

**COMPLIANCE WITH THE EU CARBON BORDER
ADJUSTMENT MECHANISM: COMPARISON OF
BRAZIL, SOUTH KOREA, AND TURKEY**



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COMPLIANCE WITH THE EU CARBON BORDER ADJUSTMENT MECHANISM: COMPARISON OF BRAZIL, SOUTH KOREA, AND TURKEY

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To my family



DECLARATION OF ORIGINALITY

I hereby declare that I am the sole author of this thesis and that this is the true copy of my thesis, including the final revisions, approved by my thesis committee. All data and information have been obtained, produced, and presented in accordance with the rules of research ethics and principles of academic honesty. As required by these rules, to the best of my knowledge I have acknowledged ideas, thoughts, and any copyrighted material in accordance with the standard referencing rules. I certify that any part of this thesis has not been submitted for a degree or diploma in another educational institution.

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ABSTRACT

This thesis investigates the alignment models of third countries under EU regulatory influence such as Turkey, South Korea and Brazil with the environmental governance of the European Union, particularly in the context of the EU Carbon Border Adjustment Mechanism (EU CBAM). Drawing on theoretical frameworks of Europeanization and policy instruments typology, the study examines how these countries respond to the EU's evolving climate standards and market-based carbon regulations. Through a comparative analysis of more than thirty official policy documents, the thesis identifies differences in alignment strategies ranging from resistance to policy convergence. By systematically operationalizing policy instruments through the NATO framework, the study provides a detailed insight into how climate norms are diffusing beyond EU borders and the strategic responses of emerging economies in the global green transition.

Keywords: Europeanization, EU CBAM, carbon pricing mechanisms, policy tools

ÖZET

Bu tez, özellikle AB Sınırdaki Karbon Düzenleme Mekanizması (AB SKDM) bağlamında, Türkiye, Güney Kore ve Brezilya gibi AB düzenleyici etkisi altındaki üçüncü ülkelerin, Avrupa Birliği'nin çevre yönetimiyle uyum modellerini araştırmaktadır. Avrupalılaştırmanın teorik çerçevelerinden ve politika araçları tipolojisinden yararlanan çalışma, bu ülkelerin AB'nin değişen iklim standartlarına ve piyasa tabanlı karbon düzenlemelerine nasıl yanıt verdiğini incelemektedir. Otuzdan fazla resmi politika belgesinin karşılaştırmalı analizi yoluyla tez, AB ile uyuma dirençten politika yakınsamasına kadar uzanan uyum stratejilerindeki farklılıkları belirlemektedir. Çalışma, NATO çerçevesi aracılığıyla politika araçlarını sistematik olarak işlevsel hale getirerek, iklim değişikliği normlarının AB sınırlarının ötesine nasıl yayıldığına ve küresel yeşil dönüşümde gelişmekte olan ekonomilerin stratejik yanıtlarına ilişkin ayrıntılı bir içgörü sunmaktadır.

Anahtar Kelimeler: Avrupalılaştırma, AB SKDM, karbon fiyatlandırma mekanizmaları, politika araçları

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LIST OF ACRONYMS AND ABBREVIATIONS

ABC: Low-Carbon Agriculture Plan (Plano de Agricultura de Baixa Emissão de Carbono)

BUR: Biennial Update Report

CBAM: Carbon Border Adjustment Mechanism

CDP: Carbon Disclosure Project

CO₂ : Carbon Dioxide

COP: Conference of the Parties

DG CLIMA: Directorate-General for Climate Action (European Commission)

EC: European Commission

EEA: European Economic Area

EIA: Environmental Impact Assessment

EP: European Parliament

ETS: Emissions Trading System

EU: European Union

GHG: Greenhouse Gas

IPCC: Intergovernmental Panel on Climate Change

K-ETS: Korea Emissions Trading System

LULUCF: Land Use, Land-Use Change and Forestry

MRV: Monitoring, Reporting, and Verification

NATO: Nodality, Authority, Treasure, Organization

NDC: Nationally Determined Contribution

PNMC: National Policy on Climate Change (Brazil)

SBCE: Brazilian Emissions Trading System (Sistema Brasileiro de Comércio de Emissões)

SK: South Korea

T-ETS: Turkish Emissions Trading System

UN: United Nations

UNFCCC: United Nations Framework Convention on Climate Change

LIST OF SYMBOLS

€: Euro

%: Percentage

₩: South Korean Won

\$: US Dollar



1. INTRODUCTION

The escalating global climate crisis, marked by observable phenomena, highlights the urgent need for collective international action. The Paris Agreement, ratified by 180 countries by 2016, sets a common goal of limiting global warming to 2°C above pre-industrial levels, while serving as the foundational international agreement to continue efforts to limit temperature increases to 1.5°C. Achieving these ambitious goals requires significant greenhouse gas (GHG) emission reductions and a comprehensive global shift toward decarbonization across all economic sectors. (United Nations, 2015)

The global climate policy landscape is currently undergoing a transformative shift, moving from broad aspirational targets to more concrete and enforceable regulatory frameworks. Initially, international climate agreements such as the Paris Agreement set general, though often voluntary, targets. However, the subsequent development of market-based instruments such as the European Union's (EU) Carbon Border Adjustment Mechanism (CBAM) and the proliferation of national Emissions Trading Schemes in countries such as Brazil (Sistema Brasileiro de Comércio de Emissões - SBCE), South Korea (K-ETS), the United Kingdom (UK-ETS), New Zealand (NZ-ETS), Canada (OBPS & TIER), Japan (Tokyo-ETS), and Switzerland (CH-ETS) represent a critical evolution. This progress reflects the increasing recognition that economic incentives and disincentives are indispensable to driving decarbonization. These mechanisms force countries to internalize carbon costs, thereby transforming climate action from a purely voluntary effort into an economic imperative to remain globally competitive (Zhong & Pei, 2024; Otto, 2025)

Brazil, South Korea and Turkey are important emerging economies whose climate action is crucial to achieving global decarbonization targets (Fragkos et al., 2021). As the

largest country in Latin America and the world's eighth largest economy, Brazil has vast natural resources that are vital for green technologies and plays a key role in global climate cooperation, including hosting COP30 in 2025 and taking over the G20 Presidency in 2024. A global innovation leader and a major global economy, South Korea was the world's thirteenth-largest emitter of greenhouse gases in 2023, and its industrial sectors are particularly energy-intensive. Turkey ranks as the world's 17th largest emitter of carbon and maintains a significant trading relationship with the EU, supported by a Customs Union. Beyond purely environmental concerns, climate action in these countries is increasingly driven by geopolitical and economic considerations, particularly the need to maintain robust trade relations with the EU and to remain competitive in a rapidly decarbonizing global market.

The European Union's ambitious climate agenda, particularly the European Green Deal and CBAM, directly links environmental performance to market access. This regulatory pressure is forcing trade-dependent economies like Turkey, Brazil, and South Korea to align their domestic climate policies with evolving EU standards. Failure to comply with these standards risks significant tariffs and the loss of significant market share. This dynamic demonstrates that economic interests, rather than mere environmental sacrifice, are emerging as a powerful and often primary motivation for accelerating the adoption and implementation of climate policies in these countries.

As major emitters and trading partners, Brazil, South Korea, and Turkey wield significant influence but lack the unilateral power of global superpowers. Climate policy decisions are shaped by a complex interplay of internal factors, such as their economic structure, prevailing political will, and level of societal acceptance of climate policies, and external pressures, such as EU regulatory influence, China's expanding economic

footprint, and relations with the United States. Their strategic ability to effectively manage these multifaceted pressures and leverage their unique positions is instrumental in defining their role within the emerging global green economy (Prakash & Potoski, 2017).

With this background, this thesis investigates how selected non-European countries respond to the EU's external climate governance instruments, particularly the CBAM. It aims to understand the extent to which Brazil, South Korea and Turkey have aligned their domestic carbon pricing policies with EU expectations and how these alignments reflect different patterns of adaptation, resilience or hybrid adaptation. By answering these questions, the study aims to contribute both to the theoretical literature on external Europeanization and to the empirical understanding of how emerging economies in a multipolar world strategically respond to climate-related trade conditions.

Against this backdrop, this thesis explores how selected third countries under EU regulatory influence namely; Brazil, South Korea, and Turkey, respond to the European Union's external climate governance, particularly the CBAM. To do so, it addresses three main research questions: (1) What is the degree and nature of policy change in these countries in response to the EU's carbon pricing policies? (2) How can the policy instruments approach enhance our understanding of the variation in climate policy alignment within Europeanization research? (3) What are the main drivers behind the adoption or resistance to carbon pricing reforms in these cases? By integrating insights from the policy studies literature and systematically analyzing over thirty official documents using a structured typology of policy tools, the thesis aims to demonstrate differentiated patterns of policy change and identify the mechanisms through which external regulatory pressures shape domestic climate governance.

2. CONCEPTUAL FRAMEWORK: EUROPEANIZATION, EUROPEAN ENVIRONMENTAL POLICY, AND POLICY TOOLS

Europeanization is generally defined as the impact of European Union (EU) integration on domestic and international politics and has become a fundamental concept in political science and European studies. This literature review examines Europeanization and its importance in environmental policy, focusing on how EU norms have spread beyond EU borders. First, the concept of Europeanization will be defined by emphasizing the definitions of leading scholars such as Börzel, Risse, Radaelli, Featherstone and Bulmer. Then, the mechanisms of Europeanization in the fields of environment and climate change will be examined by discussing how EU environmental standards and practices have spread internationally. To assess how Europeanization is reflected in climate change policies, this study employs the 'NATO' typology, comprising Nodality, Authority, Treasure, and Organization, proposed by Christopher Hood in his seminal work *Instruments of Government* (1983), one of the most widely cited frameworks in the policy studies literature.

2.1 Defining Europeanization

Europeanization generally refers to the processes through which European regional integration affects local structures, policies, and even identities. Scholars offer a variety of definitions. For example, Saurugger and Radaelli (2008) defines Europeanization as “the processes of (a) construction, (b) diffusion, and (c) institutionalization of formal and informal rules, procedures, policy paradigms, styles, ‘ways of doing things’, and shared beliefs and norms that are first defined in EU policy processes and then incorporated into local discourse, structures, and public policies.” This

definition emphasizes the transfer of European-level decisions and norms to the local sphere. Earlier, Ladrech (1994) emphasized the gradual adaptation of national politics to European Community influences, defining Europeanization as “an incremental process that reorients the direction and shape of politics to the extent that EU political and economic dynamics become part of the organizational logic of national politics and policymaking.” Börzel (2013) similarly saw this as local policy areas becoming “increasingly subject to European policy making.” In short, Europeanization requires domestic-level change encouraged by Europe Union (Börzel & Risse, 2000; Risse et al., 2001).

From a theoretical perspective, Europeanization is not a single theory, but a lens or framework for analyzing change. As Bulmer et al. (2015) argue, it describes the influence of Europe on domestic politics, a phenomenon rather than a unified theory. As such, it draws on multiple theoretical approaches, such as institutionalism and constructivism, to explain how and when EU influence leads to change. Scholars have distinguished the mechanisms through which Europeanization occurs. A common distinction is “top-down” Europeanization, defined as pressures at the EU level causing domestic adaptation, while “bottom-up” Europeanization is defined as domestic actors imposing their preferences on the EU level. In the top-down Europeanization, hard mechanisms include legal obligations and conditionality. There are EU regulations or accession requirements that force states to comply. Soft mechanisms involve more indirect influence, such as norms, benchmarking, or policy diffusion through transnational networks, where a binding rule does not compel adoption but European ideas reshape domestic preferences.

Tanja Börzel and Thomas Risse (2007) have discussed how the ‘goodness of fit’ between European policies and local structures determines the pressure for change. If there is a mismatch, the pressure for conformity is high and is mediated by local institutions and actors such as supporting coalitions or veto players. Knill and Lehmkuhl (1999) provide a typology of Europeanization mechanisms. They introduce the concepts of an institutional fit model (positive integration, prescribing institutions or rules), a changing local opportunity structure (negative integration, changing incentives without strict prescriptions), and a framing mechanism (shaping beliefs and expectations). These correspond to coercive, mixed, and persuasive forms of influence.

Other scholars also identify mechanisms such as ‘coercion’, ‘emulation’, meaning imitation or voluntary copying of EU practices, ‘competition or market-driven adaptation’, and ‘social learning/normative internalization’ (Börzel & Risse, 2012). In short, Europeanization can occur through normative means as well as through binding rules and material incentives. This is a multifaceted process, blending rational adaptation and normative socialization, in which internal change is “regulated” by the presence of the EU.

Kevin Featherstone and Claudio Radaelli’s groundbreaking work “The Politics of Europeanization” (2003) has argued that Europeanization research needs to clarify the direction, mechanisms, and consequences of EU-driven change. They and other scholars like Börzel (2002) emphasize that Europeanization is fundamentally about internal transformation driven by the EU, but that this is conditional. The results vary by country and sector, depending on mediating factors. Europeanization is not limited to EU member states. It can also affect non-members through their relationship with the EU, a point that is relevant to our discussion of the diffusion of environmental norms beyond EU borders.

A fundamental weakness in the Europeanization literature is the lack of detailed frameworks that systematically capture the nature of policy change beyond its degree. Existing typologies such as inertia, absorption, adaptation, and transformation typically focus on the extent of local adaptation but are often vague or overlapping in characterizing the form and mechanisms of change. To address this limitation, this thesis uses the NATO policy instruments typology developed by Hood (1983), one of the most widely used typologies in policy studies, as an analytical framework to assess not only the extent of policy change but also how change is implemented through different governance instruments. By combining this typology with a structured content analysis of official documents, the thesis offers a more detailed and operational measure of Europeanization effects in the area of carbon pricing. This approach fills a gap in the existing literature by distinguishing between symbolic, procedural, and substantive policy adjustments and contributes to methodological innovation in the study of EU external governance.

2.2 Europeanization of Environmental Policy

The EU has long been recognized as a leader in environmental policy, and Europeanization has profoundly shaped national environmental governance within and across its member states (Jordan & Liefferink, 2004). Since the 1970s, EU environmental directives and regulations have set common standards on issues ranging from air and water quality to waste management and chemical safety, and have required member states to adjust their laws and enforcement practices.

Scholars have documented extensive policy convergence in European environmental standards as a result of EU legislation (Knill & Lenschow, 2005). This can be considered an example of top-down Europeanization. For example, new member states in Central and Eastern Europe have undergone rapid environmental policy transformation

upon EU accession, transposing hundreds of EU environmental acquis into local law (Carmin & VanDeveer, 2004). This has led to increased institutional capacity for environmental protection and the adoption of EU norms such as sustainable development and precautionary principles. However, the literature indicates that the degree of implementation varies, i.e., there are different cases of Europeanization. While some states have fully internalized EU norms, others have only superficially adapted due to local policies or capacity constraints (Börzel, 2011).

Importantly, environmental Europeanization is not limited to EU members. The concept of external Europeanization or the external governance of the EU highlights how EU environmental norms are disseminated to third countries. One channel is the EU's enlargement and neighbourhood policies. Aspiring members and close partners, such as Turkey and the Western Balkan countries, are encouraged or obliged to comply with EU standards. For example, during Turkey's EU candidacy, compliance with EU environmental directives was pursued as part of the accession process, demonstrating external Europeanization through conditionality. Although Turkey's accession has stalled, research shows that EU environmental policy-making still has a lasting, albeit selective, impact on Turkish law and institutions. This highlights how the EU's soft power and market leverage can lead to convergence in environmental policy beyond EU borders (Savaşan, 2020).

Another mechanism in that regard is international regimes and normative leadership. The EU often acts as a norm entrepreneur in global environmental policies, championing ambitious climate targets and agreements. Scholars such as Ian Manners argue that the EU's identity as a "Normative Power Europe" means that it seeks to export core values, including environmental sustainability, through example and diplomacy

(Manners, 2002). In climate negotiations, the EU has consistently pressed for tighter emissions cuts and binding agreements by influencing other nations' commitments. This normative influence complements material incentives. The EU also uses trade and aid to spread green standards (Yang, 2017). For example, the EU has inserted environmental clauses into trade agreements and promoted initiatives such as forest protection agreements that effectively externalise EU norms. Such strategies result in policy diffusion, with countries outside the EU adopting EU-like regulations either to gain market access or as part of global best practice.

A strong driver of diffusion is the EU's market size and regulatory capacity. What Anu Bradford calls the "Brussels Effect" is when EU regulations become de facto global standards because companies and trading partners choose to comply in order to access the EU market (Bradford, 2020). Environmental regulations clearly illustrate this effect. EU bans on certain chemicals, such as the REACH regulation, have forced firms worldwide to eliminate these substances from products destined for Europe (Angerer et al., 2008). Similarly, EU vehicle emissions standards have affected production globally. A recent study on climate policy convergence between the EU and Turkey found that periods of deepening trade integration were associated with greater alignment of Turkey's climate policies with EU standards (Uğurlu, 2024). Conversely, when political relations deteriorated and EU-Turkey trade slowed, convergence stalled. In essence, access to the EU market acts as a carrot or stick to encourage external actors to implement cleaner technologies and regulations that are compatible with those in Europe. This dynamic is increasingly important in the climate arena, where the EU's decarbonization efforts can have external repercussions.

In short, Europeanization in environmental policy works both internally, by driving member state changes, and externally, by disseminating norms abroad. The EU's environmental acquis, its normative leadership in international area, and its market power have made it a "green regulator" beyond its borders. The concept of Europeanization, therefore, provides a useful lens through which to understand how EU climate initiatives can reshape policies in other countries, particularly the European Green Deal and its components.

There are many studies in the Europeanization literature on how the EU has an impact on policy changes in member and candidate states. While some of these studies analyze the "conditionality" criteria of states in the negotiation process with the EU, some focus on the EU's success in spreading norms outside of member states. There are many studies on the policies and changes pioneered by the EU in the field of environmental policy. For example, Börzel (1998) examined the changes in Spain as a single-country case study of Europeanization of environmental policy making. Bull and Baudner (2004) focused on the Europeanization of Italian regional policy in Italy as a single-country case study. Several studies (Radaelli, 1997; Börzel, 1998) report that European Union rules, such as directives, require legal and administrative changes at the national level. These direct constraints are described as a primary mechanism for domestic policy change.

There are also comparative case studies in Europeanization literature. Prontera (2010) analyzed policy change in electricity policies in France and Italy using the most similar systems design. Another study comparing France and Italy was conducted by Graziano (2011). Here, Graziano examined the adaptation link between domestic employment policy and the European Employment Strategy. Prontera (2010) and Graziano (2011) emphasize that changes in policy structures, actor preferences, and the

degree of policy institutionalization mediate how domestic institutions respond to European pressures. The capacity of these institutions to absorb or resist such pressures is central to the extent and direction of change.

Mendez, Wishlade, and Yuill (2008) conducted a cross-national comparative study using the process tracing method. They contributed to the Europeanization literature by analyzing competition policies in the context of "goodness of fit" and "adaptation". Analyses of Radaelli (1997) and Ganza (2014) highlight the role of European Union policy paradigms and ideas in shaping domestic policy, even when there are no formal legal requirements. This indirect influence is reported to affect policy frames and cognitive structures.

The concept of "goodness of fit", which refers to the fit between the European Union and local policies, is a recurring theme. Several studies (Ganza, 2014; Börzel, 1998; Graziano, 2011; Mendez et al., 2008) report that greater mismatch leads to more significant local adaptation. The degree of policy institutionalization is reported to mediate the effect of Europeanization (Prontera, 2010; Knill et al., 2009). Highly institutionalized systems experience more gradual change, while less institutionalized systems experience more pronounced change. The preferences and bargaining power of national actors (Ganza, 2014), the role of key institutional and social actors (Graziano, 2011), and the level of local opposition (Kelley, 2004) have been identified as important determinants of the nature and extent of local policy transformation.

Across the studies mentioned, the lack of standardized measurement frameworks limits comparability in research on Europeanization and domestic policy change. This study aims to systematically examine whether the change in the carbon pricing policies of non-European countries is a change originating from the European Union and if there

is a change, it aims to demonstrate the "degree of change" in that context. This study aims to contribute to the Europeanization literature by systematically examining EU CBAM's reflections beyond EU borders. Since EU CBAM is a salient topic in international environmental governance and it also aims to provide a fine-grained measurement with structured content analysis, apart from the methods used in the Europeanization literature to show the degree of change in countries' carbon pricing policies.

2.3 Hood's NATO Typology

"The Tools of Government" framework summarized in Christopher Hood's NATO model provides a systematic conceptualization to understand the various tools that governments can use for policy formulation and implementation. This framework is important for policy makers to systematically evaluate the effectiveness, acceptability and feasibility of various policy options and to develop a comprehensive and innovative approach to complex problems. The model divides policy tools into four separate types; Nodality, Authority, Treasure and Organization. These instruments can serve both "substantive" functions that directly affect the achievement of policy objectives, and "procedural" functions that affect the policy development or review process. (Hood, 1983)

Hood's NATO model provides a systematic measurement framework for Europeanization that goes beyond simply observing policy impact. Rather than simply stating that Europeanization has occurred, this model allows for a detailed analysis of how it has occurred and what specific levers the EU has used. For example, in the context of CBAM, it shows that the EU does not simply issue a directive (Authority), but also demands specific data (Nodality), imposes financial costs or incentives (Treasure) and requires organizational adjustments both within the EU and in third countries. This

systematic breakdown allows researchers to identify the specific policy instruments that are most effective in driving Europeanization in a given context, and whether the resulting changes are substantive or procedural, such as the actual emissions reduction target. This shifts the analysis from a qualitative assessment of ‘impact’ to a more structured ‘measurement’ of policy instruments and their effects. The components of Hood’s NATO model are detailed as follows:

Nodality: This refers to a government’s capacity to collect, process and disseminate information. It acts both as a “detector” to understand policy issues and as an “influencer” such as through persuasion or nudge policies. In the context of CBAM, the mechanism relies heavily on Nodality by requiring comprehensive reporting obligations from exporters outside the EU on their established emissions. This data collection is critical for calculating carbon liabilities and acts as an influencer by compelling companies to measure and disclose their emissions, thus promoting transparency and potentially driving internal decarbonization efforts in exporting countries.

Authority: Authority represents a government’s power to create and enforce laws, regulations and rules. It operates both as a detector (i.e., through reporting requirements) and as a coercive actor such as mandating or prohibiting certain actions. CBAM itself is a comprehensive legal arrangement that imposes a carbon price on imports. The EU exercises its Authority by setting the rules for emission calculation, purchase of CBAM certificates and transitional reporting phase. The fact that non-EU countries are “forced to comply” or face “excessive burdens” highlights the coercive power inherent in this regulatory authority.

Treasure: This component refers to a government’s financial power, including its ability to collect taxes and allocate funds. It acts both as an “influencer” through subsidies,

grants or direct spending, and as a “detector” by monitoring economic indicators related to taxation and spending. CBAM directly employs the Treasury by imposing carbon taxes on imports. The income from CBAM certificates or the financial burden imposed on importers acts as a powerful financial lever. The provision allowing Turkish companies to offset their CBAM tax liabilities with local carbon taxes demonstrates how this mechanism effectively influences the flow of financial resources by encouraging non-EU countries to implement their own carbon pricing.

Organization: Organization involves the capacity of a government to establish and manage organizations or groups to carry out policy functions and includes direct organization, multi-level management or external partnerships. The implementation of CBAM relies on various EU institutions, such as the European Commission for strategic oversight and customs officers for implementation. Furthermore, it requires the development or adaptation of national agencies in countries outside the EU to report, verify and potentially manage their own Emissions Trading Systems. The EU’s ‘green diplomacy’ and interaction with partner countries also fall into this category, as they involve organizing diplomatic efforts and cooperation frameworks to promote climate goals.

The analysis conducted with Hood's NATO typology aims to provide insight into the "policy density" and "policy intensity" of countries' policy instruments in the carbon pricing context. The “policy density” refers to the measurement of the breadth of government intervention in a policy area and shows the number of policy targets and instruments in force. It concerns with the diversity of issues that governments address. Policy instruments are the tools used to achieve these targets. For example, while reducing emissions in the transportation sector is a policy objective, the development of

performance standards and the provision of economic incentives can be given as examples of policy instruments to achieve this goal. Policy density increases with the adoption of new targets or instruments (Steinebach, 2022).

On the other side, the “policy intensity” captures changes in the calibration of policy instruments and assesses whether existing policies are becoming less stringent or more generous (Schaffrin et al., 2015). It can be measured by changes such as increasing the intensity of a policy instrument. An increase in policy intensity can be interpreted as a government setting stricter emissions targets or setting an emissions target that applies to all vehicles instead of new vehicles.

The EU’s implementation of CBAM demonstrates a complex, multi-faceted approach to externalizing climate policy. The interaction of these NATO elements demonstrates the strategic complexity of CBAM as a foreign policy instrument. For example, CBAM uses the legal power (Authority) to impose costs (Treasure) calculated on the basis of reported information (Nodality) and therefore requires organizational capacity both within the EU and in third countries. The effectiveness of CBAM relies on the synergy between these instruments. Without accurate emissions reporting (Nodality), the carbon price mechanism (Treasure) cannot operate effectively. The challenges posed by Turkey, such as the tradability of certificates and threshold inconsistencies, and South Korea regarding compliance costs and data transparency, are directly related to the operationalization of these combined NATO elements, particularly Nodality and Treasure.

3. THE POLICY DOMAIN: EU CARBON BORDER ADJUSTMENT MECHANISM

The international community faces an urgent imperative to address climate change, driven by growing environmental concerns and ambitious decarbonization targets set by leading economies. The European Union (EU) is at the forefront of this effort, committing to a significant 55% reduction in GHG emissions compared to 1990 levels by 2030, with the ultimate goal of achieving climate neutrality by 2050 (European Commission, 2021; Council of the EU, 2023). However, a major challenge to achieving these ambitious climate targets is the phenomenon known as “carbon leakage” (Branger & Quirion, 2014; Cifuentes-Faura, 2022).

Carbon leakage occurs when strict climate policies in a region, such as the EU, lead to the relocation of carbon-intensive industries and their associated emissions to countries with less stringent environmental regulations. This relocation can also occur when EU products are replaced by more carbon-intensive imports from countries with lower or no carbon price (Regulation (EU) 2023/956; European Commission, 2021).

The main problem with carbon leakage is that it undermines global emissions reduction efforts because it merely shifts emissions geographically rather than reducing them overall (European Council, 2023). Research confirms that carbon leakage is a real concern (Vivid Economics & ICF, 2021). Without a mechanism such as CBAM, for every tonne of CO₂ emissions avoided within the EU due to the EU’s stricter Emissions Trading System (ETS), approximately 0.19 tonnes of emissions would be ‘leaked’ overseas. This would limit the global emissions reduction from EU ETS reforms to just 0.39%. The Organisation for Economic Co-operation and Development (OECD) also estimates that

13% to 25% of emissions reductions from carbon pricing are offset by such leakages (OECD, 2021).

The EU's response to this challenge, the CBAM represents a significant policy evolution. The EU Emissions Trading System (ETS) requires EU producers to bear the costs of their carbon emissions by applying the “polluter pays” principle domestically. But without an equivalent border mechanism, non-EU producers who are not subject to comparable carbon pricing will gain a competitive advantage in the EU market. This competitive imbalance could encourage further carbon leakage and thus undermine the EU's climate goals. CBAM is designed to extend the “polluter pays” principle to imported goods and equalize carbon costs between domestic and imported products. This mechanism is therefore not only a climate policy, but also a trade policy strategically designed to ensure fair competition across jurisdictions and prevent the erosion of the EU's industrial competitiveness due to different carbon costs. It effectively externalizes the EU's carbon pricing to its trading partners for goods consumed within the EU, ensuring that the environmental cost of production is accounted for independently of the country of origin (European Council, 2023; European Commission, 2020; Regulation (EU) 2023/956).

3.1 Overview of the EU CBAM

Enacted as an integral part of the European Green Deal, the EU CBAM serves as a carbon tariff applied to carbon-intensive products imported into the European Union. Its primary aim is to harmonize the economic conditions of production between EU and non-EU countries by applying the equivalent carbon cost to imported goods as if they were produced within the EU.

This mechanism aims to prevent carbon leakage to countries without a carbon price and will also accelerate domestic decarbonisation efforts by enabling the EU to phase out permits previously granted free of charge to some carbon-intensive sectors within its borders (European Parliament, 2023; Leal-Arcas, Faktaufon, & Kyprianou, 2022).

CBAM officially entered into force on 17 May 2023, marking a critical step in the EU's climate policy framework. The first phase, which includes reporting obligations for importers, was launched on 1 October 2023. Financial obligations requiring importers to purchase CBAM certificates will come into force from 1 January 2026. While the EU has sought to market the CBAM as a tool to promote sustainable trade and support global climate action, its operational design primarily serves as a coercive economic incentive. The CBAM imposes an economic cost on imported goods with high GHG emissions and includes penalties for importers who fail to report emissions or provide false information. This framework acts as an import tariff, increasing the cost of carbon-intensive imports, while also acting as a carbon tax to limit emissions. The direct financial burden placed on foreign producers potentially diverts revenue that could otherwise be used for their own decarbonisation initiatives, reinforcing the perception that the CBAM is a 'stick' rather than a 'carrot'. Thus, while the CBAM aims to achieve global climate targets, its core mechanism is punitive and leverages access to the lucrative EU market to force emissions reductions in third countries (European Commission, 2023; European Council, 2023).

To fully understand CBAM, it is essential to first understand the European Union Emissions Trading System (EU ETS). CBAM is a mechanism linked to the EU ETS and was primarily designed to address the risk of carbon leakage.

3.2 EU CBAM & EU ETS

The EU CBAM is not a standalone policy, but an integral part of the EU's wider "Fit for 55" legislative package. Its design aims to complement and strengthen the EU ETS, aligning climate, transport, land use, energy and taxation policies with the EU's ambitious climate targets. While companies operating within the EU must pay for the carbon emissions they produce under the EU ETS, CBAM ensures that imported products are subject to a similar carbon cost. This prevents production from being relocated to countries with less stringent climate regulations and promotes a level playing field in global climate policy. The key link between CBAM and the EU ETS is that the price of CBAM certificates is determined by the weekly average auction price of EU ETS permits. This direct relationship ensures that the carbon cost applied to imported goods is consistent with the carbon price paid by domestic EU producers (European Council, 2023; European Environment Agency).

A key aspect of the introduction of CBAM is the phasing out of free allowances under the revised EU ETS for covered sectors. Historically, these free allowances were granted to protect EU industries from the risk of carbon leakage and actively support their emissions. However, as the EU tightens its carbon market and increases the overall rate of border reduction, the cost burden on EU producers will increase significantly without a compensatory mechanism. The CBAM was introduced precisely to ensure that imported goods face carbon costs equivalent to those produced in the EU, thus avoiding a disadvantage for EU industries as the free permits are phased out. The phase-out of the free permits will occur over a nine-year period, starting in 2026 and ending in full in 2034. This strategic interaction between the CBAM and the EU ETS serves to shift the burden

of carbon pricing and actively encourages domestic carbon pricing in countries outside the EU (European Parliament, 2023).

The mechanism allows for deductions from CBAM obligations if a carbon price has effectively been paid in the country of origin. This creates a strong economic incentive for non-EU countries to implement their own carbon pricing mechanisms, whether Emissions Trading Systems or carbon taxes, to capture the revenue domestically rather than funneling it to the EU through CBAM certificates. CBAM is therefore not simply a border tax, but an advanced policy tool designed to externalise the EU's climate costs and actively encourage the global adoption of carbon pricing systems. This approach effectively shifts the financial burden of decarbonisation and uses market access as a driver for global environmental policy alignment, encouraging greater climate ambition and action beyond EU borders (European Commission, 2021).

3.3 Core Principles and Legal Basis of CBAM

The fundamental principles of the EU CBAM are based on the necessity to prevent “carbon leakage” and ensure equal competitive conditions for EU industries operating under the strict EU Emissions Trading System (ETS). The mechanism operates by imposing a carbon tax on imported goods, the cost of which is designed to be equal to the carbon price incurred by domestic producers under the EU ETS. The legal basis of the CBAM is Regulation (EU) 2023/956, which entered into force on 17 May 2023 (European Parliament, 2023).

The European Union has consistently claimed that the CBAM has been carefully designed to be compatible with World Trade Organisation (WTO) rules and wider international environmental law. This claim is supported by the claim that the mechanism is non-discriminatory because it aims to reflect the carbon costs applied to domestic EU

production under the ETS. Despite the EU's confidence in the WTO-compatibility of the CBAM, this issue remains a significant source of international tension and a critical design constraint.

While the EU argues that the mechanism applies equally to domestic and imported products and therefore complies with WTO principles, several major trading partners, including China, Brazil, India, South Africa and Russia, have made strong criticisms. These countries argue that the CBAM is inherently discriminatory, protectionist and potentially in violation of core WTO rules, particularly the Most Favoured Nation (GATT Article I) and National Treatment (GATT Article III) principles. Furthermore, concerns have been raised about potential violations of customs duties (GATT Article II) and its interpretation as a de facto quantitative restriction (GATT Article XI). While the EU has sought to justify the CBAM under the environmental exceptions to GATT Article XX, complying with the chapeau of the Article XX, which prohibits arbitrary or unjustified discrimination, is widely considered to be an “uphill battle.” This difference in legal interpretation and the practical effects on trading partners are based on a particular interpretation of international trade law that is not universally accepted, leading to significant legal and political frictions and highlighting the disagreements surrounding this pioneering mechanism (Durel, 2024).

3.4 Scope of Covered Goods and Emissions

The initial scope of the EU CBAM is strategically focused on a selected list of carbon-intensive products considered to be at the highest risk of carbon leakage. Collectively, these sectors account for a significant share of industrial emissions within the EU. The goods currently covered include cement, iron and steel, aluminium, fertilisers, electricity and hydrogen. In terms of emissions, the CBAM covers both direct

(Scope 1) greenhouse gas emissions from the production process itself and, under certain conditions, indirect (Scope 2) emissions, primarily from electricity consumption. During the transition period, indirect emissions are subject to monitoring and reporting for all CBAM goods. However, in the final period, the inclusion of indirect emissions will be limited to certain products.

The EU plans to review and potentially expand the scope of CBAM. An assessment is planned for early 2026 to determine whether its scope should be extended to other EU ETS sectors considered to be at risk of carbon leakage, with the overall goal of including all EU ETS products by 2030. This expansion could cover a wider range of products, such as chemicals, polymers, mineral oil products, paper and pulp (European Commission, 2023).

The initial narrow scope of CBAM and its planned expansion are highly strategic. The EU aims to test the effectiveness of the mechanism and collect real-world data, starting with a limited number of high-carbon-intensity sectors. This phased approach provides a “pilot and learning period” during which the European Commission can refine calculation methodologies, develop verification systems and engage in dialogue with countries outside the EU. This gradual introduction is designed to build capacity among stakeholders, both within the EU and among trading partners, before the full fiscal impacts come into effect. The gradual expansion then allows the EU to gradually increase its environmental and economic leverage and push a wider range of sectors globally towards decarbonization. This demonstrates a carefully considered approach to policy implementation that balances immediate impact with long-term strategic goals for global climate action (European Commission, 2023).

3.5 Transitional and Definitive Periods

The implementation of the EU CBAM is divided into two distinct phases: a transitional period and a definitive period designed to enable businesses and authorities to adapt to the new regulatory framework. The Transition Period was launched on 1 October 2023 and will run until 31 December 2025. At this stage, importers' obligations are limited to reporting only embodied emissions, without any financial payments or adjustments. Importers are required to submit quarterly reports detailing the quantities of imported goods, their direct and, if applicable, indirect greenhouse gas emissions and any carbon price actually paid in the country of origin (European Commission, 2023).

The first quarterly report was due by 31 January 2024. This transition period is explicitly described by the EU as a “pilot and learning period”. Initial attempts to collect these reports were plagued by various technical glitches and systemic complications. This highlights that the transition period serves an important dual purpose, allowing the EU to improve its calculation methodologies and verification systems based on real-world feedback while also compelling non-EU businesses and relevant authorities to establish the necessary data collection and reporting capacities before financial penalties become applicable. The “learning period” is therefore a strategic mechanism to facilitate stakeholders' compliance, collect baseline data for policy improvement, and indirectly stimulate the development of the global infrastructure required for full implementation of the CBAM. The Final Period will begin on 1 January 2026. From this date, importers will be required to register as “authorised declarants” to import goods under CBAM. Annual declarations will become mandatory and will need to be rigorously verified by an independent, accredited verifier. The first annual declaration covering imports made in 2026 must be made by 31 May 2027. Recent proposals propose postponing the sale of

CBAM certificates to February 2027 and moving the annual declaration deadline to 31 August. This gives businesses additional time to prepare. Importantly, the number of CBAM certificates to be delivered will be adjusted to reflect the phasing out of free permits under the EU ETS and any carbon price actually paid in the country of origin, thus avoiding double charging (European Parliament News, 2024; European Commission, 2021; European Parliament, 2023).

3.6 Compliance with CBAM: Reporting, Verification and Certificates

Compliance with the EU CBAM involves a multi-layered reporting, verification and certification system. During the transition period (October 2023 – December 2025), importers are required to submit quarterly reports detailing the quantities of imported goods, the embodied direct and indirect greenhouse gas emissions and any carbon price paid in the country of origin. These will become mandatory annual declarations from 1 January 2026, with the start of the strict period (European Commission, 2021; European Parliament, 2023).

A critical component of the compliance framework is the verification process. Declared embodied emissions must be verified by an independent, accredited verifier to ensure accuracy and reliability. The financial obligation under the CBAM is fulfilled through the purchase and delivery of CBAM certificates. These certificates are available through a common central platform established by the European Commission. The price of these certificates is dynamically determined weekly to reflect the average closing price of EU ETS allowances (EUAs) in the auction (Regulation (EU) 2023/956).

CBAM's strict data transparency requirements represent a significant change for global supply chains. The mechanism requires a high level of transparency and requests specific, product-level emissions data from companies outside the EU, often more detailed than

other existing company standards. While EU importers are legally responsible for the accuracy of this data, they are inherently dependent on their non-EU suppliers to provide it. Initial reporting efforts revealed obstacles, including technical glitches and widespread confusion, and indicated a general lack of preparedness and data availability among suppliers. The consequences of non-compliance or incorrect reporting are serious, ranging from significant financial penalties for importers to the potential loss of market access for suppliers outside the EU (Prazeres & Xie, 2021).

Importers seeking to mitigate their own risks are likely to shift these costs and compliance responsibilities onto someone else through contractual agreements with their foreign suppliers. This creates a strong market signal for non-EU suppliers to invest in robust emissions measurement, reporting and verification (MRV) systems and to actively engage with their supply chain partners to obtain the necessary data. As a result, CBAM is not just a border tax, but it is a profound catalyst for global supply chain transformation, forcing a new era of carbon data transparency and collaboration from raw material extraction to final product. This pressure extends beyond direct exporters to supply chain suppliers, creating a hierarchical impact throughout international production networks.

3.7 CBAM Sectors

The EU CBAM initially targets a specific group of sectors: cement, iron and steel, aluminium, fertiliser, electricity and hydrogen. These industries were selected because of their high energy intensity and significant carbon leakage risks. Producers in these sectors, especially those outside the EU, face increased production costs due to the higher carbon prices imposed by the CBAM. This economic pressure is expected to lead to changes in global trade patterns, as EU importers increasingly seek suppliers with lower carbon footprints to minimise their CBAM-related expenditures. For example, the cement

industry may experience higher costs, which may translate into increased consumer prices within the EU, thus encouraging producers to invest in greener technologies or change their supply chains. Although the direct application of the CBAM is limited to these specific goods, its economic implications are not limited to these sectors alone. The impacts are expected to spread across entire supply chains, affecting downstream products and finished goods containing these carbon-intensive materials. For example, increased costs for basic materials such as steel or cement due to CBAM could lead to higher prices for manufactured goods, construction projects, and infrastructure development (European Commission, 2021; European Parliament, 2023).

3.8 Policy Implementation Process

The implementation of the EU CBAM imposes significant administrative burdens and complex data challenges for exporters outside the EU. The mechanism requires a high level of transparency, requiring highly specific, product-level emissions data from companies outside the EU. (Regulation (EU) 2023/956; European Commission, 2021)

The primary challenge for CBAM declarants (EU importers) is to accurately calculate these specific embedded emissions in imported goods. This requires complex calculations based on detailed information about production processes and emissions from precursor materials. By requesting real data from suppliers, the EU Commission clearly restricts the widespread use of default emissions data. This can be particularly challenging for complex goods or when downstream suppliers in the value chain struggle to collect or communicate relevant data. Initial attempts at quarterly reporting during the transition phase presented significant obstacles, including technical glitches and widespread confusion, leading to fewer reports than expected.

The consequences of non-compliance, submitting false reports or failing to submit the required CBAM certificates are serious, including significant financial penalties for EU importers and potential loss of market access for non-EU suppliers. Importers are likely to pass on these compliance costs and potential liabilities to their foreign suppliers through contractual agreements to reduce their own risk.

Furthermore, the involvement of National Competent Authorities (NCAs) in all 27 EU Member States adds another layer of complexity due to the diverse structures and practices among these authorities, which can lead to a lack of harmonized standards, further complicating the system for both importers and exporters (Hinrich Foundation, 2025).

3.9 EU CBAM's Impacts on Non-EU States

The introduction of the EU CBAM carries significant macroeconomic implications for non-EU countries, with theoretical analyses suggesting potential negative impacts on the development of poorer countries and reduced export-led growth opportunities. A major 2021 study by the United Nations Conference on Trade and Development predicted that the implementation of the CBAM could lead to significant revenue losses for developing countries, estimated at US\$10.2 billion. More broadly, non-EU countries could face collective revenue losses of US\$14.2 billion, while the EU is expected to gain US\$5.9 billion, resulting in an overall net global revenue loss of US\$8.3 billion (UNCTAD, 2021). The CBAM is expected to restructure international trade flows. The mechanism encourages EU importers to shift their sources to cleaner producers, including those countries that already have existing carbon pricing mechanisms or have lower emissions intensities in their production processes. This could lead to a short-term shift in international trade, favoring products with lower embedded emissions. The design

of the CBAM creates a direct competitive advantage for non-EU countries that have inherently lower carbon intensity in their production processes or that have robust local carbon pricing mechanisms in place.

Conversely, countries with higher carbon intensity or lacking local carbon pricing systems will face increased costs and a decrease in their competitive position. This suggests that the CBAM is actively reshaping global competition based on carbon efficiency, rewarding “green” production practices and penalising carbon-intensive ones. It functions as a market mechanism. This dynamic would lead to trade distortion rather than the imposition of direct costs (World Economic Forum, 2023).

3.10 Opportunities for Green Transformation

While the EU CBAM introduces new costs and compliance challenges for non-EU countries, it also creates significant opportunities for green transformation and market differentiation. The mechanism encourages non-EU countries to adopt greener technologies and align their industrial practices with global climate goals. This pressure, while regulatory in nature, could encourage innovation and leadership in low-carbon industrial processes globally. For exporters of carbon-intensive products such as iron, steel and aluminium, the CBAM effectively creates the world’s first global market for low-carbon metals in particular. This allows manufacturers to differentiate their products based on their reduced carbon content, potentially capturing a price premium and gaining a competitive advantage.

To capitalise on this opportunity, exporters are encouraged to adopt a range of strategic responses. These include rigorously measuring and reporting their emissions, setting ambitious 1.5°C-compatible reduction targets, following best practices such as the Science-Based Targets initiative, and implementing comprehensive decarbonization

strategies. Ambitious climate action driven by CBAM can therefore translate into tangible benefits for companies and governments, enabling them to attract new customers, maintain international competitiveness, and promote sustainable economic development in the long term (European Parliament News, 2024).

CBAM acts as a powerful catalyst for a “green race” among exporting countries and companies. The mechanism imposes a carbon cost on imported goods, but this cost is significantly reduced if the production process is less carbon intensive or if a local carbon price has already been paid. This creates a direct and compelling financial incentive for non-EU producers to decarbonize their operations. Moreover, the emerging market for low-carbon products is actively driven by demand from EU importers seeking to minimize their CBAM costs (Council on Foreign Relations, 2023).

As a result, CBAM transforms a regulatory burden into a significant market opportunity. Countries and companies that proactively invest in decarbonization and can transparently demonstrate lower embodied emissions gain a distinct competitive advantage, becoming preferred suppliers in a global economy that increasingly values environmental performance. This dynamic is reshaping global trade by placing environmental performance as a key determinant of market access and competitiveness.

3.11 Global Responses to the EU CBAM

The introduction of the EU CBAM has triggered a widespread international debate, raising questions of fairness, legality and environmental efficiency. Many states, such as Brazil in the BASIC group have viewed the CBAM with concern, describing it as a one-sided “green tariff” that could disadvantage their industries. In a joint statement in 2021, the BASIC countries condemned the CBAM as “discriminatory” and said it contravened the UN principle of Common but Differentiated Responsibilities (CBDR)

for climate action. These countries argue that developed regions, such as the EU, should not impose additional costs on developing countries' exports, given their historical responsibilities for emissions and development needs. (Government of South Africa, 2021)

Critics from middle-income economies often criticize the CBAM for its “green protectionism.” It is seen as a trade measure disguised as climate-motivated, potentially inconsistent with WTO rules and burdensome for less developed producers. For example, the Brazilian government has been one of the most vocal, explicitly describing CBAM as “discriminatory” and warning that it could hinder global climate cooperation. At the COP28 climate summit in late 2023, Brazil, supported by China and others, called for discussions on “unilateral trade measures related to climate change” and demanded a COP declaration expressing “serious concern” about carbon border taxes. This reflects the growing tensions between the EU and some of its partners. As one report put it, a “green trade dispute” is emerging as emerging economies bring trade grievances to the climate talks. At the heart of these complaints is the sense that CBAM could unfairly penalise exports from countries without robust carbon pricing. (Reuters, 2024)

CBAM would force exporters to pay a large deficit per tonne of emissions, increasing the costs of industries such as steel, cement or fertiliser, which are vital to these economies. Countries such as India and South Africa are concerned about the impact on their metals exports, while Brazil is concerned about iron, steel and aluminium exports, which make up a significant portion of its trade with the EU. Furthermore, these countries argue that the revenues from CBAM will go to the EU rather than being invested in green transformations in poorer countries. This is also a point of contention in terms of climate

justice. Some pointed to potential WTO challenges or retaliation if the CBAM were implemented without addressing concerns.

The EU, on the other hand, has resorted to diplomacy to ease concerns, emphasizing that the CBAM is a climate measure applied based on carbon content rather than discriminating by country of origin.

The EU also states that countries can avoid the costs of CBAM by implementing their own carbon pricing, which is an invitation to cooperate on carbon markets. In fact, several advanced economies, such as Canada, Japan and the UK, have expressed interest in similar mechanisms or in aligning with the EU's approach, and discussions of an international "climate club" have gained momentum. Non-European emerging economies are therefore in a strategic position, they can either resist and rally the opposition, or they can turn the tide to their advantage by increasing climate efforts. As detailed in the next section, three non-European emerging economies with significant trade exposure to the EU, South Korea, Brazil, and Turkey, have adopted nuanced responses that blend elements of resistance and accommodation in their policies.

3.12 Selected EU Trading Partners' Responses to CBAM and EU ETS

3.12.1 Turkey

Turkey provides a compelling example of a country heavily exposed to the EU economy and thus motivated to comply with EU climate rules despite political frictions.

As an upper middle-income country, Turkey has a customs union with the EU and sends a large share of its exports to the EU market. Around 50% of Turkey's exports go to the EU and Turkey is also a candidate for EU membership, albeit with negotiations frozen for a long time. These factors mean that EU regulatory changes strongly affect

Turkey. It is often argued that Turkish policies are shaped by external Europeanization or the “Brussels effect.”

Turkey has historically lagged behind EU standards in the environmental arena, but the prospect of EU accession and the modernization of reforms led to the adoption of many EU-like regulations in the 2000s. However, climate policy remains an area of lag. Turkey only ratified the Paris Agreement in 2021 and, until recently, had no carbon pricing in place. The law, which was due to be adopted in 2025, has been suspended due to public opposition. The arrival of the EU CBAM has been a wake-up call for Turkey, given the Turkish economy’s dependence on exports of goods covered by the CBAM, namely steel, cement, aluminium, fertilisers and electricity sectors. Estimates suggest that products covered by the CBAM account for around 10.5% of Turkey’s exports to the EU, representing significant exposure. In the cement, iron and steel and aluminium sectors, Turkey is one of the EU’s largest foreign suppliers, which increases the importance of the CBAM’s influence.

When the European Commission announced its CBAM plans, Turkey’s initial reaction was cautious opposition. The government highlighted potential barriers to EU-Turkey trade and insisted that the EU-Turkey Customs Union should not be undermined. Turkey has referred to the principles of fairness and reciprocity in its official communications, arguing that the implementation of the CBAM must respect the spirit of the customs union. Turkish officials were concerned that the CBAM could act like an external tariff or regulation that would impede their exports, effectively penalizing Turkey despite its customs union status. Officials noted that Turkey would be uniquely affected unless a cooperative solution was found. This could be seen as a resistance phase

in which Turkey resorts to its special relationship with the EU to seek exemptions or adjustments (Tastan, 2022).

At the same time, Turkey has wasted time in developing a local strategy to cope with the looming reality. In 2021, it announced a Green Deal Action Plan that directly acknowledges EU Green Deal initiatives such as CBAM as drivers of change. The plan included a commitment to work on sectoral impacts of CBAM and to establish monitoring mechanisms for industrial emissions. Most importantly, Turkey has begun developing its own emissions trading system. Compliance with the EU ETS is visible. Turkey aims to “integrate a form of ETS into its economy, offsetting the costs expected from CBAM.” In other words, if Turkish companies have to pay a carbon price, Ankara would prefer that this be done in Turkey through a local ETS rather than in Brussels.

Indeed, analysis suggests that if Turkey were to implement a carbon price of around €50 per tonne, close to EU levels, not only would CBAM costs for exporters fall sharply, but Turkey’s GDP could actually increase (by around 1% by 2032) compared to a scenario without domestic carbon pricing. In essence, investing in decarbonization and avoiding paying CBAM to the EU would be a net economic positive for Turkey. TÜSİAD commissioned studies on the costs of CBAM to Turkish businesses, estimating an annual cost for Turkey of €1.1–1.8 billion depending on carbon prices. Other studies have found that if nothing changes, Turkish exporters could pay around €400–700 million in CBAM fees annually by 2026. These findings have galvanized support for local measures. Rather than openly opposing CBAM, Turkey’s business community has advocated turning it into a driver for modernization. TÜSİAD advocated investing in cleaner production, adopting green technology and ensuring Turkey remains integrated into European value chains. (Yeldan, Acar, Aşıcı, & Ünüvar, 2020)

The government responded with support measures, creating plans to help exporters calculate and reduce the carbon content of their goods. Turkey has provided various aids to firms, such as emission checks for export products, to comply with CBAM until 2024. Politically, Turkey remains in a somewhat precarious position. On the one hand, its relationship with the EU is “half frozen” in areas such as accession and political reform. On the other hand, climate and economic interdependence are challenging cooperation. Turkish politicians recognize that there could be mutual benefits to aligning with EU green standards. They acknowledge that reducing local pollution, improving innovation and avoiding being left behind as the world economy is following low-carbon technologies. Analysts say CBAM is encouraging Turkish rhetoric on the “green transformation” of the economy. Turkey will reportedly leverage its strengths to maintain its export competitiveness.

Ultimately, Turkey’s response to CBAM exemplifies Europeanization in action. Faced with EU foreign policy pressure, Turkey is making domestic changes, such as adopting EU-like climate policy tools, to protect its economic interests and potentially open up new growth avenues. The country has moved from early resistance, citing a customs union and justice, to pragmatic compliance with the ETS and other reforms in its planned process. Given the public backlash and economic challenges, it remains unclear how fully Turkey will implement them, but the trajectory underscores the attractiveness of the EU market and its rules. As one analysis concisely put it, “from a political perspective, CBAM is an attempt to extend the scope of EU-wide regulations to the bloc’s major trading partners,” forcing partners like Turkey to comply or face tariffs. Turkey appears to prefer alignment with its own “Europeanized” policies, which see the EU reaching beyond the formal boundaries of environmental governance (Weise, 2021).

3.12.2 South Korea

South Korea is a prominent example of an emerging economy grappling with the impacts of CBAM. The EU is a major export market for Korea's steel, electronics, and other industrial goods, and sectors targeted by CBAM account for a significant portion of Korean exports. Korea also boasts climate leadership among Asian countries. It was one of the first countries in Asia to implement a national Emissions Trading Scheme. Launched in 2015, the Korea ETS (K-ETS) covers the top 600 emitters and ~67–79% of national emissions. In theory, having a carbon market would put South Korea ahead of many of its peers and could reduce its exposure to CBAM.

However, a critical issue is the carbon price differential. Korea's carbon price has been much lower than the EU's. In early 2025, the K-ETS price was only about \$6-7 per ton, while the EU ETS was around \$85. This difference means that without adjustments, Korean exporters would have to pay the difference as CBAM tax. It implies a potentially heavy cost for steel, cement, aluminum shipments, etc. South Korea's response was twofold. First, it engaged in diplomatic engagement to reduce the trade impact of CBAM and made domestic policy adjustments to prepare its industries. (ICAP, 2024)

On the domestic front, South Korea is increasing its carbon pricing system and transparency. Realizing that a higher K-ETS price or stricter accounting could reduce CBAM payments, the government has begun consulting stakeholders on ETS reform. There is an effort to improve the MRV (Monitoring, Reporting, Verification) of emissions to meet strict international standards. In 2022, Korean officials have even suggested opening negotiations with the EU to “recognize carbon cuts achieved under the K-ETS under the CBAM.” (Carbon Pulse, 2022).

In other words, Seoul wants the EU to credit its domestic climate efforts. Ideally, it would exempt Korean exports if they have already paid into the K-ETS. While the rules of the CBAM already allow for explicit carbon costs to be deducted, Korea could seek a more formal link or at least confirmation that its ETS is compliant. Korea could choose to increase the carbon price over time to narrow the EU gap and use the CBAM as domestic justification for stricter climate policy. Choosing to increase the carbon price over time and bring it to levels similar to the EU CBAM would mean increased cooperation with the EU and greater implementation of EU norms. However, this option remains politically sensitive, as the industry fears losing its competitiveness in other markets without similar measures.

Overall, South Korea's stance combines cooperation and caution. It does not explicitly oppose CBAM in principle. In fact, as a technologically advanced economy with net-zero commitments, Korea sees value in global carbon pricing. But it has expressed a willingness to shape the mechanism in a way that is fair and recognizes early movers.

Korean politicians talk about ensuring that CBAM “does not act as a trade barrier,” which can be interpreted as a desire for rule-based fairness. South Korea's approach blends adaptation and policy alignment, with respect to its existing ETS and potential reforms, as well as advocacy through alliances and negotiations, in response to pressures for Europeanization in a country's climate policy.

3.12.3 Brazil

Brazil offers a contrasting narrative, combining vocal opposition to CBAM with recent moves toward domestic carbon pricing. Brazil-EU relations are complex on environmental issues. Brazil was a major exporter of CBAM goods, namely iron, steel,

aluminum and pulp, but under the previous government (2019-2022) Brazil rolled back its environmental policies and clashed with the EU over deforestation and climate commitments. The EU's push for a "green agenda" in the EU-MERCOSUR trade agreement and CBAM has been met with skepticism in Brazil. Brazilian authorities have consistently criticized CBAM as unilateral and unfair. (Weise, 2023)

As noted, Brazil, along with India, China, and South Africa, has called it "discriminatory" and has sought to mobilize opposition from the Global South. Even under President Luiz Inácio Lula da Silva, who took office in 2023 with a pro-climate stance, Brazil's official line was that measures like CBAM could "hinder rather than help" climate efforts if they undermined the economic growth of developing countries. (Weise, 2023).

At COP28 in Dubai, Brazilian negotiators pushed strongly for language critical of carbon border adjustments, framing them as contrary to an "equitable and just transition." Brazil has also signaled that it could use the WTO to challenge the legality of CBAM, or at least join forces with others to pressure the EU. However, in parallel with this rhetorical resistance, Brazil is moving toward policy changes that align with the global decarbonization drive.

Most notably, in late 2024, Brazil passed legislation to create a national Emissions Trading System (ETS). In November 2024, during the COP29 climate conference, the Brazilian Congress passed legislation establishing the Sistema Brasileiro de Comércio de Emissões (SBCE), a cap-and-trade framework for greenhouse gases. President Lula signed the legislation into law by December 2024. The SBCE law establishes the structure for a regulated carbon market, with mandatory emissions reporting for large emitters (>10,000 tCO₂/year) and the phasing in of caps and trade over the next 5–6 years. While

the system will take time to become fully operational, its adoption is a milestone for Brazil's climate policy. Brazil has committed to an ambitious 50%+ emissions reduction target by 2030, and the ETS is seen as a tool to help achieve this.

The timing and content of Brazil's carbon market suggest that international drivers such as the EU Green Deal and CBAM are playing a role. Brazilian diplomats have acknowledged that they need to "prepare for a carbon-constrained global economy" to avoid trade losses. Establishing an ETS could be interpreted as Brazil aligning with emerging global carbon pricing norms, potentially to gain goodwill and perhaps seek exemptions or leniency under mechanisms such as CBAM.

It is important to note that Brazil's new climate stance differs from that of the previous administration under Lula. While former President Bolsonaro's government downplayed climate concerns, Lula's government has sought to reengage with the EU and global climate leadership. Yet even Lula's Brazil argues that equity should be central. Brazilian officials argue that if the CBAM goes ahead, revenue should ideally be channeled into climate finance for developing countries, not held in EU coffers. However, the EU has not made any such commitments.

Brazil also emphasizes common global standards. It prefers multilateral approaches, such as an international carbon price or cooperation mechanisms under the Paris Agreement, over unilateral measures. Brazil's response can be seen as dual. It openly leads a coalition to contest the terms of the CBAM to ensure that it is not detrimental and it is establishing its own system domestically, adopting similar instruments. It aims to protect revenues by establishing its own Emissions Trading System.

In short, Brazil sees the CBAM as a difficult externality imposed by a key partner, and its initial response has been to resist it on principle and seek a multilateral solution. However, Brazil is shifting its axis to adapt. This is evidenced by the launch of a carbon market that is in significant alignment with norms such as carbon pricing and accountability that CBAM supports. How much Brazil will adapt to raise carbon prices and adjust export processes may depend on ongoing EU-Brazil dialogues and the outcome of broader negotiations and trade agreements. Brazil's case highlights that Europeanizing climate policy beyond the EU often faces backlash in terms of fairness but can indirectly encourage policy convergence as countries decide to shape their own destiny in response to EU initiatives.

3.13 Comparative Overview Europeanization Dynamics

As discussed, the concept of external Europeanization directly explains a situation like Turkey. The EU, intentionally or unintentionally, exports its policy model to its neighbors. According to İzci Connelly, the Europeanization of Turkish environmental policy has remained limited. Although EU conditionality has encouraged sustainability discourse, it has not led to a significant transformation due to Turkey's specific circumstances, such as development priorities, national security concerns, and the low credibility of EU awards (İzci Connelly, 2012).

According to Europeanization theory, there are some mechanisms in this process; these are “conditionality” for candidate countries, “economic competition” for trading partners, and “social learning”. (Börzel & Risse, 2007) The decisions of Turkey and South Korea to implement ETSs can be seen as policy diffusion from Europe. Both have been exposed to EU climate policy networks and have learned lessons.

In Turkey's case, being an EU candidate and being in the Customs Union means long-term exposure to EU norms. Therefore, adopting an ETS and climate laws is framed internally as catching up with Europe. Europeanization also emphasizes internal intermediary factors.

Balkır, Bölükbaşı, and Ertugal (2013) argue that Europeanization in Europe's Southern periphery has emerged through dynamics of continuity and change, where compliance is often selective, negotiated, and constrained by entrenched institutional legacies. This perspective is particularly important for understanding how non-EU powers, such as Turkey and Brazil, respond to regulatory instruments such as the EU CBAM. In Brazil's case, policy responses to the EU's decarbonization agenda have been shaped by developmental priorities, centralized decision-making structures, and limited public consultation, leading to fragmented and instrumental compliance. (Balkır, C., Bölükbaşı, H. T., & Ertugal, E., 2013)

In Brazil, the domestic political change from Bolsonaro to Lula has significantly changed the receptivity to EU influence. During the Bolsonaro era, there was no effort or aim to Europeanize environmental norms. However, during the Lula era, a convergence of European norms is observed. It can be said that Brazil has moved from the process of withdrawing its partnership ties with the EU on environmental and climate change issues to a process of "re-Europeanization", that is, realignment with the global norms advocated by the EU.

The CBAM example shows that Europeanization in the environmental sphere is not a one-way street, but involves negotiation, contestation and accommodation, and richly illuminates the dynamics of international relations in the context of the Green Deal. The literature on Europeanization increasingly emphasizes that compliance with EU

norms is neither automatic nor uniform across countries. Instead, domestic institutional configurations, economic priorities, and political structures play a critical role in shaping how external pressures, such as those originating from the EU's climate policy regime are internalized.

3.14 Classification of EU CBAM Instruments under the NATO Typology

Table 3.1 categorizes the key components of EU CBAM according to Christopher Hood's typology of NATO policy instruments. This typology allows for a structured analysis of how the EU operationalizes its regulatory, informational, financial, and organizational tools in implementing CBAM. The design is dominated by authority-based tools, including binding regulations such as Regulation (EU) 2023/956, third-party verification, penalties, and the legal obligation to purchase CBAM certificates.

Nodality tools, such as the EU CBAM database and MRV mechanisms, support transparency. Treasure tools are embedded through the ETS price link and revenue allocation, while organizational capacity is reflected in the establishment of National Competent Authorities (NCAs) and structured ministerial coordination.

Table 3.1 *Classification of EU CBAM Instruments under the NATO Typology*

EU CBAM Components	Nodality	Authority	Treasure	Organization
Technical assistance, consultations and joint programmes for developing countries				✓
EU CBAM database (transparency tool)	✓			
Regulation (EU) 2023/956		✓		
Third-party verification requirement		✓		
Penalties for non-compliance		✓		
Obligation to purchase CBAM certificates		✓		
CBAM price linked to EU ETS price (auctions)			✓	
Monitoring, Reporting and Verification (MRV)	✓			
CBAM revenue earmarking (e.g. climate fund under EU budget)			✓	
National Competent Authorities (NCAs)				✓
Feasibility studies and impact assessment reports of the ministerial bodies				✓

This categorisation not only demonstrates the EU's multi-instrumental policy structure to carbon pricing policies, but also provides a benchmark for assessing third countries' compliance with CBAM requirements.

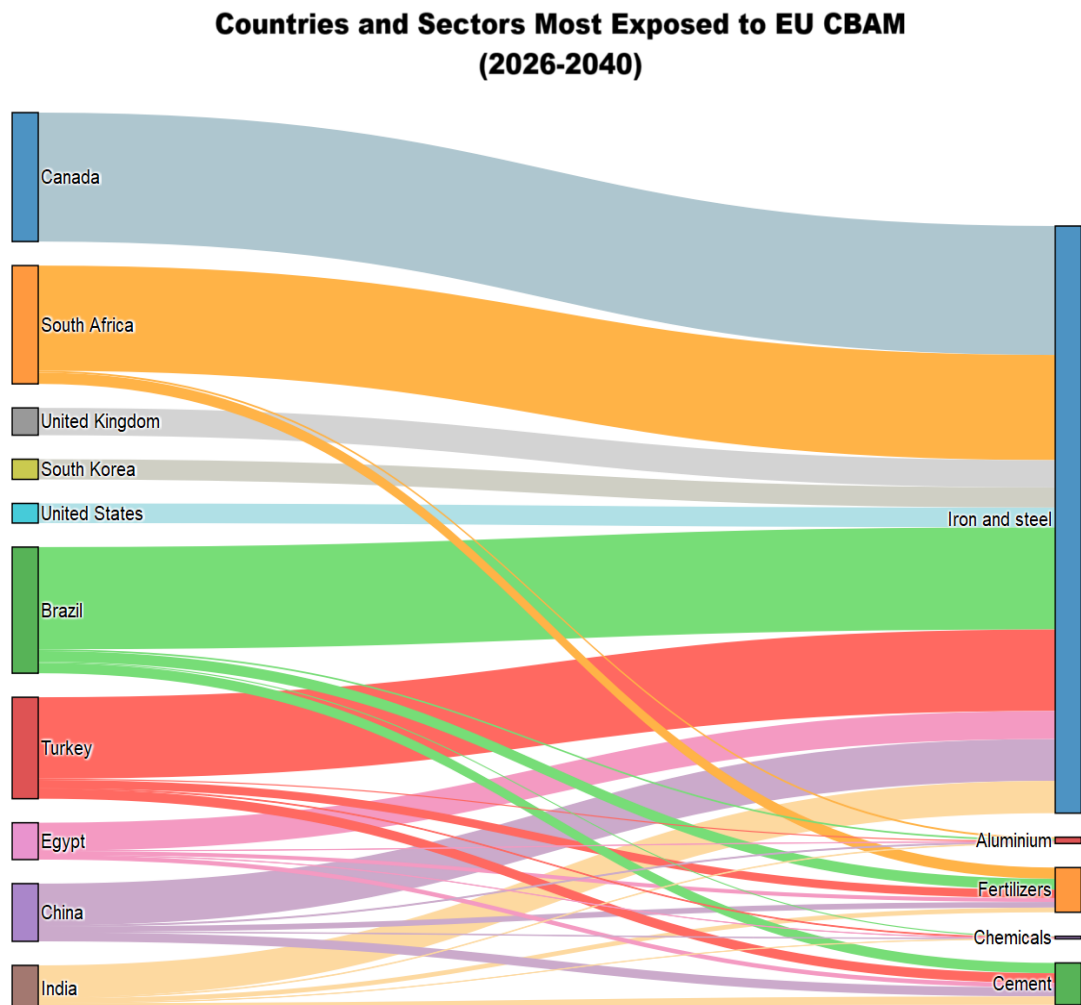
4. COMPARATIVE RESEARCH DESIGN

This study employs a comparative qualitative research design to examine how three non-EU emerging economies, namely Turkey, South Korea, and Brazil, respond to the EU CBAM. The research is grounded in Europeanization theory and operationalized using Christopher Hood's NATO typology of policy instruments, enabling a systematic and fine-grained analysis of how EU climate change norms diffuse beyond its borders.

4.1 Case Selection and Scope

The selection of Turkey, South Korea, and Brazil is based on their significant exposure to CBAM-related costs and their varying degrees of institutional and economic alignment with EU climate norms. All three countries export significant amounts of iron, steel, cement, and aluminum to the EU, and these sectors are directly targeted by CBAM. Moreover, these countries reflect a variety of political economies. Turkey is an EU candidate with a Customs Union, South Korea is a technologically advanced democracy with a mature emissions trading scheme, and Brazil is a resource-rich economy that recently underwent an environmental policy overhaul and is a member of the BASIC group, which advocates for "climate justice." This diversity allows us to track how similar external pressures have created changes in domestic politics. The temporal scope extends from 2005 to May 2025, covering developments before and after the Paris Agreement and the EU's evolving climate governance instruments.

Figure 4.1 *Countries and Sectors Most Exposed to the EU CBAM, 2026–2040*



Source: Author's own visualization based on data adapted from S&P Global Commodity Insights (2023).

Figure 4.1 shows that countries such as Brazil, Turkey, and South Korea are among the countries most exposed to CBAM-related costs, particularly through emissions embedded in iron and steel exports. These countries also differ significantly in terms of carbon pricing mechanisms, levels of EU trade integration and normative alignment with European climate standards, making them well suited for a structured comparative analysis.

South Africa is not included in this analysis because it shares several key characteristics with Brazil as part of the BASIC emerging economies group. This decision reflects the need to limit the regional concentration of cases and ensure a diverse representation of political economies and regulatory traditions. Furthermore, South Africa's unique energy mix, socio-economic challenges, and climate policy trajectory shaped by EU relations warrant focused, independent research. Given its significant exposure to CBAM and its central role in climate diplomacy, future research should consider South Africa as a primary case or within a regionally specific comparative framework.

This analysis therefore offers a strategic balance between CBAM vulnerability, institutional diversity, and geopolitical importance. Other critical cases, such as South Africa, remain important to expand the scope of this analysis in subsequent research.

4.2 Data Collection and Sources

This study examines over thirty official policy documents, including Nationally Determined Contributions (NDCs), Emissions Trading System (ETS) legislation and frameworks, Biennial Update Reports submitted to the UNFCCC, presidential circulars, ministerial declarations, regulatory roadmaps, sector-specific CBAM compliance assessments, Green Deal action plans, and carbon pricing feasibility studies.

Primary data was obtained from national ministerial websites, UNFCCC Biennial Update Reports, and the Climate Laws¹ database. Portuguese and Korean documents were translated by the researcher. Additionally, ministerial announcements on platforms

¹ <https://climate-laws.org/>

such as LinkedIn and X (formerly Twitter) were monitored to track regulatory updates in real time.

4.3 Analytical Framework: Operationalizing NATO Typology

To systematically analyze the degree and nature of policy change in response to the EU CBAM, this study used qualitative content analysis of more than thirty official policy documents from Turkey, South Korea, and Brazil. The analytical framework was based on NATO typology, which categorizes policy instruments into four functional types: Nodality, Authority, Treasury, and Organization. Each identified policy instrument was assigned a score, such as Low, Medium, or High, to reflect its intensity. Coding was conducted in two stages: first by identifying the NATO category and then by assessing the instrument's strength or importance. To increase reliability, a cross-checking process was implemented between coders. Following initial coding by the researcher, a second coder with expertise in policy tools reviewed the selected examples. Discrepancies were discussed and resolved through iterative dialogue, ensuring consistency and enhancing the robustness of the measurement process.

Each document was coded manually using a three-point ordinal scale for each NATO dimension: 1 = Low Intensity, 2 = Medium Intensity, 3 = High Intensity.

Table 4.1 illustrates the criteria used to assign values to each NATO instrument dimension. It provides concrete examples that guide the coding process and help ensure consistency across cases. This structured approach ensures that each country's policy instruments are transparently classified according to their level of legal applicability, institutional depth, and alignment with EU CBAM expectations.

Table 4.1 *Coding of CBAM Instruments 0.1*

Type of Policy Instrument	Low	Medium	High
Nodality	No or very limited emissions reporting; no MRV regulation in place. e.g., no sectoral roadmap or public guidance on CBAM	Some MRV systems in development; sector-level awareness rising. e.g., MRV draft legislation, pilot projects, limited guidance	Comprehensive MRV in place, sectoral data disclosed, CBAM-specific reports or dashboards published. e.g., quarterly emission disclosures, sectoral CBAM impact analysis
Authority	No binding rules; only voluntary action plans or proposals. e.g., CBAM is mentioned in political discourse but no law	Draft ETS or climate law exists; partial legal convergence. e.g., ETS exists but not yet enforced or price too low to affect trade	Full ETS or carbon law implemented with CBAM-compatible rules. e.g., legal obligation for carbon pricing; penalties enforced
Treasure	No carbon pricing; no fiscal support for decarbonization. e.g., no tax, no ETS, no subsidies for exporters	ETS or carbon tax exists but price is far below EU level (e.g., <€20/ton). e.g., ETS price ~\$7 like South Korea	ETS or carbon tax in place with price approaching EU ETS levels (€50–€90/ton). e.g., domestic pricing allows deduction from CBAM
Organization	No dedicated agencies for carbon policy; no CBAM-related body. e.g., climate governance fragmented, limited coordination among several ministries	Partial structures in place, existing ministries work for CBAM. e.g., the Ministry of Trade provides CBAM seminars, but customs are unprepared	Specialized CBAM response teams, MRV agencies, and carbon registries functioning; cross-ministerial coordination active. e.g., designated ETS authority with legal and technical resources

Importantly, the coding was conducted with explicit reference to compliance with the EU CBAM regulations. The mere existence of a carbon pricing mechanism, such as an ETS, was not considered sufficient for a “High” score under the Treasure dimension unless it showed price convergence or formal alignment with the EU ETS. For example, although South Korea has an operational and institutionally strong ETS, it did not receive a “High” score in the Treasure dimension due to its continued price gap with the EU ETS. This approach ensures that intensity scores not only reflect domestic policy capacity but also the extent of external alignment with EU regulatory standards.

This framework enables a systematic comparison of policy instruments across cases, capturing the depth and mode of domestic change in response to CBAM through the lens of both instrument choice and Europeanization dynamics.

5. MAPPING POLICY INSTRUMENTS THROUGH THE NATO LENS:

TURKEY, SOUTH KOREA AND BRAZIL

The global imperative to combat climate change has spurred diverse but interconnected carbon pricing mechanisms in emerging economies. This section provides a detailed analysis of the carbon pricing mechanisms and national climate policies of Turkey, South Korea and Brazil, as well as the impact of the EU climate agenda on this issue.

While all three countries are committed to long-term net-zero targets, there are significant differences in their short-term policies. Turkey, a candidate country and party to the Customs Union, is under intense pressure from Brussels and is forced to develop an ETS despite domestic political obstacles and fossil fuel dependency.

South Korea, an industrial powerhouse, relies heavily on nuclear energy and Carbon Capture, Utilization and Storage (CCUS) to meet its ambitious targets, but its domestic carbon pricing system (K-ETS) exhibits design differences from the EU ETS, making it vulnerable to the CBAM.

Brazil, a leader in natural capital and biofuels, faces challenges in extending carbon pricing to agriculture, one of Brazil's most important sectors. However, it is making strong progress in reducing deforestation, driven in part by EU regulations.

5.1 Turkey

This report provides an in-depth analysis of carbon pricing policies in Turkey, utilizing a comprehensive review of official documents issued by Turkish government agencies, including Ministries and the Official Gazette, as well as Nationally Determined Contribution (NDC) submissions to the United Nations Framework Convention on

Climate Change (UNFCCC). Eleven documents were analyzed for Turkey. Notably, since Turkey only ratified the Paris Agreement in 2021, no evidence of carbon pricing policies was identified before this date.

In this report, most of the policy documents were enacted at the national level. Nationally Determined Contributions (NDCs) are the only instance of legally binding policy documents at the international level. NDC refers to each country's self-defined commitment to reduce GHG emissions and adapt to climate change. This official commitment is submitted by countries that ratified the Paris Agreement. While the Paris Agreement requires countries to submit NDCs, the targets themselves are not legally binding. However, these targets are important for countries' position in the international arena. The parties to the Paris Agreement must update their NDCs every five years with more ambitious policies. NDCs include both mitigation and adaptation strategies. According to the Constitution of Turkey, in case of a conflict between an international treaty on fundamental rights and a national law, the treaty prevails. Therefore, it can be said that NDCs are one of the most significant parts of this analysis with the Paris Agreement and its obligations. The documents examined for Turkey are listed in Table 5.1.

Table 5.1 *The Policy Documents Analyzed for Turkey*

Name of the Document	Institution/Ministry	Date	Legal Status
Green Deal Action Plan	Ministry of Commerce	14/07/2021	Action Plan
Green Deal Action Plan (Yeşil Mutabakat Eylem Planı)	Presidency	16/07/2021	Presidential Circular
Medium Term Program	Presidency	04/09/2022	Presidential Decision
Green Agenda	European Union & Republic of Türkiye Ministry of Environment, Urbanization and Climate Change	Jan 2023	Operational Programme
Green Deal Action Plan Report (Yeşil Mutabakat Eylem Planı Raporu)	Ministry of Commerce	28/04/2023	Informational Report/Analysis
EU CBAM Transitional Implementation	Ministry of Commerce	21/06/2023	Informational Document
Impact Analysis Report	Ministry of Commerce	21/06/2023	Informational Report/Analysis
EU CBAM Iron & Steel Sector	Ministry of Commerce	31/07/2023	Informational Document
EU CBAM Aluminium Sector	Ministry of Commerce	02/08/2023	Informational Document
EU CBAM Cement Sector	Ministry of Commerce	03/08/2023	Informational Document
Climate Change Law Draft	Ministry of Environment, Urbanization and Climate Change		Code (proposed but withdrawn)

In this section, Turkey's carbon taxation policy vision and official documents will be analyzed using Hood's NATO framework.

5.1.1 Green Deal Action Plans

Turkey's engagement with CBAM began in 2021 with the publication of the Green Deal Action Plan by the Ministry of Commerce. Shortly after, a Presidential Circular with the same title was issued. Although both documents share the same name, they differ in terms of legal bindingness and content. Since these two documents share the same name, their titles will be distinguished by appending their statuses: Green Deal Action Plan by the Ministry of Commerce and Green Deal Action Plan Presidential Circular.

5.1.1.1 Green Deal Action Plan by Ministry of Commerce

The Green Deal Action Plan, published by the Ministry of Commerce on 14/07/2021, clarified Turkey's intention to align with the EU Green Deal. Turkey provided information on CBAM, Green Finance, and Circular Economy within the scope of the Green Deal to save its global competitiveness and strengthen its integration with the EU market. With this document, the goals of the EU Green Deal were accepted for the first time, and integration efforts were initiated. Unlike the Green Deal Action Plan Presidential Circular, which is more legally binding, the Green Deal Action Plan by Ministry of Commerce includes references to CBAM and ETS instruments. In contrast, the Green Deal Action Plan Presidential Circular does not mention policy instruments.

Targets: Turkey has outlined its initial targets regarding Carbon Regulation in this document, emphasizing preparatory actions rather than concrete emission targets. These targets primarily focus on feasibility studies related to carbon taxes, spurred by the EU CBAM. Within this framework, Turkey aims to model the effects of the CBAM on energy-intensive and resource-intensive sectors through scenario-based analyses, studying these impacts on a sectoral basis to determine necessary actions. To support the reduction of greenhouse gas emissions, a roadmap or specific activities will be identified

for priority manufacturing industry sectors that are likely to fall under the scope of the Carbon Tax Regulation. In addition, studies will be carried out to determine Türkiye's position on carbon pricing, taking into account the EU's Border Carbon Regulation. In parallel, the economic effects and additional costs that may arise for various sectors will be evaluated, and potential support mechanisms to manage these increased costs will be considered.

As part of these preparatory efforts, Turkey aimed to develop its greenhouse gas emission monitoring system for industrial sectors to meet emerging needs. In addition, the country will work on establishing certification activities that comply with methodologies and standards defined by the EU, while seeking technical support for reporting. These measures reflect Turkey's commitment to aligning its regulatory and technical frameworks with international standards, particularly those set by the EU CBAM.

Nodality: In the "Policies and Measures Related to Foreign Trade" section under the "Current Account Balance" heading of the program, it is stated that "*necessary studies and preparations will be conducted in coordination with the EU*" to ensure alignment with the European Green Deal in Turkey's exports to the EU within the framework of the Turkey-EU Customs Union. The program further outlines that the progress and developments regarding these actions will be monitored quarterly by the primary coordinating institution and reported to the relevant Working Group. The Green Deal Action Plan Presidential Circular established the Working Group with its structure and objectives clearly defined. Further details regarding the Working Group are provided under the "Authority" heading of the Presidential Circular.

Authority: Based on the insights gained through consultations, the aim is to protect and enhance Turkey's integration with the EU under the Customs Union while developing a roadmap to adapt to the potential impacts of climate change policies on trade. An Action Plan has been formulated with contributions from all member institutions of the Working Group.

Treasure: The National Energy Efficiency Action Plan, prepared by the Ministry of Energy and Natural Resources considering Turkey's current needs and global best practices, aims to enhance the effectiveness of support models for energy efficiency, develop sustainable financing mechanisms, and provide additional financial support for energy efficiency investments. As part of this effort, establishing a "Financing Mechanism" has been outlined as a key initiative.

Organization: Under the coordination of the Ministry of Commerce, a Working Group was established at the Deputy Minister level on February 4, 2020. The group includes the participation of the Presidency's Strategy and Budget Directorate, along with representatives from the Ministry of Environment and Urbanization, the Ministry of Foreign Affairs, the Ministry of Energy and Natural Resources, the Ministry of Treasury and Finance, the Ministry of Industry and Technology, the Ministry of Agriculture and Forestry, and the Ministry of Transport and Infrastructure.

Overview: This document was prepared in alignment with the EU Green Deal and frequently references its framework and objectives. Additionally, the document's goals are closely linked to Phases I and II of the EU CBAM, reflecting Turkey's efforts to harmonize its policies with the evolving international trade and climate agenda. Organized by the Ministry of Commerce as part of the Green Deal Action Plan, it marks Turkey's initial step towards establishing a carbon pricing mechanism. While the

document does not set particularly ambitious targets, it lays the groundwork for harmonization studies by establishing a Working Group and a Roadmap.

The document incorporates concepts of Nodality, Organization, and Authority, which align with NATO's classification system. The policies discussed with EU authorities regarding integration and certification for a carbon pricing policy consistent with EU standards represent Nodality. The identification of specific ministries to address these issues highlights Organization, while the strategic targets set by Turkey align with Authority. The targets primarily serve as feasibility studies for the implementation of a carbon pricing mechanism.

The targets outlined under the Treasure heading can be interpreted as a demand for green finance to secure sustainable funding mechanisms to support its climate and environmental initiatives. Additionally, the lack of specific CBAM sectors in the document provides significant insight regarding the flexibility and non-binding nature of the commitments at this stage, suggesting a cautious approach to defining sector-specific obligations.

5.1.1.2 Green Deal Action Plan - Presidential Circular

In the Green Deal Action Plan Presidential Circular published on July 16, 2021, in the Official Gazette of the Republic of Turkey, President Erdoğan highlighted the significance of the CBAM and outlined details about the establishment of a commission dedicated to CBAM. According to the circular, the commission will operate under the Ministry of Commerce, in collaboration with other relevant ministries. Following the establishment of this circular, there was a notable increase in publications by the Ministry of Environment and the Ministry of Trade concerning the EU CBAM.

The Green Deal Action Plan, published as a Presidential Circular, is the most legally binding document and imposes legal obligations. The Green Deal Action Plan Presidential Circular is a framework document that has formed the basis for subsequent policy papers.

The purpose of this document was to establish the Green Deal Working Group and coordinate various ministries to develop a comprehensive road map. It should be reviewed in conjunction with the Green Deal Action Plan prepared by the Ministry of Commerce.

Unlike the Green Deal Action Plan prepared by the Ministry of Commerce, this document does not address the instruments to be employed. In this analysis, the Green Deal Action Plan Presidential Circular emerges as the most legally binding document. Therefore, the omission of emission reduction targets and policy objectives in Turkey's most legally binding document is significant in terms of 'policy density.' Given that the entire Green Deal Action Plan Presidential Circular pertains to the Green Deal Working Group and also holds the status of a law-like document, it can be classified as both "O" and "A" according to NATO classifications.

Considering that the Green Deal Action Plan documents represent Turkey's first official steps toward carbon pricing, this can also be interpreted as Turkey's reluctance to declare its targets and assume obligations during the CBAM Phase I stage.

This document does not include sectors with high emissions or Green Deal sectors. In this legally binding document, the policy objective is stated as maintaining and furthering Turkey's relationship with the European Union Customs Union.

Organization: To oversee the implementation of the Action Plan, align activities with global policy developments, and ensure effective coordination, the Green Deal

Working Group was established. Chaired by the relevant Vice President of the Ministry of Commerce, the group includes the Vice Presidents of Strategy and Budget, Labor and Social Security, Environment and Urbanization, Foreign Affairs, Energy and Natural Resources, and Treasury and Finance, along with Deputy Ministers from the Ministries of National Education, Industry and Technology, Agriculture and Forestry, and Transport and Infrastructure

Overview: This document references the EU Green Deal and can be associated with CBAM Phase I. In the third paragraph, collaboration with the European Union is mentioned. While the document does not include specific targets directly engaging with CBAM and ETS instruments, its emphasis on compatibility with the Green Deal and alignment with the EU underscores its significance.

5.1.2 Medium Term Program

In the Medium Term Program, published as a Presidential Decree on April 9, 2022, Turkey's medium-term objectives are outlined. Under the heading "Green Transformation," the development of policies to achieve the 2053 Net Zero Emissions target is envisaged. Additionally, it emphasizes the necessity of preparing a Nationally Determined Contribution (NDC) and an Action Plan in alignment with the United Nations Framework Convention on Climate Change (UNFCCC). This comprehensive document extends beyond the EU and CBAM, incorporating green transformation objectives aligned with the Paris Agreement and UNFCCC.

The aim of the document is to develop policies to protect the sectors most likely to be impacted by the activation of the EU CBAM in global trade and to provide relevant information.

In the document, CBAM is indicated as a policy instrument. The stated reasons for this decision include: developing the National Taxonomy and National Emissions Trading System in alignment with the EU CBAM, and conducting legislative work to harmonize currently applied taxes with EU carbon taxes.

Although the document does not address sectors individually, the phrase "potentially most affected CBAM sectors" is used. This document does not include emission targets.

Authority: As part of compliance with CBAM, an effectively functioning National Emission Trading System will be developed. The Turkish Tax System will be reviewed to assess the conversion of existing taxes into carbon taxes, and the economic and social impacts of carbon pricing tools on the development and investment environment will be analyzed. A comprehensive National Circular Economy Action Plan will be developed to facilitate the transition to a circular economy, aiming to enhance efficiency and support effective waste management.

Treasure: To establish a green transformation infrastructure, R&D projects in green technologies, particularly in the agriculture, industry, transportation, and energy sectors, will continue to receive support. Additionally, the investment ecosystem for technologies that contribute to emission reduction, such as green hydrogen and energy storage, will be developed.

Access to climate finance will be expanded, considering the needs of the private sector. Priority will be given to investments that enhance efficiency, drive transformation, provide high added value, limit greenhouse gas emissions, and promote green skills.

To shield the country's agriculture and farmers from the adverse effects of climate change, the scope of agricultural insurance will be broadened to cover more products and risks.

Overview: This document is associated with the CBAM Preparation Phase and emphasizes compatibility with the EU CBAM and the Green Deal, particularly in the "Green Economy" chapter.

The document includes several internal references to other national policy documents, such as the National Contribution Declaration, the Long-Term Climate Change Strategy, and the National Climate Change Action Plan.

Other supplementary policies to CBAM and ETS include low carbon production, preparation of green taxonomy legislation, green industrial zone certification system, zero waste initiatives, increasing forest availability and creating carbon sink areas to reduce carbon emissions, developing low-carbon projects in railways and urban transportation, reducing the use of traditional fuels and incentives for green port implementation.

5.1.3 Green Agenda

This report was jointly prepared by the European Union and the Republic of Turkey's Ministry of Environment, Urbanization, and Climate Change and was published in January 2023. The document can be considered an Operational Programme.

In this report, the cooperation between the EU and Turkey is mentioned, and the institutions that will be responsible for this cooperation are listed. In addition to the objectives, the document also introduces the environmental projects that have been carried out together with the EU so far.

Green Agenda is a very long informative document written jointly by the EU and the Ministry of Environment of the Republic of Turkey in the transition to circular

economy. It is important that the document is prepared jointly with the EU and that it is fully compatible with the EU climate targets. The report mentions both the Green Deal and carbon emissions.

Nodality: Within the scope of the project, workshops and training sessions are organized for public and private sector representatives. In the workshops, experiences and best practices from EU member states, public and private sectors are shared for sectors with high circularity potential, and applied examples from circular economy business models are examined. As part of the training activities, comprehensive information is provided on the circular economy model, while the latest developments in the field in EU member states and Turkey are shared with the participants. The opportunities and challenges of Turkey's transition to a circular economy are discussed.

Treasure: The project, implemented by the Ministry of Environment, Urbanization and Climate Change, General Directorate of Environmental Management, Air Management Department, within the framework of the financial cooperation between the European Union and the Republic of Turkey, under the Environment and Climate Action Sector Operational Program, with a budget of approximately 3.8 million Euros, will continue until July 2023.

The Ministry of Environment, Urbanization and Climate Change will continue to implement capacity-building projects to enable Turkey to make significant progress in combating and adapting to climate change in the new period.

Accordingly, four projects prepared by the Ministry, with a budget of 32 million Euros for the 2021 programming year, and 12 projects with a budget of 41.2 million Euros for the 2022 programming year, were approved by the EU Commission. For the 2023 programming year, based on the Ministry's prioritization studies, applications for relevant

and mature actions were submitted to the EU Commission. Tender processes for the accepted projects are expected to be completed shortly to facilitate their implementation.

Organization: The project, for which the contracting authority is the General Directorate of European Union and Foreign Relations / European Union Investments Department of the Ministry of Environment, Urbanization and Climate Change, and the beneficiary institution is the General Directorate of Environmental Management / Zero Waste and Waste Processing Department, aims to strengthen Turkey's institutional and technical capacity in the transition to a circular economy. The project is planned to last for 36 months.

Overview: The following external documents are referenced in the report: Zero Waste Movement (pg. 6) The European Circular Economy Action Plan (pg. 12) EU Green Deal (pg. 15) Green Development Revolution and Circular Economy Strategy and Action Plan (pg. 9)

The “Technical Assistance Project for the Evaluation of Turkey’s Potential for Transition to a Circular Economy,” supported by IPA funds, was launched in February 2022. The project aims to encourage the transition to a circular economy in Turkey, contributing to more efficient resource and waste management across the country. It seeks to strengthen Turkey’s institutional and technical capacity in areas such as knowledge base, strategic documents, relevant legislation, and human resources.

Within the scope of the project:

- The circular economy potential in Turkey will be investigated, and a “National Circular Economy Strategy and Action Plan” specific to Turkey will be developed.
- A Sectoral Impact Assessment Report will be prepared.

- A Regulatory Impact Analysis Assessment Report for single-use plastics will be conducted.
- Alternative collection models will be evaluated, and guidance on good practices will be prepared.
- Institutional capacity will be strengthened.

In addition to CBAM and ETS, this document also discusses Circular Economy objectives. The emphasis on collaboration with the EU is highlighted in the "National Efforts in Transition to Circular Economy" chapter (page 16).

5.1.4 Green Deal Action Plan Report

The report published by the Ministry of Commerce on April 28, 2023, can be classified as an Informational Report. Therefore, it does not contain findings related to the Authority category.

This plan was prepared by the Ministry of Commerce of the Republic of Turkey specifically for the EU Green Deal compliance process. The document outlines Turkey's EU Green Deal policies and details the actions taken toward achieving these objectives. Additionally, the Ministry has developed a dedicated work plan for the Green Deal compliance process. This comprehensive plan is considered the most significant document for Turkey's alignment with EU climate policies.

The primary purpose of this document is to present the objectives of the Green Deal and to establish a work schedule for its implementation.

This document can be considered part of the Green Deal Action Plan. Directly aligned with the Green Deal, it identifies CBAM and ETS as policy instruments and discusses policies encompassing all Green Deal sectors.

Although it does not contain significant points in terms of Authority, the emission target of "Meeting the 2030 greenhouse gas emission reduction target and achieving a climate-neutral transition by 2050" is indicated. Turkey's official emission reduction policy is included in this document. However, it is essential to note that Turkey's emission reduction target is a "reduction from an increase" target rather than an absolute reduction goal.

Nodality: In line with the Green Deal Action Plan, CBAM (Sınırdaki Karbon Düzenleme Mekanizması, SKDM) was organized by the Ministry of Environment, Urbanization and Climate Change with the support of the European Bank for Reconstruction and Development (EBRD) in order to model the effects of the EU Borderline Carbon Regulation Mechanism on our energy-intensive and resource-intensive sectors on a scenario-by-sector basis and to determine the actions that need to be taken. The "Assessment of Potential Impacts of Turkey's Economy on the Turkish Economy" project was carried out. Within the scope of the study, the model based on the European Parliament's CBAM proposal was run and the impact analysis and action set recommendations were presented to the opinions and suggestions of relevant institutions and organizations in the form of a draft report. The results of the study were shared with public and private sector stakeholders within the framework of a workshop where the possible effects of CBAM were evaluated on December 8, 2022.

This document does not include any policies under the Authority category; however, the policies under the Treasure and Organization categories are identical to those in the Green Deal Action Plan.

Overview: It is possible to associate this document with CBAM Phase I. While aligned with the Green Deal Action Plans, it also references the Circular Economy Action

Plan, Sustainable Financing Framework Document, Energy Efficiency 2030 Vision and Strategy, and the National Energy Efficiency Action Plan.

Supplementary policies to CBAM and ETS and targets include works conducted within the scope of the Green Deal Action Plan, encompassing Border Carbon Regulations, A Green and Circular Economy, Green Financing, Clean, Economical and Safe Energy Supply, Sustainable Agriculture, Sustainable Intelligent Transportation, Fighting Against Climate Change, Just Transition Policies, Green Transformation in Education and Training, Diplomacy, and Information and Awareness Raising Activities.

The text is aligned with the Green Deal Action Plans and can be considered one of the documents that generally emphasize collaboration with the European Union.

5.1.5 EU CBAM Transitional Implementation

The document published by the Ministry of Commerce on June 21, 2023, can be classified as an Informational Document. Rather than imposing legal obligations, this document serves as an informational resource and can, therefore, be generally evaluated under the Nodality category. No instruments related to the Authority, Organization, or Treasure categories were identified.

The purpose of this document is to provide information on CBAM and ETS, share details about reporting, calculation, and the CBAM transitional period, and communicate these aspects to the public. It should be considered as part of the broader Green Deal Action Plan.

One of the key aspects that make this document significant is that it is the first to include all CBAM sectors and provide information on them comprehensively. The sectors covered are iron and steel, aluminum, cement, fertilizers, electricity, and hydrogen. However, no clear target is outlined in this document.

5.1.6 Impact Analysis

The document, published as an informational report by the Ministry of Commerce on June 21, 2023, examines the potential effects of CBAM on the Turkish economy through three different scenarios. According to the major findings of the report, it was concluded that *"in any case, switching to carbon pricing would be more advantageous than taking no measures."* The analysis highlighted the benefits of Turkey adopting a carbon pricing system, providing scientific legitimacy for the decisions to be made and the commissions to be established.

This report serves as a scientific analysis of the effects of CBAM on Turkey's economy and lays the groundwork for policy development in this direction. It can be regarded as a feasibility study of CBAM in the Turkish context. From an informational perspective, the report falls under the Nodality category. While it presents a detailed scientific analysis, it is not a policy document in itself but rather a preparatory document for policymaking.

As the report elaborates on the economic impacts of CBAM, findings related to the Treasure category are present. However, it does not include policy instruments in the Authority or Organization categories.

This report also addresses all CBAM sectors. It directly discusses the impacts of CBAM and emphasizes the necessity of alignment with the EU and the inevitable implementation of carbon emission reduction policies. Despite this emphasis, the report does not specify a strict emission reduction target.

5.1.7 EU CBAM Informational Documents for CBAM Sectors

These documents, published by the Ministry of Commerce in July and August 2023, aim to provide information on the CBAM sectors that will be most affected by

Turkey's exports. Since these documents were entirely prepared with the aim of informing stakeholders and businesspeople in the sectors, all of them can be evaluated under the Nodality category. These documents have been prepared separately for I) Iron & Steel, II) Aluminum, and III) Cement. While the sectoral information provided varies, they have been evaluated together as they share the same content across the Nodality, Authority, Treasure, and Organization categories.

The documents include details on key reporting dates, the entities responsible for bearing reporting costs, and the CN codes of the raw materials. It also specifies which types of iron and steel, aluminum, and cement are excluded from CBAM. Furthermore, it highlights that Turkey is the second-largest exporter of iron and steel and is among the top 10 countries exporting cement to the EU. It also includes comparisons with other countries.

This document is part of the EU CBAM Transitional Phase. Given Turkey's critical position as a major exporter of iron and steel to Europe, the iron and steel sector has become one of the most significant sectors for Turkey in terms of CBAM's potential impacts.

Nodality: It has been decided that Reporting Guidelines and the Calculation of Embedded Emissions will be regulated through secondary legislation. During the transition period, it has been stated that both direct and indirect emissions must be calculated and reported for all products. (Page 13)

Authority: It has been stated that the targets identified under the Nodality, Treasure, and Organization categories will be regulated through secondary legislation. However, since this document does not implement the legal regulation, no policy is observed under the Authority category.

Treasure: The carbon price paid in third countries has been decided to be regulated through secondary legislation.

Organization: The authorization of validator organizations will be regulated by secondary legislation. The approach that verifier organizations can be established anywhere in the world, but that verifier organization accreditation can only be done by authorized accreditation bodies of EU member states, is maintained. (pg. 16)

Overview: The reports can be associated with both Phase I and Phase II of CBAM, as they cover regulations regarding which institutions will conduct the reporting, embedded emissions, and carbon taxes paid in third countries. The documents directly refer the Green Deal Official Regulation published by the European Union on May 16, 2023, and have been prepared in alignment with the obligations introduced by that regulation. Furthermore, the documents repeatedly emphasizes collaboration with the European Union.

In addition to CBAM and ETS, these documents aim to implement Clean Energy Transition and Low Carbon Production policies to mitigate the negative impacts of CBAM. Furthermore, establishing a national carbon pricing system, so called the Turkish CBAM, has been set as a target. Additionally, the creation of sector-specific decarbonization roadmaps has also been prioritized.

5.1.8 Assessment of Turkey's Carbon Pricing Policies

Turkey's carbon pricing policy development is best understood as a hybrid governance response, blending nodal communication, organizational coordination, and financial mobilization under EU-aligned rhetoric. The NATO instrument mix and Europeanization framework indicate a cautious engagement strategy, where domestic

policy adaptation is driven more by external economic incentives than internal normative commitments.

This approach helps Turkey navigate the "compliance without commitment" paradox often observed in non-member states under the EU's regulatory shadow. As CBAM moves into its full implementation phase, the depth of Turkey's carbon pricing reform will hinge on whether these initial instruments evolve into binding regulations backed by robust authority mechanisms.

5.2 South Korea

The CBAM is highly significant for South Korea due to its export-dependent economy and carbon-intensive industries. As the EU is a key trading partner, CBAM pressures Korean exporters, especially in steel, aluminum, and cement, to reduce emissions or face added costs. This has spurred policy momentum to strengthen South Korea's Emissions Trading System and invest in cleaner technologies. CBAM also fosters closer climate cooperation with the EU and supports South Korea's broader transition toward carbon neutrality by 2050.

In 2016, South Korea ranked as the 11th largest emitter of greenhouse gases globally and held the 4th position among OECD countries, following the United States, Japan, and Germany. Its manufacturing sector is heavily concentrated in energy-intensive industries such as steel, petrochemicals, automobiles, and semiconductors. Although Korea has achieved exceptionally high energy efficiency within its manufacturing sector, its energy intensity has shown little improvement over the years. In 2017, Korea placed 33rd among OECD countries in energy intensity, reflecting the persistent impact of its energy-heavy industrial structure. (2050 Carbon Neutral Strategy)

South Korea signed the Paris Agreement at a very early stage, on November 3, 2016. One of South Korea's motivations for signing the Paris Agreement, as stated in the 2050 Carbon Neutral Strategy, is the fact that global demand for new coal-fired power plants has been in steep decline since its peak in 2015, and the international community should collaborate and find a way for phasing out fossil fuels. The documents examined in this analysis are listed in Table 5.2 below.

Table 5.2 *The Policy Documents Analyzed for South Korea*

Name	Institution/Ministry	Date	Legal Status
Framework Act on Low Carbon, Green Growth	The Government of Republic of Korea	13/01/2010	Code
Third Biennial Update Report of Republic of Korea	The Government of Republic of Korea	November 2019	Report
The Korean New Deal	The Government of Republic of Korea	July 2020	Long-Term Strategy
2050 Carbon Neutral Strategy	The Government of Republic of Korea	December 2020	Long-Term Strategy
Framework Act on Carbon Neutrality and Green Growth to Response to the Climate Crisis	Ministry of Environment	24/09/2021	Code
The Republic of Korea's Enhanced Update of its First Nationally Determined Contribution	Republic of Korea & UNFCCC Secretariat	23/12/2021	Nationally Determined Contribution to UN

5.2.1 Framework Act on Low Carbon, Green Growth

The Framework Act on Low Carbon, Green Growth was enacted by the Republic of Korea (ROK) on January 13, 2010. This document outlines policies related to the low-carbon economy, reduction of GHG emissions, and green finance. It specifies how government incentives and public-private cooperation will be provided to various sectors to promote green finance. It should be noted that the Framework Act was adopted before the Paris Agreement.

This act can be considered ROK's main policy package. The document aims to enact ROK's low-carbon economy and green growth policies through a detailed five-year plan and a long-term 20-year program.

As it includes a detailed short-term plan and long-term objectives, this document can be classified under the Authority category within Hood's NATO framework. In terms of policy density and policy intensity, it is a comprehensive and binding document.

The purpose of this document is to establish long-term policies regarding green finance, green transformation, and a low-carbon economy in the Republic of Korea. It has been stated that this Act aims to promote the development of the national economy by laying down the foundation necessary for low-carbon, green growth and by utilizing green technology and green industries as new engines for growth.

Regarding GHG reduction objectives, it has been established that the Government may operate a system for trading emissions of greenhouse gases by utilizing market functions in order to accomplish the State's target of reduction of greenhouse gases (*Cap and Trade Article*).

Nodality: It has been decided that an assessment of current performance will be conducted, along with the presentation of policy recommendations.

Authority: This document outlines the establishment of medium and long-term greenhouse gas reduction targets by analyzing the economic costs and benefits of emission reductions while considering both domestic and international conditions. It emphasizes the adoption of a cost-effective and rational regulatory framework based on pricing mechanisms and market systems to ensure systematic and efficient emission reductions. Additionally, the government is mandated to develop and implement a comprehensive climate change response plan every five years, covering a 20-year planning period, in alignment with fundamental climate change response principles. (pg. 16)

Treasure: The Government shall enhance the soundness and competitiveness of the national economy by materializing green economy, search for and foster new green industries with high growth potential and prepare measures for fostering and supporting a green economy and green industries. Additionally, it has been decided to carry out studies on the operation of the taxation system.

Organization: The Government shall enhance to achieve low-carbon, green growth with the active participation of all citizens, as well as the cooperation of national agencies, local governments, enterprises, economic organizations, and non-governmental organizations. To oversee and deliberate on the State's major policies and plans related to low-carbon, green growth, the Presidential Committee on Green Growth shall be established under the authority of the Prime Minister. Additionally, the Government may develop and support clusters and complexes dedicated to the joint research and development of green technology, the shared utilization of facilities and equipment, and the creation of networks linking industrial sectors, academia, and research institutions.

Central administrative agencies will establish and implement action plans to advance low-carbon, green growth in line with national policies and objectives, while local governments will develop and execute region-specific plans to ensure alignment with the broader national strategy. To oversee, deliberate, and coordinate these efforts, the Presidential Committee on Green Growth shall be established under the authority of the Prime Minister, playing a key role in guiding and monitoring the implementation of major policies and initiatives.

Overview: South Korea's strategy is to protect its domestic market while actively working towards integrating into international carbon markets. It is stated that the Government has emphasized the importance of efficiently distributing resources by reorganizing taxation and financial systems so that the economic costs associated with environmental pollution or greenhouse gas emissions can be accurately reflected in market prices for goods and services. It aims to actively encourage citizens to change their consumption patterns and lifestyles in a way that supports low-carbon, green growth. However, in pursuing these goals, the Government will also consider measures to prevent the weakening of the international competitiveness of domestic industries.

The strategy further highlights the importance of enabling autonomous reduction efforts by clarifying rights and obligations related to greenhouse gas emissions and facilitating the market-based trading of these rights and obligations. This approach is designed to ensure readiness for participation in the international carbon market while strengthening the domestic carbon market.

In addition to CBAM and ETS, it has been stated that the Republic of Korea aims to enhance energy efficiency and promote resource recycling. The country plans to reconsider its infrastructure, including national land and cities, buildings, transportation

networks, roads, ports, harbors, and water and sewage systems, to align with low-carbon, green growth objectives while preserving the value of natural resources and the environment.

Furthermore, the government is committed to expanding the development, production, use, and distribution of new and renewable energy sources, such as solar energy, waste-to-energy, bioenergy, wind power, geothermal energy, tidal power, fuel cells, and hydrogen energy. This strategy seeks to diversify energy sources and strengthen sustainability in the long term.

5.2.2 Third Biennial Update Report of Republic of Korea

This report was published in November 2019 as a compulsory report under the UNFCCC framework. It states that Korea has strengthened its alignment with the European Union through the EU-Korea Emissions Trade Project (2016-2018) and continues to enhance its capacity in climate change mitigation. The report outlines mitigation policies differentiated by sector and details the strategies for capacity building in addressing climate change.

This document covers 26 different sectors, including transportation, industry, and waste.

Targets: In May 2015, the Republic of Korea (ROK) set a new national GHG reduction target of 37% below business-as-usual (BAU) levels by 2030. To guide the achievement of this target, the Roadmap to Achieve the National GHG Reduction Target for 2030 was prepared in September 2017.

This roadmap outlines the projected emissions, reduction targets, and major reduction plans by sector and sub-sector. According to the roadmap, the ROK will reduce GHG emissions through the implementation of technologies and policies tailored to

sector-specific conditions in areas such as energy transformation, industry, buildings, transportation, waste, public/other, and agriculture and livestock.

Nodality: The Republic of Korea (ROK) continues to develop country-specific emission and removal factors to enhance the accuracy of its national GHG inventory. The application of these country-specific emission factors is determined through Monitoring, Reporting, and Verification (MRV) processes, similar to those used for the national inventory.

Emission factors that are researched and analyzed by external institutions are submitted to the Greenhouse Gas Inventory and Research Center of Korea (GIR) via the relevant ministry. GIR then convenes a verification team composed of experts from the Technical Group and internal specialists to evaluate the appropriateness of the development methods, the representativeness of the factors, and the accuracy of measurement and analysis. After this verification process, the emission factors are finalized following a review by the Working Group and deliberation by the Management Committee.

Measurement and Reporting: The preparation of the national GHG inventory begins with the selection of an appropriate methodology. To improve inventory quality, the Greenhouse Gas Inventory and Research Center of Korea (GIR) revises the Monitoring, Reporting, and Verification (MRV) Guidelines at the start of each year, incorporating improvements identified during the previous year's verification process. Once the revised MRV Guidelines are reviewed by the Working Group and approved by the Management Committee, GIR distributes them in March to the sectoral responsible ministries and relevant measurement agencies.

Verification: Upon receiving the draft inventories from sectoral responsible ministries, GIR conducts a verification process. This includes reviewing the measurement methodologies, activity data, and the appropriateness of emission and removal factors, while also identifying any calculation errors in subcategories. GIR then requests the ministries to revise their drafts by correcting errors and addressing issues identified in the verification process. After the ministries submit the revised versions, GIR consolidates them into the final draft of the national inventory.

This policy mechanism is primarily a Nodality instrument, as it centers on the systematic collection, verification, and refinement of country-specific GHG emission and removal factors. The use of MRV processes and expert validation panels ensures data integrity, while the involvement of the Greenhouse Gas Inventory and Research Center (GIR) and its technical subgroups introduces an Organizational dimension supporting technical governance.

Authority: In addition to carbon pricing mechanisms, the Republic of Korea (ROK) has adopted a range of supplementary policies to achieve its emission reduction targets, including participation in the Clean Development Mechanism (CDM).

To support its national GHG reduction goals, the ROK introduced the GHG and Energy Target Management System (TMS) in 2010 for companies with high levels of GHG emissions and energy consumption. This was followed by the establishment of a legal framework through the enactment of the Act on the Allocation and Trading of Greenhouse-Gas Emission Permits and its Enforcement Decree in 2012. In 2015, the country launched its Emissions Trading System (ETS) for 525 companies as part of Phase I (2015–2017).

The ROK has also laid out long-term strategic frameworks to guide its climate policies. The National Strategy for Green Growth (2009–2050) sets policy goals, strategies, and directions for low-carbon, green growth, including measures related to climate change, energy, and sustainable development. The Climate Change Response Master Plan, established and updated every five years, provides regulatory, market-based, and technological approaches to GHG reduction and aims to minimize the impacts of climate change.

Meanwhile, the National Climate Change Adaptation General Plan (2009–2030) offers a long-term vision for national adaptation policy. It is supported by shorter-term implementation plans such as the First (2010) and Second (2015) National Climate Change Adaptation Measures, which focused on priority areas like vulnerability assessments and capacity building. The ROK executed a mid- to long-term strategy to reduce climate-related risks, capitalize on adaptation opportunities, and transform them into new engines for economic growth.

Furthermore, in June 2015, prior to the finalization of the Paris Agreement, the ROK submitted its Intended Nationally Determined Contributions (INDCs), which included a 37% reduction below BAU levels by 2030. This target was legally reinforced through an amendment to the Enforcement Decree of the Framework Act on Low Carbon, Green Growth in May 2016.

Treasure: The Republic of Korea (ROK) demonstrated its financial commitment to global climate action by announcing a contribution of USD 100 million to the Green Climate Fund (GCF) at the UN Climate Summit in September 2014 despite the global financial crisis.

Furthermore, at the 22nd Conference of the Parties (COP 22) to the UNFCCC in November 2016, the ROK, together with the European Union and seven developed countries, pledged a joint financial contribution of USD 23 million to the Climate Technology Center and Network (CTCN), a move that was important for a non-Annex I country.²

Organization: The Greenhouse Gas Inventory and Research Center (GIR) is the primary institution responsible for tasks related to the national GHG inventory in the Republic of Korea. Its responsibilities include:

1. Establishing the regulations on the management of the National GHG Inventory,
2. Providing Measurement, Reporting, and Verification (MRV) Guidelines for calculating the national GHG inventory,
3. Reviewing national GHG inventory data, including emission and removal factors,
4. Organizing and managing the key institutional bodies involved in inventory processes: the National GHG Inventory Management Committee, the National GHG Working Group, and the National GHG Technical Group,
5. Collecting and preparing the national GHG inventory data, and
6. Developing and operating the IT system used for managing and storing inventory data.

² Non-Annex I countries are those parties to the United Nations Framework Convention on Climate Change (UNFCCC) that were not listed in Annex I of the Convention, which primarily includes industrialized and transitioning economies. Non-Annex I parties are typically developing countries with limited historical responsibility for greenhouse gas emissions and are not subject to legally binding emission reduction commitments under the Convention. However, they are encouraged to adopt mitigation and adaptation actions, often with international financial and technological support.

Prepared in alignment with the Paris Agreement, this document outlines the policy shifts undertaken by the Republic of Korea in the field of climate change. It provides reporting on the country's progress through key legislative and strategic frameworks, including the Framework Act on Low Carbon, Green Growth, the Climate Change Response Master Plan, and the National Climate Change Adaptation General Plan, highlighting the advancements Korea has made in addressing climate change.

Improving cooperation with the European Union has been established as a strategic target. (Page 33)

5.2.3 The Korean New Deal

The policy document published by the Government of the Republic of Korea in July 2020 serves as the country's long-term strategy, marking a significant milestone in its development agenda. As stated by the President, this initiative laid the foundation for Korea's next 100 years. The Korean New Deal is composed of two pillars: *"the Digital Deal"* and *"the Green Deal"*.

According to this framework, ROK aims to promote digitalization while simultaneously transitioning to a low-carbon economy and encouraging the growth of environmentally friendly sectors. The document seeks to establish the groundwork for Korea's long-term environmentally sustainable development policies.

The significance of this policy lies in its formal adoption of the "Twin Transition" namely, Green Transformation and Digital Transformation, as official national objectives. For this reason, it is regarded as one of the most important strategic documents of the Republic of Korea in recent years.

Targets: The Korean government aims to transition toward a net-zero society by reinforcing and supporting key ongoing policies. These include achieving the 2030 GHG

emissions reduction target and implementing the plan for renewable energy to make up 20% of the country's total power generation capacity by 2030.

Nodality: The government plans to collect and disseminate comprehensive environmental data through smart grid systems, Internet of Things (IoT) sensors in industrial zones, and digital twin platforms. These tools facilitate real-time monitoring of pollution, energy use, and resource flows. For example, smart ecological plants and smart cities integrate environmental data into planning and public services. Public awareness campaigns about energy efficiency, renewable energy, and green mobility are implied through initiatives such as the promotion of eco-friendly lifestyles and the development of urban green spaces. Moreover, digital platforms for sharing climate-related R&D and environmental education, along with participation in global networks like RE100, signal Korea's intent to use Nodality to align with international climate norms and reporting standards.

Authority: The government mandates energy efficiency in public buildings and schools, requiring the installation of solar panels and insulation. In the transport sector, regulations will be updated to facilitate the transition to electric and hydrogen vehicles, including infrastructure mandates like charging station deployment. Additional legal instruments are used to manage ecosystem restoration and water systems (e.g., smart sewage treatment and leak detection). The use of planning instruments to designate smart and green industrial complexes, alongside regulatory frameworks to control toxic emissions, reinforces the state's role in setting enforceable environmental standards. Authority tools also support the fair transition by requiring regulatory protections for communities and workers affected by the decline of coal and diesel industries.

Treasure: Financial tools are at the core of Korea's environmental strategy. The Green New Deal allocates KRW 73.4 trillion (KRW 42.7 trillion from the treasury) by 2025, targeting climate mitigation, green infrastructure, and ecological resilience. Direct investments include support for zero-energy buildings, renewable energy facilities, smart grids, and electric/hydrogen vehicle deployment. Households receive subsidies to install renewable energy systems; farmers and small businesses gain access to green finance, such as public-private funds and low-interest loans. The state also supports R&D for advanced climate technologies like CCUS (carbon capture, utilization and storage), hydrogen systems, and fine dust monitoring. Subsidy schemes for scrapping old diesel vehicles and retrofitting industrial processes with pollution control technology further demonstrate the use of Treasure. By using financial instruments, Korea reduces the cost of behavioral change and stimulates both green consumption and green production across the economy.

Organization: Public-private partnerships (PPPs) are used in sectors like school green remodeling and renewable energy deployment, showing that the state acts as both implementer and facilitator. The Korean New Deal also supports the creation of "green clusters" and startup towns, indicating a strategic role in shaping industrial geography and supporting ecological innovation ecosystems.

5.2.4 2050 Carbon Neutral Strategy

The policy document published by the Government of the Republic of Korea in December 2020 is one of the most up-to-date and significant strategic documents concerning the reduction of carbon emissions. As a long-term strategy, it outlines the Republic of Korea's comprehensive approach to carbon emissions policy. The release of such a detailed strategy specifically focused on emissions is a strong indication of ROK's

extensive efforts in this area, demonstrating its capacity for policy development and its integration of climate objectives with broader economic growth goals.

The document adopts the Paris Agreement's target of limiting global warming to 1.5°C, and the strategies and vision outlined are elaborated sector by sector. In addition to environmental goals, the document discusses the political, social, and technological dimensions of Korea's carbon neutrality strategy, further reflecting the multidimensional and integrated nature of the country's approach.

The aim of the document is stated as establishing long-term circular economy and carbon neutrality policies across various sectors, in alignment with the Paris Agreement's long-term goals.

Targets: South Korea's Nationally Determined Contribution (NDC) target is to reduce GHG emissions by 24.4% below 2017 levels by 2030, setting the 2030 emissions cap at 536 million tCO₂eq.

Sectors: The document identifies emission reduction potential across eight key sectors: power (electricity and heating), industry, transport, buildings, agriculture and livestock farming, waste, public sector, and forestry.

According to Korea, sector-specific plans should be developed; a "one-size-fits-all" approach may lead to inefficiencies. Such a uniform strategy could result in gaps across different industries. Therefore, a variety of mitigation options should be considered to effectively achieve the 2050 vision for the industrial sector.

Steelmaking, cement, and petrochemical manufacturing are among the most carbon-intensive sub-sectors, and as such, the application of CCUS (Carbon Capture, Utilization, and Storage) technology in these areas could be more cost-effective compared

to other industries. However, CCU technology is still in its early stages of development and currently suffers from low economic feasibility due to its high implementation costs.

In 2017, emissions from the transportation sector accounted for 14% of Korea's total greenhouse gas emissions. The sector's growth is being largely influenced by the advancement of Industry 4.0 technologies, with two central themes: green innovation and intelligent systems.

For the building sector, geothermal energy, hydropower, and waste heat from power generation and incineration are identified as viable alternatives to fossil fuels used for heating and cooling. The core strategy for achieving the 2050 vision in this sector focuses on improving energy efficiency and promoting the development of passive and active buildings.

South Korea plans to phase out coal-fired power plants or convert them to Liquefied Natural Gas (LNG) facilities as part of its energy transition strategy. Additionally, Carbon Capture, Utilization, and Storage (CCUS) technology will be implemented at remaining coal plants to reduce greenhouse gas emissions. The Republic of Korea also aims to facilitate a low-carbon transition in energy-intensive industries, particularly in steel, cement, and petrochemical production.

Nodality: To transform climate change awareness into tangible public action, South Korea plans to strengthen its public outreach and education efforts in collaboration with local communities. As part of its path toward carbon neutrality by 2050, the government aims to establish a social conflict management system to ensure a just and inclusive transition for all stakeholders.

The realization of a carbon-neutral society is framed as a vision that can only be achieved through the shared understanding and engagement of all members of society. In

line with this, a nationwide online public survey was conducted over two months (June–July 2020) to promote awareness of Long-term Low Greenhouse Gas Emission Development Strategies (LEDS). The results indicated that a majority of respondents recognized the urgency of the climate crisis and supported the goal of achieving carbon neutrality by 2050. In parallel, expert input was also gathered to inform policy design.

The ROK emphasizes that policymaking on climate change should follow a participatory, democratic, and inclusive process. Society must develop a clear and deep understanding of the severity of the climate crisis and be willing to engage in collective action. To support this, there is a need for inclusive dialogue among all stakeholders, including government, civil society, and the private sector, based on shared values and perspectives. The government will play a central coordinating role in facilitating this dialogue and will establish a climate information platform to ensure public access to relevant knowledge and updates.

Traditional outreach strategies include appointing celebrities as climate ambassadors and using cultural content such as e-comics, animated films, and documentaries. In addition, digital platforms, including web-based talks, social media, and other emerging channels, will be increasingly utilized, especially to engage young people, who are expected to drive future climate action. The government has also designated the week surrounding April 22 (Earth Day) as “Climate Change Week” to draw national attention to climate issues.

Authority: The Government of the Republic of Korea has made several binding decisions to support its carbon neutrality and emission reduction goals. One major step is the suspension of new coal-fired power station construction and the planned closure of 14 coal power plants that are 30 years or older.

To further this commitment, the 9th Basic Plan for Power Supply and Demand was established, outlining additional closures of coal-fired power plants to help meet the country's Nationally Determined Contribution (NDC) targets.

South Korea aims to generate 20% of its electricity from renewable sources by 2030, and under the 3rd Basic Energy Plan, this share is projected to increase to 30–35% by 2040. To support this transition, the government will incrementally raise the mandatory renewable energy share in the national energy mix.

From 2020 onward, the public sector is only permitted to purchase eco-friendly vehicles, reinforcing Korea's commitment to clean mobility. Additionally, energy efficiency standards for consumer products and home appliances will be progressively strengthened, including the phase-out of fluorescent lighting by 2027.

As renewable energy becomes a larger component of South Korea's power generation, ensuring the stability and reliability of electricity supply across the entire grid has become a strategic priority, making grid security and flexibility central to the country's clean energy transition.

Treasure: According to the document, ROK is aiming to advance a wide range of financial and incentive-based strategies to steer its economy toward a greener, low-carbon direction. Key among these is the development of green finance strategies designed to integrate climate policies with technological innovation and R&D, in this way facilitating the country's transition to a carbon-neutral society by 2050.

To address F-gas (fluorinated gas) emissions, the government plans to establish institutional frameworks and incentives that encourage businesses to set and implement voluntary mitigation targets. These efforts complement the Emissions Trading Scheme (ETS), which is a key policy instrument of the Treasure category, by offering alternative

pathways for large emitters to reduce their emissions. If these voluntary targets are met, the government may provide financial incentives to further encourage reductions.

Government budget planning also plays a critical role. The budget not only provides direct and indirect support to citizens and industries but also helps build social infrastructure. Therefore, integrating climate impact assessments into fiscal policy and national priority setting is seen as essential. In this context, high-carbon projects are to be discouraged from the initial budgeting stages, while low-carbon projects with long-term environmental benefits should be promoted, even if they require higher costs.

Additional incentive-based programs have also been implemented to encourage individual behavioral change. The Carbon Point Program rewards households with monetary incentives based on their savings in electricity, water, and gas usage, with 2.8 million households currently participating. The Green Card Program, with over 20 million cards issued, offers discounts on public transportation and eco-friendly products, encouraging sustainable consumer habits.

Moreover, financial tools such as loan interest deductions for green businesses (e.g., solar energy and LED lighting projects) and green investment funds are being promoted. The government aims to expand and diversify the scale and types of such funds to support the growth of environmentally friendly industries and stimulate private-sector participation in the green transition.

Organization: The Presidential Committee on Green Growth has been established as a central coordinating body to oversee and guide South Korea's green transformation efforts.

The formulation of the 2050 Carbon Neutral Strategy serves as a key example of public engagement in policymaking. To ensure inclusiveness, public opinions were

incorporated to the greatest extent possible. The 2050 Low-Carbon Vision Forum, introduced in Chapter I, operated for nine months from the initial planning stage, facilitating dialogue among stakeholders. The outcomes of this forum, along with the results of extensive public consultations, were integrated into the final version of the Strategy.

At the local level, strong organizational efforts have also emerged. In July 2020, 17 metropolitan cities and 63 municipalities formally declared their commitment to 2050 carbon neutrality and jointly established the Carbon-neutral Cities Coalition, signaling a coordinated local response aligned with national climate goals.

5.2.5 Framework Act on Carbon Neutrality and Green Growth to Response to the Climate Crisis

The law published by the Ministry of Environment on September 24, 2021, outlines the Republic of Korea's medium-term and long-term carbon neutrality targets in detail. This document serves as the primary legal framework governing Korea's carbon neutrality objectives. It defines the scope of the green transformation toward carbon neutrality, sets specific targets, and includes clear role definitions for implementation.

The aim of the document is to determine emission reduction targets and specify the timeline by which each target is to be achieved.

Referred to as the Framework Act on Carbon Neutrality, this document is one of the most significant policy packages of the Republic of Korea in the field of carbon policy. It provides the legal and strategic foundation for Korea's transition to a carbon-neutral society and outlines key targets, responsibilities, and timelines for emission reductions.

Targets: The medium-term to long-term reduction target, as defined in the Framework Act on Carbon Neutrality, is to reduce national greenhouse gas emissions by at least 35% from 2018 levels, as specified in the Presidential Decree. The ultimate goal set by the government is to achieve a carbon-neutral society by 2050.

Nodality: The Framework Act demonstrates extensive use of Nodality by structuring how the government gathers and disseminates climate-related data. It mandates transparent public access to climate impact assessments, emissions inventories, and national strategy evaluations (Articles 9, 13, 23). Public institutions, enterprises, and citizens are encouraged to participate in the carbon-neutral transition through information-based mechanisms such as environmental education, public hearings, and stakeholder consultations (Article 4, Article 7).

Moreover, the law promotes public access to GHG performance data from managed companies and public institutions (Articles 26–27), and integrates climate change data into environmental impact assessments. This highlights the use of the state’s central informational position to shape awareness, foster accountability, and guide behavior across all sectors.

Authority: This law can be associated with Authority. The law sets binding medium-to-long-term GHG reduction targets and sector-specific caps (Article 8), reinforced by legally mandated climate action plans at national, provincial, and municipal levels (Articles 10–12). The Act also institutionalizes the Climate Change Impact Assessment system and obligates its integration into environmental and development planning (Article 23). The government can issue improvement orders if GHG targets are missed (Articles 26–27), and mandates compliance from designated companies.

Furthermore, it establishes legal duties for public institutions and business operators to align their operations with carbon neutrality targets. These tools establish binding obligations and compliance mechanisms that drive climate action.

Treasure: The Act actively deploys financial tools to guide the economy toward green growth. It includes provisions for a GHG Reduction Recognition Budget System (Article 24), which integrates climate criteria into fiscal planning and public budgeting. The government is authorized to provide financial and technical support to public institutions and businesses to help them achieve GHG reduction targets (Articles 26–27).

A national Emissions Trading Scheme (ETS) is codified in Article 25, using market-based instruments to allocate and trade emission allowances. In addition, the law encourages the mobilization of financial resources for green innovation, climate resilience, and ecosystem services (Article 7 and Article 10).

Organization: The document establishes a comprehensive organizational structure to implement the 2050 carbon neutrality goal. It establishes the 2050 Carbon Neutral Green Growth Committee, chaired by the Prime Minister and composed of ministers, experts, and civil society representatives (Article 15). Subcommittees and expert panels further support governance tasks (Articles 19–20). Local committees and city/province-level climate plans are also institutionalized (Articles 11–12, 22), creating a multilevel governance architecture. The Ministry of Environment and other central agencies are tasked with monitoring progress, coordinating sectoral strategies, and integrating local actions into the national framework. Public institutions are required to report annually on GHG reduction performance (Article 26), and the state itself leads in developing carbon-neutral cities (Article 29).

5.2.6 The Republic of Korea's Enhanced Update of Its First Nationally Determined Contribution

On December 23, 2021, the Republic of Korea, in collaboration with the UNFCCC Secretariat, submitted its Nationally Determined Contribution (NDC) as part of its commitment under the Paris Agreement. This document highlights a significant shift in Korea's greenhouse gas emissions trajectory, noting that after nearly 30 years of continuous increase, emissions began to decline post-2018. This change is attributed to the introduction of the Korean Emissions Trading System (K-ETS), which has been in operation since 2015 and is recognized as the largest nationally-operated emissions trading system. The K-ETS serves as a central policy instrument to help achieve the emission reduction targets set out in Korea's third NDC, with the aim of meeting these targets by 2030. The document positions K-ETS as a key element in Korea's broader carbon neutrality strategy and reinforces the country's alignment with global climate goals.

Targets: The updated 2030 target of the Republic of Korea is to reduce total national GHG emissions by 40% from 2018 levels, which were 727.6 MtCO₂eq, by 2030. This enhanced reduction target goes beyond the linear reduction pathway from 2018 to 2050, demonstrating Korea's increased ambition in pursuing its goal of achieving carbon neutrality by 2050.

Nodality: The ROK government shares climate scenarios, GHG emissions forecasts, and adaptation planning data with stakeholders, and it uses platforms like the National Climate Change Adaptation Plan (NAP) and the Climate Change Assessment Report. South Korea also leverages satellites (e.g., GEO-KOMPSAT-2) and forecasting models to collect and share meteorological and climate risk information, which support

science-based assessments and long-term scenario planning. Public consultation processes (e.g. Talanoa Dialogue sessions and Citizens' Evaluation Groups) reflect strong information based governance by embedding civic and expert input into policymaking.

Authority: The ROK government gave the report to UNFCCC about the instruments related to Authority, including legal frameworks and regulatory measures on carbon emissions. The Carbon Neutrality and Green Growth Act, enacted in September 2021, provides the legal basis for the 2030 and 2050 climate targets. It mandates a 40% reduction of GHG emissions from 2018 levels by 2030, codifies the national vision of 2050 carbon neutrality, and institutionalizes tools like climate impact assessments, climate budgeting, and mandatory adaptation planning. The Emissions Trading Scheme (K-ETS) is governed by regulatory caps and allocation rules that bind companies to compliance. Public and private entities managing vulnerable infrastructure are legally obligated to prepare and implement adaptation plans.

Treasure: Key financial instruments include the Korea Climate Action Fund which is launched in 2022 and the large-scale investment in the Korean Green New Deal, which commits 51.7 billion USD to support decarbonization. The country also employs carbon pricing via the K-ETS, covering 73.5% of national GHG emissions, with tradable permits allocated by sector and sub-sector. Fiscal incentives and green public procurement are used to accelerate the adoption of low-carbon technologies.

Organization: The public and private sectors have collaborated to implement Korea's NDC, with the "2050 Carbon Neutrality Commission" serving as the central governance body. Launched in May 2021, the Commission plays a pivotal role in supporting the country's transition to carbon neutrality. It is co-chaired by the Prime Minister and a representative from the private sector, reflecting its inclusive and high-

level nature. The Commission's broad membership includes cabinet members and other key stakeholders.

Its responsibilities include reviewing the overall direction of carbon neutrality policies, overseeing the framework of national plans, and monitoring NDC implementation. In addition, the Commission gathers input from a wide range of societal actors and ensures that these perspectives are integrated into the NDC implementation process.

5.2.6.1 Supplementary Policies to CBAM & ETS

The Republic of Korea is pursuing supplementary policies to support its low-carbon transition alongside CBAM and the Emissions Trading System (ETS). One of the key measures is the phasing down of coal-fired power generation, with plans to shut down aged coal power plants or convert them to Liquefied Natural Gas (LNG), thereby significantly reducing emissions from the energy sector.

In addition to energy transition efforts, the document outlines a broad set of policy areas to support Korea's carbon neutrality goals, including: Power Generation, Industry, Buildings, Transportation, Agriculture, Livestock Farming, and Fisheries, Waste Management, Carbon Sinks (Land Use, Land-Use Change, and Forestry – LULUCF).

These policies reflect a multi-sectoral approach aimed at ensuring comprehensive progress toward Korea's low-carbon development objectives.

5.2.7 Assessment of South Korea's Carbon Pricing Policies

Understanding the motivation behind the Republic of Korea (ROK) government's carbon reduction and carbon pricing policies is important. These motivations offer

important insights in terms of cooperation with the European Union in the environmental domain and the dynamics of Europeanization.

Official documents of the Republic of Korea indicate that a cost-benefit analysis was conducted while implementing these policies. Some of the stated motivations align with the “rational choice” category in Börzel & Risse's typology (Börzel & Risse, 2012). For example, as expressed in the 2050 Carbon Neutral Strategy:

“The key to reducing GHG emissions and responding to climate change is to use less fossil fuel. Inevitably, the economy and industry will suffer a short-term impact from it. However, the losses and damages from inaction could be far greater than the short-term economic and industrial impact.” (2050 Carbon Neutral Strategy, p. 22)

Other motivations fall under the “globalization” and “policy learning” categories in Börzel and Risse's framework (Börzel & Risse, 2012). For instance, the same strategy highlights:

“An increasing number of economies are opting for this cost-effective GHG reduction scheme using the market mechanism including the EU, Switzerland and New Zealand.” (2050 Carbon Neutral Strategy, p. 37)

“Tackling climate change requires global efforts and collective engagement. Korea will lead by example to help the international community jointly make efforts to reach carbon neutrality by 2050.” (p. 46)

Moreover, the ROK has described itself as “a responsible member of the international community” (p. 46)

ROK also positions itself as a leader among Asian countries for having been the first to implement an Emissions Trading System (ETS) and for being ahead of its regional peers in global environmental policymaking:

“Korea has set itself as a leading nation in implementing carbon pricing policies.”

(2050 Carbon Neutral Strategy, p. 109)

In conclusion, the ROK's carbon neutrality and carbon pricing policies reflect a complex interplay of rational cost-benefit assessments and global norm adaptation in global climate governance. As demonstrated by official documents, ROK recognizes both the economic risks of inaction and the strategic opportunities embedded in early climate leadership. The government's framing of climate action as both a necessary economic transition and a global responsibility reveals an approach that aligns closely with multiple categories of Börzel and Risse's typology, particularly rational choice and globalization.

5.3 Brazil

As one of the world's largest economies and home to the world's largest tropical rainforest, Brazil plays a key role in global climate governance. Since the early 2010s, the country has undertaken a series of legislative, regulatory, and market-based efforts to reduce GHG emissions and has established a national Emissions Trading System (SBCE) in 2024. These developments mark an important step towards aligning Brazil's domestic climate policy with international standards, particularly compliance with the EU CBAM. Emissions Trading Systems have emerged as a new cooperation area in Brazil-EU relations, which had been confined to a narrow area until now. Given its renewable energy potential, biodiversity and its stance in climate negotiations, Brazil is one of the key non-European powers in shaping the direction of global environmental governance. Brazil is scheduled to host the COP30 in 2025, which will shed light on climate efforts, and as a host country, Brazil is expected to take a leadership role in this context. The documents examined for Brazil are listed in Table 5.3.

Table 5.3 *The Policy Documents Analysed for Brazil*

Name of the Document	Institution/Ministry	Date	Legal Status
National Policy on Climate Change (PNMC) – Law 12,187/2009	Federative Republic of Brazil	2009	Law
Brazil's Nationally Determined Contribution (NDC)	Federative Republic of Brazil	2015 (Updated in 2020 & 2022)	NDC
Low-Carbon Agriculture Plan (Plano ABC)	Ministry of Agriculture, Livestock and Food Supply (MAPA)	2021	Adaptation Plan
National Biofuels Policy (RenovaBio) – Law 13,576/2017	Federative Republic of Brazil	2017	Law
Brazilian Emissions Trading System (SBCE) – Law 15,042/2024	Federative Republic of Brazil	2024	Law
Economic Reciprocity Law – Law 15,122/2025	Federative Republic of Brazil	2025	Law

5.3.1 National Policy on Climate Change - PNMC

National Policy on Climate Change is Brazil's primary climate framework law, enacted by the National Congress in December 2009, which establishes a comprehensive climate strategy that aims to reconcile greenhouse gas reduction with sustainable development. Key provisions include reducing emissions in all sectors, improving carbon sinks, protecting biomes by reducing deforestation, and adapting to climate impacts. In particular, the law calls for the development of a cap-and-trade system, the Brazilian Emission Reduction Market, and sectoral climate plans for major economic sectors. The PNMC also builds on previous initiatives, such as the National Climate Change Plan and the National Climate Fund, integrating them into a unified framework. The law identifies

the following responsible institutions: the Presidency and the Interministerial Climate Change Committee, with the Ministry of Environment overseeing implementation.

Nodality: The PNMC promotes climate research and improved data on GHG emissions, for example, encouraging the development of scientific studies to reduce uncertainty in climate projections and to inform adaptation measures. The policy also established climate change forums for awareness and transparency, integrating climate objectives into public discourse and planning.

Authority: This 2009 law set Brazil's first national GHG target and regulatory framework. It codified a voluntary economy-wide emissions reduction goal of 36.1%–38.9% below projected 2020 levels, and it incorporated deforestation control plans and other existing measures into law. The PNMC provides legal mandates climate action plans for many sectors such as forests, agriculture and energy. It provided the use of regulatory tools to achieve targets, such as integrating climate criteria in environmental licensing.

Treasure: The PNMC created financial instruments to support climate goals. It established the National Climate Change Fund, which uses revenues such as oil royalties to finance mitigation and adaptation projects. The PNMC also envisioned market-based incentives. It explicitly proposed the establishment of the Brazilian emissions trading market ("MBRE") as a tool to promote carbon pricing and emissions reductions. These provisions laid the foundation for carbon credit trading and financial incentives in later policies.

Organization: Law 12.187/2009 established a comprehensive institutional framework for climate management. It coordinated previously separate initiatives under a single policy. It linked national plans, funds and deforestation programmes into a unified

strategy. Implementation was to be overseen by an inter-ministerial committee which was established in 2007 and carried out through sectoral plans in key areas.

5.3.2 Brazil's Nationally Determined Contribution (NDC)

Nodality: Brazil uses various communication tools under the Nodality category to influence both local and international audiences on climate policy. The NDC submission represents a highly specific and tailored dissemination of information to a major international institution. However, the transfer of information and sharing of messages is exemplified by initiatives such as the Brazil Climate Change Forum. This forum was established to raise awareness, mobilize society, and contribute to the national discourse on the actions needed to address global climate change. Through this mechanism, the government aims to inform and persuade a broad audience about the urgency and importance of climate action. Similarly, Brazil's efforts to promote scientific knowledge on climate adaptation align with this category, emphasizing the dissemination of educational and persuasive content to the public. Finally, Brazil uses self-service messaging through tools such as the AdaptaBrasil system developed by the Ministry of Science, Technology and Innovation (MCTI). This system aggregates and makes available vital information to better understand the impacts of climate change in the country. It allows stakeholders to access and use data independently.

Authority: The country's stated commitment to "reduce greenhouse gas emissions by 37% below 2005 levels by 2025 and by 50% below 2005 levels by 2030" and the long-term goal of achieving climate neutrality by 2050 serve as the Authority. These are official and comprehensive statements by Brazil in the international arena that set normative expectations. In addition, Brazil's environmental laws include standard restrictions requiring landowners to protect between 20% and 80% of their land,

depending on the region. The national commitment to eliminate illegal deforestation by 2028 represents a general legal ban that is similarly applied in a uniform manner. In addition, Brazil sets standard restrictions on data collection by specifying the use of tier 2 methodologies and the 100-year global warming potential (GWP-100) metric for the collection of emissions data. These authoritative standards ensure uniformity, reliability and legal consistency in how climate-related information is compiled and interpreted.

Treasure: Brazil's NDC points to the use of financial mechanisms and support in its climate strategy. It makes clear that achieving long-term goals such as climate neutrality around 2050 could depend on carbon market mechanisms and international climate finance. This means that Brazil will leverage market-based instruments, such as buying or selling carbon credits under Article 6 of the Paris Agreement and seek funding to complement domestic resources. The NDC also points to economic incentives for clean energy and low-carbon development, framing the need for subsidies, investments and possibly carbon pricing to achieve the goals, although specific financial instruments are detailed in local policies, not in the NDC text.

Organization: Implementation of the NDC requires significant coordination across government institutions and sectors. In Brazil, the NDC has encouraged an update of the institutional framework. The government is revising the National Climate Policy and formulating a new "Climate Plan" by 2035 to operationalize the NDC targets. This involves organizing sectoral working groups and strategies for energy, land use, industry and other sectors under coordinated oversight. The Interministerial Committee on Climate Change and the Ministry of Environment play important roles in translating the NDC into organized action, ensuring that each sector contributes to the overall target.

Essentially, the NDC has been seen as a reference point that organizes the various institutions and plans for Brazil's 2030–2035 mitigation targets.

5.3.3 Low-Carbon Agriculture Plan - Plano ABC

Nodality: Plano ABC, or the Agricultural Sector Plan for Low Carbon Emissions, relies heavily on knowledge dissemination and capacity building. It has established extensive technical assistance and rural extension programs to train farmers on sustainable practices. State Management Groups have been established in all Brazilian states to transfer technology, provide training to local technicians and producers, and share information on low-carbon farming techniques. In this respect, it can be evaluated together with the Organization category. Information efforts such as workshops, demonstration units, and guides have been central to the plan, raising awareness of practices such as integrated crop-livestock-forestry and better fertilizer management to reduce emissions.

Authority: The ABC Plan is largely voluntary and does not impose new legal requirements on producers. Instead, it works through incentives and existing regulatory frameworks. The plan outlines sectoral reduction commitments for agriculture. However, these are aspirational targets rather than mandatory obligations. Instead of using bans or standards, the plan is implemented through incorporation into Brazil's official climate policy under the PNMC and regular monitoring of progress. In summary, Plano ABC does not create new regulations for farmers. It foresees the voluntary adoption of existing agricultural policies and climate-friendly practices to meet Brazil's emissions reduction targets in agriculture.

Treasure: Financial incentives have been the cornerstone of the ABC Plan. The government has created a special low-interest credit line, the ABC Program, to finance

the adoption of low-carbon practices on farms. This subsidized rural credit policy has provided around R\$197 billion between 2011 and 2020 for farmers to implement technologies such as pasture restoration, biofuel crops and waste treatment. By offering cheap loans through public banks, rural insurance and some tax benefits, the plan has used financial instruments to encourage investment in sustainable agriculture. These Treasury instruments, namely credit subsidies and public funds, are vital to overcoming the upfront costs for producers switching to low-carbon techniques.

Organization: The ABC Plan introduced new coordination mechanisms in the agricultural sector. It was developed by a multi-institutional working group led by the Presidency's Civil Council, including the Ministry of Agriculture (MAPA), the Agricultural Research Corporation (Embrapa) and others. This inter-ministerial collaboration ensured that the plan was compatible with both climate goals and agricultural development. Institutional structures were created at the federal and state levels for implementation. Accordingly, the National Executive Committee oversees the plan and the State Management Groups implement the plan regionally. These groups coordinate local institutions, rural extension services and banks to implement the plan's programs. Plano ABC is therefore characterized by a strong organizational network from the central government to the local agricultural offices to integrate climate action into Brazil's vast agricultural sector.

5.3.4 National Biofuels Policy - *RenovaBio*

Nodality: RenovaBio uses knowledge-based tools to promote cleaner fuels. One of RenovaBio's key features is the introduction of a biofuel certification system that assesses the lifecycle greenhouse gas emissions of each biofuel producer. Accredited auditing companies measure a producer's emissions per unit of fuel and provide

transparent data on the carbon intensity of different biofuels. Namely, the “Energy-Environmental Efficiency Rating” system enables this data sharing process. This certification information is used to award Decarbonization Credits (CBIOs) proportional to the emission reductions achieved. The policy also requires public disclosure of targets and progress. For example, each fuel distributor’s annual carbon reduction target and compliance status are publicly published, ensuring that information flows to market participants and the public.

Authority: RenovaBio is supported by strong legal obligations. The law has set mandatory national greenhouse gas reduction targets for the fuel sector. At the same time, annual emission reduction targets are set by regulation. These are divided into binding individual targets for all fuel distributors and essentially limit the carbon intensity of the fuel blend sold by each distributor. To implement this, distributors are required by law to acquire and retire a certain number of CBIO credits corresponding to their target share. In addition, this policy has ensured continued demand for biofuels by strengthening biofuel blending obligations, such as the required percentage of ethanol in gasoline and biodiesel in diesel. Through these mandatory targets, credit obligations and blending standards, RenovaBio legally directs fuel suppliers to lower carbon outcomes. Non-compliance is subject to penalties by the regulator (ANP) and the direction of authority is critical.

Treasure: Financial and market instruments are central to RenovaBio’s design. RenovaBio has created a tradable credit system. Biofuel producers who exceed baseline emissions receive CBIO credits that they can sell to fuel distributors, effectively monetizing the emissions savings. This market incentive puts a price on carbon reductions in the transportation fuel sector. In addition, the law explicitly provides tax, financial, and

credit incentives to support biofuels. These include tax breaks and credit facilities to encourage biofuel production and use. In practice, a significant “Treasure” element is the CBIO market itself, with a global annual target of 38.78 million credits by 2024. This is creating a new carbon finance flow in Brazil. The combination of tradable credits and financial incentives under RenovaBio is an example of the use of monetary instruments to achieve climate goals.

Organization: RenovaBio uses Brazil’s existing institutional framework for energy regulation, with some new coordination mechanisms. The National Energy Policy Council (CNPE) is tasked with setting overall annual carbon intensity reduction targets for fuels and providing high-level strategic control. The National Petroleum Agency (ANP) is then tasked with implementing the policy. The ANP certifies biofuel plants, calculates separate targets for each fuel distributor, and monitors compliance. No new, independent agency has been created. Instead, RenovaBio envisions the establishment of committees and technical working groups within the Ministry of Mines and Energy and the ANP to manage the certification program and market surveillance. The operation of the policy, therefore, depends on organized coordination between energy authorities and industry. By formalizing the roles for the CNPE and ANP and requiring cooperation with fuel producers and importers, RenovaBio’s success depends on a well-structured administrative process to manage the credit market and maintain regulation.

5.3.5 Brazilian Emissions Trading System - SBCE

Nodality: The ETS law places information and monitoring as key elements. Regulated entities must develop a detailed Monitoring Plan and submit regular emissions reports to the SBCE’s governing authority. This provides for a rigorous MRV (Monitoring, Reporting, Verification) system where emissions data are collected and

verified. The law also defines CO₂ equivalent standard measures and aligns Brazil's accounting with UNFCCC rules, facilitating clear communication of emissions. In addition, transparency provisions, such as public registers of permits and reported emissions, mean that information flows to market participants and regulators, increasing transparency and compliance in the system.

Authority: Law 15.042/2024 establishes a mandatory cap-and-trade regime with legal force. It sets enforceable limits on greenhouse gas emissions for covered sectors and translates Brazil's climate targets into binding limits. Each regulated company must obtain emissions quotas (Cotas Brasileiras de Emissão, CBE), where one quota allows the emission of 1 tonne of CO₂e. Exceeding the limit is illegal and triggers sanctions. The law authorizes fines of up to 3% of a company's gross turnover, or 4% for repeat offenders, for non-compliance. These penalties create a strong legal deterrent. The SBCE law also grants the new regulatory mechanism the authority to set and enforce rules. It also empowers these institutions to issue regulations, hold permit auctions and penalize violators. The authority instrument is, in effect, the backbone of the ETS. It uses legal obligations, caps, quotas and sanctions provisions to enforce emissions reductions in industry.

Treasure: The SBCE uses market and financial instruments to drive emissions cuts. It creates tradable emissions quotas and credits. Companies that emit less than their permits can sell their excess quotas, while those that need more must buy them on the market. This bonus system financially rewards efficient companies and imposes a cost on those that exceed their limits. The law also provides for permit auctions that generate public revenue. In particular, up to 15% of auction revenues are allocated for the administration and monitoring of the system. By allocating auction revenues, it provides

a financial stream to maintain the policy regulatory infrastructure. Furthermore, the SBCE framework integrates with international carbon markets, potentially allowing international credit trading, which could lead to foreign investment or lower-cost abatement opportunities. In terms of the financial burdens that the EU CBAM would impose, the establishment of the SCBE and the work to integrate it with other ETS systems provide a significant advantage in the international market.

Organization: The implementation of a national carbon market requires new organizational arrangements. The law establishes a three-tiered governance structure. These structures can be listed as follows:

- 1) Strategic coordination by the Inter-Ministerial Committee on Climate Change (CIM), chaired by the President's Chief of Staff, will determine the overall emission limit trajectory and integrate the ETS with Brazil's NDC and climate policy.

- 2) Regulatory implementation will be implemented by a newly created SBCE Management Authority, a special institution responsible for issuing technical regulations, operating the emissions registry, overseeing emissions trading issues such as auctions and secondary markets, and ensuring compliance.

- 3) The law authorizes the SBCE Authority to convene advisory committees with representatives from the public sector, industry, and civil society to provide input on quota allocation, MRV methodologies, and market supervision. The SBCE law thus establishes a solid institutional framework to ensure the effective governance of the carbon market, from high-level policy oversight to technical management and stakeholder engagement.

5.3.6 Economic Reciprocity Law

Nodality: This law includes an important element of communication and negotiation in Brazil's response to foreign carbon measures. It clearly states that

diplomatic consultations must be held to resolve any disagreements before retaliatory actions are taken. In practice, this means that Brazil will engage in dialogue and exchange with countries that have established mechanisms such as the EU CBAM. By mandating diplomatic communication, the law uses the communication tool of Nodality as a first step, aiming to inform counterparts about Brazil's position before moving on to trade countermeasures.

Authority: The Economic Reciprocity Law is of great importance in terms of enacting into law Brazil's emphasis on "green colonialism" in international climate negotiations. This law authorizes the Executive Branch to impose countermeasures in the event that another country or trading bloc imposes unilaterally advantageous or excessively burdensome practices. These practices largely include international environmental regulations and mean that Brazil can enact reciprocal regulations on the EU CBAM. These countermeasures may include restricting imports, suspending trade privileges, or imposing other sanctions. In particular, the law targets foreign policies that are "more severe than the environmental standards adopted by Brazil." Economic Reciprocity Law is a significant step for Brazil and sets the conditions under which Brazil can retaliate to protect its producers against carbon regulations.

Treasure: The Economic Reciprocity Law, although framed as a trade law, effectively offers a financial tool in the form of retaliatory tariffs or suspension of trade benefits. By allowing additional import restrictions or tariffs, the law creates a potential financial penalty for countries that impose carbon costs on Brazilian goods. It threatens economic costs to deter or offset foreign carbon fees. Under this law, if Brazilian steel or aluminum faces a CBAM fee, Brazil can respond with its own tariffs to level the playing field.

Organization: The implementation of the law will be coordinated by the Executive branch in collaboration with the private sector. This means that the decision to take retaliation will involve consultations between government officials and industry stakeholders affected by the foreign measure. The organizational aspect ensures that Brazil's response is unified and informed by those on the ground. It will likely use existing institutions to design and implement countermeasures. By formalizing a coordination process with private sector input, the law creates an organizational mechanism to decide whether, when, and how to implement retaliatory actions, rather than leaving it to private decisions. This structure aims to protect national interests while calibrating responses to international carbon policies.

5.3.7 Assessment of Brazil's Carbon Pricing Policies

Officially, Brazil has criticized the CBAM. In July 2023, the Brazilian Ministry of Foreign Affairs described the CBAM as “clearly incompatible with multilateral environmental agreements and the multilateral trading system” and warned that “green protectionism threatens the sustainability of the multilateral trading system”. It called for a longer transition period for countries outside the EU, so as not to unfairly penalize emerging industries. Similarly, industry groups and some trading partners have accused the CBAM of being coercive or incompatible with the WTO. The Economic Reciprocity Law can also be seen as a formal response. It gives Brazil the authority to retaliate if foreign “carbon control mechanisms” harm Brazilian trade. Brazil has therefore stated that it opposes the EU's new border tax and sees it as a trade barrier, while at the same time saying that it will work to align its own system with international norms. While the ETS is being established as a factor that strengthens cooperation in Brazil-EU relations, legal measures are being taken against EU practices.

RenovaBio's scope includes fuels that are not currently covered by CBAM. On the contrary, CBAM targets energy-intensive industries, not biofuels. It is loosely aligned with EU renewable fuel policies. The law even benefits from the EU's Renewable Energy Directive. In principle, low-carbon ethanol or biodiesel certified under RenovaBio could help meet any future EU sustainability criteria, but CBAM itself does not apply to fuel imports. RenovaBio therefore has little direct connection to EU CBAM & ETS. However, its presence strengthens Brazil's overall climate credentials and decarbonizes globally competitive sectors. It also sets a carbon price signal that could inform energy or transportation pricing beyond Brazil via CBIO credits, even if it is currently outside EU mechanisms.

In summary, the design of the SBCE aligns with EU ETS principles in terms of capacity and trading, allowance auctions, MRV, and even interoperability, suggesting potential collaboration/connection. In contrast, CBAM has been a point of contention. Brazil's diplomatic statements and the Reciprocity Law suggest that it is defensive rather than harmonious. RenovaBio reflects a policy inspired by the EU. Brazil is copying EU-style market instruments because it sees them as effective tools to meet its Paris commitments and attract investment. The Reciprocity Law is a stance against external measures. This mixed picture means that Brazil is positioning itself partly in line with EU climate governance in order to maintain market access and leverage its Paris commitments, but is also prepared to resist what it sees as unfair trade measures. There is no EU conditionality that obliges Brazil to establish an ETS. Instead, Brazil is proactively building an ETS that will be internationally recognized. The climate transparency analysis calls on Brazil to further align the SBCE "with evolving international norms, border adjustment rules and other leading ETS standards" so that CBAMs "will give credit to

Brazil's pricing effort". This strategy would make Brazil an example of the diffusion of EU external norms through voluntary learning. On the EU's side, some might think that Brazil's ETS development is partly driven by its desire to avoid CBAM penalties. But Brazil frames this as meeting its own climate targets rather than surrendering to the EU. So, compliance here is mostly voluntary. Brazil has stated: "We will build an ETS on our own terms, and if you implement CBAM, we will retaliate."



6. DISCUSSION

Each country's mix reflects its own policies, economics, and external pressures. Brazil's portfolio of instruments is broad but shaped by its federal, consensus-based system: the 2009 climate law itself lists 18 types of instruments, and many new measures, such as sectoral plans and the Amazon Fund, strengthen regulation (Authority) and public finances (Treasure). Consistent with its agro-forest economy, Brazil heavily emphasizes deforestation control through the implementation of the Forest Code and subsidies for biofuels/renewables. Nodal instruments such as public education and data collection & monitoring primarily support these goals.

South Korea, on the other hand, uses its strong government capacity by combining command and control with markets. It mandates targets through the TMS and RPS but also manages one of Asia's largest ETSs as a Treasure instrument, directing government R&D and subsidies toward green technology. Its unitary state and governance structure of committees led by the President facilitate coherent policy delivery.

Turkey has historically relied on centralized mandates and subsidies, but the EU's CBAM and Paris commitments are pushing it toward market instruments. Therefore, Turkey now emphasizes an ETS to raise funds and meet EU standards and a new climate bureaucracy, while continuing to provide financial support for renewables.

In terms of strategic emphasis, Brazil prioritizes regulatory measures, such as forest and land-use laws, and fiscal incentives, such as funds and tax breaks, to address its unique deforestation and energy profile. South Korea supports regulatory binding targets and information disclosure (Authority/Nodality) to rapidly reduce industrial emissions, supported by its long-standing ETS (Treasure). Until recently, Turkey relied

on organizational decrees and subsidies, but is now moving toward market-based approaches (Treasure) under EU influence.

Figure 6.1 *Radar Chart of NATO Instruments*

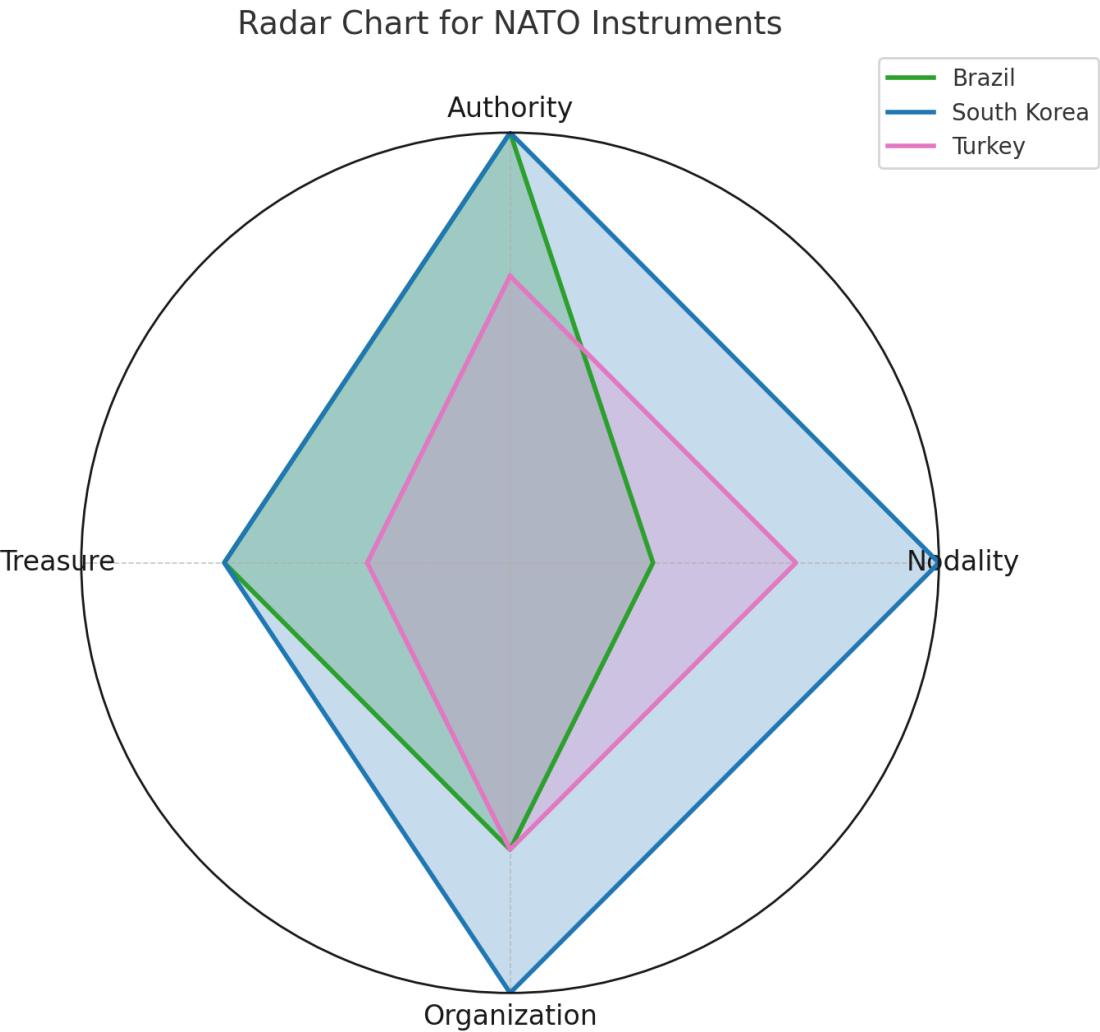


Figure 6.1 shows the distribution density of Hood’s NATO policy instruments across Turkey, South Korea and Brazil in the context of climate policies related to carbon pricing and CBAM. Turkey places more emphasis on Nodality and Organization, reflecting high engagement in information dissemination and institutional coordination, while South Korea shows a balanced use of all four instruments in Organization, particularly due to its early adoption of K-ETS and institutional reforms. Brazil, although

active in legal reforms (Authority), shows a relatively limited emphasis on Treasure and Organization, suggesting a more fragmented policy landscape.

In Nodality section, Turkey received a score of 2, as the 2021 Green Deal Action Plan introduced MRV development and CBAM modeling efforts in priority sectors. South Korea scored 3, operating a comprehensive MRV system under K-ETS, including third-party verification. Brazil was assigned a score of 1, having submitted Biennial Update Reports to the UNFCCC, yet demonstrating limited domestic MRV enforcement.

Turkey scored 2 for Authority. Although it proposed a Climate Change Law in 2023, it was later withdrawn, remaining regulatory instruments, such as presidential circulars, are largely nonbinding. South Korea received a score of 3, having implemented a fully operational K-ETS with robust regulatory support since 2015. Brazil also scored 3, following the enactment of the SBCE ETS law in 2024, which includes a phased implementation schedule.

For fiscal tools, namely Treasure, Turkey was scored 1, as it has not yet introduced carbon pricing, although feasibility studies related to CBAM are underway. South Korea also scored 2 due to the lower carbon price (~€6/ton) within its ETS, which limits its policy impact. Brazil was assigned a score of 2, since the SBCE provides for emissions trading, although financial mechanisms are not yet operational.

In Organization section, Turkey received a score of 2 with the establishment of the Green Deal Coordination Board and CBAM Working Groups. South Korea scored 3, having launched a dedicated International CBAM Office under the Ministry of Environment in 2025. Brazil was given a score of 2, as the SBCE mandates future administrative capacity, although implementation remains incomplete.

The radar charts and coding tables demonstrate significant variation across countries in terms of the degree and nature of policy change. South Korea exhibits high scores in Nodality, Authority, and Organization, reflecting a mature institutional structure, transparent MRV systems, and long-standing ETS. Turkey shows medium-level engagement in most dimensions but scores low on treasure, indicating fiscal and carbon pricing gaps. Brazil, while politically engaged in global climate governance, displays moderate institutionalization with a limited MRV system and no active carbon pricing mechanism.

These differences stem from differences in institutions and motivations across countries. Brazil's federal, multi-stakeholder model and reliance on land-based economies require multiple coordinating bodies and incentive programs. South Korea's developmental strategy offers uniform sovereign powers and technology-focused solutions and Turkey's relationship with the EU Customs Union and its geopolitical location mean that it is almost forced to adapt to external regimes while managing resource constraints. Therefore, Hood's tools appear differently in each country. Brazil's mix is weighted toward financial assistance and regulation, while South Korea's is weighted toward command and control with a strong market. Turkey's is shifting from regulatory mechanisms to market mechanisms, reflecting their different political economies, goals, and capacities.

The findings of this study highlight the complexity of Europeanization processes in the climate policy arena, particularly in the context of the EU CBAM. While the EU frames the CBAM as a normative power tool to promote global decarbonization and climate justice, the mechanisms of influence on third countries often reflect a hybrid dynamic tied to both ideological diffusion and economic leverage.

The comparative analysis shows that Europeanization under the CBAM is not simply a process of norm diffusion or “leading by example.” Rather, it involves power projection, conditionality, and even coercive economic instruments. This duality is particularly evident in the Brazilian case, where CBAM has been framed by local political actors and the media as a form of “green colonialism.” Brazil’s strong opposition, particularly voiced through the BASIC group and reinforced by the Economic Reciprocity Law, exemplifies a pattern of resistance rooted in both normative contestation and structural power asymmetries. Brazil’s climate governance relies heavily on Authority and Treasure instruments, such as deforestation laws, biofuel subsidies, and federal programs; however, the absence of a functional ETS and divergent trade strategies, such as prioritizing South-South alliances, suggest a deliberate shift away from EU-led regulatory harmonization.

In contrast, Turkey reflects a more mixed model of reluctant but increasing adaptation. As a candidate country and EU Customs Union member, Turkey is structurally embedded in EU regulatory frameworks. While initial reactions to CBAM were politically resistant, Turkey has moved toward greater EU cooperation due to economic dependency, IPA funds, and the impact of CBAM on carbon-intensive export sectors such as iron, steel, and cement. Although not yet in force, the establishment of a national ETS compatible with the EU ETS, institutional reforms, and legal convergence with the EU climate acquis suggest a path-dependent form of Europeanization shaped by both incentives and mandates.

South Korea presents a third model, characterized by proactive adaptation and strategic cooperation. Despite lower exposure compared to Brazil or Turkey, South Korea’s response reflects high institutional and technological readiness. Early adoption

of K-ETS, investments in CCUS and IoT monitoring, and targeted industrial decarbonization policies, especially in the semiconductor and heavy industry sectors, are important. The almost complete lack of emphasis on cooperation with the EU compared to Turkish documents and the incompatibilities between ETS systems demonstrate the limitations of EU-South Korea cooperation. Despite the almost complete lack of emphasis on cooperation, South Korea has not described the EU CBAM as “green colonialism.” In this respect, it is clearly different from Brazil’s opposition to the EU’s market-based instruments. South Korea’s self-definition as a leader among Asian countries in climate change policies and the policies it implements accordingly strengthen South Korea’s role as a “regional power and global actor.” South Korea harmonizes its climate goals by combining the instruments of the Authority and the Treasury through climate committees and green R&D subsidies.

Several factors help explain the variation in policy change observed among Turkey, South Korea, and Brazil in response to the EU CBAM. First, the degree of trade dependence on the European Union plays a crucial role. South Korea and Turkey exhibit deeper economic integration with the EU. Customs Union is significant in Turkish case and for South Korea bilateral trade agreements and significant export dependency motivated this change. In contrast, Brazil’s lower volume of EU-bound exports reduces the immediacy of compliance, despite its ongoing diplomatic engagement with EU environmental priorities. Second, the presence of pre-existing domestic climate policy frameworks shapes national capacities for adaptation. South Korea benefits from a mature and well-institutionalized carbon governance system, including an emissions trading scheme (ETS) operational since 2015 and detailed sectoral decarbonization plans. Turkey and Brazil, however, began to formalize such frameworks only after the introduction of

the EU Green Deal and CBAM, indicating more reactive policy behavior. Third, political leadership and ideological preferences influence climate ambitions. South Korean governments in recent years have prioritized green innovation and sustainability, while both Brazil and Turkey have experienced governance periods marked by populism or conservative tendencies, which often resulted in ambivalence toward environmental reform.

A fourth explanatory factor is search for global reputation. South Korea actively engages in international climate diplomacy and presents itself as a normative green actor. This contrasts with Brazil and Turkey, where environmental performance is less aligned with foreign policy branding. Fifth, institutional capacity and administrative structure determine the feasibility of reform. Brazil's decentralized governance and limited fiscal space raise the cost of adaptation, while South Korea's centralized digital bureaucracy allows for more effective CBAM-related implementation. Lastly, differing levels of globalization and economic complexity contribute to variation. South Korea's tech-intensive economy, heavily integrated into global value chains, increases the incentive for regulatory convergence.

These cases demonstrate that CBAM operates not only as a normative mechanism but also as an instrument of economic power. Countries are not only norm recipients but also strategic actors who weigh economic costs, institutional capacity, and geopolitical alignments when deciding on levels of compliance or resistance. Therefore, the concept of Europeanization should be examined to account for the dynamics of external governance, contestation, and economic conditionality.

In summary, this study provides a fine-grained, instrument-based comparative framework for understanding how non-EU countries interact with EU climate

conditionality under CBAM. It advances the literature on global climate governance, norm diffusion, and the political economy of decarbonization by integrating Hood's NATO typology with Europeanization theory.



REFERENCES

- Angerer, G., Nordbeck, R., & Sartorius, C. (2008). Impacts on industry of Europe's emerging chemicals policy REACH. *Journal of Environmental Management*, 86(4), 636-647.
- Bache, I., Bulmer, S., George, S., & Parker, O. (2015). *Politics in the European Union*. Oxford University Press, USA.
- Balkır, C., Bölükbaşı, H. T., & Ertugal, E. (2013). Europeanisation and dynamics of continuity and change: Domestic political economies in the 'Southern Periphery'. *South European Society and Politics*, 18(2), 121–137. DOI: 10.1080/13608746.2013.795040
- Börzel, T. A. (1998). The Greening of a Polity? The Europeanization of Environmental Policy-Making in Spain. *South European Society and Politics*, 3(1), 65–92. <https://doi.org/10.1080/13608740308539526>
- Börzel, T., & Risse, T. (2000). When Europe hits home: Europeanization and domestic change. *European integration online papers (EIoP)*, 4(15).
- Börzel, T. A. (2002). Member state responses to Europeanization. *JCMS: Journal of Common Market Studies*, 40(2), 193-214.
- Börzel, T. A., & Risse, T. (2007). Europeanization: The domestic impact of European Union politics. *Handbook of European Union Politics*, 483-504.
- Börzel, T. A. (2011). When Europe hits... beyond its borders: Europeanization and the near abroad. *Comparative European Politics*, 9, 394-413.
- Börzel, T. A., & Risse, T. (2012). From Europeanization to diffusion. *Domestic politics and norm diffusion in international relations*, 290.

- Börzel, T. A. (2013). Comparative regionalism: European integration and beyond. *Handbook of international relations*, 2, 503-530.
- Bull, M., & Baudner, J. (2004). Europeanization and Italian policy for the Mezzogiorno. *Journal of European Public Policy*, 11(6), 1058–1076. <https://doi.org/10.1080/1350176042000298101>
- Bradford, A. (2020). *The Brussels effect: How the European Union rules the world*. Oxford University Press.
- Branger, F., & Quirion, P. (2014). Climate policy and the ‘carbon haven’ effect. *Wiley Interdisciplinary Reviews: Climate Change*, 5(1), 53-71.
- Carbon Pulse. (2022, October 3). South Korea to seek EU CBAM acceptance for ETS carbon reductions, strengthen MRV. Carbon Pulse. <https://carbon-pulse.com/174458/>
- Carmin, J., & VanDeveer, S. D. (2004). Enlarging EU environments: Central and Eastern Europe from transition to accession. *Environmental Politics*, 13(1), 3-24.
- Cifuentes-Faura, J. (2022). European Union policies and their role in combating climate change over the years. *Air Quality, Atmosphere & Health*, 15(8), 1333-1340.
- Council of the EU. (2023). Fit for 55: Council and Parliament reach deal on Carbon Border Adjustment Mechanism (CBAM).
- Council on Foreign Relations. (2023, May 17). Trade tools for climate action: Carbon border adjustment mechanisms. <https://www.cfr.org/article/trade-tools-climate-action-carbon-border-adjustment-mechanisms>
- Durel, L. (2024). Border carbon adjustment compliance and the WTO: the interactional evolution of law. *Journal of International Economic Law*, 27(1), 18-40.

- European Commission. (2021). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: The European Green Deal.
- European Commission. (2021). Proposal for a Regulation of the European Parliament and of the Council establishing a Carbon Border Adjustment Mechanism. COM/2021/564 final.
- European Commission. (2023). Carbon Border Adjustment Mechanism (CBAM).
- European Commission. (2023). CBAM Q&A: Reporting during the transitional period.
- European Commission. (2023). CBAM Transitional Registry and Reporting Guidelines.
- European Council. (2023). Carbon Border Adjustment Mechanism (CBAM).
- European Environment Agency (EEA). (2021). The EU Emissions Trading System (EU ETS). EEA. <https://www.eea.europa.eu/publications/the-eu-emissions-trading-system-2>
- European Parliament. (2023). Carbon Border Adjustment Mechanism: Frequently asked questions.
- European Parliament News. (2024). MEPs endorse proposals to simplify Carbon Border Adjustment Mechanism.
- Featherstone, K., & Radaelli, C. M. (Eds.). (2003). The politics of Europeanization. Oxford University Press.
- Fragkos, P., van Soest, H. L., Schaeffer, R., Reedman, L., Köberle, A. C., Macaluso, N., ... Iyer, G. (2021). Energy system transitions and low-carbon pathways in Australia, Brazil, Canada, China, EU-28, India, Indonesia, Japan, Republic of Korea, Russia and the United States. *Energy*, 216, 119385.

- Ganza, J. (2014). Book review: Europe: Europeanization and domestic policy change: The case of Italy. *Political Studies Review*, 12(3), 456. DOI: 10.1111/1478-9302.12067_112
- Graziano, P. R. (2011). Europeanization and domestic employment policy change: Conceptual and methodological background. *Governance*, 24(3), 583–605. DOI: 10.1111/j.1468-0491.2011.01533.x
- Government of South Africa. (2021, April 8). Joint Statement issued at the conclusion of the 30th BASIC Ministerial Meeting on Climate Change hosted by India on 8th April 2021. Media Statements. <https://www.gov.za/nr/news/media-statements/joint-statement-issued-conclusion-30th-basic-ministerial-meeting-climate>
- Hinrich Foundation. (2025). Assessing the gaps in CBAM and the EU's net zero strategy. Hinrich Foundation. <https://www.hinrichfoundation.com/research/wp/sustainable/gaps-in-cbam-and-the-eu-net-zero-strategy/>
- Hood, C. (1983). *The tools of government*. Macmillan.
- International Carbon Action Partnership (ICAP). (n.d.). Korea Emissions Trading System (K ETS). ICAP. <https://icapcarbonaction.com/en/ets/korea-emissions-trading-system-k-ets>
- Izci Connelly, R. (2012). Europeanisation of Turkish environmental policy with special reference to sustainability discourse. In Ç. Nas & Y. Özer (Eds.), *Turkey and the European Union* (pp. 181–203). Ashgate. DOI: 10.4324/9781315549569-10
- Jordan, A. J., & Liefferink, D. (2004). *Environmental policy in Europe: The Europeanization of National Environmental Policy*. Routledge.

- Kelley, J. (2004). International actors on the domestic scene: Membership conditionality and socialization by international institutions. *International Organization*, 58(3), 425–457. <https://doi.org/10.1017/S0020818304583017>
- Knill, C., & Lehmkuhl, D. (1999). How Europe matters: different mechanisms of Europeanization. <https://dx.doi.org/10.2139/ssrn.302746>
- Knill, C., Tosun, J., & Bauer, M. W. (2009). Neglected faces of Europeanization: The differential impact of the EU on the dismantling and expansion of domestic policies. *Public Administration*, 87(3), 519–537. DOI: 10.1111/j.1467-9299.2009.01768.x
- Knill, C., & Lenschow, A. (2005). Compliance, communication and competition: patterns of EU environmental policy making and their impact on policy convergence. *European Environment*, 15(2), 114-128.
- Ladrech, R. (1994). Europeanization of domestic politics and institutions: The case of France. *J. Common Mkt. Stud.*, 32, 69.
- Leal-Arcas, R., Faktaufon, M., & Kyprianou, A. (2022). A legal exploration of the European Union’s carbon border adjustment mechanism. *European Energy and Environmental Law Review*, 31(4).
- Manners, I. (2002). Normative power Europe: a contradiction in terms?. *JCMS: Journal of Common Market Studies*, 40(2), 235-258.
- Mendez, C., Wishlade, F., & Yuill, D. (2008). Made to measure? Europeanization, goodness of fit and adaptation pressures in EU competition policy and regional aid. *Journal of Comparative Policy Analysis: Research and Practice*, 10(3), 279–298. <https://doi.org/10.1080/13876980802231081>
- OECD. (2021). *Effective Carbon Rates 2021: Pricing carbon for a green recovery*. OECD Publishing.

- Otto, S. (2025). The external impact of EU climate policy: political responses to the EU's carbon border adjustment mechanism. *International Environmental Agreements: Politics, Law and Economics*, 1-18.
- Prakash, A., & Potoski, M. (2017). The EU effect: does trade with the EU reduce CO2 emissions in the developing world?. *Environmental Politics*, 26(1), 27-48.
- Prontera, A. (2010). Europeanization, Institutionalization and Policy Change in French and Italian Electricity Policy. *Journal of Comparative Policy Analysis: Research and Practice*, 12(5), 491–507. <https://doi.org/10.1080/13876988.2010.516510>
- Prazeres, T. L., & Xie, Z. (2021, October 26). What is a carbon border tax and what does it mean for trade? *World Economic Forum*. <https://www.weforum.org/stories/2021/10/what-is-a-carbon-border-tax-what-does-it-mean-for-trade/>
- Radaelli, C. M. (1997). How does Europeanization produce domestic policy change? Corporate tax policy in Italy and the United Kingdom. *Comparative Political Studies*, 30(5), 553–575. DOI: 10.1177/0010414097030005002
- Regulation (EU) 2023/956 of the European Parliament and of the Council of 10 May 2023 establishing a Carbon Border Adjustment Mechanism. *Official Journal of the European Union*, L 130/52.
- Reuters. (2024, November 21). Trade demands clash with climate agenda at COP29 talks. Reuters. <https://www.reuters.com/sustainability/trade-demands-clash-with-climate-agenda-cop29-talks-2024-11-21/>
- Risse, T., Cowles, M. G., & Caporaso, J. (2001). Europeanization and domestic change: Introduction. *Transforming Europe: Europeanization and domestic change*, 1-20.

- Saurugger, S., & Radaelli, C. M. (2008). The Europeanization of public policies: Introduction. *Journal of Comparative Policy Analysis*, 10(3), 213-219.
- Savaşan, Z. (2020). The development process of environmental law in Turkey: the EU impact. *Environmental law and policies in Turkey*, 7-31.
- Schaffrin, A., Sewerin, S., & Seubert, S. (2015). Toward a comparative measure of climate policy output. *Policy Studies Journal*, 43(2), 257-282.
- S&P Global Commodity Insights. (2023, June 13). EC releases reporting obligations under CBAM, seeks feedback. <https://www.spglobal.com/commodity-insights/en/news-research/latest-news/energy-transition/061323-ec-releases-reporting-obligations-under-cbam-seeks-feedback>
- Steinebach, Y. (2022). Instrument choice, implementation structures, and the effectiveness of environmental policies: A cross-national analysis. *Regulation & Governance*, 16(1), 225-242.
- Tastan, K. (2022, November 11). The challenge of decarbonisation and EU–Turkey trade relations (SWP Comment No. 2022/C 66). *Stiftung Wissenschaft und Politik*. <https://doi.org/10.18449/2022C66>
- Uğurlu, D. (2024). Enhancing Green Partnership Between Türkiye and European Union Through the European Green Deal (Master's thesis, Middle East Technical University (Turkey)).
- UNCTAD. (2021). The EU Carbon Border Adjustment Mechanism: Implications for developing countries. UNCTAD. <https://unctad.org/publication/european-union-carbon-border-adjustment-mechanism-implications-developing-countries>
- United Nations. (2015). The Paris Agreement. United Nations Framework Convention on Climate Change. https://unfccc.int/sites/default/files/english_paris_agreement.pdf

- Weise, Z. (2021, November 6). EU's looming carbon tax nudged Turkey toward Paris climate accord, envoy says. Politico. <https://www.politico.eu/article/eu-carbon-border-adjustment-mechanism-turkey-paris-accord-climate-change/>
- Weise, Z. (2023, December 5). Brazil's anger over EU carbon tax infiltrates COP28. Politico. <https://www.politico.eu/article/brazil-anger-eu-carbon-tax-infiltrates-cop28-luiz-ignazio-lula-da-silva-china-india-south-africa/>
- Yang, Y. (2017). How do EU norms diffuse? Rule of law promotion in EU-China cooperation on environmental governance. *Journal of European Integration*, 39(1), 63-78.
- Yeldan, E., Acar, S., Aşıcı, A., & Ünüvar, B. (2020). The new climate regime through the lens of economic indicators (TÜSİAD Publication No. T/2020-06/614). Turkish Industry and Business Association (TÜSİAD).
- Zhong, J., & Pei, J. (2024). Carbon border adjustment mechanism: a systematic literature review of the latest developments. *Climate Policy*, 24(2), 228-242.



APPENDICES

APPENDIX A. THE POLICY INSTRUMENTS SCORE OF TURKEY

Policy Tool	Level	Instruments	Explanation	Source Documents
Nodality	Medium	Sectoral CBAM documents (steel, cement, aluminium), Impact Analysis, workshops, Green Agenda training	Informational CBAM reports, sectoral guidance, impact studies, but no binding MRV yet.	Green Deal Action Plan Report (2023), Impact Analysis (2023), CBAM Sectoral Documents, Green Agenda
Authority	Medium	Presidential Circular, Climate Change Law (draft), Medium-Term Program commitments	Working group established, draft climate law and ETS planned, but no binding pricing legislation.	Presidential Circular (2021), Draft Climate Law, Medium-Term Program (2022)
Treasure	Low	IPA funds, project-based climate finance, references to green investment mechanisms	No domestic ETS or carbon tax; only limited EU-funded project-based financial tools exist.	Green Agenda, Green Deal Action Plan (2021), Medium-Term Program
Organization	Medium	CBAM Working Group, EU coordination units, circular economy technical teams	Multi-ministerial working group exists, limited coordination capacity, no ETS authority or registry.	Presidential Circular, Green Agenda, Green Deal Action Plan

APPENDIX B. THE POLICY INSTRUMENTS SCORE OF SOUTH KOREA

Policy Tool	Level	Instruments	Explanation	Source Documents
Nodality	High	-Regular disclosures under K-ETS MRV -Climate dashboards (e.g., emissions inventory, adaptation databases) -Detailed sectoral projections (industry, transport, energy) -CBAM briefings to exporters	South Korea has robust information dissemination mechanisms. The K-ETS provides verified emissions data, ministries like MCT and K-eco offer dashboards and tools to understand sector-level emissions. Exporters receive guidance regarding CBAM through public webinars and publications.	-2050 Carbon Neutral Strategy -Updated NDC Submission (2021)
Authority	High	-K-ETS (mandatory cap-and-trade) -Framework Act on Low Carbon Green Growth regulations -Legal mandates for MRV, ETS, and reduction targets	The K-ETS is a binding legal mechanism enforced by law. Emissions caps, quota allocations, penalties, and mandatory reporting make it strongly authoritative.	-Framework Act on Low Carbon Green Growth -Updated NDC Submission (2021)
Treasure	Medium	-K-ETS market trading -Support for green tech sectors via subsidies -Climate finance under the Green Fund -Carbon price is ~₩10,000–₩20,000/ton (€7–14), lower than EU ETS	Although the carbon pricing system is operational, its price signal is weaker than the EU ETS, limiting CBAM creditability. Green subsidies exist but are fragmented.	-2050 Carbon Neutral Strategy

Organization	High	- Ministry of Environment bodies -K-eco (implementation & MRV) -Presidential Committee on Carbon Neutrality -Multi-ministerial coordination mechanisms	South Korea maintains a high level of organizational capacity through clearly designated climate governance agencies, technical institutions, and national strategies.	-Framework Act on Low Carbon Green Growth -2050 Carbon Neutral Strategy
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APPENDIX C. THE POLICY INSTRUMENTS SCORE OF BRAZIL

Policy Tool	Level	Instruments	Explanation	Key Documents
Nodality	Low	- Brazil Climate Change Forum - AdaptaBrasil platform -MRV provisions in SBCE -Biofuel efficiency labels (RenovaBio)	Brazil uses information tools such as platforms and MRV guidelines. There is limited CBAM-specific sectoral guidance.	- Brazil NDC- RenovaBio Law (13.576/2017)- SBCE Law (15.042/2024)- PNMC
Authority	High	- SBCE (cap-and-trade law) -Binding emissions targets (NDC) -RenovaBio quotas -Legal bans on deforestation	The SBCE mandates carbon limits with sanctions. RenovaBio imposes distributor-level obligations. Climate goals are embedded in laws and enforcement mechanisms.	- SBCE Law (15.042/2024)- RenovaBio Law- PNMC- Brazil NDC
Treasure	Medium	-CBIO carbon market (RenovaBio) -Rural credit program (ABC Plan) - Climate Fund (PNMC) -Auction revenue (SBCE)	Market mechanisms and incentives exist, but ETS prices are not yet aligned with EU ETS. Financial instruments are fragmented, and ETS revenue use is limited.	- RenovaBio Law- ABC Plan- SBCE Law- PNMC
Organization	Medium	- Interministerial Climate Committee (CIM) -SBCE Authority - CNPE / ANP (RenovaBio regulators) -Sectoral coordination (ABC Plan)	Brazil has structured institutions, but operational coherence and coordination depth vary. Climate governance is evolving, but institutional specialization remains partial.	- SBCE Law- PNMC - RenovaBio Law- ABC Plan