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Picking Losers: Climate Change and Managed Decline in the European Union

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ABSTRACT

Decarbonization forces societies to cope with the restructuring and outright unwinding of assets, firms, workers, industries, and regions. We argue that this problem has created legitimacy for industrial policies managing the reallocation of resources. We illustrate this dynamic by documenting incremental state-building in the European Union, an administration institutionally tilted toward regulatory statehood and the making of the Single Market in energy since the 1990s. European greening policies, we argue, have incrementally lessened the primacy of regulatory tools and have introduced a plethora of instruments to accelerate green restructuring and carbon unwinding. Best understood as a process of multi-sited institutional layering, the European Union increasingly appears to complement financial and regulatory instruments to effect green energy transitions with the management of decline in targeted regions and sectors, based on targeted funds and targeted transition planning.

1 | Introduction

Recent studies examining the state's role in 21st-century capitalism reveal that green transitions appear to compel governments to adopt interventionist approaches that diverge significantly from traditional models of the regulatory state. The governance challenges arising from climate change mitigation and adaptation can hence be understood as drivers of ongoing institutional change. This article adds to this perspective on the climate change-related evolution of the regulatory state by documenting responses to an empirically underexplored dimension of green transitions—the state management of socio-economic unwinding caused by greening policies. Complementing the growing literature on Just Transitions that highlights emerging compensatory logics in the political economy of climate change (Edenhofer and Genovese 2024; Im 2024; Schaffer 2024), this article contributes to understanding how states raise political legitimacy for green structural change.

The research question this article investigates is how the divestments and losses involved in decarbonization policies challenge the regulatory state. The two main answers our analysis provides are (a) that policy-induced divestments and losses push states into hands-on repertoires of managing decline and restructuring in affected regions and sectors and (b) that these repertoires may be layered on top of the regulatory state, rather than displacing it. The empirical case we rely on consists of the European Union's climate policies since the early 2000s. We demonstrate that the bloc has gradually expanded its decarbonization policy toolkits to include fiscal capacity building and economic planning, specifically targeting regions transitioning away from carbon-intensive activities. By targeting transfers and transition policy aid to specific regions and sectors, the EU's greening policies have an overtly directional character, where administrative decisions aim to alter resource allocations on a granular regional and sectoral level. Importantly, such granular policy toolkits emerged as

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part of settlements meant to overcome political resistance to regulatory policies raising the price of emissions. They did not replace the European regulatory state in the climate arena but were layered on top of it.

Green transitions are not just about phasing in green technologies or practices, but about the phasing out of polluting practices and structures (Albert et al. 2021; Elliott 2021; Thurbon et al. 2023). As such, they are problems of socio-economic reallocation, structural change, and restructuring. The restructuring problems associated with climate change policy confront states institutionally fashioned under very different political constraints, distributional coalitions, and ideational backdrops. As has been pointed out by an emerging political economy of the green state, one of the major dynamics of contemporary climate policy-making concerns the fault lines between institutional regimes built in times of regulatory statehood and pressures to accelerate climate change mitigation and adaptation. Core insights from this line of research concern attempts to mobilize (hidden) fiscal resources for green transitions (Lepont and Thiemann 2024; Mertens and Thiemann 2017), to stimulate industrial and technological innovation (Kupzok and Nahm 2024; Meckling 2021), and to enlist financial markets for green investment (Gabor and Braun 2023; van 't Klooster 2022).

This article contributes to this line of inquiry by showing for the case of the European Union how problems of socio-economic decline have conditioned a revival of industrial policy repertoires long thought dormant—if not dead. In a turn of phrase common in debates on industrial policy (Cowling 2003), we document the return of *vertical* repertoires in the climate arena. Reacting to the post-1980s abandonment of policies supporting state-picked firms, sectors, regions, and technologies, industrial policy debates diagnosed a shift from *vertical* to *horizontal* policies—where the latter were designed to improve conditions for business activity without "picking winners" (see Ergen and Rademacher 2023).

While recent writings on the green state have documented a return of the state in the innovation-oriented "picking of winners," this article describes emerging policy repertoires around green states "picking losers." Those repertoires revolve around the active state management of structural change—and particularly around the political easing of the phase-out of fossil fuel-heavy activities. Hence, if green transitions involve a process of "institutional layering" (Thelen 2004) of an innovation state, an investment state, and a green macro-financial state on top of the established regulatory state, we argue that they have at the same time given rise to the growth of a *decommissioning, liquidating*, or *stranding state*.

The main empirical case we rely on for illustration is the European Union since the late 1990s. We document an incremental process of layering through which regulatory instruments intended to make carbon emissions more costly are increasingly complemented with interventionist policy toolkits targeting transition losers. The European Union emissions trading system (ETS)—long heralded as an institutionally elegant and efficient way to phase out carbon emissions—has increasingly been supplemented with transfer programs targeted at the decarbonization of specific industries and regions. Since the mid-2010s, the EU has actively built governance capacities to plan for decline in affected regions. Here, we are among the first to shed light on the role of the European Commission's Directorate-General for Structural Reform Support (DG REFORM)—an institutional complex repurposed from working on Greece's structural reforms during the European sovereign debt crisis—to an agency active in *greening the East* by working to transition regions heavily dependent on fossil fuels.

This article is structured in two major parts. Section 2 reconstructs previous work on deviations from the regulatory state related to climate change policy and describes how the management of socio-economic decline represents a distinctive added transition challenge. We aim to show how the literature in various fields has documented piecemeal but systematic deviations from classic patterns of regulatory statehood related to low-carbon transitions. Laying the ground for our argument, we sketch scattered previous evidence that green transitions lead states towards granular transition governance. Section 3 illustrates our argument based on a case study of European transition policies. We demonstrate how a process of institutional layering unfolded over the last 30 years. Since the early 2000s, a regulatory regime for emissions trading was incrementally punctured by industrial and regional policies seeking to organize and enable green restructuring in specific regions and sectors. In the conclusion, we lay out the main ways in which our argument can enrich ongoing debates in political economy.

2 | The Regulatory State, Climate Change, and the Question of Green Statehood

Observations of a reemergence of a more activist, or "positive," state in the early 21st century span multiple empirical fields of research. Thirty years after Majone's seminal paper on the decline of *dirigisme* in Europe (Majone 1994), the regulatory state appears to be under siege on multiple interlocking fronts. One major issue area leading the charge relates to the reappearance of geopolitics and security as major concerns (Levi-Faur 2013; McNamara 2024; Seidl and Schmitz 2024). Other important issues concern problems of rapid technological change (Mügge 2024), as well as problems of inequality, structural change, and political legitimacy (Piore 2019).

In the original formulation by Majone (1994), the European regulatory state appeared as a post-statist polity focused on market regulation. This characterization reacted both to the increasing power of regulatory agencies after widespread privatization and deregulation and to the EU's institutional oddities, such as its fiscal limitations. After agricultural policy expenditure, Majone (1994, 87) observed that "remaining resources are insufficient to support large-scale initiatives in areas such as industrial policy, energy, research, or technological innovation. Given this constraint, the only way for the Commission to increase its role was to expand the scope of its regulatory activities." The primacy of regulatory statehood for Majone implied a narrowing down of state goals to "a single normative justification: improving the efficiency of the economy by correcting specific forms of market failure such as monopoly, imperfect information, and negative externalities" (Majone 1994, 79). This meant a

stark deviation from the "positive state" of the postwar decades, whose policies where motivated by a plethora of political goals.

While Majone's characterization has been amended, historically situated, and criticized for years, it can still serve as a valuable baseline to characterize state activity—particularly in the European Union where regulatory justifications of Union responsibility vis-à-vis member states are still extremely common. In the literature on the European Union, the ideal-typical regulatory state has increasingly been described as coming under siege from multiple fronts (among many: Genschel and Jachtenfuchs 2018; Di Carlo and Schmitz 2023). This article builds on this perspective by highlighting a front related to the management of climate policy-induced decline. We want to highlight that we do not consider this front dominant or overall characteristic of the European Union. One of the major tenets of the debate on the regulatory state since Majone has been a cautionary take against monomorphic notions of state intervention (Levi-Faur 2013; Morgan and Orloff 2019). Instead, large parts of the literature on the siege of the regulatory state describe processes of partial and issue-specific bricolage and institutional layering, rather than unidirectional change. This is particularly true for research uncovering institutional change in climate policy.

As laid out in the following, influential research on the return of the activist state as a greening state describes localized experiments with non-conventional policy instruments, niche developments, the presence of conflicting logics, and forms of "hidden" policies that do not openly challenge formalized notions of the regulatory state. There currently exist three major takes on how the green state punctures the regulatory state in the European Union: the investment state, the derisking state, and the rise of green industrial policy. To situate the original contribution of our article, we briefly reconstruct the basic tenets of each perspective before pointing to an emerging additional view stressing how states deal with transition losers.

2.1 | The European Green State as an Investment State

Particularly for the European case, recent research has documented the rise of a wide range of unconventional forms of fiscal statehood aimed at decarbonization. Most of the institutional foundations of the European investment state have existed for a long time but have grown significantly in the aftermath of the European sovereign debt crisis. Institutions such as the European Investment Bank and member states' development banks have become large-scale de facto providers of investment assistance across Europe in a situation of institutionalized austerity in member states and the lack of fiscal capacity of the European Union itself (Mertens and Thiemann 2017; Lepont and Thiemann 2024). Given the centrality of fiscal underdevelopment in Majone's original scheme, the development of central fiscal powers implies a major deviation.

The literature on the European investment state has stressed that the expansion of fiscal capacity is partially unfolding in a politically "hidden" way—without overt challenges to institutionalized notions of fiscal policy in the EU. Nonetheless, the remodeling of institutions to serve green policy ends has been underwritten by official acknowledgments that climate change mitigation as an infrastructural problem requires massively rising levels of public investment (Mertens and Thiemann 2023). Given the hard-coded institutional constraints of European fiscal policy, however, the public provision of investment has largely relied on off-balance-sheet vehicles and the public underwriting of private investment (Alayrac and Thyrard 2024; Endrejat 2024).

2.2 | The European Green State as a Derisking State

The European tendency to favor public-private co-financing over actual public investment has been at the center of work on the rise of the derisking state. In particular, Gabor (2021) has argued that 21st-century macro-financial regimes push states to rely on private investment for transition financing by creating attractive assets in the green economy. Shadowing her earlier work on the structural dominance of financial interests in development policy, Gabor argues that the European "small" green state primarily *derisks* investments to create profitable assets for large financial pools (Gabor 2022; Gabor and Braun 2023). Critical macro-finance places the locus of state action at the level of institutions seeking to carve pathways for finance to flow in strategic directions. As a theory of changing forms of statehood under conditions of climate change, Gabor's analyses point toward the odd forms in which developmental ambitions in the green economy are channeled into states underwriting market-led transition policies. In recent comparative extensions of the macro-financial approach to green transitions, Gabor and Braun (2023) point to how institutional, ideological, and international power dynamics shape the extent to which states seek investment through financial markets, rather than through public means. The derisking state stands in an odd relationship to Majone's notion of the regulatory state. It highlights the return of non-regulatory goals of policy but describes (in parts self-inflicted) limitations of policy capacity that induce states to seek public policy goals by incentivizing private service provision.

2.3 | The European Green State as a Green Developmental State

A third core strand of research on greening states emphasizes the return of developmental policies for green industries and technologies. Green industrial policies have been emerging around the world as governments seek to develop technologies to combat climate change and vie for position in emerging industries (Allan et al. 2021; Meckling 2021; Rodrik 2014). Compared to the "old" East Asian developmental state of the 1980s, recent green industrial policies in rich countries have deployed a range of more light-touch policies, such as start-up assistance, R&D support, consortia, grants and loans, and consulting services (Block 2008; Nahm 2021). "Winning coalitions" of businesses, investors, social movements, workers, and political beneficiaries may form around growing green industries, which may then increasingly marginalize transition losers (Meckling et al. 2015). Through the logic of positive policy feedback (Béland et al. 2022), green industrial development may

subsequently buy political room for maneuvering to scale down polluting industries (Meckling et al. 2017). In the European case, many historical green industrial and technology policies have been devised by member states—sometimes using carve-outs, sometimes in open conflict with the bloc's regime to limit state aid to industry. Recently a number of studies have documented green developmentalist initiatives originating at the European level (Cooiman 2023; Mocanu and Thiemann 2024; Di Carlo and Schmitz 2023; Prontera and Quitzow 2021). As compared to perspectives on investment and derisking states, descriptions of a green neo-developmental state deviate strongly from Majone's characterization of the EU. In the green industrial policy space, states appear to not just return to non-regulatory policy goals but to develop positive state capacities enabling them to actively pick (green) winners.

2.4 | The European Green State and the Problem of Decline

There are scattered observations in the literature on green transitions that suggest that contemporary deviations from the regulatory state relate to a distinct additional challenge. Policies appear to play an active role in managing the unwinding of emission-intensive activities and the restructuring of affected communities. We discuss exemplary evidence on problems of governing greening-related decline before formulating a systematic take on decline as a green transition challenge.

In political economy, Breetz et al. (2018) have suggested that efforts to introduce commercialized green technologies into energy systems shift the politics of transitions toward conflicts over administrative and institutional reform and the redesign of large technological systems. Similar arguments about a distinct "late-stage" politics of green transitions have been developed in the specialized transition literature (Geels 2014; Isoaho and Markard 2020; Koretsky et al. 2023; Turnheim and Sovacool 2020). A major problem is that climate policy-related losses are heavily concentrated in specific regions and industries (Jakob et al. 2020). Brauers et al. (2020) have documented the political challenges of phasing out coal in Germany and the United Kingdom. Like any attempt at forced large-scale societal change, climate policy-making as a deep socio-economic transformation tends to turn "noisy" even after initial advances (Patterson 2022). Highlighting sequencing and potential misalignment between the "creative" and "destructive" aspects of transition policy, Thurbon et al. (2023) have shown for the cases of Korea and China how the state has recently taken up the phasing out of fossil infrastructures as a distinctive task beyond green industrial policies.

Concerns about the climate change-related unwinding of socio-economic structures have risen markedly in recent years—particularly after the Paris Agreement of 2015. In rich Western nations, this is especially true for clusters related to coal mining, processing, and use. There are transnational as well as national aspects to debates about the organized winding down of coal power generation. In the realm of transnational climate change governance, a major concern is how to compensate poorer and medium-income nations for forgoing the developmental potential of continued (if not expanded) fossil fuel usage and how to rewire exporting nations' growth models (Edwards 2019). Across countries, the relationship between assets deemed as "stranded" due to climate change and states is anything but uniform, as states can be major direct and indirect owners of fossil assets and infrastructures (Babic et al. 2022; Semieniuk et al. 2020).

For the case of the European Union, an emerging research literature investigates notions and practices of *Just Transition*. While hitherto largely a normative debate about the need for redistributive logics in green transitions (Newell and Mulvaney 2013), a range of recent policy initiatives picks up the language and compensatory focus of the debate for policy-making. Bradlow and Swamidurai (2024) show how the recent proliferation of "Just Energy Transition Partnerships" between Global North and South countries is heavily tilted toward phase-out policies. Compensatory transfers are effectively tied to decommissioning commitments, rather than to developmental projects. Volintiru and Nicola (2024) have documented how European institutions have inserted themselves into the Romanian policy process to restructure the mining-intensive Jiu Valley through the EU Just Transition Mechanism. They show how European compensatory resource flows are tied to local investment projects with high technical planning requirements and highly uncertain restructuring outcomes.

The systematic problem research on restructuring in energy transitions points to is that common notions of green transitions emphasizing the state-led manipulation of relative prices operate with a reductive notion of socio-economic change. Notions of green transitions in which societies fluidly and proactively adapt to predicted futures of cheap green and expensive carbon-heavy energy vastly underestimate the inertia of socio-economic structures. This is all the truer as green transition policies target the unwinding of socio-economic structures that are viable, provide for economic livelihoods, and sustain community life on an ongoing basis—not to speak of the hitherto extremely prosperous and profitable sections of the global fossil fuel economy (Christophers 2022).

In this sense, we suggest understanding policies easing, managing, and planning greening-related decline as forms of the incremental coping of policy-makers with the fact that greening policies aim to transition complex societies, rather than systems of economic stocks, flows, and price signals. In a process reminiscent of Polanyi's (2001, 88) take on 19th-century British social reforms, policy-makers can be thought to "discover society" through problems of social resistance to (green) socio-economic change. The process of institutional layering we describe in our case study below represents a sequence of piecemeal attempts to establish socio-economic and political room to maneuver in order to decarbonize.

Transition measures targeting decline often overlap with the policies described in the literature on the investment, derisking, and entrepreneurial state, but have distinct political-economic logics. In terms of social coalitions, as compared to notions of the green entrepreneurial or innovation state, a decommissioning state aims at providing societal legitimacy for structural change, rather than at the development of new technologies or the growth of green profits—and thereby the creation of "winning coalitions" (for a similar take on industrial policy, see Katzenstein 1985). In

this sense, the decommissioning state we are describing is "picking losers," rather than "winners." As compared to the derisking state, a decommissioning state becomes administratively active in regional and sectoral restructuring, rather than through financial incentives. And as compared to the investment state, policies aimed at decline have distinct compensatory and restructuring logics and involve direct government planning.

In the following section, we build on this notion of decline as a transition challenge by showing how the European regulatory approach to climate policy has been incrementally perforated by measures for green restructuring. Important examples are transfers to declining regions and a planning repertoire targeting specific regions and industries, developing roadmaps for resource and workforce shifts, and establishing local expertise in the management of green transitions. As we show in the following section, fiscal and administrative capacity for decommissioning, as it has emerged since the mid-2010s, has been instrumental in reforming the EU's emissions trading system and has become a key part of the bloc's climate policy toolkit.

3 | Case Selection: The EU as a Green State

Situating the EU in the universe of 21st-century greening states is not straightforward. It requires situating the EU in both the climate policy and the industrial policy universes of cases. In the early 2010s, the European Union would undoubtedly have qualified as one of the "most advanced cases" of climate mitigation policy due to early participation in transnational climate accords and attempts to implement an emission trading scheme. It would hence constitute a primary target to study the late-stage political economy of green transitions. By the mid-2020s, the bloc's slow and troubled response to U.S. and Chinese green industrial policies appears to make it more of a laggard. We contend, however, that the EU's unique position in rolling out the "sticks" in conjunction with the "carrots" of climate change mitigation policy has given rise to another set of policies aimed at managing the decline of regions and sectors of a carbon-based economy. Across the world, we increasingly see that the political viability of climate policies depends on the state capacity to manage the politics of green transitions. Here, the early European experience is arguably important for the transitions states elsewhere face in the future.

The problems of situating the EU as a climate policy-maker are compounded by its distinct role in economic and industrial policy. The analysis of the EU as a state-like structure has recently given rise to debates in political science (Kelemen and McNamara 2022). Particularly in fiscal and administrative terms, the EU remains uniquely weak given the breadth of its policy mandates.

Furthermore, the bloc represents a major exception in industrial policy terms in that it formally abandoned vertical industrial policies as distortionary of the Single Market during the 1990s (Thomas 2000). Nevertheless, the bloc has had extensive policy experience with declining industries and regional restructuring and hence with industrial policies seeking to manage the reallocation of resources (Warlouzet 2019).

While the EU can hence hardly be seen as "representative" of green states around the world, its policies respond to structural problems of green transitions facing polities all around the world. In this problem-centered sense, we discuss the EU as an illustrative case of a regulatory state resorting to more interventionist, granular toolkits to phase out the carbon economy. The systematic contribution of this article is to document and situate the rise of policies aimed at green structural change. Methodologically, then, it provides a "formation story" (Hirschman and Reed 2014)—an account of the emergence of a policy repertoire—of what we argue is a distinctive set of instruments aimed at managing decline. Our data consists of primary material from hearings, public consultations, speeches, and reports published by DG REFORM and other parts of the European Union. Our reconstruction of the earlier phases in the ETS draws from secondary literature and selected Commission-level policy documents.

4 | Planning Like a Regulatory State: The Case of the ETS Reform

Since the mid-2010s, the EU's climate policies have increasingly strayed away from a predominantly regulatory approach and adopted industrial and regional policy repertoires. Many of the EU's earlier climate policies aimed for single market-wide harmonization and the primacy of horizontal, regulatory policy instruments. The crucial instrument with which the Union sought to harmonize green energy transition efforts across the continent was (and is) the European Union ETS—a cap-and-trade system formally devised in 2003 and operational since 2005. This section traces how the political-economic logic behind the push for regulatory harmonization through the ETS ran into political roadblocks. Over time, the focus on regulatory price-shifting through the ETS has gradually been complemented by more interventionist green policy initiatives. These have partially been described as the rise of a green investment, derisking, and innovation state. What gets overlooked in such accounts are efforts deploying significant administrative and fiscal facilities to dissociate European societies from carbon-intensive economic activities. This section describes the importance of capacity building to manage decline as a critical building block of the EU's transition governance. To illustrate the incremental nature of policy change, our analysis is structured in a chronological way, documenting the gradual layering of programs onto the original regulatory regime.

4.1 | The ETS and the Regulatory State in European Climate Policy

The dominance of the regulatory state in EU climate action rests on three pillars: the European Commission's long-standing concern about cost efficiency and harmonization in the environmental field, the complex and extensive system of European emissions trading, and the bloc's legacy of rolling back member state interference in the energy sector. We provide a very cursory account of the ideas tied to the ETS to lay the groundwork for situating the novel characteristics of the EU's recent transition policies.

The European Union has been a key actor in international initiatives to mitigate climate change (Bäckstrand and Elgström 2013). At the same time, bloc-wide policies to meet international

commitments seemed for many years to fail. The European Commission had been pushing for a European carbon tax since the early 1990s (called an "energy tax" in 1997). Besides the goals of expanding the EU's reach in environmental and fiscal terms, the early proposals for a carbon tax were motivated by the idea of establishing "efficient" and "coherent" instruments to combat climate change (van Eijndthoven 2011). Historiographies of the 1990s push for European carbon taxes share the assessment that the proposal failed politically due to business lobbying and reservations among member states (Newell and Paterson 1998; Skjaerseth 1994).

Notwithstanding the defeat of tax-based proposals, the concerns about efficiency and harmonization strongly shaped future policy rounds in the climate field. The major follow-up project to the European carbon tax was the European system for emissions trading. In the EU context, emissions trading got its first mention in a 1992 report on environmental degradation, which identified it as a line of action to "[i]ntroduce [c]arbon emission trading permits to set up a global market" (European Commission 1992).

Commission support for the instrument picked up in the late 1990s, originally as an escape route from carbon tax proposals (Dreger 2014, 30; Skjaerseth and Wettestad 2016). Crucial for our case study, emissions trading proved highly complementary to the EU's focus on "horizontal" and "non-distortionary" policies, in which climate change mitigation would not open the door to renewed discretionary member state interference with the Single Market. As described in a Commission green paper in 2000:

> ... a coherent and coordinated framework for implementing emissions trading covering all Member States would provide the best guarantee for a smooth functioning internal emissions market as compared to a set of uncoordinated national emissions trading schemes ... [A] Community approach is necessary to ensure competition is not distorted within the internal market ... [while it] should also be ensured that Member State initiatives do not also create undue barriers to the freedom of establishment within the internal market
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> (European Commission 2000, 4–5).

Since its initiation in 2005, the European Union ETS has grown into the global front-runner experiment with cap-and-trade to combat climate change, and it remains one of the world's largest artificial markets for trading rights to pollute. As an evolving policy, the ETS has been devised in multiple "phases" through which the EU has tried to expand, adjust, and reorient the regime over time. We discuss major milestones of ETS development to demonstrate how resistance to the administrative pricing of emissions created the political space for experiments with vertical policies and the creative repurposing of existing institutions for managing decline.

4.2 | The Regulatory Spirit and the Initiation of the ETS

Phase 1 of the ETS, from 2005 to 2007, has been called the pilot or experimental phase. The ETS was the first major EU-led intervention in European energy systems after the coordinated deregulation of the electricity and gas sectors that began in 1996. A crucial starting point for understanding the spirit of the ETS as an energy policy is the liberalization process. Indeed, liberalization and emerging centralized emissions allocation have been discussed as the major successive landmarks of European state-building in the energy domain (Jegen and Mérand 2014).

Still in the 1990s, energy generation and distribution were among the major fields of state intervention and non-market coordination in EU member states. National and regional monopolies, extensive state ownership, deeply interwoven cross-ownership across the sector, and routine interest-group bargaining were the norm across much of the continent (Matláry 1997). Historical accounts of energy market liberalization have usually portrayed it as the result of member-state bargaining—particularly between France, Germany, and the United Kingdom (Matláry 1997; McGowan 1993). As illustrated by Eising and Jabko (2001), EU electricity market liberalization was embedded in a larger normative shift across the continent, which redefined common notions of good governance toward transnational market organization and horizontal industrial policy. This did not rule out attempts by member states and dominant firms to use deregulatory tools as a basis for hidden industrial policy measures, particularly through national champion policies and forms of formal privatization with continued state influence (Bulfone 2019). Notwithstanding such hidden deviations, public utility notions of energy provision, as well as the plethora of traditional member state interventions in the sector, were redefined as "barriers" to a single market for energy enabled by transnational regulatory frameworks. As in other domains, European state-building in the energy sector had a dominant "negative" tilt (Scharpf 1999), in that it consisted of the institutionalization of regulatory powers with the explicit purpose of rolling back member state interference in energy.

This tilt has also influenced the EU's policy styles in the climate arena. The bloc's translation of international climate accords into EU directives (such as the Kyoto 2020 goals into Directive 2001/77/EC) expressly left space for member states to implement their own instruments in pursuit of decarbonizing the energy sector. The European innovation or neo-developmental state in support of green energy technologies had for years been growing in parallel to the ETS as the centralized regulatory tool. "27 Member States operate 27 different national support schemes," a 2008 summary report stated, raising concerns over potential market fragmentation and inefficiencies (European Commission 2008). While accepting in principle member states' pursuit of green technology development, the Commission for years expressed concerns that decentralized subsidy schemes for renewable energy sources could shield sections of European electricity production and use from market mechanisms and thereby undermine the single market (Leiren and Reimer 2018). Aligning with the spirit of the 1990s plans for the institutionalization of a single market for energy, selective benefits for renewable sources, for example, were routinely framed as "distortions" in European public policy debates (Gawel and Strunz 2014; Lehmann and Gawel 2014). Accompanying a 2008 push to expand "market-based instruments" to further environmental policy domains, the Commission stressed their two-sided benefits for regulatory statehood:

> "[b]esides their merits in helping achieving specific policy goals, the EU has used market-based instruments to avoid distortions within the internal market caused by differing approaches in individual Member States, to ensure that a similar burden falls on the same sector across the EU and to overcome potential adverse competitiveness effects within the EU"
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> (European Commission 2007, 3–4).

While there has arguably been further accommodation with regard to member state greening schemes throughout the years, DG Competition and DG Energy continued to advocate that member states limit vertical policies in favor of EU-wide carbon pricing (good insight into the spirit of regulatory concern with decentralized greening policy repertoires can be found in the 2014 Commission state aid guidelines for green energy support, 2014/C 200/01).

To summarize, core parts of European state-building in the energy arena were based on the paradigm of single market-enabling regulatory harmonization and, above all, on the idea of centrally orchestrated price-shifting. European green technology policies—the European green innovation state—grew in a fragmented fashion in member states. From the perspective of the European regulatory state, vertical policy measures, such as green technology policies, public ownership, sectoral subsidization, regional policies, and industrial targeting, were often treated as temporary matters of member states and potential obstacles to a functioning single market as well as to cost-effective climate policy.

4.3 | Gradualism, Leakage, and Overallocation

As a "single market-compatible" approach to European greening policies, the ETS was meant to achieve compliance with transnational greenhouse gas reduction commitments by raising the cost of carbon throughout the EU. While the ETS would in theory bring immediate cost pressure to the EU's carbon economy, phases 1 and 2 of the regime were kept decidedly unencompassing. The ETS traditionally excluded important sectors such as aviation, issued extensive free emission allowances based on historical levels of pollution (and hence historical levels of technology), and was for a long time very slow in making good on the "cap aspect" of cap-and-trade systems (Skjaerseth and Wettestad 2016). At times, the "economic growth-compatible" implementation of the ETS was decried as a form of hidden industrial policy, particularly for energy-intensive sectors. At a minimum, the ETS's early evolution was characterized by high levels of gradualism in that it had a certain sectoral or political-economic logic of only incrementally including societal emitters deemed politically more difficult to decarbonize (Genovese and Tvinnereim 2018). A similar gradualist logic appeared in 2008 stipulations that granted free allowances to the power sectors of 10 eastern European member states for emitting facilities initiated before 2009 (Müller and Slominski 2013, 1436). In a similar vein, the Commission responded to concerns about "carbon leakage" in globally competitive markets as a justification for the overallocation of allowances in the late 2000s (Rehn 2008). Based on extensive stakeholder consultations, the ETS has spared sectors "deemed to be exposed to a significant risk of carbon leakage" from having to purchase emissions allowances since 2009 (European Commission 2009). The associated list of sheltered sectors has been amended multiple times since 2009 and still comprises 63 industries for the period of 2021–2030. By some estimates, the overallocation of EU allowances to industry between 2008 and 2020 amounted to around 1.1 billion allowances, representing a potential transfer of up to around €90 billion at current ETS prices (Pellerin-Carlin et al. 2022). While these and other early perforations of the ETS as a regulatory tool implied a certain sectoral logic, we would caution against understanding them as vertical instruments in the early ETS. They represented "common strategies of grandfathering, postponed implementation, and phased or graduated implementation" visible in all kinds of policy fields to appease policy losers (Trebilcock 2014, 156). The process of layering of vertical repertoires we aim to highlight by contrast consists of active transition work in losing regions and sectors.

Particularly in the years after the Global Financial Crisis and the Eurozone crisis, the ETS slid into a deep crisis. Initial overallocation paired with the decrease in demand for emission allowances due to the recession led to a collapse in prices for emission allowances (see Figure 1). The result was that the Commission feared that the logic of price-shifting to accelerate green transitions was increasingly undermined, as carbon prices at the turn of the decade were not "painful" enough to incentivize reallocation:

> the low-carbon transformation and innovation effect has been compromised. New but not yet fully commercial technologies … are not progressing toward the market as anticipated or may require more direct support, just as budgetary constraints make this more difficult for governments to provide. By depressing the carbon price, the fall in emissions in the ETS has paradoxically increased the risk of Europe getting locked into too high-carbon investments. This is particularly inopportune considering the size of the capital stock still to be replaced this decade
>
> (European Commission 2012, 5–6).

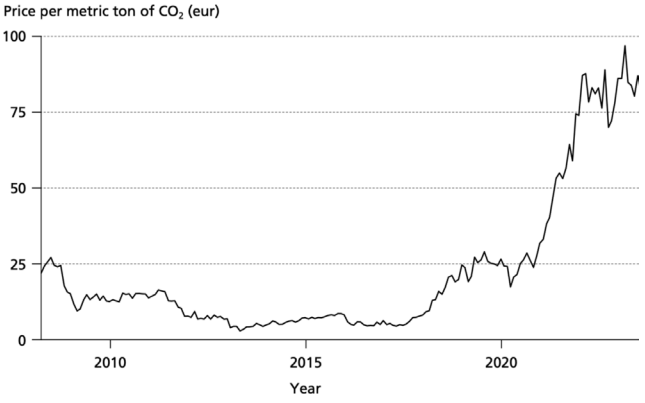

FIGURE 1 | The development of EU ETS spot market prices, 2005–2021. *Source:* International Carbon Action Partnership (2023).

While most of the EU's policy initiatives at the time continued to advocate the ratcheting up of carbon prices and expansion to excluded sectors, attempts to revive the ETS met massive political resistance in the aftermath of the crises and austerity measures after 2008. Observers repeatedly pronounced the ETS dead when a Commission proposal to temporarily reduce the number of allowances failed to pass the European Parliament in early 2013, not even reaching the Council for deliberation (Wettestad 2014). At its lowest level, the price of emission allowances hit €2.50. It was arguably this state of blocked reform, coupled with a changing international environment, that gradually gave way to more vertical transition policy repertoires—European transition policies aimed at the restructuring of specific regions and economic sectors—as well as an incremental tightening of the ETS.

4.4 | Post-2014: ETS Reform and the Political Problem of Decline

This section traces the development of EU climate policy from the stasis around 2014 through the creation of the Just Transition Fund and DG REFORM, illustrating how the EU has incrementally layered new policy instruments and administrative capacities onto its existing regulatory framework to deal with the management of declining industries and the phase-out of fossil fuels.

The 2014 European Council conclusions on the 2030 climate and energy policy framework set the political guidelines for the ensuing ETS reform. While reaffirming the centrality of the ETS as the primary instrument for reducing greenhouse gas emissions, the European Council also laid the groundwork for new mechanisms that would later evolve into more interventionist and sectoral policies (European Council 2014, 1–3). The European Council conclusions outlined three key elements that would shape future policy developments: A Market Stability Reserve (MSR) as suggested a few months earlier by the Commission to reduce the surplus of emission allowances; a new fund aimed at upgrading energy systems in lower-income member states using ETS revenues; and an expansion of the use of ETS revenue focused on supporting innovative low-carbon technologies through project-based financing.

Building upon the European Council's framework, the Market Stability Reserve (MSR) was introduced as a mechanism to address the longstanding issue of allowance surplus in the ETS. The MSR was initially proposed in 2014 and negotiated over the following years, with the legal basis established in 2015. However, a significant reform of the MSR was adopted in early 2018 and formally approved later that year. The MSR began operating in January 2019, with its key features fundamentally altering the nature of the cap-and-trade system by endogenizing the emissions cap (Beck and Kruse-Andersen 2020). Prior to this reform, the EU ETS operated with a fixed, politically determined cap on emissions. The MSR changed this by making the cap responsive to market conditions, specifically the allowance surplus. Under the new system, when the allowance surplus exceeds 833 million, a percentage of allowances are absorbed into the MSR, effectively reducing the available supply. Conversely, if the surplus falls below 400 million, allowances are released from the MSR. This dynamic adjustment mechanism aims to stabilize allowance prices and improve the system's resilience to supply and demand imbalances. Crucially, the 2018 reform introduced a cap on the MSR itself, stipulating that from 2023 onward, any allowances in the MSR exceeding the previous year's auction volume would be permanently revoked. This endogenized the cap and effectively severed the link between policy interventions and the number of allowances.

The consequence was that through these interventions the ETS actually started to bite (see Figure 1). As a result, the problem was no longer that the ETS did not work, but rather that it promised to work, prompting activity to actively plan transitions. The legislative process around the ETS reform, unfolding since 2014, reveals a two-faced nature. On the one hand, the Modernisation and Innovation Funds represented initial steps toward more granular interventions in specific sectors and regions, moving beyond the regulatory logic of the ETS.

From 2010, the ETS included a small program called NER 300, which repurposed a minor share of the revenues from allowances auctioned to fund demonstration projects for low-carbon technologies. During two selection stages, NER 300 funded 39 projects with a total of €2.1 billion (Marcantonini et al. 2017). The Innovation Fund was meant to significantly scale up this model by providing greater funding and by propagating the use of more diverse financing instruments. It signified a spirit that deviated from the regulatory vision underlying the single European price for carbon. In the latter, increased costs for carbon would—through market-led adjustment—induce low-carbon innovation and the reallocation of resources. In the realm of the Innovation Fund, by contrast, European institutions would (directly or indirectly) fund green industrial activities in member states on a project basis.

The final implementation of both funds was subject to intense political negotiation. The debate about the Modernisation Fund, targeted at poorer eastern European member states, centered on the question of to what extent funds would be allowed to be spent on coal power plants and gas generators. The final agreement contained language limiting the fund's purpose to the modernization of energy systems and precluding primary generators from burning solid fossil fuels—with limited carve-outs for low-income member states (Wettestad and Jevnaker 2019). Both funds were subject to consultations with business sectors, experts, and other societal groups. The summary report on the initial 2017 expert hearings in preparation for the Innovation Fund hinted at the problems of business reluctance to shoulder the risks of green technology development highlighted in the literature on the green derisking state: groups pleaded for the funds to be used to finance and insure risky ventures (Climate Strategy and Partners 2017, 16).

The Innovation and the Modernisation Funds have massively expanded in size and sophistication since their initiation—not least due to the revived ETS actually laying open a source of quasi-fiscal space. The Innovation Fund's net assets grew from €1.33 billion (50 million allowances) at the end of 2020 to €4.14 billion (through an additional 40 million allowances) by the end of 2021 and €5.43 billion (through an additional 15 million allowances) by mid-2022 (European Commission 2022a). Recent

Commission proposals aim to endow the Innovation Fund with €43 billion by 2030 (European Commission 2023b, 3). The Modernisation Fund has seen a similarly rapid growth. Revenue from auctioning allowances earmarked for the Modernisation Fund has grown from €3.75 billion in 2021 to €5.44 billion in 2022 and is planned to achieve a volume of €60 billion up to 2030 (European Commission 2023b, 3; Modernisation Fund Investment Committee 2022, 2023). In late 2024, Modernisation Fund eligibility has been expanded to include Portugal, Greece, and Slovenia.

This active capacity building to transition regions and industries by means of extending regulatory climate instruments represents the initial steps toward layering a more fine-grained planning logic on top of regulatory instruments. However, the other face of the ETS reform of 2014–2016 was one of continuity. Specifically, several rounds of stakeholder consultations in 2014–2015 reveal the continued dominance of cost-effectiveness and industry concerns in policy formulation. The European Commission's framing of consultation questions and the limited involvement of civil society actors reflected a persistent focus on market mechanisms and industry competitiveness (Wettestad and Jevnaker 2019). This approach made it difficult for labor and social movements to meaningfully engage in the policy process at this stage.

However, cracks in the industry-centric approach began to appear. In 2016, the European Parliament Committee on Industry, Research, and Energy discussed ETS reforms. Amendment 717, penned by Edouard Martin (S&D) proposed to add section (e) to Article 10 of the ETS Directive. The proposed amendment stated:

> A Just Transition Fund is created as of 2021 as a complement to the European Regional Development Fund and the European Social Fund; it is funded through the pooling of 2% of the auctioning revenues. The revenues of these auctions would remain at the EU level, with the goal to use them for cushioning the social impact of climate policies in regions which combine a high share of workers in carbon-dependent sectors and a GDP per capita well below the EU-average [...] The core activities to be financed by a Just Transition Fund being strongly related to the labour market, social partners should be actively involved into the fund management—on the model of the ESF committee—and the participation of local social partners should be a key requirement for projects to get funding
>
> (European Parliament 2016, 105–106).

This proposal represented a departure from the prevailing market-based approach, explicitly addressing the social impacts of climate policies on workers and regions. The term *Just Transition* originated from the trade union movement, dating back as early as the late 1960s. From the early 1990s onward, it diffused to trade union positions on climate change (Hampton 2016, 68–79). Securing trade union support would eventually prove to be instrumental for passing the EU's Green Deal in 2019. However, around 2016, the JTF lacked support from the Commission and the Council, and the amendment failed to gain traction (Kyriazi and Miró 2023).

4.5 | Emerging Recognition of Transition Challenges (2017–2018)

Despite the failure of the S&D group's Just Transition Fund proposal, the period from 2017 to 2018 saw growing recognition of the need to address the socio-economic challenges of the low-carbon transition, particularly in coal-dependent regions. In 2017, the European Commission launched the Coal Regions in Transition Platform, signaling increased attention to the specific challenges faced by carbon-intensive regions (European Commission 2017).[1] The platform's establishment under DG Energy, with key support from Commission Vice-President Maroš Šefčovič and DG Energy's Klaus-Dieter Borchardt, indicated a shift in the Commission's approach to climate policy (Leppänen and Liefferink 2022, 58). This initiative provides a forum for knowledge sharing and capacity building, helping regions apply for European funding to support energy transitions. Since early 2019, a secretariat composed of a consortium of actors from academia, industry, and civil society has managed all of the initiative's activities with the European Commission.

The 24th Conference of the Parties (COP24) in Katowice, Poland, in 2018 further elevated the concept of just transition on the international and EU agendas. The conference resulted in the Solidarity and Just Transition Silesia Declaration, signed by over 50 states (UNCCC 2018). Significantly, it stated that a "just transition of the workforce and the creation of decent work and quality jobs are crucial to ensure an effective and inclusive transition to low greenhouse gas emission and climate-resilient development, and to enhance the public support for achieving the long term goals of the Paris Agreement." This echoed and explicitly referred to the Guidelines for a Just Transition, published by the International Labour Organization (2015). Poland's position at COP24 reflected its broader stance within the EU on climate issues. As a heavily coal-dependent EU member state, Poland has often been at odds with more ambitious climate policies proposed by other member states. The COP24 provided a platform for Poland to bring its concerns about the social and economic costs of rapid decarbonization to the forefront of EU and global climate discussions.

In the same year, the European Parliament adopted a resolution calling for the creation of a Just Energy Transition Fund (JETF) as part of the Multiannual Financial Framework (MFF) 2021–2027 negotiations. The resolution proposed a €4.8 billion fund to support the energy transition in coal regions (European Parliament 2018, 7). While ostensibly focused on socio-economic impacts, the fund's primary aim was "to ensure support for companies in coal regions to implement the transition" (Leppänen and Liefferink 2022, 59). This proposal, championed by MEP Jerzy Buzek, represented a more targeted approach to transition management, albeit one still primarily oriented toward industry support.

4.6 | Mass Mobilization and Political Realignment (2018–2019)

The period from late 2018 to 2019 also saw significant shifts in the political landscape surrounding climate policy, driven by mass mobilizations and changing public sentiment (Bocquillon 2024). The emergence of movements like Fridays for Future and Extinction Rebellion brought unprecedented attention to climate issues, particularly among younger generations (Kyriazi and Miró 2023). Simultaneously, events like the yellow vests protests in France were a reminder of "environmentally beneficial" past transitions "undertaken in socially regressive ways" (Newell and Simms 2021, 909). Pressures to keep transition activity from leading to social unrest pushed the EU "to move the debate beyond the focus on technological change, introducing social policy considerations and questions of redistribution into the transition equation" (Kyriazi and Miró 2023, 113).

This shifting political context set the stage for the mainstreaming of Just Transition concepts into EU policy. The S&D group leveraged its position in the European Parliament to make the Just Transition Fund a key issue in the approval of the Von der Leyen Commission in 2019. In a letter outlining their priorities, the S&D group called for "a Just Transition Fund to address the effects of climate change and of digitalization on the workforce" as part of a broader Sustainable Europe Investment Plan (García Pérez 2019). The appointment of social democrat Frans Timmermans as First Vice-President responsible for the European Green Deal and Elisa Ferreira as Commissioner for Cohesion and Reforms, also from a social-democratic background, further increased the S&D group's influence on the development of the Just Transition Fund (Leppänen and Liefferink 2022, p. 60).

4.7 | Greening the East: The Case of the Just Transition Fund and DG REFORM (2019–2020)

The political realignment and growing recognition of transition challenges culminated in the creation of the Just Transition Fund (JTF) as part of the European Green Deal in 2019. The JTF represented a second layering moment of EU climate policy by developing policies that explicitly address the socio-economic impacts of the low-carbon transition with targeted financial support and capacity-building measures. The decision to house the JTF within the Directorate-General for Regional and Urban Policy (DG REGIO)—a European agency responsible for cohesion and regional policy—rather than DG Climate or Energy was driven by practical and institutional considerations (Kyriazi and Miró 2023, 61–62). DG REGIO has extensive experience creating shared management instruments, involving the Commission and member state authorities, and had all the structural and organizational aspects in place to get the Fund quickly operational. Thus, the technical design of the JTF would become closely similar to the other cohesion funds also administered by DG REGIO. This placement within DG REGIO and its status as a shared management fund underscores the JTF's conception as a structural and regional development tool, rather than solely a regulatory policy instrument.

Concurrent with the JTF's creation, the European Commission established DG REFORM in 2020. It succeeds the Structural Reform Support Service, originally devised to bundle a set of ad hoc initiatives to assist Greece in implementing reforms in the aftermath of the Eurozone crisis. Since then, the Structural Reform Support Service has been redeployed to co-develop regional transition plans in coal-intensive regions in Lithuania, Slovakia, Greece, and Romania since 2017 (European Commission 2018, 2019b, 2023a, 2024).

The mission letter for Elisa Ferreira, Commissioner for Cohesion and Reforms puts a just transition front and center: "Your task over the next five years is to ensure that Europe invests and supports the regions and the people most affected by the twin digital and climate transitions." The focus on eastern Europe, which houses the most regions affected by the phase-out of fossil fuels becomes clear too: The "Just Transition Fund [...] should offer tailored support for the most affected, for instance, those in industrial, coal and energy-intensive regions undergoing significant local transformations" (European Commission 2019a, 4–5). Taking heed of this political guidance, DG REFORM has begun to style itself as being about governance and capacity building for the green transition. It serves as a conduit for regional governments to develop planning capacities to access EU funds that are devised to ease green transitions:

> those territories ... most negatively affected based on the economic and social impacts resulting from the transition, in particular with regard to the expected adaptation of workers or job losses in fossil fuel production and use and the transformation needs of the production processes of industrial facilities with the highest greenhouse gas intensity
>
> (European Union 2021, 10).

The work of DG REFORM is enmeshed in the EU's Just Transition Mechanism (JTM). The JTM consists of three funding instruments: the estimated €17.5 billion Just Transition Fund, a dedicated InvestEU Just Transition Scheme (estimated €10–15 billion) and a public sector loan facility with the European Investment Bank (estimated €25–30 billion).

The creation of these facilities has been complemented by administrative transition knowledge building across Europe. In 2010, the EU initiated an annual reporting system intended to coordinate governance across the continent, the European Semester. Since 2020, member states have been asked, as part of the European Semester reporting, to identify and characterize priority investment areas and framework conditions for effective delivery of Just Transition Fund investments. Based on information on regions' dependence on fossil fuels (notably coal, lignite, peat, oil shale, heavy oil, and diesel) and/or on greenhouse gas-intensive industrial activities, the 2020 Semester led to a preliminary Commission identification of 99 regions facing major transition challenges (European Commission 2020). As part of the JTM, territories have to draft territorial just transition plans to qualify for targeted transfers. These plans have to "script" regional transitions aligning with the EU's climate policy goals for 2030 and 2050, detail how regional transitions interact with

national green transition policies, and provide plans for specific actions alleviating the impact of the transition.

Region-specific transition planning requires bureaucratic capacity to engage stakeholders on the ground, as well as technical expertise. To facilitate these tasks, DG REFORM has been providing support to assess transition needs, to prepare action plans with a road map of policy measures, for stakeholder consultations with actors on the ground, and with governance mechanisms to implement the transition. Reports on Slovakia and Romania provide some insight into how the process plays out. Territorial transition planning efforts involve knowledge generation on an extremely granular level; in its report on Slovakia, the Commission details the efforts to transition regions from coal, the rehabilitation of land and assets connected to industrial sites of coal-mining companies and power plants, and the work to prepare a territorial just transition plan to qualify for JTF transfers (European Commission 2022b). Support for Slovakia, carried out by PricewaterhouseCoopers Advisory on behalf of DG REFORM, involved online surveys, focus groups, qualitative interviews, webinars, thematic workshops, and support to develop methodologies and governance processes to make local projects compatible with EU funding.

There exist similar EU-devised planning efforts in the Innovation and Modernisation Funds. Both instruments disburse funds based on centralized project evaluations. They both entice member states to develop planning capacities related to transition investments and—in the case of the Modernisation Fund—to submit annual reports on transition processes to the Commission. Innovation Fund projects are tendered, evaluated, and managed by the European Climate Infrastructure and Environment Executive Agency, while the European Investment Bank and member states encourage and assist applicants with proposal development (European Commission 2022a). Modernisation Fund project proposals are evaluated by a newly founded Investment Committee, composed of representatives of member states and of European institutions (Investment Committee of the Modernisation Fund 2020).

4.8 | The Perforated Green Regulatory State

To emphasize the momentous shift of policy repertoires from the European regulatory state, these induced restructuring policies concern selective state intervention into working socio-economic systems. To be clear, re-emerging state planning capacities in the service of green restructuring must still be seen against the backdrop of the European Union being an unevenly developed bureaucracy (Kelemen and McNamara 2022), with limited expertise and personnel resources. That notwithstanding, financial inducements and project-based allocation and monitoring go beyond the merely regulatory, horizontal model of governance typical for earlier years of the ETS. From a political economy perspective, co-financing and project-based policy tools are part of an increasingly prominent breed of hybrids—signifying increasing interventionist ambitions, on the one hand, and limited options to influence business conduct, on the other. The types of instruments flourishing in the EU may indicate the broader point that post-neoliberal state intervention does not imply a return to pre-neoliberal policy styles. In historical institutionalist fashion (Mahoney and Thelen 2012), what we observe is a layering of new elements onto an existing institutional regime. Figure 2 presents a schematic overview of this layering, showing how over time, the purely regulatory and market-based approach has increasingly been complemented with developmental and decommissioning policies.

ETS reform since the mid-2010s has been about the incremental coping of policy makers with the fact that green transitions aim to transition complex societies, rather than systems of economic systems. This involves a partial shift in policy making, too, from regulatory and horizontal instruments to positive, vertical, and place-based policies, combined with capacity building to pacify redistributive conflicts. To this end, the EU has institutionalized a series of measures that aim to restructure economic sectors and specific regions in the name of climate change mitigation. In line with classic takes on industrial policy (Katzenstein 1985), states can raise the acceptance conditions for individuals, firms, and

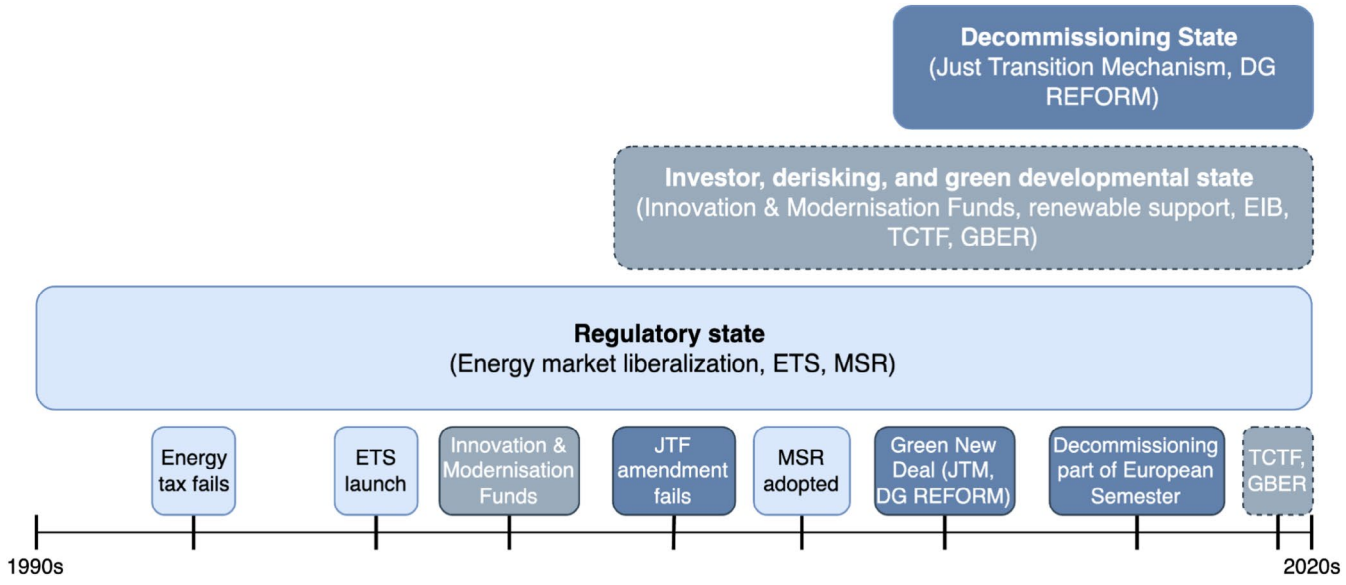

FIGURE 2 | Institutional layering in EU climate policy, 1990–2020s. *Source:* Authors' elaboration. Dotted line represents member-state dominated policy areas.

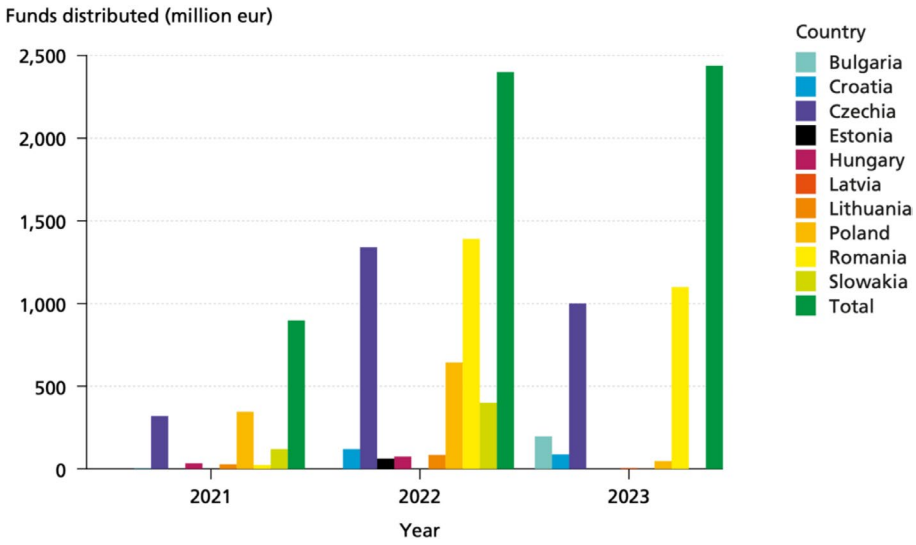

FIGURE 3 | Modernisation Fund disbursements by member state, 2021–2023. *Source:* Modernisation Fund Annual Reports. 2023 figures are for the June cut-off published in https://ec.europa.eu/commission/presscorner/detail/en/ip_23_3126.

regions to exit from declining sectors. All of this happens under conditions of the bloc's uniquely diffuse state capacities for vertical industrial policies and hence often takes the form of project-based inducements to develop decentral planning capacities.

While it is too early to assess the effectiveness of the decommissioning planning central to the EU's post-2015 climate policies, the scale of funding and granularity of planning efforts show how a new decommissioning logic has been layered on top of—or pierced through—the European regime of climate policy-making (Figure 3).

5 | Conclusion

In the context of climate change and green industrial policy, the return of the state has been heralded many times and under many different guises. With our case study of the EU's climate policies, we have shown how the destructive side of creative destruction is pushing states to develop the capacity to liquidate and manage decline. With DG REFORM and quasi-fiscal tools such as the Modernization, Innovation, and Just Transition Funds, the EU is developing capacities for industrial and regional planning, consultations with stakeholders on the ground, and detailed plans to rehabilitate communities, land, and infrastructure connected to the extraction and use of fossil fuels. We submit that such decommissioning policies are layered on top of the regulatory, (hidden) investment, entrepreneurial, and derisking states previously diagnosed in the context of green transitions. As argued in a critique of the common practice of sorting country cases into singular ideal types (Crouch 2005), we believe that *decommissioning*, *liquidating*, or *stranding* repertoires of state action may be found in a range of cases—the interesting questions being to what degree and with what change over time.

Notwithstanding the exploratory nature of our case study and argument, its account of the rise of repertoires intended to manage green structural change should prove beneficial to three current scholarly debates.

First, we believe our case study may contribute to debates about the evolution of the European regulatory state in the context of accelerating climate change. Building on a view of the regulatory state as "one morph of the polymorphic capitalist state" (Levi-Faur 2013), our article has shown the sustained growth of vertical policies in the climate arena *next to*—if not to sustain—a horizontal regulatory policy regime.

Second, we hope that our article contributes to the political economy of green transitions by showing that the governance challenges of climate change go beyond the (already massive) problems of getting prices right (Christophers 2022). Much of the debate about climate change-related reallocation is based on a vision of the carbon economy as being locked in place by an unfavorable set of relative prices. This is true for approaches arguing for the pricing of carbon emissions (Carbon Pricing Leadership Coalition 2019), for approaches arguing for industrial and technology policies shifting the relative prices of energy technologies (Meckling et al. 2017), and for approaches viewing the problem of transition as primarily a (public or private) investment problem (Blyth and Driscoll 2024; Gabor and Braun 2023). We hope that our case study has provided clues that green transitions involve targeted "transition work" in affected regions and sectors that goes beyond the administrative manipulation of economic incentives. Decarbonization practically means the unwinding of densely institutionalized socio-economic structures (Beckfield and Evrard 2023; Council of Economic Advisers 2024, Chapter 6). In Polanyian terms, it involves socio-economic change in complex societies.

Third, we hope that our article contributes to bringing industrial decline back into the study of (green) industrial policy. Reflecting the policy priorities of the 1990s and 2000s (Piore 2019), much of the recent (green) industrial policy scholarship has focused on how governments aim to support sunrise industries and breakthrough technologies. Recent research on the political viability of climate policy points to the crucial role of compensatory and decommissioning policies for affected sectors, regions, and communities (Edenhofer and Genovese 2024; Schaffer 2024). While we do not want to belittle the many fields in which the green state appears as

a regulatory, investment, derisking, or neo-developmental state, a major concern of climate change adaptation and prevention today is the question of how to scale down and remodel economic structures that are deemed outmoded. Research on Just Transitions mentioned in section 2 of this article has provided evidence that dealing with losers is gaining increasing importance in contemporary climate policy. The major focus of this line of research has been on compensatory and welfare state logics. While having crucial compensatory logics, the policies we found to be emerging in the European Union went beyond side payments. In line with the old literature on structural change, particularly in Japan (Dore 1986; Uriu 1996), our analysis found emerging state planning and state management of regional, sectoral, and workforce restructuring. The working out of the commonalities and differences of today's climate policy-inflicted structural changes to the 1980s' crises of Fordist production, as well as potential international varieties, must be reserved for future analyses, however.

To conclude, we want to highlight two major loose ends of our article that may fruitfully be at the basis of future research.

First, our single case study approach to the problem of managing decline begs the question in how far we have been documenting a distinctly European approach to managing decline in green transitions. This is certainly true for some of the oddities of how the EU devised decommissioning policies—such as the "projectivization" of transfer policies and the quasi-fiscal reuse of emissions trading proceeds. Beyond such institutional idiosyncrasies, we want to highlight that an earlier literature on structural change in industry highlighted a certain European predilection for compensatory logics in industrial policy (Katzenstein 1985). Embedding the European approach to green transitions in a systematic comparative analysis would allow for a more systematic account of the political economic determinants of the rise of decommissioning repertoires in the bloc. We hope that our approach to state-building in the climate policy field—emphasizing the layering and perforation of different state approaches—constitutes a promising starting point for such analyses.

Second, our article focused on how a repertoire of policies emerged at the level of a central administrative structure. This should in no way be interpreted as a more general take on where climate policy and green transitions are made in practice. Transition pathways are routinely shaped through decentralized experimentation and interactions between transnational fields, central state intervention, and local practice (Sabel and Victor 2022). Embedding our perspective on decommissioning into a more holistic analytical framework of climate policy would be a straightforward and promising extension. Volintiru and Nicola's (2024) path-breaking study on how European policies interfered with the multilevel Romanian political economy of transitioning the Jiu Valley represents a case in point. In the context of uniquely weak European statehood, we would particularly point to inequalities of member state and regional administrative capacities to become potential sources of growing interregional inequalities in the context of the growing importance of European project-based funding (Ducastel et al. 2024). We hope that our perspective on institutional change as layered improvisation in the face of socio-economic inertia would help to anchor multilevel inquiries of unwinding dynamics across types of green transitions.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

Endnotes

[1] The initiative defines these regions as follows: 'coal, lignite, peat, and oil shale regions, defined as NUTS-2 regions, with over 100 jobs in coal, peat or oil shale extraction in 2018'.

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