in May 2023. Following a transitional implementation period through 2025, it entered into full force on January 1, 2026, after the adoption of a simplification package in October 2025 (Regulation 2025/2083). The instrument was designed as a complement to the EU Emissions Trading System (EU ETS) with the objective of reducing the risk of carbon leakage. Under the mechanism, importers are required to report the embedded emissions of covered products and, during the full implementation phase, to purchase certificates equivalent to the prevailing carbon price in the European market. From a typological perspective, the CBAM operates primarily as an import tariff—a border fiscal adjustment that imposes an economic burden functionally comparable to that faced by European producers under the EU ETS—while also incorporating elements of conformity assessment through requirements related to emissions measurement, reporting, and verification. Its sectoral scope is concentrated in emission-intensive and trade-exposed industries, including cement, iron and steel, aluminum, fertilizers, hydrogen, and electricity.

The EUDR, by contrast, establishes a market access regime based on substantive conditions linked to product origin and production processes. Originally introduced through a European Commission proposal in 2019 and adopted in 2023, it prohibits the placing on the European market of products such as soybeans, beef, palm oil, timber, cocoa, coffee, and rubber—and their derived products—unless three cumulative conditions are met: the products must not be associated with deforestation occurring after December 2020, they must have been produced in compliance with the laws of the country of origin, and they must be accompanied by a due diligence statement.

The regulation requires traceability down to the plot level through geolocation data, as well as risk assessment and mitigation systems. From a typological standpoint, the EUDR is primarily classified as a technical regulation that relies on conformity assessment procedures, while incorporating a prohibition as the legal consequence of non-compliance. For the purpose of risk assessment, the European Union has classified countries into three categories—low, standard, and high risk—based on its own methodology.

Unlike the CBAM, which is already in force, the EUDR has undergone successive delays and remains in a pre-implementation phase. Initially scheduled to apply from December 30, 2025, for large operators and June 30, 2026, for small enterprises, its entry into force was postponed to December 30, 2026, and June 30, 2027, respectively. The most recent update occurred in May 2026, when the European Commission published a simplification review of the regulation. Without modifying the legal text or altering the implementation timeline, the review introduced a series of technical measures aimed at reducing administrative burdens, which the Commission estimated would lower annual compliance costs for affected firms by 75% (European Commission, 2026). These delays reflect both domestic pressures—including administrative complexity, compliance costs for SMEs, and uneven preparedness among member states—and international resistance from affected exporting countries (Zelicovich, 2026).

TABLE 4

Summary of the Measures Analyzed and Harmonization of Selected Characteristics

Trade measure	Instrument used	Standardized instrument used	Aggregated sector	Subsector	Environmental objective pursued	Standardized environmental objective
EUDR	Mandatory due diligence regime incorporating geo-located traceability, risk assessment, and legality verification requirements to demonstrate defor-estation-free status, with market access prohibited in cases of non-compliance.	Technical regu-lations and specifications; Conformity assessment procedures; Prohibition.	Agriculture; Forestry.	Soybeans; Beef; Palm Oil; Cocoa; Coffee; Rubber; Timber.	Reduction of deforestation and forest degradation associated with the expansion of agricultural and forestry commodities.	Sustainable Forest Man-agement; Deforestation/ Reforestation.
CBAM	Border adjustment mechanism based on embedded carbon content, requiring the purchase of CBAM certificates and the reporting of embed-ded emissions.	Import tariffs; Conformity assessment procedures.	Manufacturing; Chemicals.	Cement; Iron and Steel; Aluminum; Fertilizers; Hydrogen; Electricity	Reduction of Greenhouse Gas (GHG) Emissions; Prevention of Carbon Leak-age; Extension of the Carbon Price Signal.	Climate Change Mitigation and Adaptation.

Source: Author's Own Elaboration.

Disruptions and Continuities: A Comparative Perspective

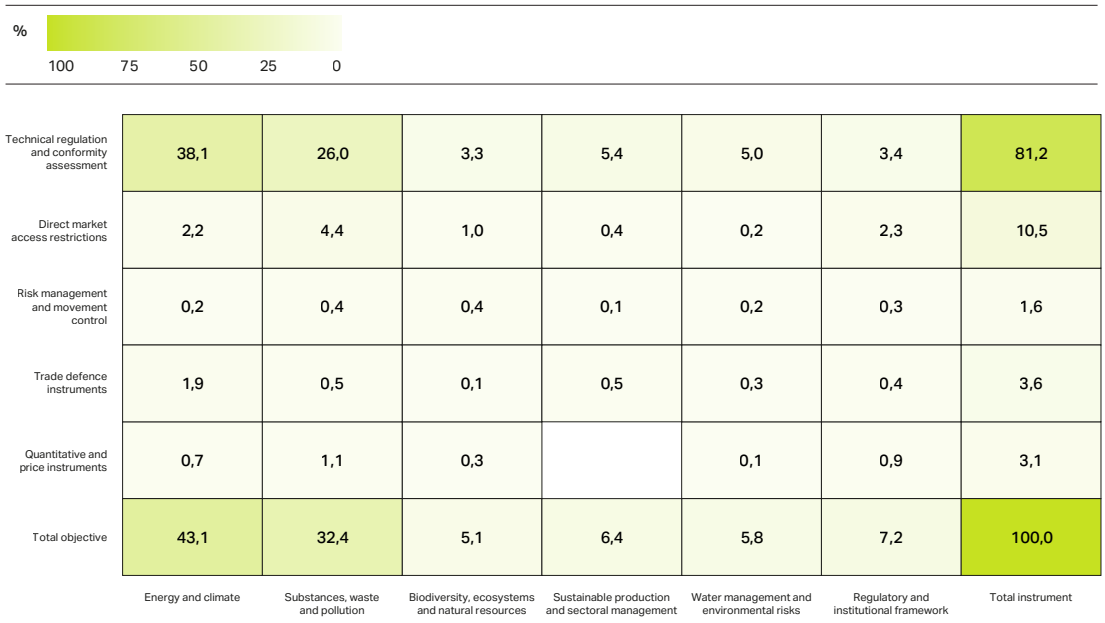
Carbon Internalization as an Instrumental Shift: The Case of the CBAM

Given that the CBAM primarily affects manufacturing industries and segments of the chemical sector—particularly through its coverage of fertilizers—this section examines the characteristics of the green trade measures in force across the Global North as of 2024 that target these sectors.

Within the manufacturing sector, there is a strong concentration of objectives related to Energy and Climate, which account for nearly 40% of all objective–instrument combinations in 2024. These objectives are implemented predominantly through technical regulations and specifications (see Figure 7). Examples include energy efficiency standards and emissions limits for vehicles and other industrial goods, as well as ecodesign and energy-labeling requirements that establish minimum performance thresholds for the commercialization of industrial and electronic equipment.

FIGURE 7

Environmental objectives by policy instrument in the manufacturing sector (measures in force in 2024)



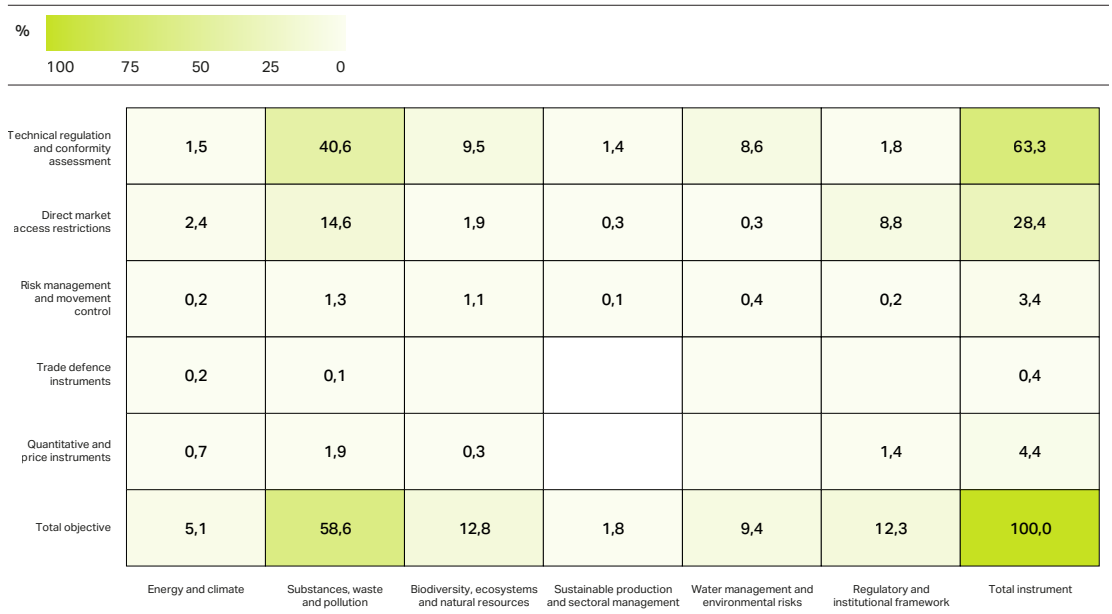
Source: Author's Own Elaboration.

In the chemical sector—which is also affected by the CBAM through its coverage of fertilizers—the stock of green measures in force in 2024 displays a clear predominance of objectives related to the management of chemical and hazardous substances, implemented primarily through technical regulations and assessment

and authorization procedures. These measures encompass the approval, restriction, or non-renewal of active substances used in pesticides, fertilizers, and biocides, establishing toxicity thresholds, conditions of use, and ecosystem risk criteria for their commercialization. In addition, objectives linked to the implementation of multilateral environmental agreements are also present.

FIGURE 8

Environmental objectives by policy instrument in the chemical sector (measures in force in 2024)



Source: Author's Own Elaboration.

From the perspective of environmental objectives, the CBAM does not represent a radical departure from the orientation of the Global North's stock of green trade measures, at least within the manufacturing sector. There, the climate agenda (within the broader category of Energy and Climate) was already well established through technical regulations and performance standards, accounting for approximately 40% of all objective–instrument combinations declared by green trade measures. In the chemical sector, however, a more significant innovation can be identified. Historically, regulatory measures in this sector have focused on managing the risks associated with chemical substances, waste, and pollution. The CBAM shifts the focus toward the emissions generated during production processes, explicitly incorporating the climate dimension through the carbon footprint of affected products. If the CBAM were merely a continuation of existing regulatory patterns, one would expect to observe a greater prevalence of climate- and energy-related objectives within the chemical sector than is revealed by the data.

The principal departure introduced by the CBAM lies, however, at the instrumental level: the shift from standards-based regulation toward a price-based adjustment mechanism. The stock of green regulations affecting the sectors under analysis has been structured predominantly around technical regulations and conformity assessment procedures, which condition market access through compliance with predefined standards. By contrast, the CBAM introduces a border fiscal instrument that operates in a manner functionally equivalent to a tariff on embedded emissions, internalizing climate-related costs through an explicit price signal.

Nevertheless, the CBAM retains an important element of operational continuity. Its implementation relies on emissions Measurement, Reporting, and Verification (MRV) systems that build upon pre-existing regulatory, certification, and monitoring infrastructures. In this sense, the mechanism does not replace the existing framework of technical regulatory governance; rather, it complements it through an additional layer of fiscal adjustment, creating a hybrid model that combines environmental standards with carbon pricing at the border.

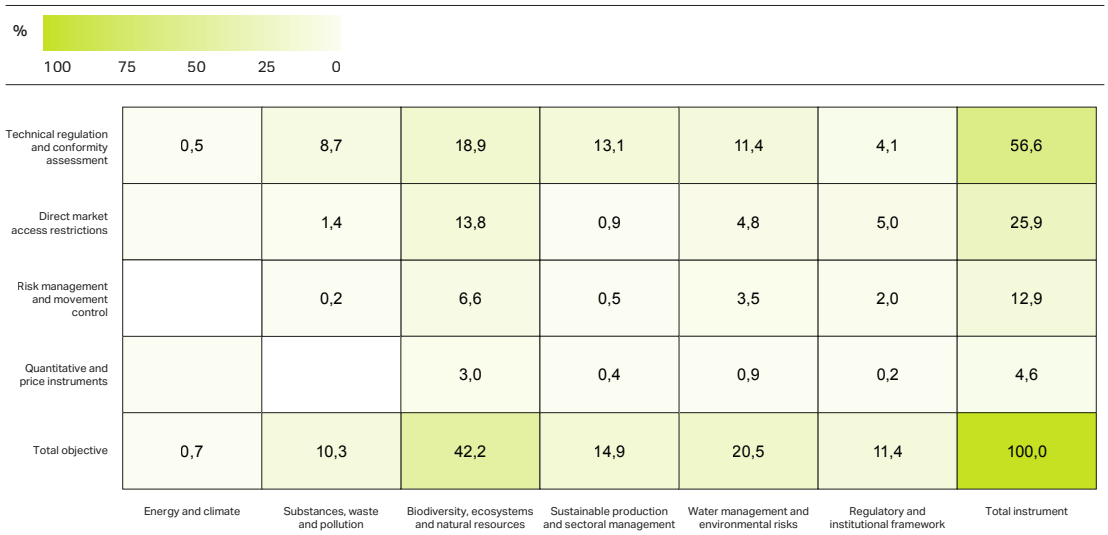
From Ecological Risk to Explicit Deforestation: The Case of the EUDR

In the case of the EUDR, which primarily affects the agricultural and forestry sectors, the following section characterizes the stock of green trade measures in force across the Global North as of 2024 that target these activities.

In both agriculture and forestry, objectives related to the protection of biodiversity, ecosystems, and natural resources occupy a central position within the broader universe of green trade measures (see Figures 9 and 10). In agriculture, these objectives are implemented primarily through technical regulations and specifications designed to restrict and control the use of pesticides and other phytosanitary inputs. Instruments involving direct restrictions on market access, as well as risk management and movement control measures, also play a particularly important role, especially in preventing the introduction of invasive species and reducing the risk of pests and diseases associated with international trade.

FIGURE 9

Environmental objectives by policy instrument in the agricultural sector (measures in force in 2024)

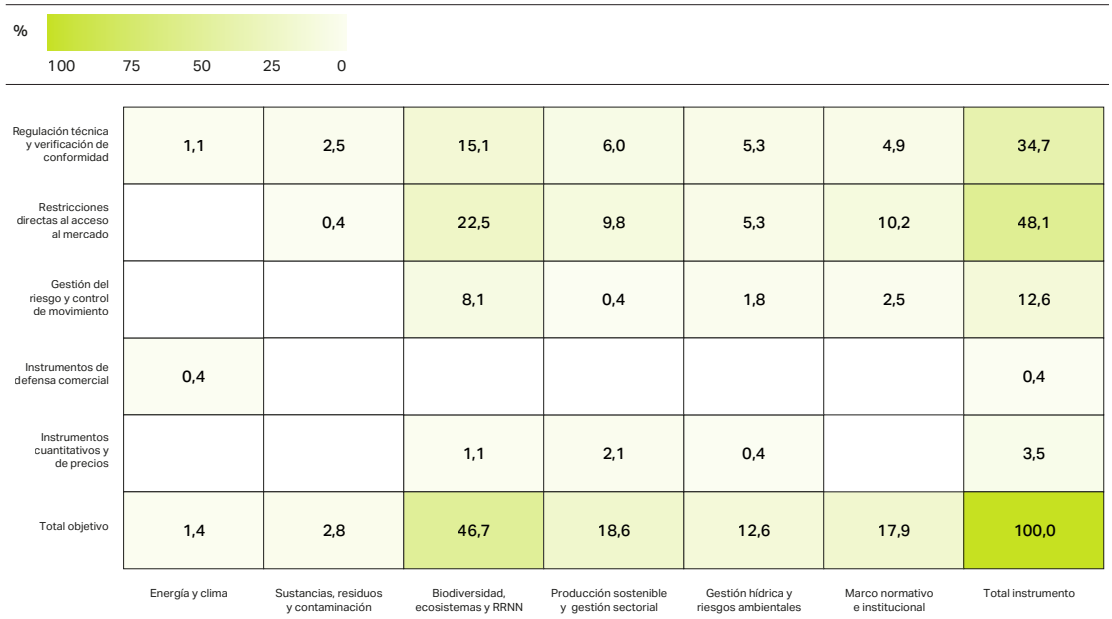


Source: Author's Own Elaboration.

In the forestry sector, objectives related to the protection of biodiversity, ecosystems, and natural resources are likewise pursued through direct market access restrictions. Examples include licensing requirements applicable to forest products. In addition, the regulatory landscape includes frameworks associated with species conservation and the implementation of multilateral environmental agreements, which condition trade in certain forest species on international permit and certification systems.

FIGURE 10

Environmental objectives by policy instrument in the forestry sector (measures in force in 2024)



Source: Author's Own Elaboration.

From the perspective of environmental objectives, the EUDR introduces a significant discontinuity. Whereas the historical stock of measures has largely focused on biodiversity protection, the regulation of inputs, and the certification of sanitary or legality-related attributes, the EUDR shifts the focus toward land-use change and, more specifically, deforestation associated with agricultural and forestry expansion.

At the instrumental level, however, continuity predominates. The regulatory regime in these sectors has historically been structured around import licensing requirements, technical regulations, and certification mechanisms, and the EUDR maintains this logic of trade conditionality based on compliance with standards as a prerequisite for access to the European market. In this sense, rather than introducing a novel instrument, it deepens and systematizes technical-regulatory tools that were already present within the framework of environmental trade governance.

Finally, it is important to note that the comparative analysis is limited to the dimensions of objectives and instruments. As a result, certain distinctive features of the EUDR—particularly its extraterritorial reach and its emphasis on regulating production processes at origin—are not fully captured by the categories used in the database. Historically, the stock of measures has tended to regulate product attributes, the inputs used in production, or sanitary risks associated with market entry, rather than the territorial dynamics of land-use change in exporting countries. Although this distinction does not emerge directly from the systematized variables, the qualitative review of the measures suggests that the EUDR represents a shift toward a more explicit regulation of production processes and their territorial impacts.

Conclusions

Critical Considerations for a Public Policy Agenda in the Global South

Both the database and the analysis of the European Union's new trade measures provide strategic inputs for policymakers and business actors seeking to design competitive production and international integration strategies in a context where trade is increasingly conditioned by environmental regulations.

To the extent that the mapping exercise points to a structural deepening of environmental trade regulation, rather than merely a quantitative increase in the number of measures, environmental considerations need to be integrated into international trade and industrial policy strategies rather than treated as isolated trade requirements. Moreover, given the growing centrality of technical regulations and conformity assessment procedures as the dominant mechanisms governing market access, it becomes strategically important for countries in the Global South to strengthen domestic capacities for certification, standardization, and environmental verification. Doing so would reduce dependence on external compliance infrastructures while facilitating the adaptation of export-oriented sectors.

As agriculture and bioeconomy-related sectors become increasingly regulated under objectives related to biodiversity, ecosystems, and land use, the development of national traceability and environmental monitoring systems becomes essential for anticipating and complying with requirements such as those introduced by the EUDR. Likewise, considering that manufacturing and chemical industries face the highest levels of regulatory exposure—particularly with respect to climate mitigation and energy efficiency objectives—promoting productive decarbonization strategies and improving environmental performance in these sectors is critical for maintaining export competitiveness.

Future Research Directions

Expanding the typology of environmental instruments and objectives. Future work could broaden the analytical framework to capture additional dimensions present in recent regulations such as the CBAM and the EUDR, particularly due diligence regimes and extraterritorial traceability requirements. Making these dimensions explicit would allow for a more precise distinction between interventions targeting products, production processes—especially when regulated beyond the importing jurisdiction—and value chains, thereby improving the analytical capacity to map the structural depth of the environmentalization of trade.

Refining and harmonizing sectoral and tariff classifications. Advancing toward more disaggregated classifications (e.g., HS6-level codes) would enhance analyses of regulatory exposure. This is particularly important for identifying the sectoral and territorial impacts of instruments such as the CBAM and the EUDR, as well as for assessing differential effects according to countries' income levels, export structures, and dependence on specific productive sectors.

Systematically incorporating green industrial policies "behind the border." As the analysis highlights the growing sophistication of environmental restrictions at the border, it becomes increasingly important to complement this perspective with a systematic mapping of domestic policy instruments that are reshaping the international competitiveness of green sectors. Subsidy programs, tax credits, local content requirements, and investment support measures can function as de facto trade measures by altering relative costs, production locations, and investment flows. Integrating these policies into the mapping framework would provide a more comprehensive understanding of the emerging regulatory and competitive asymmetries that structure the green transition in international trade.

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