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# An analysis of the decline in EU climate leadership based on punctuated equilibrium theory

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As global climate governance progresses, the European Union (EU) has long played a prominent leadership role in international climate affairs, driven by its proactive policy measures and steadfast commitments. However, in recent years, there have been clear signs of decline in the EU's climate leadership. This paper adopts a qualitative research method and integrates the Punctuated Equilibrium Theory (PET) to conduct an in-depth analysis of this decline. This study employs qualitative research methods to delineate the application logic of the PET framework, the rationale for case selection, and the criteria for identifying punctuation points. By systematically examining key events in the EU's climate governance from 2009 to 2023, it provides a thorough analysis of the manifestations and causes of leadership decline. The findings indicate that shifts in the EU's internal political and economic environment, combined with adjustments in the external international competitive landscape, have acted as significant disruptive forces, destabilizing the previously established equilibrium in climate policy. During the punctuation period, intensified interest group bargaining within the EU constrained policymaking processes. In the phase of re-equilibration, challenges in coordinating diverse interests hindered the formation of a stable policy model, further undermining the EU's international climate leadership. The outcomes of this study not only expand the application of PET in the field of climate governance, offering empirical insights for the transformation of global governance systems and the formulation of national climate policies, but also address a gap in existing research by providing empirical analysis and theoretical linkages related to the phenomenon of leadership decline.

### KEYWORDS

climate leadership, climate policies, European Union (EU), global climate governance, punctuated equilibrium theory (PET)

## 1 Introduction

In recent years, the EU has consistently positioned itself as a global leader in climate action. However, shifts in the international landscape, internal policy disagreements, and the rise of emerging economies have collectively contributed to the gradual erosion of the EU's climate leadership. While the EU committed to providing €100 billion in climate assistance between 2020 and 2025, the actual disbursement has fallen significantly short, leading to criticism of its pledge as a "hollow promise." On the international relations front, policy fluctuations in the United States have introduced instability into global cooperation. Meanwhile, China's promotion of low-carbon technologies in developing nations has fostered competitive dynamics with the EU's "Global Gateway" initiative. Furthermore, within the EU, disagreements among

member states over the formulation and implementation of energy-saving and emission-reduction policies, coupled with the substantial financial demands of industrial transition, have impeded internal coordination. Under the dual pressures of a rapidly evolving international environment and insufficient cooperation among its members, the decline of the EU's leadership in climate governance appears increasingly inevitable.

Nonetheless, the EU's accomplishments in the sphere of climate governance remain noteworthy. Research into the internal mechanisms driving the decline of the EU's climate leadership holds significant value, offering policy insights not only for the EU itself but also for other actors engaged in global climate governance, facilitating the pursuit of a balance between policy implementation effectiveness, international equity, and industrial competitiveness. This paper proposes that the trajectory of global climate governance does not follow a linear path but rather exhibits a pattern of punctuated equilibrium, characterized by alternating phases of rapid advancement and stagnation. This perspective offers a promising analytical framework for subsequent research and may also provide a valuable lens for examining other domains of international governance.

The structure of the article is as follows:

Part 2: Literature review: surveys existing research on the EU's climate leadership and the application of PET.

Part 3: Theoretical framework and methodology: outlines the core concepts of PET and constructs an analytical framework based on PET to examine the decline of the EU's leadership in climate governance.

Part 4: Research findings: present the punctuated equilibrium evolution of the EU's climate governance leadership (2009–2023) and describe the causal mechanisms underlying its decline.

Part 5: Discussion: examines the manifestations of the EU's leadership decline and explores its multidimensional impacts.

Part 6: Conclusion: clarifies that, on a practical level, the findings are expected to provide theoretical guidance for various aspects of climate policy formulation and implementation. Theoretically, the study contributes to broadening the application of PET and advances the theoretical understanding of the dynamic evolution of leadership exercised by non-state regional actors within the global governance system.

## 2 Literature review

### 2.1 The early formation of the EU's climate leadership (1988–1997)

The early formation of the EU's climate policies began in the late 1980s. In 1988, the European Community (EC) first discussed climate change at the European level, marking the EU's formal recognition and initial steps to address this global challenge. Prior to this, climate change had not yet entered the EU's political agenda. However, as international awareness of the dangers of climate change grew, the EU gradually recognized its urgency and importance.

The development of Europe's environmental movement and green politics provided the early foundation for the EU's climate policies. The advocacy of environmental pioneer countries like Germany and Sweden, along with the rise of the European Green Party, elevated environmental issues within the EU (Andersen and Liefferink, 1997).

Additionally, the establishment of the Intergovernmental Panel on Climate Change (IPCC) in 1988 and the signing of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 provided an international context and cooperative framework for the formulation of the EU climate policies.

During this phase, the EU engaged in climate governance as a builder of multilateral frameworks through dialogue and cooperation, gradually establishing common climate policy objectives. This laid the groundwork for the EU's subsequent leadership in the Kyoto Protocol negotiations.

### 2.2 The rise of the EU's climate leadership (1997–2005)

The rise of the EU climate leadership occurred primarily between 1997 and 2005. During this period, the EU emerged as a prominent actor in international climate negotiations, with its leadership steadily strengthening. The EU played a pivotal role in the formulation of the Kyoto Protocol, not only as a key driver of agenda-setting but also by actively seeking compromise and cooperation between developed and developing countries to facilitate the Protocol's ratification (Sbragia and Damro, 1999).

By implementing stringent emission reduction policies, the EU demonstrated its commitment to addressing climate change. Under the Kyoto Protocol framework, the EU's member states shared responsibilities and adopted measures such as emissions trading and fiscal instruments, achieving significant emission reductions. These efforts not only earned the EU's international recognition but also established its leadership in global climate governance.

Subsequent milestones included the launch of the European Climate Change Programme in 2000, the adoption of the Emissions Trading Directive in 2003, the inclusion of climate clauses in accession conditions for new member states in 2004, and the launch of the world's first carbon market in 2005 (Eldredge and Gould, 1972).

During this era, the EU made substantial contributions to global climate governance through its strong leadership and action. It pioneered market-based governance innovations, such as carbon trading, and reinforced climate policy consistency during its eastward expansion. These measures solidified the EU's position as the undisputed leader in climate governance (Ellerman and Buchner, 2007).

### 2.3 The consolidation and strengthening of the EU climate leadership (2005–2009)

Entering the 21st century, the EU actively advanced climate policies to consolidate and strengthen its leadership. In 2005, the EU succeeded in including the "2 °C temperature control target" in the G8 Summit communiqué and launched the EU-China Partnership on Climate Change. In 2007, it adopted the binding "20-20-20" targets, aiming to reduce greenhouse gas emissions by 20% below 1990 levels by 2020 (Climate and Energy package 2009, 2008). At COP13 in Bali, the EU pushed for a "two-track negotiation" approach, creating a standoff with the U.S. position. During the 2008 economic crisis, the EU insisted on integrating climate action into recovery plans. It also legislated to include aviation in the EU Emissions Trading System (EU ETS), a move that inadvertently sowed the seeds for the subsequent decline of its climate leadership (Oberthür and Kelly, 2008).

On the policy front, the EU continuously refined its climate policy framework. In 2009, it adopted the Climate and Energy Package,

providing clear guidelines for member states to coordinate emission reduction efforts.

In international cooperation, the EU played a critical role in the adoption of the Paris Agreement. It actively mediated between parties to facilitate negotiations and inject momentum into global climate governance.

In technological innovation, the EU increased investments in clean energy R&D (Paramati et al., 2021). The rapid growth in renewable energy sectors like wind and solar power reduced reliance on traditional energy sources and enhanced the EU's technological edge. Through policy leadership, international cooperation, and technological innovation, the EU consolidated and strengthened its leadership in global climate governance, becoming a key driver of global climate action (Oberthür, 2007).

## 2.4 Research on the application of PET theory

The PET framework is applicable to the analysis of public policy areas characterized by long-term stable policy patterns and influenced by multiple factors. It demonstrates strong explanatory power, especially for understanding changes in global and cross-sectoral policies.

### 2.4.1 Case study 1: policy changes in U.S. Air pollution governance

The systematic application of the PET framework in policy studies can be traced back to the seminal work *Agendas and Instability in American Politics*. As a foundational text of PET theory, this book analyzed policy changes in areas such as civil nuclear power, smoking regulation, and automotive safety, indirectly revealing the underlying logic of environmental governance in the United States. The

theoretical framework aligns closely with the actual trajectory of U.S. air pollution governance. According to PET theory, the evolution of U.S. air pollution governance policies can be divided into “periods of equilibrium” and “point of punctuation,” a process fully consistent with the PET logic of long-term stability interspersed with short-term radical change (Table 1).

### 2.4.2 Case study 2: the adjustment of Germany's renewable energy policy

Germany, as a global benchmark in energy transition, has long anchored its renewable energy policy on a “radical decarbonization” approach. However, the dual shocks of the 2022 energy crisis—triggered by the Russia-Ukraine conflict—and concurrent breakthroughs in green technologies fundamentally disrupted the conventional energy policy equilibrium. This disruption has driven a shift in policy orientation from idealism toward pragmatic balance (see Table 2).

## 3 Theoretical foundation and methodology

### 3.1 Punctuated equilibrium theory

Punctuated Equilibrium Theory (PET) was first proposed by American paleontologists (Eldredge and Gould, 1972) to explain punctuated patterns in biological evolution. Contrasting with the traditional Darwinian model of phyletic gradualism, PET posits that species evolution occurs through abrupt “jumps” rather than continuous incremental changes.

TABLE 1 Brief case study of policy change in U.S. air pollution governance.

Time period	PET phase	Policy characteristics	Triggering factors for punctuation points
1950s	Equilibrium period	Economic growth prioritized over pollution control	
		Weak social consensus	
		Decentralized local management.	
1960s–1970s	Punctuation point	The establishment of the Environmental Protection Agency in 1970 and the passage of the Clean Air Act (Amendments) marked a shift from local, decentralized management to federal, unified regulation	Policy Image Reshaping: A 1963 U.S. Public Health Service report established a clear link between air pollution and respiratory diseases, transforming “smog” from a “harmless haze” to a “health threat.”
		External shocks broke the equilibrium, driving radical policy change.	Policy venue change: Environmental interest groups broke the policy monopoly of industrial interests by lobbying Congress and providing scientific data.
1980s–present	New equilibrium period	A cooperative model of “federal standard setting, state implementation, and public oversight” emerged	
		Emissions trading was introduced	
		The policy image of air pollution control stabilized, the policy venue reached a new balance, and subsequent policy adjustments have been primarily incremental.	

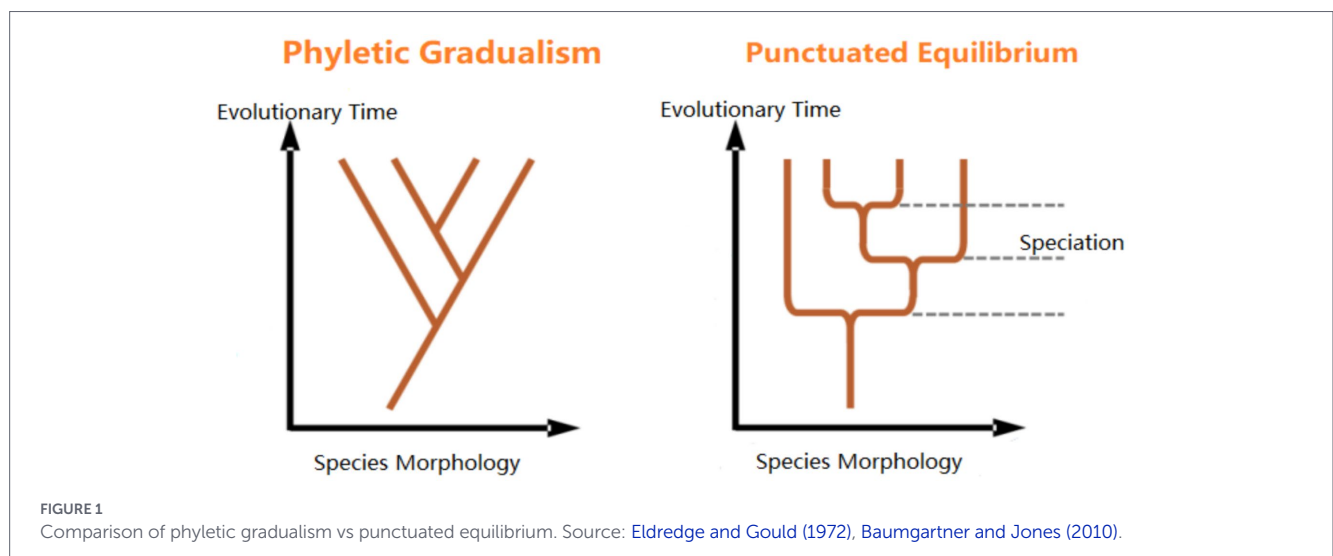
Source: Baumgartner and Jones (2010).

TABLE 2 Brief case study of adjustments in Germany's renewable energy policy.

Time period	PET phase	Policy characteristics	Triggering factors for punctuation points
2020–2022	Equilibrium period	Emission reduction prioritized, subsidy-driven policy	
		The Federal Ministry for Economic Affairs and Climate Action (BMWK) coordinated energy and climate policies	
		A collaborative alliance formed among environmental groups, renewable energy firms, and local governments, ensuring clear policy implementation and strong societal consensus.	
2022	Punctuation point	Shift from single-emission focus to multi-objective balance (security, affordability, decarbonization). Drastic policy priority adjustments: Phasing out fixed feed-in tariffs, fully adopting market-based instruments.	Policy image reshaping: The Russia–Ukraine conflict triggered energy price surges and supply shortages.
		Introduction of the Solar Peak Act (2025) to limit negative electricity price subsidies.	Policy venue shift: Decision-making authority moved from climate-focused agencies to economic-security institutions, amplifying industry and public welfare concerns.
2023–Present	New equilibrium period	Legally binding target: “80% renewable electricity by 2030” (Rahman, 2024)	
		Solar-storage integration becomes standard	
		Streamlined permitting, regionally differentiated incentives	
		Policy now centers on “security, decarbonization, and affordability” synergy.	

Source: Goldthau and Tagliapietra (2022) and Rahman (2024).

Gazprom says European requirements being met after pipeline stoppage (2021). Available online at: <https://www.reuters.com/business/energy/russian-westbound-gas-flow-via-yamal-europe-pipeline-stops-data-shows-2021-10-30/>.



In 1993, American political scientists Baumgartner and Jones (2010) introduced PET into political science through their seminal work *Agendas and Instability in American Politics*, applying it to the study of policy change. Their analysis of U.S. public policymaking revealed that policy transformations do not follow the conventionally assumed linear, incremental path. Instead, they exhibit alternating phases of prolonged stability and sudden radical shifts. During equilibrium periods, policy systems remain stable under the influence of dominant paradigms, institutional rules, and entrenched interest group dynamics. However, external

shocks—such as unexpected societal events, technological disruptions, or paradigm shifts — can trigger punctuation episodes, leading to rapid policy overhauls (Baumgartner and Jones, 2010; see Figure 1).

Over time, PET has been widely adopted to study diverse policy domains across nations, evolving into a key analytical framework in political science and public administration. Recent advancements include Fagan’s (2023) application of PET to dissect policy disasters and the role of political institutions in such processes. PET has transitioned from a descriptive theory to an explanatory framework,

challenging conventional wisdom such as the notion that “more veto points necessarily yield better policies” (Fagan, 2023).

Climate policy inertia, often characterized as a slow-burning crisis, exemplifies PET’s relevance. Building on these theoretical foundations, this study integrates PET with the performance of the EU climate governance leadership to analyze the root causes of its decline (see Figure 2).

## 3.2 Punctuated equilibrium theory in political science: four core concepts

### 3.2.1 Policy image

Refers to how the public and political elites perceive and understand policy issues. Different policy images guide policy participants to take different actions. If the EU’s climate policy is perceived by the public as promoting green job growth, implementing such policies will proceed more smoothly. Conversely, if climate policies are seen as detrimental to employment—particularly in regions where polluting industries account for a large share of jobs—policy implementation becomes more difficult (Vona, 2019). Changes in policy image often trigger policy punctuation.

### 3.2.2 Policy venue

This refers to the environment in which policies are formulated and implemented, encompassing government agencies, interest groups, experts, and other actors. In the EU’s climate policy venue, the interactions among these actors and their power dynamics influence policy direction. In recent years, many scholars have begun to criticize the limitations of a “rules-first” approach in climate governance. The cross-scale

and cross-sector nature of climate issues requires rule-makers to reconcile cultural differences among diverse stakeholders (Bremer et al., 2021).

### 3.2.3 Critical junctures

These are specific events or moments that trigger dramatic policy changes (Baumgartner and Jones, 2010). For example, major climate disasters or the signing of international climate agreements can serve as turning points, shifting the EU’s climate policy from equilibrium to punctuation (Dupont et al., 2020).

### 3.2.4 Incremental change and punctuated change

Incremental change refers to slow, gradual policy adjustments over long periods, while punctuated change involves significant, short-term policy shifts. The decline in the EU’s climate leadership may stem from mismanagement during the transition from incremental to punctuated change.

## 3.3 Methodology

This study examines climate policy shifts within the EU from 2009, marked by the Copenhagen Climate Conference, to 2023. The EU serves as the primary case study due to its historical role as a recognized leader in global climate governance, which in recent years has been characterized by policy stagnation and a loosening of targets—a pattern consistent with the “long-term stability and sudden change” dynamic described in PET. The period 2009–2023 is selected because the Copenhagen Conference represented an the EU attempt to steer

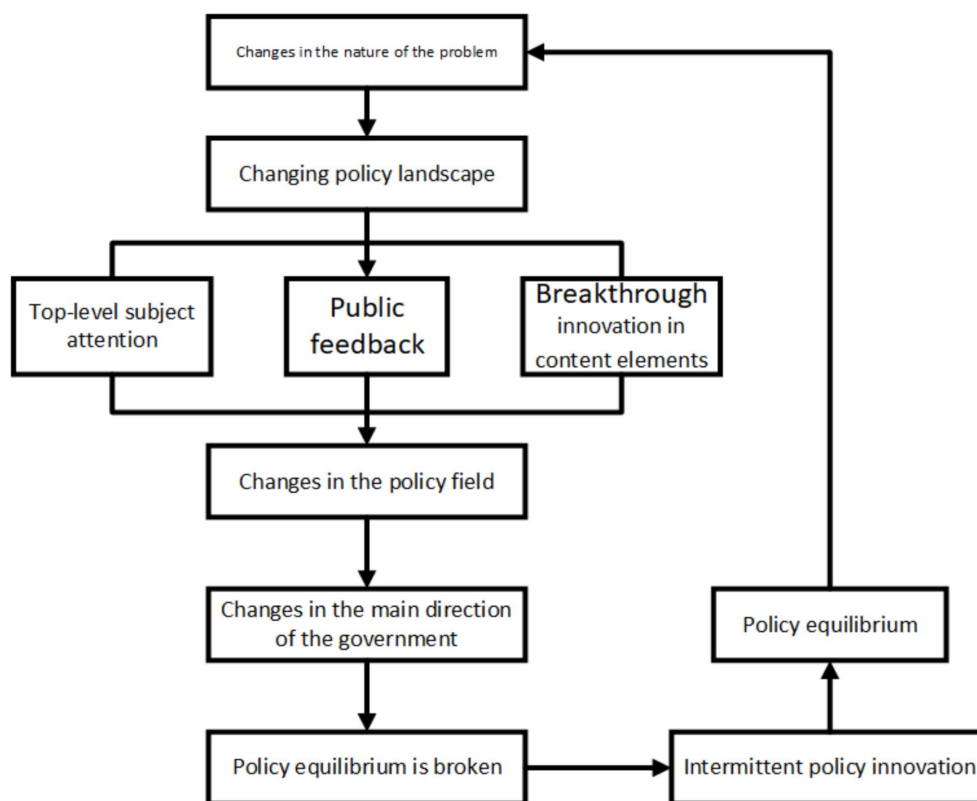


FIGURE 2  
PET in political science. Source: Drawn by authors.

global climate governance, yet the failure of its “top-down” emission reduction framework is widely viewed as the onset of the EU’s declining leadership in climate governance.

This setback served as the first major “punctuation point” in climate governance, prompting a fundamental realignment in governance pathways. The top-down mitigation model that prevailed from 2005 to 2009 lost its broad applicability and effectiveness in the subsequent phase. Nevertheless, this earlier failure helped shape the new “bottom-up” governance paradigm established under the 2015 Paris Agreement. The outbreak and global spread of COVID-19 in 2020 further challenged the operational mechanisms, regulatory frameworks, and underlying drivers of global climate governance. Reliance on the leadership of a single country or even a bloc of nations proved inadequate in the face of increasingly complex and intensifying trends.

Methodologically, the study employs a case-based analytical approach. Through data collection and literature review, it traces changes in the intensity of the EU climate policy around key critical junctures—including the 2008 European financial crisis, the 2015 refugee crisis, and the 2020 COVID-19 pandemic—to examine how external shocks trigger policy punctuations. The 2023 United Nations COP28 climate conference in Dubai, United Arab Emirates, signaled the consolidation of a reinforced equilibrium phase, during which the EU’s climate governance leadership continued to decline. Growing international focus on developing countries, China’s rapid rise in climate governance, the United States’ “protectionist policies,” and the leadership vacuum resulting from the EU’s diminished role collectively characterize this period, in which international agreements have sought to anchor an already ambitious transition pathway.

By applying the PET framework to analyze the erosion of the EU leadership, the study reveals how external shocks and internal veto points interact to produce policy reversals, offering an explanatory lens for the inherent fragilities in global climate governance. Data are drawn from publicly available sources, including statistics and annual reports from [World Bank \(2015\)](#), Eurostat, and the United Nations; policy documents and legislative texts issued by the European Commission; records of international climate negotiations; and scholarly publications and research reports in relevant fields. Descriptive analysis is applied to the collected data to support the study’s findings.

### 3.4 Research design and qualitative research

The purpose of this study is to explain the dynamic process, manifestations, and underlying mechanisms of the decline of the EU leadership based on the PET, providing theoretical and practical insights for global climate governance. The research pathway is structured as follows:

- I Establishing the Research Foundation: By examining the formation of the EU leadership and the application of PET theory in relevant fields, a conceptual and theoretical groundwork will be laid.
- II Case Selection: the EU Global Climate Governance Practices (2009–2023), this period is chosen due to its typicality of short-term ruptures and long-term stability, as well as the complexity arising from the interplay of internal interest pluralism and shifts in the external international landscape. It serves as an ideal case for testing PET theory and fully demonstrates the framework’s explanatory power in complex policy environments.

III Case Analysis Based on PET Theory: Drawing on the core tenets of PET, the study will analyze the selected case to identify key events that triggered policy punctuations and examine their impacts on policy image, policy venue, and policy instruments.

IV Analyzing the Decline of the EU Leadership Through PET: Constructing a research framework that demonstrates how external shocks trigger an interactive transmission of mediating variables, leading to leadership decline. This decline, in turn, weakens the capacity to respond to subsequent shocks, resulting in more intense policy disruptions and ultimately reinforcing a further deterioration of leadership.

The analytical scope of PET focuses on the core logic whereby external shocks trigger policy punctuations, subsequently disrupting the existing policy equilibrium and driving the formation of a new equilibrium. Its key elements include policy images, policy venues, critical junctures, incremental change, and punctuated change. The application of this theoretical framework in this case is primarily aimed at explaining the alternating patterns of stability and abrupt shifts in policy change, rather than directly encompassing the complete causal chain of leadership decline. Based on the analytical boundaries of PET outlined above, in the case analysis of the European Union policy change, the following aspects strictly adhere to the PET framework: external shocks triggering policy punctuations, policy images and policy venues serving as mediating variables influencing policy change, and the alternating progression of policy punctuations and equilibrium periods. In contrast, content related to leadership decline triggered by policy change, the cyclical decline formed by reverse causality, and the adapted differences of mediating variables in the context of supranational governance represents an extension and enhancement of PET theory in light of the unique characteristics of the EU supranational governance. This extension aims to explain the linkage mechanisms between policy change and the evolution of governance actor capabilities, which are not sufficiently covered by the traditional PET model.

## 4 Results

### 4.1 The punctuated equilibrium evolution of the European Union’s climate governance leadership (2009–2023)

Due to the plurality of actors involved in climate governance, their interests, demands, and positions vary to different degrees. As climate governance encompasses an increasing number of actors and addresses a growing range of governance issues, its trajectory is inevitably shaped by multiple forces rather than being determined by a single actor or collective. Consequently, during this period, the declining leadership of the European Union and the punctuated equilibrium dynamic of climate governance mechanisms have gradually taken shape.

Specifically, when multiple stakeholders remain uncompromising on climate policy, the leading actor leverages its strong leadership or commits substantial resources to establish new institutional arrangements. When climate policy aligns with the interests of multiple stakeholders, these actors proactively and voluntarily take action to alter

the status quo. However, when dissatisfaction arises, strategic interactions and counteractions between the leading actor and other stakeholders generate “punctuation points,” followed by the emergence of a “new equilibrium period.” Compared to the previous equilibrium, this new equilibrium is regarded as an innovation in governance mechanisms and a responsive adaptation to evolving circumstances (see Figure 3).

The PET offers a robust framework for analyzing change in international relations. It posits that stable policy equilibria can be disrupted by external shocks and internal shifts, leading to rapid transformation before a new equilibrium is established.

Applied internationally, PET illuminates three dynamics. Firstly, international institutions evolve through long stability punctuated by abrupt reorganization, as seen in the shift from the League of Nations to the UN after world wars. Secondly, national foreign policies, while typically path-dependent, can fracture and reorient during geopolitical or economic crises—like the diversification of Western energy strategies after the oil shocks. Thirdly, international cooperation and conflict exhibit punctuated patterns, where sustained stability may give way to new modes of confrontation or collaboration triggered by critical events.

In the EU climate governance, PET proves particularly revealing. External shocks redefine policy images and redistribute power within policy venues, driving adjustments in climate objectives, instruments, and pathways. Internal actor contestation, goal trade-offs, and adaptation to international discourse collectively shape the direction and outcome of policy punctuations, thereby reconfiguring actors’ influence. By tracing critical junctures and changes in policy images, venues, and instruments, PET provides a coherent analytical path for understanding the nonlinear evolution of international institutions, state policies, and global interactions.

In accordance with PET research, the following criteria are established for identifying punctuation points:

- I A significant shift in the policy image, i.e., a change in the core perception of climate policy among the public and political elites.
- II A transfer of power within the policy venue, i.e., a change in the balance of influence among key policy-making actors.
- III Fundamental innovation in policy instruments.

#### IV A change in policy implementation pathways.

An event that involves two or more of the above factors is classified as a punctuation point within the punctuated equilibrium model. By reviewing landmark events in the EU from 2009 to 2023, this period can be academically delineated accordingly (see Table 3).

## 4.2 Linear causality—interaction and differential adaptation of mediating variables

The weakening of the European Union’s leadership in climate governance is not an isolated outcome of a single shock. Rather, it is the cumulative product of seven rounds of external shocks between 2009 and 2023—including setbacks in international negotiations, economic crises, geopolitical conflicts, and public health emergencies—each triggering policy punctuations. The subsequent policy adjustments, characterized by compromises, contradictory instruments, and fragmented policy venues, have collectively contributed to a causal loop of “external conflict, institutional change, and erosion of governance capacity.”

### 4.2.1 Interactive effects of mediating variables

Policy images and policy venues interact through mutual construction, jointly amplifying or mitigating the impact of external shocks on leadership. When the direction of the policy image aligns with that of the policy venue, adjustments to EU climate policy instruments tend to be more disruptive. However, this alignment also significantly increases the cost of internal interest coordination, accelerating both internal fragmentation of leadership and the loss of external authority—as exemplified by the response to the Russia-Ukraine war (see Figure 4).

Conversely, when the policy image and the policy venue diverge—such as during the dual shocks of the 2015 refugee crisis and the Paris Agreement—the policy image shifted from coercive dominance toward negotiated coordination. Yet the policy venue became fragmented, marked by the rise of the Visegrád Group in Eastern Europe and its resistance to emission-reduction targets. This led to a transition in venue power from core-member-state dominance to multipolar

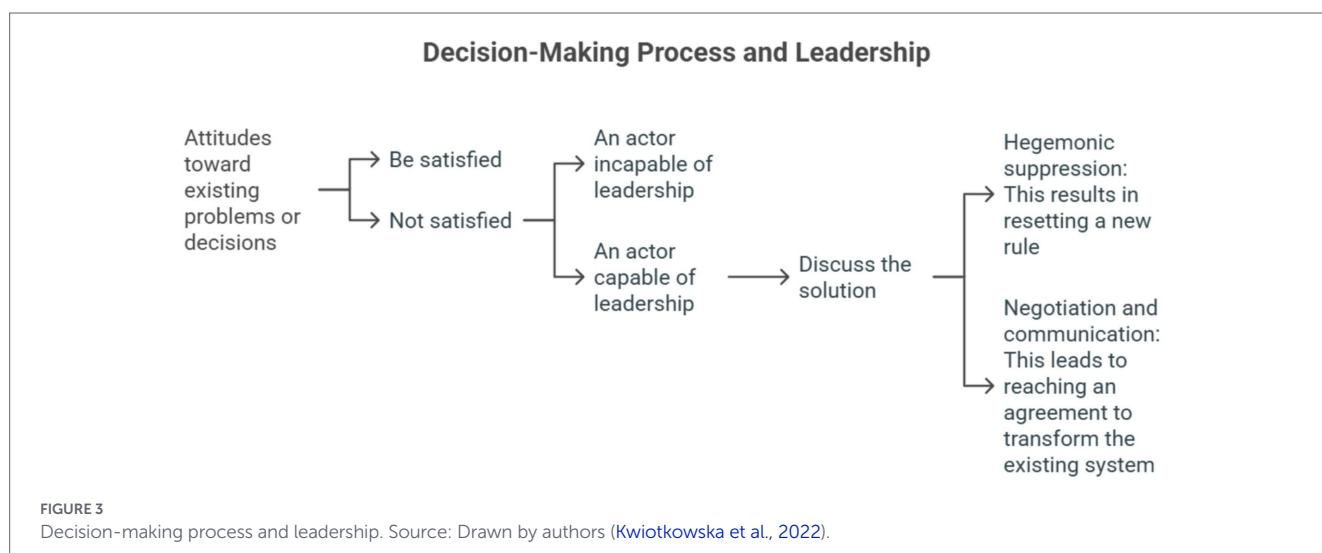
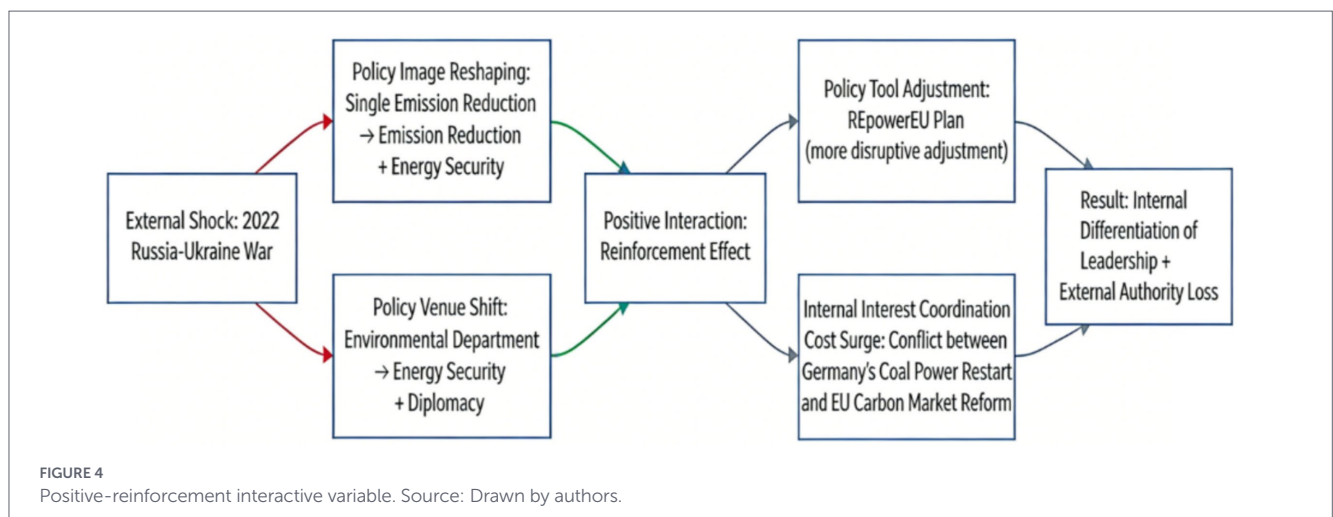


TABLE 3 An analysis of the decline in the EU's climate governance leadership based on PET.

Time point	Landmark event	Criteria for identifying policy punctuation points (meeting ≥2 criteria)	Phase attribute
2009	Copenhagen Climate Conference (COP15) negotiation setback	Significant shift in policy image: From “reliance on multilateralism and unilateral compulsory emission reduction leadership” to “prioritizing autonomous action.” Public and political elites’ perception of the EU’s role in global climate governance shifted from “rule-maker” to “implementer” (Groen and Niemann, 2013)	Policy punctuation point
		Transfer of power in the policy venue: Climate issues were elevated from the EU environmental department to the core agenda of the European Commission, with policymaking authority centralized at the EU level.	
2015	Refugee crisis coupled with the signing of the Paris Agreement	Significant shift in policy image: Climate policy goals shifted from “prioritizing emission reduction” to “coordinating emission reduction with social issues such as refugee resettlement.” Political elites adjusted their perception of the resource allocation priority for climate governance (Oberthür and Groen, 2018; European Court of Auditors, 2016).	Policy punctuation point
		Transfer of power in the policy venue: The rise of the Eastern European “Visegrád Group” resisted the EU’s 2030 emission reduction targets, breaking the previous “dominance by core member states” pattern.	
2020	Outbreak of the COVID-19 pandemic	Significant shift in policy image: From “contraction of climate policy post-crisis” to “green recovery leading economic transformation,” forming a consensus on “binding pandemic recovery with low-carbon transition.” Fundamental innovation in policy tools: The launch of the €750 billion Recovery and Resilience Facility, with 37% of funds allocated to green investment, creating a linked tool of “fiscal stimulus and climate goals.”	Policy punctuation point
2022	Energy crisis triggered by the Russia-Ukraine war	Significant shift in policy image: Core goals evolved from “single emission reduction” to a triple objective of “emission reduction + energy security + supply chain resilience.”	Policy punctuation point
		Fundamental innovation in policy tools: Introduction of the REPowerEU plan, accelerating renewable energy deployment and building a new energy substitution toolset.	
		Change in policy implementation pathways: Shift from “the EU unified standards” to “differentiated emergency responses by member states”, e.g., Germany reactivating coal power.	
2010–2014	Period affected by the European debt crisis	Only met the criterion of “minor adjustments in policy tools”, strengthening the EU ETS but with limited effectiveness, with no significant changes in policy image, venue power, or implementation pathways (Jevnaker and Wettstad, 2017). Adjustments were primarily characterized by “goal compromises under resource constraints (European Court of Auditors, 2016).”	Policy equilibrium period
2016–2019	Brexit + U.S. withdrawal from the Paris Agreement	Policy adjustments exhibited “stagnation dominated by institutional inertia”, the 28-month delay in revising the Energy Taxation Directive, with no fundamental changes in policy image, venue power, or tools.	Policy equilibrium period
2023-Present	COP28 led by China and the U.S. + the EU farmer protests	Policy adjustments are characterized by “institutional consolidation and partial compromises”, CBAM transition exemptions, withdrawal of agricultural emission reduction clauses, with no breakthrough changes in policy image, venue power, or tools.	Reinforced equilibrium period

Source: Oberthür and Groen (2018); European Commission, etc. Carbon Border Adjustment Mechanism, European Commission, March 28, 2025. Available online at: [https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism\\_en](https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en).



contestation (Zapletalová and Komínková, 2020). The result was a complex outcome: while international discursive influence recovered somewhat, internal leadership became significantly polarized, thereby offsetting part of the leadership decline that might otherwise have followed such shocks (see Figure 5).

### 4.2.2 Adaptive heterogeneity of mediating variables

The compatibility between different external shocks and the policy image and policy venue varies, leading to differences in the intensity of causal transmission. In a global public crisis such as the COVID-19 pandemic, the demand for economic recovery resonated with the consensus on green transition, enabling the policy image of “green recovery” to rapidly gain social and political acceptance (Wang, 2023). During this period, the European Commission took the lead in allocating recovery funds, resulting in a shift in the power structure of the policy venue that aligned closely with the policy image. This synergy temporarily strengthened leadership in the short term. Conversely, in the case of geopolitical conflicts such as the outbreak of the Russia-Ukraine war, the immediate disruption to energy supply chains led to a sudden increase in the influence of energy and foreign affairs departments. While the resulting policy adjustments exhibited emergency-driven characteristics and alleviated the energy crisis in the short term, they contradicted the EU’s long-term climate objectives, thereby severely undermining the legitimacy of the EU’s leadership in climate governance (see Figure 6).

### 4.2.3 Non-linear causality—the cyclical decline of the EU leadership in climate governance

A linear causal chain focuses only on the unidirectional transmission of “external shocks leading to leadership decline.” In practice, however, governance exhibits significant reverse causality: the decline of leadership itself weakens the EU’s capacity to respond to external shocks, which in turn triggers more frequent and more intense policy punctuations, ultimately forming a

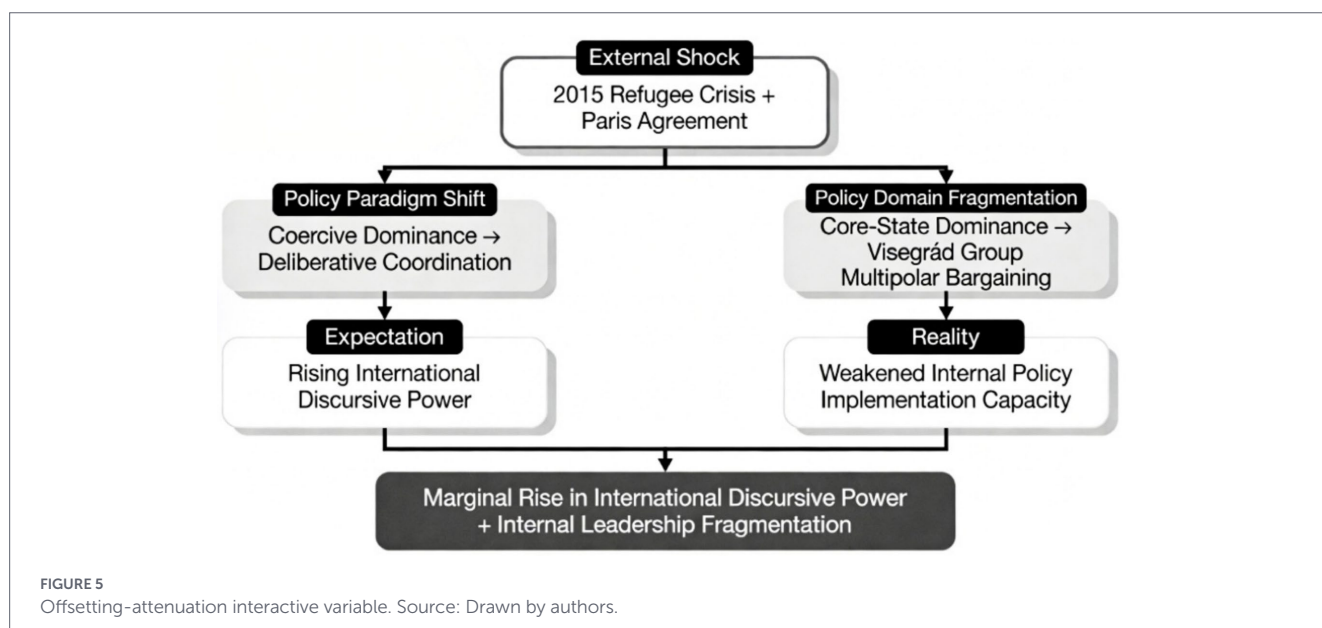
cyclical pattern of decline. This process can be broken down into three components:

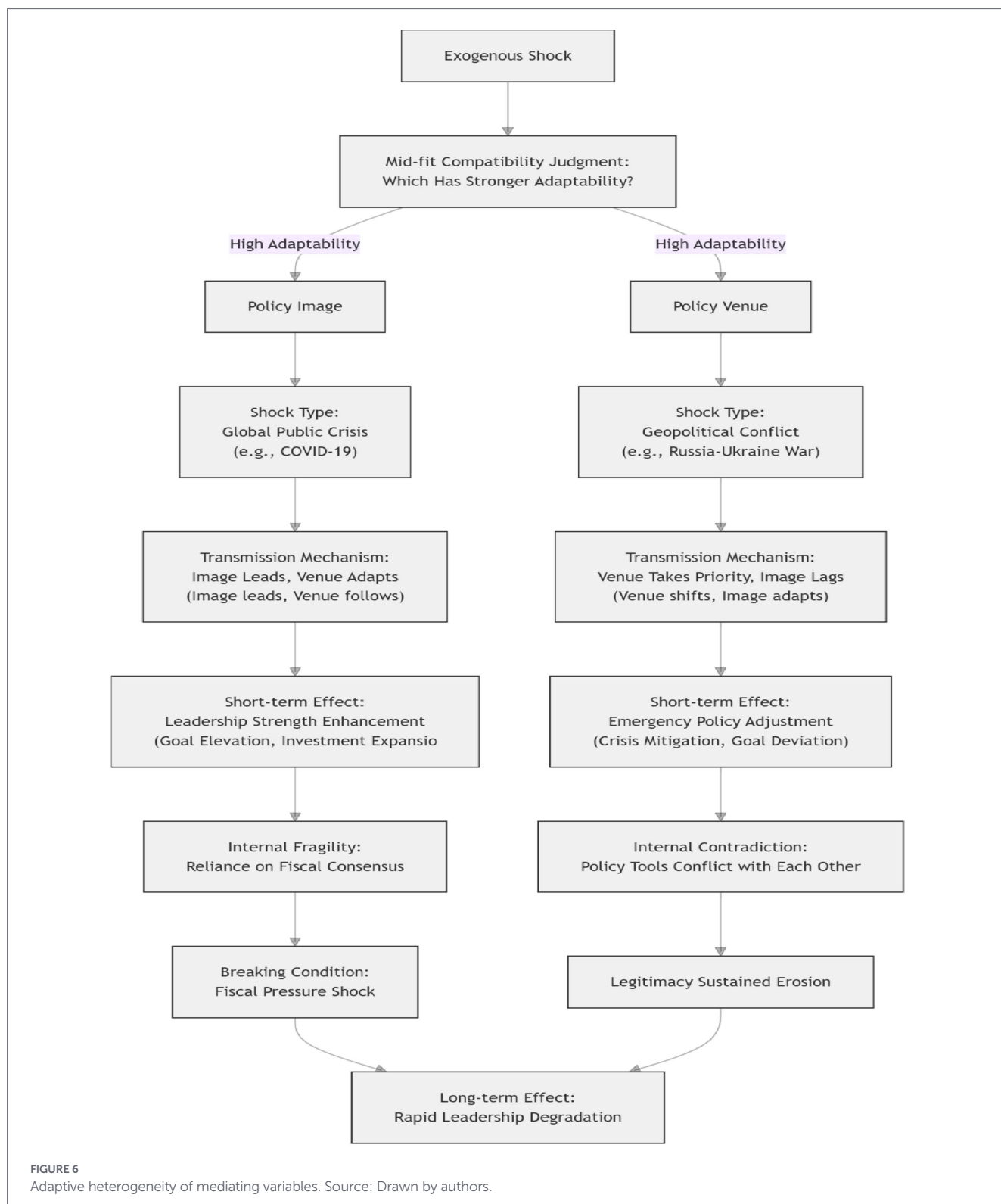
- I Leadership decline weakens the capacity for shock anticipation and preparatory response.

One core manifestation of the EU climate leadership is “agenda-setting and risk anticipation”—during the Kyoto Protocol phase, the EU could mitigate the impact of external shocks by proactively designing rules and consolidating internal consensus. As leadership has eroded, however, internal interest fragmentation and loss of international discursive power have reduced its ability to anticipate potential shocks, while effective advance coordination mechanisms have been lacking. After the 2009 COP15 setback, the EU failed to repair internal consensus and international cooperation networks in a timely manner. Consequently, when the European debt crisis erupted in 2010–2014, there was no contingency plan for “coordinating economic crisis response with climate policy,” forcing a passive cutback in emission-reduction investments that further weakened leadership. Similarly, after the 2020 pandemic, despite launching a green recovery plan, the EU—already experiencing phased weakening of leadership—could not drive member states toward unified implementation standards. This resulted in uneven efficiency in the use of funds, sowing the seeds for policy reversals after the 2022 Russia-Ukraine war.

- II Ineffective shock response triggers more disruptive policy punctuations.

Weakened leadership makes it difficult for the EU to formulate a unified and effective policy response to external shocks, leaving it to rely on compromise-based adjustments or emergency-driven changes. This, in turn, provokes more radical policy punctuations. Under the twin shocks of Brexit and the U.S. withdrawal from the Paris Agreement (2016–2019), the EU—facing an internal leadership vacuum (diminished weight after Brexit, diverging member-state interests)—neither filled the global climate leadership gap nor advanced substantive policy reforms. The revision of the Energy Taxation Directive was stalled for 28 months. Such ineffective





responses broke the institutional inertia of the policy equilibrium period. When the pandemic struck in 2020, the EU could only drive policy punctuation through extraordinary fiscal measures. This model of punctuations reliant on a single instrument lacked sustainability; once subsequent shocks occurred, policy had to shift again—as seen in the turn toward energy-security priorities after the Russia-Ukraine war. A vicious cycle thus emerged: ineffective shock response leads to policy vacillation, which in turn intensifies punctuations.

III Intense policy punctuations further undermine the core foundations of leadership: internal consensus and international trust.

Internally, repeated policy adjustments, compromises on emission-reduction targets, and contradictions among instruments exacerbate distrust among industries and the public: traditional industries struggle to form long-term investment expectations, while public skepticism grows regarding the rationality of policies—as illustrated

by the 2023 farmer protests. Consequently, social and industrial support for policy implementation continues to decline, and internal leadership becomes further fragmented (Brewer et al., 2004). Externally, policy instability reduces the credibility of the EU as a rule-setter: the EU Carbon Border Adjustment Mechanism (CBAM) underwent multiple revisions to its exemption clauses from proposal to implementation<sup>1</sup>, and even after its 2023 launch a transition period until 2026 was retained. The Office of the United States Trade Representative (USTR) stated in its 2024 National Trade Estimate Report on Foreign Trade Barriers that the CBAM rules lack long-term stability, as the emission accounting methodology was revised twice in 2024 alone. This has forced U.S. steel companies to invest an additional \$20 million to adapt their compliance systems. The USTR accuses the EU of using climate goals as a pretext to set up trade barriers, undermining businesses' trust in regulatory consistency (United States Trade Representative (USTR), 2024). This compromise-based rollout has raised doubts among other countries about the stability of the EU's climate rules, reducing their endorsement of the EU-led regulations and leading to a continuous erosion of international discursive power.

In summary, The causal relationship behind the decline of the EU climate leadership exhibits a cyclical and cumulative pattern: external shocks trigger → mediating variables interact and transmit → leadership declines → capacity to respond to shocks is weakened → more intense policy punctuations occur → leadership declines further. In the initial phase (2009–2015), external shocks were the dominant driver, with linear causality prevailing; leadership decline was directly caused by shock-induced policy adjustments. In the middle phase (2016–2020), reverse causality began to emerge: leadership decline led to ineffective shock response, the frequency of policy punctuations increased, and the pace of decline accelerated. In the later phase (2021–2023), cyclical cumulative effects became prominent: external shocks and internal decline reinforced each other, while the interaction between policy image and policy venue further amplified the erosion of leadership, shifting the process from “gradual weakening” to “accelerated loss.”

## 5 Discussion

### 5.1 Manifestations of the EU climate governance leadership decline

#### 5.1.1 Decline of internal leadership

The decline of internal leadership is primarily manifested in the significantly reduced coordination and implementation efficiency of climate policy-making. At the legislative level, the advancement of key bills has been hindered. The revision of the Energy Taxation Directive was stalled for 28 months, and the process from the adoption of separate Emissions Trading System (ETS) proposals for the transport and building sectors to the final clarification of carbon prices spanned over 2 years, highlighting how severe bargaining among member states

over their interests has obstructed legislative progress, breaking the EU's previous rhythm of efficient climate legislation. At the policy goal-setting level, contrasting sharply with the earlier style of setting clear deadlines and pushing aggressively, frequent compromises are now made to balance the economic interests of some member states. This leads to a lack of coherence and foresight, undermining the authority and enforceability of climate policies.

#### 5.1.2 Weakening of external leadership

The weakening of external leadership is reflected in the continuous erosion of the EU's rule-making dominance and cooperative influence in global climate governance. In terms of rule construction, the European Union once led the negotiation process of the Kyoto Protocol, but in recent years, it has faced challenges in multi-party coordination when promoting global climate rules. For example, the global carbon price linkage scheme proposed by the EU was not widely adopted in the follow-up negotiations of the Paris Agreement, and during COP28 in 2023, the EU primarily played a coordinating role. Meanwhile, as major carbon emitters, China and the United States demonstrated stronger agenda-setting influence in pre-conference consensus-building, agenda-setting, and negotiation coordination, particularly on core issues such as fossil fuel phase-out, climate finance, and energy transition. The EU's proposal for linking its carbon border adjustment mechanism was not included as a core outcome of the conference, as it was perceived by some countries as unilateral (Akhtar et al., 2024).

In terms of financial cooperation, in 2023, the EU and its member states collectively provided 28.6 billion euros in public climate funds and mobilized an additional 7.2 billion euros in private funding. However, its detailed proposal for the allocation of the 100 billion U.S. dollar climate finance pledge failed to gain widespread support due to insufficient responsiveness to the concerns of emerging economies. In contrast, differentiated climate assistance proposals put forward by China and the United States received greater recognition from developing countries.

In terms of project cooperation, in Southeast Asian renewable energy collaborations, the regional grid decarbonization projects promoted by the EU have been adjusted or shelved by some host countries due to their relatively stringent rule design and numerous attached conditions. In comparison, the project-oriented and flexibly adapted cooperation models adopted by China and the United States have garnered more attention in certain regions (Trang, 2025). These developments reflect the existing diversity in strategies, pathways, and levels of acceptance among current international climate cooperation participants, and they also provide indirect evidence for the argument regarding the weakening of the EU's external leadership (Zartman, 1994).

#### 5.1.3 Insufficiency of instrumental capacity

The insufficiency of instrumental capacity is evident in the dual weaknesses of the effectiveness of climate policy tools and resource guarantee capabilities. Regarding policy tools, core instruments like the EU Emissions Trading System (EU ETS) have failed to fully deliver, with long-term low carbon prices proving inadequate to effectively drive industrial emission reductions. Policy tools for specific sectors have been slow to materialize, failing to form a synergistic portfolio. In terms of resource guarantees, the coverage capacity of EU-level climate

1 “Carbon Border Adjustment Mechanism,” European Commission, March 28, 2025, [https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism\\_en](https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en)

funds is declining. For instance, in 2025, the Innovation Fund allocated €520 million for net-zero technology R&D, yet required an additional €176.5 million in national funds from member states to fill the funding gap. Industrial support tools lack flexibility. Transformation costs for traditional energy-intensive industries remain high. The green hydrogen-based steelmaking transition for the steel industry requires a total investment of €130 billion, with a single large enterprise bearing over €5 billion. In the chemical industry, only 12% of decarbonization funding is covered by the EU, leaving the remaining costs to be borne by the companies themselves. This renders the policy tools insufficient to gain industry support and, instead, triggers collective resistance.

### 5.1.4 Erosion of normative authority

The erosion of normative authority stems from the continuous weakening of the social legitimacy and international credibility of the EU's climate policies (Parry, 1976). Domestically, public support for climate policies is divided. A 2025 the EU poll showed that 85% of citizens acknowledge the seriousness of climate change, but 38% have already felt the negative impacts of climate policies. In eight countries, including Southern Europe and Poland, over half the population believes the policies are increasing the cost of living. Between 2022 and 2024, there were over 30 protests against climate policies triggered by rising energy prices. Collective actions, such as a 100,000-person demonstration in France and strikes by chemical workers in Germany, have severely shaken the social foundation of the policies. Internationally, the instability of its policies has diminished the EU's credibility as a rule-maker.

## 5.2 The impact of the decline in the EU climate leadership

### 5.2.1 Impact on the global climate governance process

The decline in the EU climate leadership has significantly affected the global climate governance agenda. As a long-standing leader, the EU played a crucial role in advancing global climate policy formulation and fostering international cooperation. However, as its leadership weakens, the momentum of global climate governance has slowed, and international collaboration faces increasing challenges. The erosion of the EU leadership has contributed to a lack of dynamic impetus in global climate governance, making coordination and cooperation among countries on climate policies more difficult. Moreover, the EU's diminished role in climate governance has left some countries without clear guidance or benchmarks in addressing climate issues, which in turn has undermined the direction and effectiveness of global climate governance. On the other hand, the decline in the EU climate leadership has prompted other countries, such as China and the United States, to assume more proactive roles in global climate governance. While this has partially filled the leadership gap, it has also introduced new power dynamics and governance challenges, rendering the process of global climate governance more complex and fluid.

### 5.2.2 Impact on the EU's international standing

The decline in the EU's climate leadership has significantly affected its international standing. Historically, the EU has served as a leader in international climate governance, but in recent years its leadership

position has increasingly been challenged. The erosion of climate leadership has weakened the EU's discursive power in global environmental governance, diminishing its influence and credibility in international affairs. Furthermore, the EU's failure to fulfill its climate policy commitments as pledged has tarnished its international image. This has not only reduced other countries' trust in the EU but also undermined its bargaining power and negotiation position in international cooperation (Zartman, 1994). More critically, amid the rise of emerging market economies, the EU's position in the global economic landscape has also been challenged. The decline in climate leadership has further exacerbated the EU's isolation in addressing global climate change, hindering its ability to play a leading role on the international stage. This not only damages the EU's international reputation but may also adversely affect its long-term economic and social development. Therefore, the EU must engage in deep reflection and take effective measures to restore its leadership image in international climate governance.

### 5.2.3 Implications for other countries' climate policies

The decline in the European Union's climate leadership provides crucial insights for climate policy formulation in other countries globally. First, the stability and continuity of climate policy leadership are fundamental prerequisites. Policymakers need to establish mechanisms resistant to interference, ensuring policy implementation is not disrupted by internal political changes or external pressures. Second, international cooperation is the core pathway for addressing climate change. Countries should strengthen multilateral communication and collaboration, jointly advancing the process of global climate governance. Third, it is necessary to learn from the EU's experience in constructing a robust climate policy system, which involves clarifying emission reduction targets, improving implementation mechanisms, and strengthening oversight effectiveness. Fourth, focus should be placed on the dual drivers of technological innovation and financial investment to accelerate the research, development, and application of clean energy and low-carbon technologies. Countries must draw lessons from the EU's practice, maintain a firm stance on climate governance, actively fulfill international responsibilities, and, through sustained and coordinated efforts, collectively build a green, low-carbon, and sustainable global development landscape.

## 6 Conclusion

Against the backdrop of increasingly severe climate change, countries are actively optimizing their climate policies. The European Union, as a key actor in global climate governance, holds significant research value for its policy evolution. This study focuses on the EU's climate policy from 2009 to 2023, employing Punctuated Equilibrium Theory (PET) to conduct stage division and causal mechanism analysis, yielding a series of core findings. By deconstructing dynamic causal relationships, the study reveals the "path dependence" characteristic of the EU's declining climate leadership—once caught in a cycle of decline, single policy adjustments or improvements in the external environment are insufficient to reverse the trend. Only by "breaking the cycle" can leadership be restored. This analysis addresses the limitations of linear causal analysis and better aligns with the reality of "multiple actor interactions and complex interest bargaining" in supranational governance.

Internally, the EU needs to strengthen climate policy coordination among member states. This involves establishing efficient communication mechanisms and regular coordination meeting systems to reduce policy disparities among members (Gonand et al., 2024), thereby rebuilding internal consensus. Concurrently, a dedicated fund should be established to incentivize member states with proactive policy implementation and provide technical and financial support to lagging countries, ensuring consistency in overall the EU action and optimizing the power structure within the policy venue. In responding to external shocks, the EU should deepen cooperation with other countries and international organizations, with a particular focus on enhancing support for technology transfer and capacity building in developing nations to elevate its influence in international climate governance discourse. It should also actively participate in and lead the formulation of international climate rules, promoting the establishment of a fair, equitable, and cooperative global climate governance system.

Furthermore, increased investment in technological innovation is needed to construct resilient decarbonization pathways. Geopolitical risks should be integrated into the framework of climate policy design, and multilateral cooperation should be leveraged to mitigate transition risks (Proedrou, 2023). Specifically, the EU should establish specialized research programs focused on key technology areas such as renewable energy and carbon capture and storage, encouraging collaborative efforts among universities, enterprises, and research institutions. Policy incentives should guide enterprises to increase investment in green technology innovation, accelerating the commercial application of technologies. This technological advantage can consolidate climate leadership and achieve synergistic enhancement of energy security and economic competitiveness (Gonand et al., 2024).

This study identifies the correlation patterns between different types of external shocks and the conditions triggering policy punctuations. Compound shocks—such as setbacks in international negotiations, geopolitical conflicts, and global public crises—are more likely to simultaneously trigger changes in policy image, venue power, and policy instruments. Such changes constitute a “window of opportunity” for substantive policy adjustments (Wang, 2023). This finding holds significant reference value for climate policymakers in other countries: when facing external shocks, they should proactively seize opportunities for policy change, avoiding a disconnect between crisis response and long-term climate goals. Climate policy formulation should be forward-looking, incorporating mechanisms for coordinating multiple objectives and abandoning the pattern of passive compromise post-crisis. For other global economies, the policy design stage should establish coordination mechanisms between climate goals and objectives like energy security, economic stability, and social equity. Flexible policy tools, such as differentiated emission reduction quotas and contingency clauses, can be used to reduce the risk of policy fluctuations under external shocks.

The study clearly delineates the trajectory of the EU’s climate leadership weakening from a “global rule-maker” to a “regional coordinator.” Core driving factors include internal interest fragmentation, changes in the external governance landscape, and the insufficient efficacy of policy instruments. This conclusion provides important insights for regional climate governance actors like ASEAN and the African Union: sustaining leadership requires balancing three dimensions—fostering internal consensus, building supportive and appropriate policy instruments, and embedding within a globally diverse collaborative network—while eschewing unilateralism and governance models overly reliant on external rules.

This study contributes both theoretical extension and research supplementation. Regarding Punctuated Equilibrium Theory (PET),

existing research has primarily applied it to analyze the dynamic evolution of policies within a specific domain of a single country (e.g., U.S. air pollution control, German renewable energy policy). This study extends its application to the context of supranational climate governance, validating the applicability of the core “equilibrium-punctuation-new equilibrium” analytical framework within the EU’s multi-actor governance system. Furthermore, addressing the limitation in existing research, which often defines the “criteria for policy punctuation” from a single dimension (e.g., policy instrument change), this study proposes a stricter framework: at least two of the four criteria—“policy image, policy venue, policy instruments, and implementation path”—must be met. This refines the operational definition of PET in the field of climate policy, addressing the research gap of ambiguous criteria for identifying policy punctuations at the supranational level.

Existing global climate governance research has predominantly focused on national leadership (e.g., China-U.S. climate dynamics) or the effectiveness of multilateral mechanisms (e.g., Paris Agreement implementation), paying insufficient attention to the dynamic evolution mechanisms of leadership in regional actors like the EU. The causal chain constructed in this study resonates with the core view in existing literature that the EU’s leadership decline stems from internal fragmentation and changes in the external landscape. Simultaneously, by leveraging quantitative data and stage division, it provides empirical support for the “cumulative” nature of leadership decline, enriching the body of empirical evidence in global climate governance leadership research.

## Author contributions

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## References

- Akhtar, S., Shaima, S., Rita, G., Rashid, A., and Rashed, A. J. (2024). Navigating the global environmental agenda: a comprehensive analysis of COP conferences, with a spotlight on COP28 and key environmental challenges. *Nat. Environ. Pollut. Technol.* 23, 1849–1856. doi: 10.46488/nept.2024.v23i03.057
- Andersen, M. S., and Lieferrink, D. (1997). *European Environmental Policy: The Pioneers*. Manchester, UK: Manchester University Press.
- Baumgartner, F. R., and Jones, B. D. (2010). *Agendas and Instability in American Politics*. Chicago, USA: University of Chicago Press.
- Bremer, S., Glavovic, B., Meisch, S., Schneider, P., and Wardekker, A. (2021). Beyond rules: how institutional cultures and climate governance interact. *WIREs Clim. Change* 12:e739. doi: 10.1002/wcc.739
- Brewer, P. R., Gross, K., Aday, S., and Willnat, L. (2004). International trust and public opinion about world affairs. *Am. J. Polit. Sci.* 48, 93–109. doi: 10.1111/j.00925853.2004.00058.x
- Climate and Energy package 2009 (2008). Available online at: <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+20081217+TOC+DOC+XML+V0//EN&language=EN> (Accessed March 03, 2025).
- Dupont, C., Oberthür, S., and Von Homeyer, I. (2020). The COVID-19 crisis: a critical juncture for EU climate policy development? *J. Eur. Integr.* 42, 1095–1110. doi: 10.1080/07036337.2020.1853117
- Eldredge, N., and Gould, S. J. (1972). Punctuated equilibria: an alternative to phyletic gradualism. *Models Paleobiol* 82:115.
- Ellerman, A. D., and Buchner, B. K. (2007). The European Union emissions trading scheme: origins, allocation, and early results. doi: 10.1093/reep/rem003
- European Court of Auditors (2016). *EU Climate Finance*. Available online at: [https://www.eca.europa.eu/Lists/ECADocuments/SR16\\_31/SR\\_CLIMATE\\_EN.pdf](https://www.eca.europa.eu/Lists/ECADocuments/SR16_31/SR_CLIMATE_EN.pdf) (Accessed June 26, 2025).
- Fagan, E. J. (2023). Political institutions, punctuated equilibrium theory, and policy disasters. *Policy Stud. J.* 51, 243–263. doi: 10.1111/psj.12460
- Goldthau, A., and Tagliapietra, S. (2022). Energy crisis: five questions that must be answered in 2023. *Nature* 612, 627–630. doi: 10.1038/d41586-022-04467-w
- Gonand, F., Linares, P., Lösche, A., Newbery, D. M., Pittel, K., Saavedra, J., et al. (2024). *Watts next: Securing Europe's energy and competitiveness where the EU's energy policy should go now* (no. 49). EconPol policy report. ifo Institute – Leibniz Institute for Economic Research at the University of Munich. Available online at: <https://www.econstor.eu/handle/10419/289558>
- Groen, L., and Niemann, A. (2013). The European Union at the Copenhagen climate negotiations: a case of contested EU actorness and effectiveness. *Int. Relat.* 27, 308–324. doi: 10.1177/0047117813497302
- Jevnaker, T., and Wettstad, J. (2017). Ratcheting up carbon trade: the politics of reforming EU emissions trading. *Glob. Environ. Polit.* 17, 105–124. doi: 10.1162/GLEP\_a\_00403
- Kwiatkowska, A., Wolniak, R., Gajdzik, B., and Gębczyńska, M. (2022). Configurational paths of leadership competency shortages and 4.0 leadership effectiveness: an fs/QCA study. *Sustainability* 14:27. doi: 10.3390/su14052795
- Oberthür, S. (2007). The European Union in international climate policy: the prospect for leadership. *Intereconomics* 42, 77–83. doi: 10.1007/s10272-007-0211-1
- Oberthür, S., and Groen, L. (2018). Explaining goal achievement in international negotiations: the EU and the Paris agreement on climate change. *J. Eur. Public Policy* 25, 708–727. doi: 10.1080/13501763.2017.1291708
- Oberthür, S., and Kelly, R. (2008). EU leadership in international climate policy: achievements and challenges. *Int Spect* 43, 35–50.
- Paramati, S. R., Alam, M. S., Hammoudeh, S., and Hafeez, K. (2021). Long-run relationship between R&D investment and environmental sustainability: evidence from the European Union member countries. *Int. J. Financ. Econ.* 26, 5775–5792. doi: 10.1002/ijfe.2093
- Parry, G. (1976). Trust, distrust and consensus. *Br. J. Polit. Sci.* 6, 129–142. doi: 10.1017/s0007123400000594
- Proedrou, F. (2023). EU decarbonization under geopolitical pressure: changing paradigms and implications for energy and climate policy. *Sustainability* 15:5083. doi: 10.3390/su15065083
- Rahman, M. (2024). Renewable energy policy in Germany and Malaysia: success factors. *Int. J. Front. Technol.* 1, 20–20.
- Sbragia, A. M., and Damro, C. (1999). The changing role of the European Union in international environmental politics: institution building and the politics of climate change. *Environ. Plann. C Gov. Policy* 17, 53–68. doi: 10.1068/c170053
- Trang, N. T. T. (2025). Strengthening ASEAN'S climate governance: challenges, opportunities, and pathway for regional cooperation. *J. Int. Dev. Stud.* 33, 15–30.
- United States Trade Representative (USTR) (2024). *2024 National Trade Estimate Report on foreign trade barriers*. Available online at: <https://ustr.gov/sites/default/files/2024%20NTE%20Report.pdf> (Accessed October 13, 2026).
- Vona, F. (2019). Job losses and political acceptability of climate policies: why the 'job-killing' argument is so persistent and how to overturn it. *Clim. Pol.* 19, 524–532. doi: 10.1080/14693062.2018.1532871
- Wang, C. (2023). Low-carbon transition toward green recovery: policy framework after COVID-19. *Econ. Chang. Restruct.* 56, 3117–3137. doi: 10.1007/s10644-023-09485-w
- World Bank (2015). *Low-carbon investment in the EU: trends and determinants*. Available online at: <https://www.worldbank.org/content/dam/Worldbank/document/Climate/State-and-Trend-Report-2015.pdf> (Accessed June 10, 2025).
- Zapletalová, V., and Komínková, M. (2020). Who is fighting against the EU's energy and climate policy in the European Parliament? The contribution of the Visegrad group. *Energy Policy* 139:111326. doi: 10.1016/j.enpol.2020.111326
- Zartman, I. W. (1994). *International Multilateral Negotiation: Approaches to the Management of Complexity*. San Francisco, California, USA: Jossey-Bass.