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Carbon Pricing Under Pressure: Withering Markets?

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Editorial

Carbon Pricing Under Pressure: Withering Markets?

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Abstract
Emissions trading systems (ETSs) are operating and developing in many regions and countries. Doubts have been raised about their effectiveness, but the global picture has many nuances, as the contributions to this thematic issue on carbon markets show. In this editorial, we briefly review some of the achievements and limitations of key ETSs, and provide an overview of the assembled articles. The cases examined in this issue include carbon markets rules under the Paris Agreement, the reform of the EU ETS and the proposed expansion of its sectoral coverage to shipping, and emissions trading initiatives in China, the USA, and New Zealand. The evidence indicates that, despite uncertainties related to future developments, carbon markets are continuing to evolve and expand around the world.

Keywords
carbon markets; carbon pricing; climate policy; emissions trading; Paris Agreement; policy design; policy diffusion

Issue
This editorial is part of the issue "Carbon Pricing Under Pressure: Withering Markets?" edited by Jørgen Wettestad (Fridtjof Nansen Institute) and Lars H. Gulbrandsen (Fridtjof Nansen Institute).

1. Introduction

As of 2008 the EU Emissions Trading System (EU ETS) was by far the biggest cap-and-trade carbon market in the world. Then, in late 2008, the financial crisis hit the EU. In the following years, that led to lowered industrial production and economic activities—and indirectly to reduced demand for allowances and a much lower carbon price development than anticipated. However, after some difficult years with an accumulating surplus of allowances and a low carbon price, the EU ETS managed to deal with the crisis. Important reforms were adopted in 2015 and 2018 (see Jordan & Moore, 2020; Wettestad & Jevnaker, 2016, 2019). Moreover, emissions trading had been spreading around the world, with carbon markets established in the Pacific (e.g., New Zealand), Asia (e.g., South Korea), and the USA (e.g., California). Importantly, China began piloting carbon markets from 2013 onwards, to be followed by a full-fledged carbon market (International Carbon Action Partnership, 2021; Wettestad & Gulbrandsen, 2018; World Bank, 2021).

However, several recently published analyses have raised doubts about the effectiveness of carbon pricing, particularly as regards emissions trading as an instrument to induce the low-carbon transition (see Cullenward & Victor, 2020; Green, 2020; Stokes & Mildenberger, 2020). When the Covid-19 pandemic struck in the winter of 2020, that crisis was expected to complicate the position for carbon markets further, possibly leading to "withering markets." However, evidence reported in this thematic issue indicates that the development of carbon markets has taken a different course. Interestingly, according to analysts Refinitiv, the world's carbon markets grew by more than 2.5 times in 2021 to reach a turnover of 760 billion dollars compared to 288 billion in 2020, mainly due to significantly higher prices ("Global carbon market value soars," 2022). The characteristics of the Covid crisis are one key explanatory factor here. In contrast to the financial crisis, which affected economic activities and production levels directly, the Covid pandemic has been a health crisis, influencing economic activities and emissions only indirectly. There

are also indications that increasing public and political concern about a different crisis—accelerating global climate change—has served to counteract Covid-induced economic concerns. Here we sum up some important developments around the globe and key findings in the contributions to this thematic issue, starting with the global negotiations on new flexible mechanisms under the Paris Agreement.

2. Article 6 Under the Paris Agreement: Challenges—But Towards Solutions

The article by Ahonen, Kessler, Michaelowa, Espelage, and Hoch explores the evolution of the governance of compliance and voluntary carbon markets, from the Kyoto Protocol to the Paris era (Ahonen et al., 2022). The term "compliance markets" refers to centrally governed and decentralized market mechanisms and forms of cooperation for meeting Kyoto mitigation targets. By "voluntary carbon markets" is meant market mechanisms governed bottom-up and outside the Kyoto Protocol by private institutions and actors. Ahonen and colleagues show how, over time, the distinction between compliance and voluntary markets has become increasingly blurred. They foresee further alignment across baseline-and-credit systems with the international rules for market-based cooperation under Article 6. Further, they discuss several "crunch issues" heavily debated in the Article 6 negotiations—including whether to apply corresponding adjustments to all internationally transferred mitigation outcomes (ITMOs) to avoid double counting, and whether this includes mitigation outcomes used for voluntary offsetting, in addition to those authorized for use towards nationally determined contributions (NDCs) and international mitigation purposes, such as the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). Ahonen and colleagues argue that private actors on the voluntary carbon market should be provided with access to adjusted mitigation outcomes, to enable them to contribute to closing the "ambition gap" by supporting mitigation beyond NDCs.

After failed attempts in 2018 and 2019, the Article 6 rules were finally agreed at COP26 in Glasgow in November 2021. These final rules include the necessary conditions for success highlighted by Ahonen and colleagues, including strong provisions for environmental integrity and robust accounting that can be applied to voluntary carbon markets as well. The price to be paid for such robust rules involved permitting a generous transfer of pre-2021 credits from the Kyoto Protocol for potential use towards the Paris Agreement's first NDCs.

3. A Further Ratcheting Up of EU Emissions Trading: Coverage and Mechanisms

The EU ETS has been the frontrunner system globally. After reforms in 2018, the carbon price has risen significantly, hitting nearly 100 euros in early February 2022. However, the Covid-19 pandemic has proven less dramatic for the ETS dynamics than feared, with lowered emissions apparently facilitating increased ambitions rather than hindering ratcheting up. Under the European Green Deal "Fit for 55" package launched by European Commission (hereafter Commission) President Ursula von der Leyen in the autumn of 2019, several further reforms of the ETS have been launched. Two important parts of this process are covered in this thematic issue.

First, as to the coverage of the system, in 2019 the Commission decided to develop a proposal to include emissions from shipping in the EU ETS, as part of the Green Deal initiative. This shipping initiative came only one year after the Commission had heralded the emissions reduction agreement negotiated in the International Maritime Organization (IMO) as a significant step forward—thereby signalling support for the IMO process. In their contribution on the process of including shipping in the EU ETS, Wettestad and Gulbrandsen apply a Multi-Level Reinforcement perspective to explain this apparent policy volte-face which resulted in a Commission Proposal in July 2021, currently moving through the EU institutions (Wettestad & Gulbrandsen, 2022). The Multi-Level Reinforcement perspective notes the "friendly" competition for leadership among central actors at various levels in the EU—particularly the Commission, the European Parliament, and leading member states. We find, first, that the inclusion of shipping is in line with the broadening ambitions of the Commission since the start of the ETS. Second, until 2019, the Parliament carried the regulatory torch. A turning point in the policymaking process came with the inclusion of the shipping issue in von der Leyen's programme for getting accepted by the Parliament and elected as Commission leader in 2019. From then on, the Commission again took the lead. Third, despite the 2018 IMO agreement, the Parliament and Commission deemed further IMO progress in addressing emissions from shipping to be slow, which motivated EU policymakers to act unilaterally.

A second important dimension of ETS reform concerns the ambitiousness and coherence of the system, with the operation of the Market Stability Reserve (MSR)—established in 2015 and in operation since 2019—as a central element. In their contribution, Willner and Perino discuss why the EU's current climate policy mix, consisting of the EU ETS and overlapping policies, is arguably incoherent with respect to emissions abatement and cost-effectiveness (Willner & Perino, 2022). The concept of policy coherence guides their analysis in identifying the EU ETS' current dynamic supply-adjustment mechanism, the MSR, as a central factor in the shortcomings of current market design. They argue that incoherence emerges because of the MSR's quantity-based indicator for scarcity. It works well for current and past demand fluctuations, but not for anticipated changes in demand, like those caused by a member state's fossil-fuel phase-out. As a result,

instead of fostering synergies as intended, the MSR acts to undermine coherence by creating backfiring interactions and making precise predictions of overlapping policies' impacts nearly impossible. Noting the Commission's reform proposal of July 2021, they argue that a change in the MSR's parametrization leaves the fundamental cause of incoherence unaddressed. Based on recent findings in the economics literature, they propose the introduction of a price-based indicator for scarcity, as a way of substantially reducing the current incoherence of the policy mix.

4. The National Emissions Trading System in China: Much Shaped by Internal Learning

China is the biggest greenhouse gas emitter in the world: Thus, the development of carbon pricing there is of special interest and potential importance. Heggelund, Stensdal and Maosheng discuss experiences and lessons learned during the development of China's national ETS (Heggelund et al., 2022). When the ETS was launched in late 2017, it was decided to start with the power sector, the largest-emitting sector, and initially cover coal- and gas-fired power plants. The ETS started operation in July 2021 and began with online trading of emissions permits. The past decade has been used for preparing and testing for the ETS, including operating seven pilot markets. However, concerns have been expressed this is taking longer than expected.

The contribution by Heggelund and colleagues offers theory-oriented and empirical contributions to domestic-level learning, and enquires into what happens after a policy has been launched. Their analysis is based on diffusion theory, and identifies internal learning as a key mechanism. The authors argue that having a slow and well-prepared start contributes to the potential success of the carbon market. They also hold that the preparatory period has enabled China to address foreseen and unforeseen obstacles, thereby providing a strong basis for the success of the ETS, on its own and as part of the national mitigation policy mix. As internal learning has been crucial to the development of China's ETS, it is important to let this learning process continue as the national ETS enters operation. Their article also discusses the possibility of linking China's carbon market with other markets. Such linkages, still only at the discussion stage, should draw lessons from China's ETS' experience, they argue, and emphasize learning.

5. The USA: Federal Stalemate; Complicated Local Progress

Narassimhan, Koester and Gallagher examine the politics of carbon pricing at the subnational and federal level in the USA from the perspective of policy entrepreneurship and interest-group politics (Narassimhan et al., 2022). The politics of carbon pricing in the USA involves numerous interest groups, and greater public climate-scepticism than in many other parts of the world. The multiplicity of US interest groups and veto actors, combined with the lack of effective policy entrepreneurship, all make a federal carbon pricing policy unlikely. Subnational activities show some continued promise regarding carbon pricing, however. The Regional Greenhouse Gas Initiative (RGGI) is now covering 11 states, and is exploring a cap-and-trade system for the transport sector. California has managed to expand its emissions coverage, increase the percentage of auctioning of allowances, and link with the cap-and-trade system in Quebec, Canada.

On the other hand, the subnational trading regimes have struggled to increase their policy stringency due to political opposition, which has resulted in relatively low carbon prices and, in turn, relatively weak price incentives to reduce emissions. Those weaknesses have led to growing disenchantment with carbon pricing among environmental advocates, even while private sector actors increasingly embrace carbon pricing as a policy measure—perhaps disingenuously supporting carbon pricing policies because firms know that they are politically unlikely to be implemented. US trade unions have remained ambivalent about carbon pricing, but have embraced the idea of a just transition in the context of a Green New Deal. Narassimhan and colleagues conclude that carbon pricing will probably continue as one among several important policy tools in the USA, with fiscal and regulatory policy tools more likely to prevail at the federal level.

6. New Zealand: The Zero Carbon Act Anchoring Emissions Trading System Ratcheting Up

In their contribution, Inderberg and Bailey employ a novel framework to examine how anchoring policies are used to define and embed the premises for subordinated policies in New Zealand (Inderberg & Bailey, 2022). This framework is applied to analyse debates on reforms to the New Zealand ETS, originally introduced in 2008, following the introduction of the national Climate Change Act, the Zero Carbon Act, in 2019. Inderberg and Bailey find that the Zero Carbon Act has placed alignment pressure on several key features of the New Zealand ETS, including emission caps, price controls, and rules for international units. More generally, the Act has contributed to a political shift from a cost-effectiveness logic to the pursuit of net-zero emissions as a normative and practical political goal. These findings provide general empirical support for the anchoring perspective. However, the authors note that the government has employed several strategies in negotiating tensions between anchoring and subordinate policies, in particular to protect the integrity of the Zero Carbon Act and secure political and stakeholder support for changes to the New Zealand ETS. More broadly, their anchoring perspective offers a fresh approach to examining the distinctive changes in climate policy and politics created by climate change acts in many jurisdictions.

7. Conclusions

Although doubts have been raised about the effectiveness of emissions trading, the global picture has many nuances. On the one hand, as part of an ambitious new Green Deal initiative, the EU ETS is in the midst of ambitious new reform processes that include expanding sectoral coverage to shipping and other transport activities. Record-high allowance prices can also be noted. Regarding the global Paris Agreement, complicated and long negotiation processes on new carbon market rules have been concluded. China, the largest greenhouse gas emitter globally, has launched a nationwide ETS, benefitting from experiences gained from several local pilots. In the USA, state-level systems have increased their membership and emissions coverage.

On the other hand, in the EU ETS the record-high prices have contributed to political turbulence, particularly in Eastern Europe, as have efforts to increase coverage by establishing a new ETS for transport and buildings (Abnett, 2021). Moreover, it is unclear what ETS reform proposals will mean for dealing with the fundamental challenge of achieving a coherent EU climate and energy policy. With regard to the global climate regime, the practical implications and importance of the Article 6 agreements are not clear. Furthermore, the launch of China's ETS has been delayed several times, and its practical impact on businesses and emissions cannot yet be assessed. In the USA, the federal stalemate over carbon pricing continues.

Hence, there is ample room for exciting new research in the years ahead. We hope that this thematic issue will contribute to serious discussion of the merits of carbon pricing, highlighting the weaknesses as well as acknowledging the successes. It is essential to keep in mind that the designs of carbon pricing schemes are always shaped by political and economic interests: They can never be more effective than politicians, economic interests, and electorates or specific groups of voters and veto players allow them to be.

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Conflict of Interests

The authors declare no conflict of interests.

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Article

Governance of Fragmented Compliance and Voluntary Carbon Markets Under the Paris Agreement

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Abstract
Over the past two decades, the emergence of multiple carbon market segments has led to fragmentation of governance of international carbon markets. International baseline-and-credit systems for greenhouse gas mitigation have been repeatedly expected to wither away, but show significant resilience. Still, Parties to the Paris Agreement have struggled to finalize rules for market-based cooperation under Article 6, which were only finalized at COP26 in 2021. Generally, there is tension between international top-down and bottom-up governance. The former was pioneered through the Clean Development Mechanism under the Kyoto Protocol and is utilized for the Article 6.4 mechanism, while the latter was used for the first track of Joint Implementation and will be applied for Article 6.2. Voluntary carbon markets governed bottom-up and outside the Kyoto Protocol by private institutions have recently gained importance by offering complementary project types and methodological approaches. The clear intention of some Parties to use market-based cooperation in order to reach their nationally determined contributions to the Paris Agreement has led to an ongoing process of navigating the alignment of these fragmented carbon market instruments with the implementation of nationally determined contributions and the Paris Agreement's governance architecture. We discuss emerging features of international carbon market governance in the public and private domain, including political and technical issues. Fragmented governance is characterized by different degrees of transparency, centralization, and scales. We assess the crunch issues in the Article 6 negotiations through the lens of these governance features and their effectiveness, focusing on governance principles and their operationalization to ensure environmental integrity and avoid double counting.

Keywords
Article 6; baseline-and-credit system; Clean Development Mechanism; double counting; environmental integrity; fragmentation; governance; Paris Agreement; voluntary carbon markets

Issue
This article is part of the issue "Carbon Pricing Under Pressure: Withering Markets?" edited by Jørgen Wettestad (Fridtjof Nansen Institute) and Lars H. Gulbrandsen (Fridtjof Nansen Institute).

1. Introduction

International markets for greenhouse gas (GHG) mitigation credits (hereafter referred to as "credits") have seen a tumultuous history over the past two decades (Michaelowa, Shishlov, et al., 2019). The first "baseline-and-credit" systems for generating carbon credits emerged in the 1990s and have since played a significant role on multiple levels of climate policy. While in the mid-2000s there was a "gold rush" to develop activities and generate credits under the Clean Development Mechanism (CDM) of the Kyoto Protocol (KP), in other periods, like the early 2010s, many observers speculated that the demise of the international carbon markets was imminent. As the title of this thematic issue "Withering Markets?" shows, this view persists in the early 2020s. However, the reality on the ground has many facets. Despite uncertainties relating to the anticipated

wind-down of the CDM and lack of agreement on the rules for market-based cooperation under Article 6 of the Paris Agreement (PA), there is a flurry of early Article 6 pilots (Greiner et al., 2020). Moreover, record-high volumes of credits are being transacted on the voluntary carbon markets (VCM; Trove Research, 2021). These differing fortunes of various strands of international carbon markets result from a process of fragmentation that accelerated after the failure to agree on a new global climate policy regime at the Copenhagen climate conference in late 2009 (Bernstein et al., 2010; Lövbrand & Stripple, 2012). This article seeks to answer the question of whether fragmentation and institutional complexity will eventually result in the withering of all or some international carbon market segments, or whether the paradigm shift through the PA and new approaches to governance will lead to a flourishing of reconfigured carbon market instruments.

We will first conceptually discuss different features and dimensions of global carbon markets governance before assessing how governance of international carbon markets has developed over time. The subsequent section focuses on the paradigm shift from the KP to the PA. The PA's bottom-up nature creates specific challenges for governance of international carbon markets that are illustrated by the "crunch issues" that were heavily debated in the Article 6 negotiations prior to agreement at COP26. We conclude with our view on which components of international carbon markets are likely to wither away due to governance challenges, and which ones are likely to thrive.

2. Governance Dimensions for Baseline-and-Credit Carbon Market Instruments

Carbon markets are trading a non-tangible commodity, GHG mitigation, to achieve a public good. Usually, public goods require regulation to be mobilized. While VCM are not directly built on regulation, they can only emerge in a situation where there is public pressure for provision of the public good, and buyers of credits on the voluntary market expect a reduced pressure on themselves if they can prove to be "good citizens" or act on their "corporate social responsibility" (Bernstein et al., 2010; Kreibich & Hermwille, 2020).

Demand for carbon credits from a certain crediting standard depends on the legitimacy of the governing institution that issues the credit (Bernstein, 2011). The level of legitimacy and trust is inextricably linked to the governance features of the carbon market, which include rules to ensure environmental integrity of the credits, a procedure for development of methodologies for setting baselines and monitoring, reporting, and verification of activity emissions (ideally involving independent auditors), a process for registration of activities and issuance of credits, and an infrastructure, often called registry, to list issued credits, as well as provisions for publication of relevant documents on activities and their performance (see Mehling, 2019). A key function of all fully-fledged baseline-and-credit systems is to ensure the environmental integrity of credits, resulting in common principles, criteria, and procedures across all systems (Kollmuss et al., 2008; Michaelowa, Greiner, et al., 2019). What differs across systems and over time are the details relating to (activity and geographic) scope, governance, and operationalization of criteria (Michaelowa, Greiner, et al., 2019).

Based on the concept of a "governance architecture" where multiple organizations, regimes, and norms regulate action (see Biermann & Kim, 2020), we understand governance of carbon markets to encompass the institutional features to oversee a carbon market (e.g., institutional design principles and their material expressions, such as methodologies to determine credits) and agency by different actor types, including in decision-making processes. Governance can be exerted by public or private entities, as well as hybrid variations (see Green, 2013, 2016; Mehling, 2019) and can change over time. Generally, we expect a preponderance of public governance when the climate change problem is taken seriously by governments and citizens; these governments have stringent regulatory control and can implement far-reaching policy instruments. In contrast, in a situation where governments are politically unable to introduce carbon pricing due to resistance of stakeholders (e.g., there is important fossil fuel-related economic activity in the country), the role of private governance will be larger (see Levi et al., 2020, for a discussion). We note that idiosyncrasies of political leaders may influence government positioning, as seen in the cases of Trump and Bolsonaro.

In a situation of expansion of public governance due to increased efforts in climate policy when the political salience of GHG mitigation is high, as has been the case after the emergence of the "Fridays for Future" movement in 2018, private governance systems may be "taken over" or integrated into public systems. For example, in the early 2000s, the governance system created by the World Bank's Prototype Carbon Fund was replaced by the regulation under the CDM and Joint Implementation (JI), due to the KP's entry into force (Michaelowa et al., 2021). A "governance expansion" from the public domain into private-led carbon markets may also happen in the context of the VCM, where Article 6.2 rules could determine key requirements regarding "corresponding adjustments" (CAs) of national emissions balances for credit transactions. Expansion of public governance is likely to lead to the centralization of oversight on international carbon market transactions and greater alignment across approaches, at least with regard to accounting for transfers.

When governments see climate policy as less relevant, as in the period after 2009, when the future of the international climate policy regime was uncertain and public pressure largely absent, there may not be a direct abolition of public governance systems, but they may fall

into disuse, and private systems may emerge. The case of the Gold Standard is illustrative—it first emerged to resolve the CDM's inability to mandate minimum sustainable development requirements due to host countries' unwillingness to give up their sovereignty (see Philips et al., 2013). When the CDM market crashed, the Gold Standard metamorphosed into one of the key private governance systems on the international VCM (Green, 2016; Hickmann, 2017; Michaelowa et al., 2018; Streck, 2021a). As private systems have the tendency to evolve through competition and diversification, in a period of increased relevance of private systems, fragmentation is likely to increase. It should be noted that there are now attempts to achieve meta-governance of the international VCM e.g., through the Taskforce on Scaling Voluntary Carbon Markets (2021).

Governance can be exerted on different levels of jurisdictions, ranging from international to sub-national (Bulkeley et al., 2012). There can also be a "cascade of governance," with principles or guardrails being defined at a high level, while lower-level entities provide specific interpretations or oversight on the operationalization of these principles. For example, under the CDM, each participating country had leeway in defining criteria and indicators for approval of projects and programs. In international carbon markets, there has been a clear trend towards increasingly fragmented governance, as the CDM became less relevant while bilateral alternative mechanisms (e.g., the Japanese Joint Crediting Mechanism [JCM]) and VCM instruments became more relevant. This tendency was reinforced by the shift from the top-down KP system to the bottom-up PA system. The delay in agreeing on multilateral rules for PA-backed carbon markets has further accelerated the fragmentation of the markets, as bilateral cooperation has proliferated in the temporary absence of a new United Nations Framework Convention on Climate Change (UNFCCC) mechanism (Greiner et al., 2020).

A critical aspect of the legitimacy of carbon market governance is the transparency of decision-making (Gupta & Mason, 2016), including the possibility for stakeholders to interact with the institution overseeing the system. Stakeholder consultations and grievance mechanisms are crucial to prevent negative impacts on sustainable development and environmental integrity.

3. Evolution of International Baseline-and-Credit Systems Until 2020

3.1. The Kyoto Era

The KP established both centrally governed and decentralized market mechanisms and forms of cooperation to promote the flexibility and cost-effectiveness of compliance with Kyoto mitigation targets. These governance options accommodate differences in host countries' capacities to ensure environmental integrity and robust accounting. JI and the CDM are baseline-and-credit systems with rules governing the generation of units, while International Emissions Trading (IET) enables trading of all types of Kyoto units in line with rules governing the transfers.

JI credits mitigation in host countries with Kyoto targets and associated GHG accounting requirements. JI provided two governance tracks: Track 1 was governed by host countries that met full eligibility criteria and Track 2 by the multilateral JI Supervisory Committee. Whereas under Track 1 most of the governance was delegated from the global to the national level (cascade of governance), under Track 2 most of the governance was retained at the multilateral level. Under both tracks, host countries issued JI units by converting their Assigned Amount Units, thereby avoiding double counting of the same mitigation outcomes towards both the host and buyer country's Kyoto targets. Multilateral criteria to safeguard environmental integrity applied to both tracks, which were operationalized by host countries and the JI Supervisory Committee, respectively. As an early policy-based alternative to the project-based JI, Green Investment Schemes (GIS) earmarked revenue from the sale of the excess Assigned Amount Units (so-called "hot air") to specific mitigation policies (Tuerk et al., 2013). GIS represented an additional level of bilaterally-agreed governance for Kyoto units traded under IET in the context of the KP. Due to its voluntary nature, there was no international oversight or transparency requirements for GIS. The lack of transparency and international oversight have undermined trust in the environmental integrity of Kyoto units transferred under GIS and JI Track 1 (see Kollmuss et al., 2015).

Host countries with stringent mitigation targets had the incentive to ensure environmental integrity of transferred units, while economies in transition with lenient targets did not. In addition, host countries also need capacity to overcome challenges related to asymmetric information (Schmitz & Michaelowa, 2005). Applying Track 2 for activities in countries with lenient targets promoted confidence in the environmental integrity of project-based credits. The draft revised JI guidelines (United Nations Framework Convention on Climate Change [UNFCCC], 2016; which were never adopted due to the effective discontinuation of JI after 2012) proposed a single-track JI with some degree of centralized governance for all JI activities, including international minimum criteria and oversight for environmental integrity, transparency, and accountability of decision-making.

The CDM credits mitigation outcomes in developing countries without Kyoto targets, and operates under the authority of the Conference of the Parties, serving as Meeting of the Parties to the Kyoto Protocol, while being supervised by the CDM Executive Board. Due to its prompt start, CDM—building on the Prototype Carbon Fund—pioneered the development of international baseline-and-credit systems through an iterative process, starting with bottom-up development of project-specific

methodologies by project developers, which were approved and sometimes consolidated by the CDM Executive Board. In addition, the CDM Executive Board and its support structure (see Streck, 2007) developed (especially small-scale) methodologies and standardized methodological tools top-down. The CDM was among the international institutions to levy a tax on credit issuances (share of proceeds), resulting in a strongly resourced Secretariat which assumed an influential role in CDM governance and decision-making, and was even perceived as using the CDM Executive Board as a mere rubber stamp (Michaelowa & Michaelowa, 2017). The Clean Development Mechanism Policy Dialogue (2012) identified shortcomings in accountability and transparency of CDM decision-making and recommended formalizing the Secretariat's role in decision-making and setting up a robust accountability system. Regarding transparency of CDM activities, Cames et al. (2016) found a marked increase after 2007, which has facilitated external scrutiny. An important role in CDM governance was played by the national approval authorities. While there were many that essentially rubber-stamped all applications, others did thorough checks (see Friberg, 2008; Fuhr & Lederer, 2010). It has been suggested that, rather than indicating CDM's failure, extensive scrutiny and criticism of CDM by global stakeholders has successfully driven CDM's steady—but often overlooked—institutional evolution (Ahonen & Raab, 2014).

In parallel with the KP's compliance carbon markets, private baseline-and-credit systems emerged to cater to the VCM (Green, 2013, 2016). Such private systems are self-governed and transnational in reach, which will most likely contribute to fragmentation of governance. In the KP era, they focused on host countries that did not have mitigation targets, namely the US and developing countries, thereby avoiding double counting between voluntary purposes and host country targets. Private systems have focused on activity types not covered extensively by the CDM, such as nature-based removals.

National and sub-national governments have also developed baseline-and-credit systems, primarily for domestic compliance purposes (e.g., Australia, California, South Korea) but also for domestic voluntary purposes (e.g., Costa Rica, Peru, and Thailand), as well as for bilateral cooperation (Japan's bilateral JCM; see Jung & Sohn, 2016; and Michaelowa, Shishlov, et al., 2019). JCM governance is special inasmuch as it builds on bilateral joint committees with an equal number of members from Japan and the partner countries. All decisions on methodologies to calculate emission credits as well as issuance of credits are taken by these committees. Although governed at the national level, a "cascade of governance" can be observed as national systems are often based on international principles and guardrails and developed based on policy diffusion and mutual learning (see Wettestad et al., 2018). If used for compliance purposes with national mitigation targets though, more centralized forms of governance will play an essential role.

The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) harnesses existing baseline-and-credit systems to source carbon credits that meet CORSIA's eligibility criteria (see Broekhoff et al., 2020). Governance under CORSIA is international, takes place at sector-level and outside the PA, and delegates key functions to selected mechanisms (i.e., oversight on activities implemented and issuance of credits) while retaining the power to decide on eligible standards and credit types.

3.2. Interactions Between Baseline-and-Credit Systems

Many baseline-and-credit systems build on experiences gained under the CDM. For example, JI, operationalized later than CDM, allowed the use of applicable approved CDM methodologies alongside JI-specific approaches (Ahonen et al., 2021). The main private systems, namely the Verified Carbon Standard and Gold Standard, also allow the use of CDM methodologies. Therefore, there are various interactions between compliance and voluntary baseline-and-credit systems, stemming from common features, which in turn drive cross-pollination, governance expansion, and the blurring of boundaries.

Although originally designed to cater solely to voluntary offsetting, private systems have also been approved for compliance use under various carbon pricing systems, such as the Californian cap-and-trade scheme and South African and Colombian carbon taxes (Michaelowa, Shishlov, et al., 2019). Similarly, the CDM, which was originally designed for compliance use towards Kyoto targets, has also been used for voluntary offsetting and delivery of climate finance. Allowances issued under the EU and New Zealand emission trading schemes or credits from the Australian Emission Reduction Fund have also been used for voluntary offsetting (Laine et al., 2021). In addition, some countries, such as Costa Rica, Peru, and Thailand, have developed domestic schemes specifically to mobilize voluntary non-state support for domestic climate action (Partnership for Market Readiness, 2020).

4. International Carbon Markets Facing a Paradigm Shift

4.1. The Paris Era

The PA represents a paradigm shift from the KP in at least two important ways: It introduces the long-term goal of net zero emissions around mid-century and requires all countries to develop and implement mitigation targets (Nationally Determined Contributions [NDCs]) to collectively reach this goal. In addition, there is a growing number of net-zero—even net negative—emission targets by state and non-state actors, increasingly embedded in national legislation and corporate strategies. These collective global goals mark the end of the division of countries into those with and without targets and blur the distinction between voluntary and compliance-driven,

as well as state and non-state mitigation action. In the Paris era, all mitigation outcomes will, generally, count towards host country NDC targets, unless excluded from national accounting due to specific provisions (or inventory granularity that, for example, does not capture specific types of emissions and removals).

The Paris regime is based on the "ambition cycle," whereby more ambitious NDCs must be communicated every five years. With increasing NDC ambition and scope, public governance will increase for efforts for which carbon markets constitute important drivers for finance mobilization and cost containment, leaving less room for additional VCM activities (Kreibich & Hermwille, 2020). At a global level, Article 6 is intended to achieve more, earlier, or faster mitigation. Articles 6.2–6.3 govern international transfers of mitigation outcomes, resembling IET and GIS in terms of functions relating to bilateral decision-making, while Article 6.4 establishes an international, centrally governed baseline-and-credit mechanism (hereafter Article 6.4 Mechanism [A6.4M]), which resembles the CDM in terms of international governance functions and JI in terms of the need to avoid double counting with host country targets.

High-level criteria for Article 6.2 are set at the PA level, while much of their operationalization are delegated to participating countries. Article 6.2 requires that countries, when engaging in international transfers of mitigation outcomes, promote sustainable development, ensure environmental integrity and transparency (also in governance), and apply robust accounting. They must report on how they are fulfilling the requirements. To avoid double counting, the host country needs to "subtract" any internationally transferred mitigation outcomes (ITMOs) from its national emissions balance to allow the buyer to count the ITMOs for its own purpose. In PA jargon, such "uncounting" is referred to as CAs (Michaelowa et al., 2020).

4.2. Interlinkages Between the Paris Agreement, the Carbon Offsetting and Reduction Scheme for International Aviation, and Private Baseline-and-Credit Systems

To track global progress towards the PA's collective long-term goal, the provisions for market-based cooperation under Article 6 would need to be applied to all transfers of mitigation outcomes that are used towards this goal, regardless of the system in which the mitigation is used. By authorizing ITMO transfers for "other purposes," including for CORSIA and VCM use, countries can link CORSIA and private baseline-and-credit systems catering to the VCM with the PA's requirement (Fearnehough et al., 2020). This is likely to drive mutual governance expansions and further alignment across baseline-and-credit systems. For example, CORSIA's eligibility criteria for post-2021 vintages of credits are expected to be aligned with Article 6 criteria for ITMOs and require CAs, as per the Article 6.2 guidance. Private systems for the VCM are preparing to cater to CORSIA demand by "labelling" credits as CORSIA-eligible. CORSIA-eligible credits would also cater to voluntary buyers that choose to use them for carbon neutrality or net zero claims. While there is emergence of some credit providers, especially in the context of removal technologies, in the VCM that try to sell credits without adhering to an established standard, we expect that sooner than later these approaches will vanish, given the challenge to upscale demand for such credits, as happened with similar attempts in the 2000s (see Green, 2016). Finally, private systems may also cater to the Article 6 compliance market. If CORSIA aligns fully with Article 6.2 requirements, a single label could serve both market segments. Otherwise, the compliance market would become fragmented and separate labels would be needed for different compliance purposes. Some Article 6 actors perceive the not-yet-operational A6.4M as the best practice standard for crediting and strive for A6.4M eligibility. This extends the governance expansion from A6.4M to the private systems. This is similar to national Track 1 JI governance systems that built heavily on Track 2 JI that, in turn, drew heavily on CDM that, in turn, significantly influenced the main private systems. These examples demonstrate how the governance expansion blurs the distinctions between centralized, de-centralized, and self-governed, as well as between voluntary and compliance baseline-and-credit systems. This alignment process is dynamic, as rules are regularly revised to reflect lessons and changes in the context.

5. Linking Negotiation Crunch Issues to the Governance Dimensions

The paradigm shift from the KP to the PA and its governance dimensions are reflected in the "crunch issues" of negotiations on Article 6 rules, which prevented agreement at COP24 in Katowice in 2018 and persisted at COP25 in Madrid in 2019, only to be resolved at COP26 in 2021.

5.1. Applying Corresponding Adjustments

The avoidance of double counting through the application of CAs to the emissions balance of NDCs is key to Article 6.2. CAs are applied to "first transferred" ITMOs authorized by a participating Party for use towards an NDC or for "other international mitigation purposes," the latter covering both international mitigation purposes other than NDC achievement and other purposes determined by the host Party (UNFCCC, 2019a). The authorization of and accounting for ITMO transfers falls under the governance responsibility of the host country.

The host country thus holds an oversight role on ITMO accounting in the PA systems. One of the crunch issues was whether this oversight role also applies to mitigation outcomes not covered by a country's NDC (Michaelowa et al., 2020; Schneider et al., 2019).

The rationale for the application of CAs is that the broadening of the NDC's scope is not disincentivized, and international oversight on the quality of credits would mitigate risks to environmental integrity (Müller & Michaelowa, 2019; Schneider et al., 2020).

Another crunch issue was the application of CAs to mitigation outcomes authorized for the VCM. Non-authorized Article 6.4 emission reductions do not become ITMOs and do not require a CA. Through the authorization process, countries can apply national and international Article 6 provisions and oversight also to VCM activities and, by extension, to private baseline-and-credit systems. Article 6.2 guidance applies also to credits issued under A6.4M, when they are "internationally transferred" (UNFCCC, 2019a). While there is broad consensus around the introduction of labels in the VCM to identify credits with CAs (Gold Standard, 2021; Verra, 2021), the need to apply CAs to post-2020 mitigation outcomes used for voluntary offsetting claims is still being debated by VCM stakeholders, including private baseline-and-credit system regulators and international initiatives, such as the Taskforce on Scaling Voluntary Carbon Markets, the Voluntary Carbon Market Integrity Initiative, the Voluntary Carbon Markets Global Dialogue and the Nordic Dialogue on Voluntary Compensation. This debate is linked to a broader discussion on the potential role of the VCM in mobilizing non-state financing for mitigation to achieve NDCs, as well as mitigation action that goes beyond current NDC levels, thereby helping to bridge the significant "ambition gap" between current NDCs and the 1.5 degree C pathway (United Nations Environment Programme, 2020).

Formalizing the links between the PA's compliance framework and voluntary market-based action can enhance transnational climate governance (Streck, 2021b). If the link is not established, the consequent double claiming of mitigation outcomes may enable host countries to mitigate less and still achieve their NDC targets (Espelage et al., 2021; Kreibich & Hermwille, 2020). In contrast, providing VCM actors access to PA's Article 6 framework would enable them to bridge the "ambition gap." Representing a governance expansion, the link's institutionalization will provide clarity and integrate action that has so far been outside the realm of governments' climate governance. The public governance expansion to self-governed modes of governance manifests itself through a "back and forth" interaction between these governance modes. As described above, private standards are considering the introduction of labels for credits. A labelling system regarding use cases proposed by parties for the A6.4M was not retained by COP26.

5.2. Transitioning From the Kyoto Protocol to the Paris Agreement

Negotiations on the A6.4M included discussions on a potential transition of activities, units, methodologies, and infrastructure from the CDM (UNFCCC, 2019b). While the transition will be important for ensuring the trust of project developers, it might undermine trust-building governance features under Article 6, such as ensuring NDC ambition and environmental integrity (Ahonen et al., 2021). Therefore, the key task for the transition is to assess the CDM activities' compatibility with the new regime and allow only Paris-compatible activities and credits that do not undermine PA implementation to transition to A6.4M (Lo Re & Ellis, 2021).

A particularly thorny crunch issue was the potential transition of CDM credits to the A6.4M (Michaelowa et al., 2020). At the core of the discussion was whether units issued for mitigation achieved pre-2021 can be used towards NDCs. The compromise outcome was a 2013 cut-off date for registration, as CORSIA also determined eligibility of Certified Emission Reductions on this basis (International Civil Aviation Organization, 2021). This represents a further situation of policy diffusion from outside the PA to PA systems. The CDM's uncertain future reduced interest in its use for voluntary purposes, demonstrating the vulnerability of multilaterally governed systems to political disagreement, which do not apply to self-governed private systems.

5.3. Share of Proceeds

Under the CDM, a so-called share of proceeds (SOP) was implemented to cover the CDM's administrative expenses and support adaptation in developing countries. The administrative SOP, based on a monetary fee, was successful in mobilizing significant revenue for CDM operations (Michaelowa & Michaelowa, 2017). The adaptation SOP was implemented by withholding a fixed share of credits upon their issuance and selling them in the international market (Fearnehough et al., 2021). The Doha Amendment expanded the levy of adaptation SOP to JI and IET (UNFCCC, 2012). Whether ITMO transfers under Article 6.2 should contribute to adaptation finance was a highly political crunch issue. For the A6.4M, an administrative and adaptation SOP in the form of a mix of monetary fees and credit shares was agreed by COP26. A sustained source of adaptation finance is of main interest to many developing countries. An argument put forward by opponents of SOPs is that due to its subsidiary nature, cooperation under Article 6.2 cannot mobilize the SOP through a centrally governed, separate account to which 2% of issued credits are transferred, as under the CDM. For instance, ITMOs transferred under Article 6.2 may not be "monetizable" on the global carbon market if they just exist in a government-to-government transfer (as under IET). One argument in favor of SOPs for Article 6.2 is that the operations of the A6.4M must not be disadvantaged compared to cooperative approaches and other transactions on carbon markets (including CORSIA and the VCM; Michaelowa, Greiner, et al., 2019). This shows that, despite their different natures, a certain degree of alignment between the two modes of Article 6 cooperation is pursued on

specific governance features. Different rules for applying SOP under 6.2 and the A6.4M as agreed by COP26 do, increase fragmentation.

5.4. Overall Mitigation in Global Emissions

The delivery of Overall Mitigation in Global Emissions (OMGE) under the A6.4M, resulting in net global emission reductions (in contrast to the CDM's "zero-sum game"), was a controversial crunch issue, particularly its application to Article 6.2 (Fearnehough et al., 2021). Some Parties proposed to deliver OMGE via stringent and conservative baselines and consequent under-crediting (compared to the generated mitigation outcomes), with the uncredited mitigation outcomes generally counting towards the host country's NDC. Others called for OMGE to go beyond any NDC and contribute to global mitigation (Michaelowa et al., 2020). Contrary to Article 6.4, Article 6.2 is silent on OMGE and the COP26 decision only "encourages" cooperating Parties to deliver an OMGE. OMGE is effectively an in-kind levy on credits and transfers, and thus opposed by many. In cases where Parties also account for voluntary actions, the question is whether and how this influences the application of OMGE in other baseline-and-credit systems. A related question, though not less contentious, is the level of ambition in baseline methodologies of the A6.4M.

6. Conclusions

The current carbon market landscape comprises multiple market segments, embodying two decades of parallel efforts by various public and private actors. This resulted in fragmentation and complexity and undermined trust in the integrity of carbon markets. This fragmentation was triggered by a loss in faith in Kyoto mechanisms after the failure to establish a robust international climate policy regime in 2009. However, this diversity also contributed to the carbon markets' versatility and resilience to changes in political and economic circumstances, enabling them to evolve to cater to various purposes. To maintain their relevance and integrity in the era of the PA, carbon markets need to continue to align with the global mitigation goals.

The KP established both centrally and de-centrally governed forms of market-based cooperation. In parallel, private, self-governed baseline-and-credit systems emerged to cater for voluntary mitigation action outside the scope of KP targets. Following the rise and fall of credit demand driven by KP compliance, voluntary mitigation action has dominated the landscape in recent years.

The PA regime, too, allows for diversity in market-based cooperation, including both centrally and de-centrally governed baseline-and-credit systems. Efforts to align existing systems and credit use with the PA will promote a certain degree of harmonization across parallel systems in terms of criteria for the generation of credits and accounting for their use. "Governance expansion" and policy diffusion across different baseline-and-credit systems was already evident in the KP era and has accelerated since the adoption of the PA. CORSIA has already aligned certain rules with Article 6 principles and potential rules and has pioneered transitional approaches to CDM activities and credits. The main private systems are preparing to implement labels to distinguish credits that are CORSIA/Article 6-eligible.

Alignment of key criteria and accounting across different baseline-and-credit systems for various use cases facilitates comprehensive tracking of progress towards the global mitigation goal, reflecting both voluntary and compliance-driven support for mitigation outcomes by both state and non-state actors. The PA assigns host countries an unprecedented task of ensuring the environmental integrity and robust accounting of ITMOs authorized for use towards NDC compliance or for other international mitigation purposes and other purposes. We argue that, in order to incentivize global ambition-raising by public and private actors alike, Article 6 accounting rules will need to be applied consistently to ITMOs used towards all these purposes. This was reflected by the adoption of Article 6 rules that enable Article 6 governance to cater also to CORSIA compliance and voluntary offsetting. Further research is needed to explore how to harmonize non-state GHG accounting with national NDC accounting frameworks (Environmental Defense Fund, 2021).

Governance was a cross-cutting dimension in the Article 6 negotiations. Crunch issues related to accounting for use for purposes other than towards NDCs, governance of the CDM transition, the implementation of an SOP under Article 6.2, and the operationalization of OMGE. Regarding the latter two, concerns had been raised that exempting decentrally governed market-based cooperation from such provisions would discourage the use of the centrally governed mechanism and consequently undermine the integrity, equity, and ambition-raising of carbon markets.

In light of the need for a diverse toolbox to support global efforts towards and beyond carbon neutrality, carbon markets are unlikely to wither away any time soon. However, to maintain their relevance in the PA era and contribute to the global mitigation goal in a transparent and credible manner, they will need to align with the PA's goals, principles, and accounting. The public governance expansion will continue if the PA is perceived to be successful in safeguarding integrity. By contrast, if carbon markets are perceived as a race to the bottom, they will lose relevance and ultimately wither away. In this case, carbon market actors may once again resort to self-governing private systems in parallel and fragmented efforts to foster high integrity.

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Conflict of Interests

The authors declare no conflict of interests.

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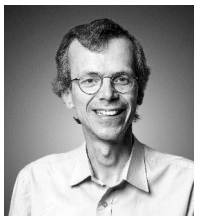

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Article

On the Process of Including Shipping in EU Emissions Trading: Multi-Level Reinforcement Revisited

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Abstract
As part of the EU Green Deal initiative in 2019, the EU Commission decided to develop a proposal to include emissions from shipping in the EU emissions trading system. This occurred only one year after the Commission had heralded the emissions reduction agreement negotiated in the International Maritime Organization (IMO) as a significant step forward—thereby signalling support for the IMO process. We apply a multi-level reinforcement perspective to explain this apparent policy volte-face, resulting in a Commission proposal in July 2021 which is now moving through institutions in the EU. Such a perspective notes the "friendly" competition for leadership among central actors at various levels in the EU—particularly the Commission, the European Parliament, and leading member states. We find, first, that the inclusion of shipping is in line with the broadening ambitions of the Commission since the start of the emissions trading system. Second, until 2019, the Parliament carried the regulatory torch. A turning point in the policymaking process was the inclusion of the shipping issue in Ursula von der Leyen's programme for getting accepted by the Parliament and elected as Commission leader in 2019. From then on, the Commission again took the lead. Third, despite the 2018 IMO agreement, progress there was deemed slow, which further motivated EU policymakers to act unilaterally.

Keywords
emissions trading; ETS; European Union; Green Deal; International Maritime Organization; shipping emissions

Issue
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1. Introduction

The EU emissions trading system (ETS) initially targeted the power sector and energy-intensive industries, although with the declared ambition of covering more sectors and emissions over time. A major broadening of scope came in 2012 when EU-internal aviation was included in the ETS. Next, in 2013 the European Commission (hereafter Commission) issued a shipping strategy that took note of the regulatory progress underway within the International Maritime Organization (IMO), but also stated that more action was needed (European Commission, 2013). Negotiations within the IMO were crowned with success in April 2018, with the adoption of a strategy that included both a target of halving shipping emissions by 2050 (against a 2008 baseline) and a zero-emissions vision. Then EU Commissioner for Energy and Climate Action Miguel Arias Cañete stated: "The agreement reached today at the IMO is a significant step forward in the global efforts to tackle climate change. The shipping sector must contribute its fair share to the goals of the Paris Agreement" (Directorate-General for Climate Action, 2018).

However, no more than a year after the IMO agreement, the Commission announced a new drive to include shipping emissions in the ETS—a drive which seems to have been little affected by the Covid-19 pandemic and the related reduction in transport activities. This process

culminated with a formal proposal to extend the EU ETS to certain shipping emissions by the Commission in July 2021, as part of the "Fit for 55" package of measures. This package is now moving through the EU institutions in a process likely to take several years to complete. How can we best understand this political process and puzzling turnaround by the Commission?

In 2007, Miranda Schreurs and Yves Tiberghien launched the concept of "multi-level reinforcement" to explain EU efforts to exert global climate leadership (Schreurs & Tiberghien, 2007). The essence of this perspective is a competition for leadership among central actors at different levels in the EU—particularly the Commission, the European Parliament (hereafter Parliament), and leading member states in the Council—creating a collective dynamic not achievable by one of these actors working in isolation. Here we revisit and update this perspective to shed light on the process of including shipping in the EU ETS, seen as part of a new effort to exert EU climate leadership. The shipping process reveals the increasingly important role played by the Parliament in the multi-level reinforcement dynamic, and also the importance of giving more weight to interaction with the EU-external environment in this dynamic.

2. Analytical Framework and Method

The essence of the multi-level reinforcement (MLR) perspective, as presented by Schreurs and Tiberghien (2007), is that EU leadership in climate change can be seen as the result of a dynamic process of multi-level competition for leadership and reinforcement among different EU political poles within a context of decentralized governance: the actions and commitments of a group of pioneering states and the leadership roles played by the Parliament and the Commission. This upward cycle of reinforcing leadership within a quasi-federal system is seen as triggered by and dependent upon strong public support and normative commitment. Schreurs and Tiberghien also acknowledge the role of interaction with the EU-external environment—however, without saying much about the dynamics.

Jordan et al. (2012) found the MLR perspective useful but refined it in several ways. Importantly, they placed it in a broader historical context, also noting periods of slow progress and no MLR dynamic functioning—as was often the case before the 2000s. Writing in the aftermath of the failure of the 2009 Copenhagen summit on climate change, and with the effects of the financial crisis putting EU climate policy under pressure, they concluded: "Consequently, one is left wondering whether 'multi-level reinforcement' is likely to persist, or was only a feature of one particularly dynamic but ultimately short-lived era of governing in the EU" (Jordan et al., 2012, p. 61). Jänicke and Quitzow (2017) have noted the relatively strong performance of the EU on emissions reductions, highlighting this as the outcome of mutually reinforcing dynamics at different levels of governance, explicitly linking back to Schreurs and Tiberghien.

As to the role of the central, individual MLR actors and institutions in shaping EU climate-policy leadership, recent studies have emphasized the role of the Commission in exerting various types of leadership, including a "green" response to the Covid-19 pandemic (see Dupont et al., 2020; Skjærseth, 2017). Others have highlighted the role of pioneering leader states and the dynamics in the Council (Wurzel et al., 2019). Also, the continuing "green force" role of the Parliament has been noted but with significant emphasis on internal divisions and challenges such as the influx of right-wing representatives in the 2014 election (see Burns, 2012, 2019; Buzogany & Cetkovic, 2021; Wendler, 2019; Wettestad & Jevnaker, 2016). In this article, we use the MLR perspective as an analytical lens to examine the political process leading up to the decision to include international shipping in the EU ETS. Our analysis sheds light on whether this perspective offers insights applicable primarily to one specific policy process at a particular time (Jordan et al., 2012)—or has wider application to the study of EU policymaking processes.

We reconstruct the shipping inclusion process by process tracing (see George & Bennett, 2005), using data from public records, position papers, media coverage, and semi-structured interviews with central policymakers and close observers of EU policymaking (see list in our Supplementary File). Process tracing enabled us to identify chains of events, path dependencies, and critical junctures that eventually resulted in the Commission proposal to include shipping in the EU ETS.

3. The EU Process of Including Shipping in the EU ETS: Chronological Overview

3.1. Designing the EU ETS, the First Revision in 2008, and Initial IMO Regulation

The EU started to develop its EU ETS in 1998, with the Commission tabling a proposal for a Directive in 2001. The initial focus was on large emitters within the industry; the power sector was a key target group, but many energy-intensive industries were also included (Skjærseth & Wettestad, 2008; Wettestad, 2005). The 2000 Green Paper stated that it would be logical to start with the large point-sources, followed by a gradual broadening ambition over time (European Commission, 2000, p. 10).

In mid-2008 came a first extension of the scope of the ETS: It was decided that the aviation sector was to be included in the ETS from 2012 on. The initial ambition was to include flights within as well as into and out of the EU (Anger & Köhler, 2010). However, the main changes to ETS design for the third trading phase—to run from 2013 to 2020—were decided as part of the climate and energy package in December 2008, in order to contribute to long-term predictability for industry and all

actors involved. Mixed experiences in the pilot phase had shown the need for significant changes. The outcome was a far more harmonized, centralized, and auctioning-based system adopted in 2008, to govern the system in the third phase. The scope was to be somewhat further broadened by including the aluminium sector (Boasson & Wettestad, 2013; Skjærseth & Wettestad, 2010).

As to greenhouse gas (GHG) emissions from international shipping, the UNFCCC began to address such emissions in 1995, but states could not agree on the allocation of shipping emissions to contributing states (Shi & Gullett, 2018, p. 137). With states unable to overcome disagreement over allocation principles and proper regulation of GHG shipping emissions in the UNFCCC negotiations, the UNFCCC chose to transfer to the IMO the responsibility for addressing this issue (Shi & Gullett, 2018, p. 137). Article 2(2) of the 1997 UNFCCC Kyoto Protocol recognizes the authority of the IMO to regulate GHG emissions from international shipping.

In the same year as the Kyoto Protocol was agreed upon, the International Convention for the Prevention of Pollution From Ships (MARPOL) conference adopted Resolution 8 on CO_2 emissions from ships. That resolution requested the IMO to conduct a study on GHG emissions and to consider strategies for CO_2 reduction. Eventually, in 2003, the IMO adopted a resolution on "IMO policies and practices related to the reduction of greenhouse gases from ships," urging the IMO to devise appropriate mechanisms. In the following years, the IMO continued to work on this issue. As to the status of various EU actors in the IMO, the member states are the core actors as contracting parties, with the Commission holding accredited observer status and the Parliament on the sidelines, but still communicating with the actors on the inside (Earsom & Delreux, 2021).

3.2. IMO Progress, EU Inclusion of Aviation in 2012, and the 2013 Maritime Strategy

In July 2011, a milestone was reached within the IMO, when it was decided that GHG emissions from international shipping would be regulated through amendments to Annex VI of the MARPOL 73/78. These amendments introduced a mandatory Energy Efficiency Design Index (EEDI) for new ships and a Ship Energy Efficiency Management Plan (SEEMP) for all ships. The IMO also discussed various possibilities for introducing market-based mechanisms, including a global ETS (proposed by France, Germany, Norway, and the UK), a GHG fund, a port-state levy, and a ship efficiency and credit trading scheme (Shi & Gullett, 2018). However, the parties were unable to agree on how to proceed regarding market-based mechanisms. Instead, they agreed to work on a US proposal to improve the energy efficiency of ships through technical and operational measures (Shi & Gullett, 2018).

In 2012, the scope of the ETS was extended to airlines. Airlines were given a majority of allowances for free (82%) and could not sell allowances into the system. However, due to considerable opposition from the USA and other actors, only intra-EU flights were included (Vihma & van Asselt, 2014).

In 2013 the Commission published a communication on integrating maritime transport emissions in the EU's GHG reduction policies (European Commission, 2013). This communication recognized that international maritime transport emissions remained the sole transport mode not included in the EU's GHG commitment, even though these emissions were expected to increase significantly (European Commission, 2013, p. 2). It was also noted that the shipping sector was a key sector for the EU economy. Concerning GHG regulatory action, the communication mentioned the work of the IMO, dating back to 1997, MARPOL, and other conventions. It also described work on efficiency measures, market-based measures, and developing systems for monitoring, reporting, and verification (MRV) being conducted by the EU in collaboration with Australia, Japan, the USA, and other states.

As to the EU's general vision on international cooperation in this issue-area at this time, the communication noted: "The EU has a *strong preference for a global approach led by the IMO* as the most appropriate forum to regulate emissions from shipping" (European Commission, 2013, p. 4, our italics). But the next sentence noted the "slow pace of the IMO discussions," indicating a certain degree of impatience. Furthermore, the gradual inclusion of maritime GHG emissions in the EU's reduction commitment was indicated, with an approach "to be considered" that would consist of three key elements: (a) implementing a system for MRV of emissions; (b) defining reduction targets for the maritime transport sector; and (c) applying a market-based mechanism (European Commission, 2013, p. 5). Again, however, reference to the IMO link was repeated: "The EU's approach is designed to actively contribute to an agreement on global measures to reduce GHG emissions from ships in the IMO" (European Commission, 2013, p. 5; see also p. 9).

The MRV part was then followed up by the adoption of such an EU system in 2015 (Regulation 2015/757 of the European Parliament and of the Council of 29 April 2015, 2015). Here, the EU required ships of above 5,000 gross tonnage to monitor and report their carbon emissions, fuel consumption, and transport work on all voyages to, from, and between EU ports. The first monitoring period was to be from January to December 2018.

The general ETS agenda at this point was dominated by discussions on how to respond to the low carbon price resulting from the surplus of allowances, caused largely by the financial crisis post-2008. The Parliament played a fairly ambiguous role: After initially voting down ETS reform in the spring of 2013, the dynamics changed and 2015 saw the adoption of a market stability reserve (MSR), to start functioning from 2019. Paving the way for the 2015 decision, key ETS reform sceptics left the EU Parliament after the 2014 elections (Wettestad & Jevnaker, 2016).

3.3. EU ETS and Maritime Politics Leading Up to the Green Deal

The MSR had been adopted through a separate decision. The decision-making focus now shifted to the revision of the ETS Directive itself, preparing the ETS for the fourth trading period (2021–2030). Following specific instructions from the October 2014 European Council meeting, which included an overall 40% 2030 emissions reduction target, the Commission tabled a proposal in July 2015. This involved an updated 2030 cap, prolonged provisions for solidarity to low-income member states, the continuation of carbon leakage arrangements (with some revisions), and two new funds: (a) an innovation fund to support industry decarbonisation and (b) a modernisation fund to assist the energy transition and move away from coal, especially in Eastern Europe.

On the global climate politics scene, the Paris Agreement was adopted in December 2015, establishing a fundamentally decentralized policy architecture for the years ahead. The Kyoto Protocol's binding targets for countries and regions were replaced by the overall temperature-focused target of limiting global warming to well below 2°C, while pursuing efforts to limit it to 1.5°C, accompanied by regular reviews and ratcheting up (Dimitrov, 2016). In 2016, Donald Trump was elected US President; in 2017, he declared that the USA would withdraw from the Paris Agreement, which angered politicians in the EU bodies and most member states (see "EU mulls economic measures," 2017).

In October 2016, IMO member states agreed on a roadmap for adopting a GHG emissions reductions strategy within two years. In the ensuing negotiations, a dynamic developed whereby a majority of EU member states (including Belgium, France, Germany, and the Netherlands) and the EU Presidency played important roles, in collaboration with entrepreneurial states in the IMO, the Marshall Islands in particular. This took place in the Shipping High Ambition Coalition (SHAC) as described by Earsom and Delreux (2021). But other EU member states, among them Cyprus, Greece, and Malta, were footdraggers. Moreover, EU Parliamentarians allegedly acted more as "bad cops," threatening unilateral EU action on this issue (Earsom & Delreux, 2021, p. 407).

With the carbon price remaining stubbornly low, the question of further reducing the accumulated allowance surplus came to dominate the EU ETS reform negotiations (Wettestad & Jevnaker, 2019). However, also the issue of broadening the coverage as to sectors and activities was part of this discussion (as per our interviews from 2018). The inclusion of shipping in the ETS was particularly pushed by the Parliament. For instance, in the Environment Committee's (ENVI) first ETS reform hearing in February 2016, several members called for extending the ETS scope to more sectors such as shipping ("Five things we learned," 2016).

ENVI then adopted its position in December 2016. It was decided that shipping was to be included in the ETS from January 2023 unless a comparable system was introduced by the IMO. One-fifth of the auctioning revenues from the maritime sector should go to a new maritime climate fund that would finance energy efficiency and emissions reductions in the maritime sector ("EU Parliament's ENVI votes," 2016).

A major reform event in 2017 was the plenary session in the Parliament in mid-February. Prior to the meeting, cargo companies had supported the inclusion of shipping in the ETS, stating that "shipping remains the only sector not contributing to economy-wide decarbonisation to meet the EU's 2030 Paris target" (Crisp, 2017). The plenary position was adopted by a comfortable majority (379 in favour, 263 against, 57 abstentions), and generally supported the ENVI position, including on shipping (European Parliament, 2017).

This was followed later in February by the Council agreeing on a common ETS reform position, one which proved generally more ambitious than that of the Parliament. However, among the many issues on the agenda, there was no mention of shipping. That explains why the shipping issue was not among the key issues that came to dominate the subsequent trilogue meetings in 2017: strengthening the ETS and increasing the MSR intake; carbon leakage protection; and low-carbon financing and support mechanisms. Still, according to shipping sources, the shipping issue had proven "contentious throughout the entire negotiation process" (Offshore Energy, 2017).

Although the shipping issue did not dominate the headlines, it was included in the final reform outcome of November 2017. This outcome adopted a framework for the 2021–2030 phase which included both a tightening of the MSR in the period leading up to 2023 and a surplus cancellation mechanism from that point (Wettestad & Jevnaker, 2019). As to sectoral broadening, the 2018 Directive noted that efforts to limit international maritime emissions through IMO were underway "and should be encouraged": This had become "a matter of urgency." The Commission was to keep this under regular review and report at least once a year to the Parliament and the Council on the progress achieved in the IMO towards an ambitious emissions reduction objective, and on accompanying measures to ensure that the sector contributed duly to the efforts needed to achieve the objectives agreed under the Paris Agreement (Directive 2018/410 of the European Parliament and of the Council of 14 March 2018, 2018). Central stakeholders interpreted this as a victory for the Parliament (as per our interviews from 2018).

The IMO adopted its own MRV system in 2016. Negotiations on a new emissions reductions strategy within the IMO were crowned with success in April 2018, with the adoption of a strategy that included the target of halving shipping emissions by 2050, compared to 2008, and a zero-emissions vision. These objectives were to be achieved by improving the energy efficiency of all ships, gradually decreasing the carbon intensity of

new ships, and strengthening their energy performance. The choice of 2008 as the baseline for emissions was deliberate, as that was just before the financial crisis and emission peaked. The adoption of the 2018 IMO GHG reduction strategy was hailed as a major breakthrough in the efforts to regulate GHG emissions from international shipping. As noted, then EU Commissioner for Energy and Climate Action Miguel Arias Cañete described the IMO agreement as a "significant step forward." However, analysts point out that the outcome was not in line with EU preferences, for instance seeking a 70% emissions cut by 2050 (Earsom & Delreux, 2021, p. 407). Moreover, many EU Parliamentarians still felt that IMO progress was much too slow (as per our interviews from 2021).

In the ensuing months of 2018, an important development was the gradual increase in the carbon price, with prices slightly above EUR 25 in September. However, the rest of that year saw little activity as to the sectoral extension issue, with actors in the EU institutions and the member states paying more attention to the question of a 2050 neutrality target for the EU.

3.4. The Green Deal and the New Shipping Drive

The first key development in 2019 was the election of a new European Parliament in May. This resulted in an increased number of seats for groupings favourable to higher climate ambitions, such as the liberals (ALDE) and the Greens (the latter up to 70 seats from the previous 51; see "EU Parliament's fragmented election," 2019; Henley, 2019).

Parliamentary elections were accompanied by the process of getting a new Commission and Commission President approved. In the July Parliamentary hearings, German presidential candidate Ursula von der Leyen promised to introduce a climate law to raise the 2030 target from 40% to 50% and achieve climate neutrality by 2050. In addition, she declared the need to broaden the ETS scope with maritime and more aviation ("Nominated Brussels chief," 2019; von der Leyen, 2019).

In a letter to the Socialists & Democrats and the Liberal Renew Europe group in the Parliament, von der Leyen elaborated a green "comprehensive plan" for Europe (now touted as a Green Deal), with a target of at least 55%, the establishment of a "just transition fund," a Sustainable Europe Investment Plan, and "the extension of the emissions trading system." In the end, von der Leyen's candidacy was approved by a moderate majority in the Parliament (383 to 327). Analysts held that her ETS plans were both "mega-bullish" but also vague, "used as a bargaining tool to get into office" ("Mega-bullish or long-shot," 2019).

In the winter of 2020, the Covid-19 crisis struck, also affecting the activities covered by the EU ETS—for example, Italy announced plans for closing all factories. Electricity use plummeted, as many commercial units were closed and the public was in lockdown. It was expected that aviation and transport generally would be hard hit.

The Green Parliamentarian Jutta Paulus was now leader and rapporteur for the shipping issue in ENVI. In late May 2020, she was reported as pushing hard for fast-track inclusion of shipping in the ETS. Germany was in favour of the measure, along with France, Ireland, Lithuania, Portugal, and Spain, while Greece, Latvia, Poland, and Romania opposed tackling maritime-sector emissions outside the IMO framework. However, the initiative encountered a setback when the influential Transport Committee (TRAN) in the Parliament supported the report of TRAN Rapporteur Adamowicz, which made no mention of the ETS and supported continued alignment with IMO processes ("Lawmaker snub,'' 2020).

In May 2020, the Commission presented its EUR 1.85 trillion European recovery plan, including a EUR 750 billion "Next Generation EU Recovery Instrument." To repay the loan part of this package, the Commission hoped to include more of the ETS revenues raised thus far and controlled by the member states, and also add revenues from including shipping in the ETS (Roberts, 2020).

When the Parliament resumed session in September 2020, it also debated the inclusion of shipping—which could increase the size of the ETS by almost 10%. Due to the Covid pandemic, the Marine Environment Protection Committee of the IMO had indefinitely postponed a meeting to discuss the organisation's 2050 GHG emissions reduction of a minimum of 50%, so the EU Parliament adopted an amendment to fast-track the inclusion of shipping through an amendment to the EU's MRV regulation for maritime emissions. This would start from January 2022 and apply to emissions from ships using EU ports. Further, ship operators were to reduce their emissions by at least 40% by 2030, compared to 2018–2019 levels. The Parliament also called for the creation of an Ocean fund based on half of the auctioning revenues raised by the inclusion of shipping ("EU Parliament supports expanding ETS," 2020; European Parliament, 2020).

In November 2020, EU negotiators finally reached an agreement on the EUR 1.074 trillion seven-year budget, at least 30% of which was to be spent on climate measures. The carbon price then shot above EUR 27. Korea and Japan expressed concern about the possible inclusion of shipping in the ETS: Given the international nature of shipping, they argued, the issue should be tackled on the global, not regional, level ("Japan, South Korea oppose move," 2020).

In December 2020, EU heads of states adopted an upgraded 2030 target of "at least 55% emissions reductions" ("EU leaders," 2020). The spring of 2021 was dominated by final preparations on a "super package" for implementing the new 55% target, referred to as the "Fit for 55" package. This included a shipping inclusion proposal as part of the ETS reform part of the package. In March, the Commission published consultation

responses from a range of shipping actors and nation-states. The negative consequences of including shipping in the ETS—like carbon leakage and increased emissions due to change to land transport—were highlighted by actors such as the International Chamber of Shipping, European Community Shipowners Association, national shipowner associations, and countries that included Estonia, Japan, Malta, and the UK (European Commission, 2021a). The formal proposal, presented on 14 July 2021, had the following main elements:

- The initial coverage concerns intra-EU voyages, half of the emissions from extra-EU voyages, and emissions at berth in an EU port.
- The focus is on large ships, above 5000 gross tonnage.
- A gradual inclusion is envisaged. Shipowners will be required to be in full compliance with emissions caps only as of 2026, with a phase-in period from 2023 to 2025. It is the responsibility of shipowners to buy and surrender units for 20% of verified emissions reported for 2023, 45% of emissions for 2024, 70% for 2025, and 100% by 2026. Over those years, the amount of allowances not surrendered will be cancelled.
- There is openness to considering amendments to the EU shipping policy in the future if the UN's IMO should introduce its own market-based measures (European Commission, 2021b).

This new "shipping drive" also included the Fuel EU Maritime Initiative, which is meant to stimulate the uptake of sustainable fuels and zero-emission technologies by setting a maximum limit on the GHG content of energy used by ships calling at European ports (European Commission, 2021c). Committees in the Parliament and member states in the Council had initial discussions of the proposal during autumn 2021, confirming overall support to the inclusion of shipping, with key Parliamentarians even seeking a quicker inclusion of shipping than that proposed by the Commission ("EU lawmakers eye quicker entry," 2021). Completing the decision-making process may take two years or even more. The previous comprehensive ETS reform process took over two years: July 2015 to November 2017 (Wettestad & Jevnaker, 2019).

4. Analysis: Revisiting Multi-Level Reinforcement

The essence of the Multi-Level Reinforcement perspective is that the EU's leadership in climate change can be seen as the result of a dynamic process of competitive multi-level reinforcement among various EU political poles within a context of decentralized governance: the actions and commitments of a group of pioneering states; and the leadership roles played by the Parliament and the Commission. This upward cycle of reinforcing leadership within a quasi-federal system is triggered by and dependent upon strong public support and normative commitment (Schreurs & Tiberghien, 2007).

Using these lenses, how can we interpret the shipping inclusion process in the EU ETS? A first thing to note from the chronological overview (Section 3 above) is that the rationale of gradually broadening EU emissions trading to more sectors than the initially targeted power industry and energy-intensive industries has been present ever since the early days of designing the initial system. Further, the initiative to include aviation in 2008 (implemented from 2012 on) must be seen in connection with the Commission seeking to exert EU leadership in a climate policy sub-issue area that had been moving too slowly at the global level.

As to shipping, the 2013 communication showed some impatience with progress at the global level, but retained its prime commitment to working within the IMO in order to make further progress. The ETS agenda in the Parliament and the member states was at this point dominated by efforts to deal with the accumulating surplus of allowances and the related depressed carbon price, due not least to the finance crisis which had hit the EU from 2009 on. The Parliament played a more ambiguous role at this stage—for instance, initially voting down ETS reform in the spring of 2013.

The role of the Parliament shifted from 2016 on, with the inclusion of shipping as one of a select few targeted ETS reform issues. What had happened? First, the 2014 elections to the Parliament had altered the internal dynamics, with key ETS reform "blockers" leaving. Second, the Paris Agreement had established new and ambitious temperature targets for the EU and the world in terms of emissions reductions. Third, the election of Trump and US disengagement with global climate politics spurred various EU actors and institutions, including the Parliament, to display strengthened EU leadership in climate policy issues. Fourth, the Parliament was growing increasingly impatient with IMO progress.

As documented in Section 3, the Parliament carried the regulatory torch up until 2019. A crucial development in the spring and summer of that year was the inclusion of the shipping issue in Ursula von der Leyen's programme to get elected as Commission leader. Various types of evidence, including interviews with central current and former EU policy-makers with differing institutional affiliations, indicate that this development can mainly be traced back to the Parliament "shipping campaign" in the preceding years, as she was fighting to get accepted by the Parliament (as per our interviews from 2021). According to one key informant, von der Leyen had to offer the Parliament something in return for their approval. The Green Deal became part of her election campaign and a key means of securing support from Parliament. When von der Leyen was elected, the shipping issue was included in the Green Deal programme. This can be seen as a critical juncture in the EU policymaking process, which changed the EU's strategy to address emissions from shipping.

Since then, the regulatory torch has been largely taken over again by the Commission. For instance, in November 2021 EU climate commissioner Frans Timmermans explicitly blamed lacklustre IMO action for the need for a unilateral extension of the EU ETS to shipping (Ernhede, 2021). However, it should also be recalled that such inclusion was clearly in accordance with a much longer line in the Commission which favoured a gradual broadening of the scope of the ETS. This shows the value of a historical, longitudinal perspective in studying the EU ETS.

But what about the member states in the reinforcement dynamics? As documented in Section 3, in the post-2015 years a majority of the member states emphasized the need to make progress within the IMO, with the 2018 strategy as a partial success for EU positions. However, we have found no evidence of a strong member-state initiative at this stage to include shipping in the EU ETS—but most member states were not opposed to including shipping in the ETS either. The eastern EU member states are land-locked or do not have a shipping industry, and member states with a significant shipping industry (such as Denmark and the Netherlands) hold progressive attitudes to climate issues. The EU shipping states Cyprus, Greece, and Malta were opposed to strong IMO climate action that could hit them hard, but they do not seem to have campaigned hard against the proposal to include shipping in the EU ETS. A central explanation is that they realized early that fighting the proposal would be an uphill battle and they could not form a blocking minority coalition. Therefore, they decided instead to get the most out of what would be proposed by the Commission in the "Fit for 55" package (according to our interviews from 2021).

In spring 2021, EU leaders added a new dimension by declaring that the revenues from an expanded EU ETS to the maritime sector (and, over time, other transport and buildings) would contribute to funding the EU's Next Generation pandemic recovery fund. This declaration may, according to some of our informants, have increased support for including shipping in the ETS among the member states, but we lack conclusive evidence.

5. Conclusion

An MLR perspective can help in explaining the drive to include shipping in the ETS. This drive cannot be understood by focusing on the central EU institution and actors separately: It is their interaction and "passing of the regulatory torch" that provides the key. The election of von der Leyen as Commission President in 2019 marked a critical juncture in the policymaking process. This event eventually resulted in the Commission's proposal to include certain emissions from shipping in the EU ETS, but the push from the Parliament to secure this move proved vital for this outcome. Commission President von der Leyen's Green Deal initiative was part of her election campaign and was important for securing support from the Parliament. Therefore, the MLR perspective was not merely a feature of one short-lived era of governing in the EU (Jordan et al., 2012); we maintain that this perspective has wider application in the study of EU policymaking processes. However, this perspective seems to have explanatory power only under certain conditions and historical circumstances that open a window of opportunity for multi-level competition among central actors at several levels in the EU. Future research should examine the scope conditions and applicability of this perspective across cases in the study of EU policymaking processes. As to the process of including shipping in the ETS, negative experience with the effort to include EU-external aviation under the ETS for some years probably discouraged EU actors from doing likewise with shipping, a far more complex issue than aviation. In addition, there was uncertainty as to the outcome of the negotiations starting in the IMO from 2016 on. This indicates that the interaction with the EU-external environment is one important conditional factor for the unfolding of the MLR dynamic.

How can the ETS shipping-inclusion case contribute to updating and further refining the MLR perspective? In view of the significant EU-internal push and EU-external pull, it makes sense to distinguish explicitly between a "vertical" and "horizontal" dimension to the MLR dynamic. The vertical dimension includes interaction with the EU-external environment and sub-national dynamics. In the case of shipping, it is essential to consider developments within the IMO and the perceived slow progress there. Hence, this case seems to fit the international entrepreneurship mechanism proposed by Boasson and Wettestad (2013). This mechanism highlights how EU actors may make strategic use of developments within international regimes and organisations to shape the EU agenda-setting. In particular, actors in the Parliament cited the slow progress within the IMO to bolster the idea of including shipping in the ETS.

The horizontal dimension mainly concerns the interaction and dynamics between the "Brussels institutions"—the Commission, Parliament, and Council. A first observation here is the lack of member-state entrepreneurship in the shipping inclusion case. A likely explanation is, first, that member states were formally acknowledged actors in the IMO and felt more loyalty to that institution than did the Parliament, which was not a formally acknowledged actor in the IMO negotiations. Second, the ETS reform agenda of most member states in the period since 2015 was very much dominated by the persistent low carbon price and ways to address the issue of reducing the surplus of allowances and strengthening the carbon price. In this picture, the shipping issue (handled also by the IMO) was not a top priority among the member states. Furthermore, this case has shown the important role played by the Parliament, which should be accorded a more prominent position in an updated MLR perspective, balancing the attention given

to the Commission in understanding EU climate leadership in recent years. A general background factor here is likely the gradual "greening" of the composition of the Parliament—not least in the 2019 elections.

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Conflict of Interests

The authors declare no conflict of interests.

Supplementary Material

Supplementary material for this article is available online in the format provided by the author (unedited).

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Article

Beyond Control: Policy Incoherence of the EU Emissions Trading System

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Abstract
In this article, we explain why the current climate policy mix of the European Union (EU), consisting of the EU Emissions Trading System (ETS) and overlapping policies, is incoherent with respect to emission abatement and cost-effectiveness. The concept of policy coherence guides our analysis in identifying the EU ETS' current dynamic supply adjustment mechanism, the Market Stability Reserve (MSR), to be at the heart of the shortcomings of current market design. Incoherence emerges due to the MSR's quantity-based indicator for scarcity. It only works well for current and past demand fluctuations, but not for anticipated changes in demand, e.g., caused by a member state's fossil-fuel phase-out. As a result, instead of fostering synergies as intended, the MSR undermines coherence by creating backfiring interactions and making precise predictions of overlapping policies' impacts close to impossible. Considering the European Commission's reform proposal of July 2021, we argue that a change in the MSR's parametrisation leaves the fundamental cause of incoherence unaddressed. Based on recent findings in the economics literature, we propose introducing a price-based indicator for scarcity as a solution to substantially reduce the current incoherence of the policy mix.

Keywords
climate policy; emission trading; EU ETS; market stability reserve; overlapping policies; policy analysis; policy coherence

Issue
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1. Introduction

Following the United Nations Conference on Environment and Development in Rio de Janeiro in 1992 and the Kyoto Protocol of 1997, the need arose for the European Union (EU) to create a policy infrastructure to achieve its greenhouse gas (GHG) abatement targets. A Union-wide carbon tax was politically infeasible due to the unanimity requirement of fiscal measures. Instead, the EU went for the quantity-based approach of a cap-and-trade scheme that only required a qualified majority (Ellerman & Buchner, 2007). As of 2021, the European Union Emissions Trading System (EU ETS) regulates roughly 11,000 installations in the energy and heavy industry sectors as well as 600 airlines (European Union, 2003, 2015). Its market mechanism sets a price for GHG emissions in 30 countries and Northern Ireland, covering about 36% of the EU's CO_2-equivalent emissions (European Commission, 2021d). Until recently, it was the world's largest carbon market in terms of regulated emissions (1.38 billion tons in 2020), now being surpassed only by the newly launched Chinese ETS (European Environment Agency, 2021; International Carbon Action Partnership, 2021). Despite several obstacles, the system's cap and thus regulated emissions have decreased by roughly 43% since 2005, substantially contributing to the EU's climate track record (Bayer & Aklin, 2020; European Environment Agency, 2020, 2021).

The EU ETS is not a standalone instrument; it interacts with other instruments, which lead to a direct or indirect change in emissions. The overlap in scope constitutes a policy mix mirroring the EU's multi-level

governance structure. Member states (MS) have interfered with the carbon market by implementing domestic carbon price floors or unilaterally cancelling allowances. Both MS and the EU have passed policies that directly target market participants, e.g., by phasing out coal or setting performance standards. Moreover, overlapping policies target the product markets of industries subject to the EU ETS. Examples are renewable support schemes, energy efficiency standards, and labels for appliances. In short, intended and unintended interactions with other climate and energy policies impacting the system's market outcome are the rule as they affect the demand (and in case of cancellations, the supply) for emission allowances.

We are interested in the coherence of the resulting policy mix, i.e., whether the individual instruments align and work in the same direction, not hampering or even improving performance with regard to the total amount of emissions abated and cost-effectiveness of achieving preset abatement targets. Several previous analyses have focused on which policies overlapping with a fixed-cap ETS lead to a coherent policy mix and how they should be designed (see del Río et al., 2013; van den Bergh et al., 2021). We add to this by focusing on the EU ETS, which no longer features a fixed cap, and its capability to coordinate overlapping policies to promote policy coherence.

For further elicitation, it is important to note the dual role of the EU ETS: As an instrument for putting a price on carbon and regulating emissions, it is an element of the policy mix in its own right. Yet, it also connects all market participants by the shared cap, which implies that any other climate policy affecting any regulated participant changes the availability of allowances for all others as well. If the overall cap on emissions does not respond to the introduction or adjustment of policies overlapping the EU ETS, they do not affect system-wide emissions but merely relocate them in space and time (Eichner & Pethig, 2019). The impact of this so-called "waterbed effect" on coherence is ambiguous. By taking the climate externality out of the picture for all other policies, regulators are able to focus on further objectives such as energy security, the under-provision of research and development, escaping technological lock-ins, or addressing information asymmetries. The pre-2019 EU ETS that featured a fixed cap could hence be seen as a breakthrough for climate policy coherence. However, as other policies continued to target emission reductions, the waterbed has been perceived as an obstacle rather than a facilitator of coherence because it prevented said climate policies from reducing total emissions.

Partly to address this perceived downside, the EU ETS has been complemented by a dynamic supply adjustment mechanism, the Market Stability Reserve (MSR). First legislated in 2015, reformed in 2018, and operative since 2019, the MSR is meant to promote investment in low-carbon technologies, dampen allowance price volatility, and reduce the number of unused allowances that had accumulated in previous years (European Union, 2015; Perino & Willner, 2016, 2017). Most importantly, for the purpose of this article, it is the explicit aim of the MSR to increase synergies with other climate and energy policies (see preamble of European Union, 2015). The idea is to adapt supply based on the quantity of banked allowances held by market participants, officially called the "Total Number of Allowances in Circulation" (TNAC; see European Commission, 2021c), which is used as the indicator for the scarcity of allowances in the system.

The MSR leads to a "puncture" in the waterbed. The supply now responds to changes in demand for allowances and hence to changes caused by other instruments (Perino, 2018). Total abatement achieved by the climate policy mix can therefore add up to more than the reduction prescribed by the baseline trajectory of the system's cap. An overlapping policy that reduces demand in any given year increases the number of allowances banked by firms at the end of that year and hence triggers additional cancellations by the MSR in future years. However, the recent literature has also shown that the flexibility of the cap can backfire, i.e., result in less overall abatement and thereby put the coherence of the policy mix at even greater risk (Gerlagh et al., 2021; Perino et al., 2020; Rosendahl, 2019).

In the following, we investigate the current design of the EU ETS with the MSR and how the latter impacts the coherence of the EU's climate policy mix within the ETS sectors. Moreover, we consider the proposed changes to the MSR published by the European Commission (EC) in the "Fit for 55 Package" as of July 2021. By focusing on the concept of policy coherence, we offer a new perspective towards the current EU climate policy infrastructure and make the key findings of the past three years of economic research on this matter accessible.

2. Policy Coherence and Carbon Markets

The concept of policy coherence, e.g., enshrined in Art. 208 of the Treaty of the Functioning of the European Union (European Union, 2012) originates from the development policy and sustainability debate of the 1980s (de Jong & Vijge, 2021; Verschaeve et al., 2016). While there is no universally agreed definition of policy coherence and the concept undergoes constant change, it is based on the idea that overlapping policies can interact with each other's objectives and performance. The interconnectedness of socio-economic systems calls for an alignment of governance systems and their policies to work in the same direction to minimise the cost of policy goal attainment (Sandström et al., 2020; Sianes, 2013). Since the 1990s, the concept has proliferated from development policy to various other policy domains, especially in the EU, where policy-making emanates on different levels of governance. In particular, a distinction can be made between horizontal policy overlap at the EU level and vertical overlap between policies at the EU and MS level (Sandström et al., 2020; Söderberg, 2016).

Current EU legislation undergoes codified procedures to analyse and minimise detrimental effects on the performance of the existing policy infrastructure. The Impact Assessment Procedure and monitoring as part of the Better Regulation Agenda of 2015 are meant to avoid conflict among interacting policies and to create synergies where possible (European Commission, 2021e). To this end, the "Better Regulation Toolbox" defines coherence as a common principle (European Commission, 2021f, p. 9) so that the choice of policy instruments should involve consideration of ways "to exploit synergies and to avoid undermining the effectiveness of existing instruments or raising compliance costs" (European Commission, 2021f, p. 120). Moreover, the European Commission established the REFIT-Program to reduce redundancies within the EU's policy infrastructure by rephrasing, discarding, or complementing legislation to align it with the legislative environment and reduce the latter's complexity (European Commission, 2019). This shall increase targeted policies' adaptability to each other and their comprehensibility for regulated entities (del Río & Cerdá, 2017). From this perspective, incoherence also describes a state of policy (inter)action from different levels of governance where at least one side, but likely multiple legislators and affected entities, cannot or do not fully consider the link between their choices and outcomes within the policy mix. Effects of deliberately designed policies amending a given policy mix are then beyond the control of the respective legislator.

In complex governance systems such as the EU's, the use of multiple instruments for shared objectives is the norm and suggests there is an expectation of possible synergies and complementarities (Nilsson et al., 2012; Sorrell & Sijm, 2003). It depends on the policy mix's design whether an increase in interactions actually results in more incoherence, leading to a loss of performance towards one or several policy goals, including cost-effectiveness (Kern & Howlett, 2009).

Interactions of policies within a policy mix can be neutral, synergetic, conflicting, or they can even backfire (see Table 1). The latter describes the situation where the policy mix performs worse than one containing only a proper subset of the instruments of the original (van den Bergh et al., 2021).

A close look at interactions is of particular relevance for a climate policy mix featuring an ETS (Coscieme et al., 2021; Fais et al., 2015; Fankhauser et al., 2010). The larger the sectoral scope of an ETS and the more fragmented legislation, implementation, and administration of the climate policy domain, the higher the amount and interdependency of potential interactions between the ETS and overlapping policies (van den Bergh et al., 2021). In this situation, the coherence of the resulting policy mix can be thought of as how well unintended interactions can be reduced, and intended ones lead to no adverse effects on the desired goals in question. In relation to an ETS, this means that interactions neither cause an expansion of the cap, i.e., a loss of stringency, nor a reduction in cost-effectiveness (de Perthuis & Trotignon, 2014). In an ETS with a fixed cap, no additional policy in the mix affects total abatement, irrespective of the nature of the policy interaction, unless it directly targets the supply of allowances, as in the case of allowance cancellations. In consequence, overlapping policies that target emissions, i.e., the demand for allowances, change the ranking of abatement options. Unless this ranking was already distorted by a market failure other than the climate externality, an intervention reduces cost-effectiveness (Sorrell & Sijm, 2003). In the presence of other distortions, additional policies have the potential to increase the static and dynamic efficiency of the policy mix (de Perthuis & Trotignon, 2014).

In principle, the carbon neutrality of policies overlapping with a fixed-cap ETS allows for a coherent policy mix. This could be achieved if overlapping policies were exclusively designed to address market failures other than the pollution externality. A policy that addresses only lock-in effects or innovation spillovers would then be fully coherent. However, in practice, most climate policies such as support schemes for renewables (Boasson et al., 2020), coal phase-outs (Keles & Yilmaz, 2020), or energy efficiency measures (Perino & Pioch, 2017) overlapping the EU ETS explicitly aim to reduce carbon emissions. Given the aspiration of these policies to reduce emissions and the fixed cap in the pre-2019 EU ETS, the EU's climate policy mix was incoherent (see Table 1) since it did not achieve more abatement than the EU ETS alone but increased total costs (Böhringer et al., 2009).

Table 1. Modes of interactions between instruments in a policy mix.

Performance of the policy mix (here: abatement achieved) instrument #1 alone: a_1; instrument #2 alone: a_2; with $a_1, a_2 > 0$; $a_1 > a_2$			
Mode of interaction		policy mix #1 + #2	Performance of the mix is…
coherent	synergistic	$> a_1 + a_2$	higher than the sum of the single instruments.
	neutral	$a_1 + a_2$	equal to the sum of the single instruments.
coherent if cost effective	conflicting	$a_1 \leq m < a_1 + a_2$	higher than for the best single instrument in the mix but lower than the sum of the single instruments.
incoherent	backfiring	$< a_1$	lower than for the best single instrument in the mix.

Source: adapted from van den Bergh et al. (2021).

Policies aiming at emission reductions overlapping an ETS with a fixed cap are fully effective if they target the supply of allowances rather than demand, i.e., pollution sources. Cancellation or retirement of allowances have been used both by governments (Government Offices of Sweden, 2016) and NGOs. Apart from such discretionary, stand-alone interventions, cancellations can complement demand-reducing policies to ensure that total emissions are reduced. This combined approach is backed by Art. *12*(4) of the EU ETS Directive and has been legislated as part of the German coal phase-out (European Union, 2003; Osorio et al., 2020). Nevertheless, abatement policies supplemented by allowance cancellations have a substantial drawback: They force society to pay twice, first for the increase in abatement and possibly infrastructural transformation costs, and second for the purchase of allowances to be cancelled. Additional abatement would be much cheaper if one merely cancelled allowances and left it to market participants to decide which plants to close down for compliance with the more stringent cap. According to the definition above, combining abatement policies with cancellations in a fixed-cap ETS constitutes an incoherent policy mix.

So-called flexibility mechanisms establish transparent rules for supply adjustments. Simple variants are price floors, ceilings, and collars (de Perthuis & Trotignon, 2014; del Río & Cerdá, 2017; van den Bergh et al., 2021), but any monotonous relationship between the allowance price and the number of allowances issued could be established (Burtraw et al., 2020; Pizer, 2002; Roberts & Spence, 1976). A hybrid system combines aspects of a tax with an ETS allowing the regulator to choose a bliss point between both extremes (Traeger et al., 2020). This flexibility brings about the possibility to stabilise price paths, control for conflicts between overlapping policies, and manage allowance supply in reaction to unforeseen shocks. A reduction in demand can thus be fully or partially channelled towards a reduction of the cap or a decrease in the price for allowances. This does not make the policy mix less cost-ineffective, but it allows to address concerns of market participants and policymakers who favour a reliable price signal or want other climate policies to feature a climate benefit. A flexibility mechanism does not do away with the basic trade-off that each change in market fundamentals translates either into a price or an emission response. However, it does allow the policymaker to split the impact between these channels rather than being bound to a fixed-cap ETS (only price response) or a carbon tax (only emission response).

3. The Incoherence of the EU Emissions Trading System in the Policy Mix

The source of policy incoherence of the EU's current climate policy mix stems from the modifications the MSR made to the EU ETS, which impact the supply of allowances by two interrelated mechanisms. Firstly, it reduces supply by taking in allowances when the TNAC is above an upper value and increases it by releasing allowances when the TNAC falls below a lower value. This mechanism adjusts the allocation schedule but does itself not affect the cumulative cap (Perino & Willner, 2016). Secondly, the MSR's cancellation mechanism keeps the number of allowances it holds for later release below a predefined level. The cumulative cap decreases by the number of allowances cancelled by the MSR, and due to the reserve's current holdings, every allowance now entering the reserve by the first mechanism will eventually be cancelled. The two mechanisms work non-discretionary along preset parameters, and the quantity of cancellations by the latter depends on the former's intake over time (Perino, 2018). Because the MSR thus reacts to changes in actual emissions, the effectiveness of the EU ETS is now endogenously linked to overlapping policies and subject to substantial uncertainty (Bruninx et al., 2020; Osorio et al., 2021). The rationale is that this rule-based link between actual emissions and the supply of allowances would allow overlapping policies to contribute to abatement. Meanwhile, the public debate seems largely unperturbed by objections that there already is a policy instrument in place that makes sure that coal-fired power stations will become unprofitable and hence go out of business in the near future (Pietzcker et al., 2021). If this argument is noticed, a typical response is that this proves that the ETS needs to be adjusted instead of changing or discarding the overlapping policy.

The MSR's bane with regard to policy coherence lies in its indicator for scarcity, the TNAC. To understand why, it is crucial to see the link between the time profile of allowance demand and how the dynamic supply adjustment stipulated by the MSR reacts to it. Market participants store allowances for future use in the expectation of scarcity, i.e., the future availability of allowances. They store more allowances when they expect greater scarcity in the future, e.g., by a steeper decrease of the cap in line with new climate targets, or they store fewer allowances when they expect less scarcity, e.g., as a result of anticipated overlapping policies or technology shocks and their effect on the speed of decarbonisation (Gerlagh et al., 2021; Karp & Traeger, 2021; Perino et al., 2020). Many circumstances determine market behaviour. The constant adaptation of expectations and the processing of information is reflected in the market price. In other words, if it is perceived or expected that future scarcity will be low, prices will be low, and vice versa. This is the result of intertemporal arbitrage, which improves the cost-effectiveness of the system as market participants use available information to engage in abatement and investment at least cost to themselves. However, the MSR responds very differently to changes in immediate scarcity as compared to changes in expected scarcity.

It is capable of credibly reducing market imbalances that resulted from the glut in allowances caused by the economic turmoil in 2008 and numerous

emission-reducing policies at the EU and MS levels (Koch et al., 2014). The same is true for unforeseen shocks leading to supply–demand imbalances in an ad-hoc fashion, such as the Covid-19-induced economic recession in 2020 and 2021 (Gerlagh et al., 2020). Immediate reductions in emissions increase the TNAC and hence intake and cancellations by the MSR. Then, the MSR reacts in the manner of any vendor of commodities in any market and reduces supply when faced with reduced demand. This is a beneficial interaction with the policy mix as it increases the system's stability and forestalls additional measures on either the EU or MS level.

Contrarily, if an overlapping policy induces a change in future scarcity, the MSR's response is likely to backfire. Anticipation of a reduction in the future demand for allowances, e.g., due to a coal phase-out, reduces prices and increases emissions already today, i.e., before actual policy-induced abatement takes place. Hence, the TNAC decreases, MSR intake drops, and fewer allowances are cancelled. Everything else being equal, the additional impact of announcing the closing down of an emission source in the future is to increase total GHG emissions within the EU ETS (Gerlagh et al., 2021; Perino et al., 2020; Rosendahl, 2019). Vice versa, if market participants expect an increase in scarcity in the future, as has been the case since the EU announced its more ambitious climate goals in the autumn of 2020, prices and the TNAC increase, emissions drop and the MSR increases scarcity further by cancelling more allowances. The way the MSR "punctures the waterbed" creates interactions between the EU ETS and (future) overlapping climate policies that are detrimental to both total abatement and cost-effectiveness of the policy mix. Instead of fostering synergies, the MSR reduces incoherence for short-term measures but pushes long-term policies that are important to create credible investment signals into the backfiring range (Table 1). If e.g., MS wanted to avoid the MSR backfiring, their additional climate policies would have to mimic sudden shocks and happen unannounced and erratically. Clearly, this cannot be prudent advice to policymakers.

The TNAC is not fit to inform dynamic supply adjustment in reaction to demand changes from expected changes of scarcity. Changing the parameter values of the MSR within the current design only affects how strongly the MSR responds to changes in the TNAC. It cannot address the problem that the MSR causes overlapping policies to backfire. Whatever makes the MSR less responsive to change in the TNAC brings the EU ETS back closer to the former design with a fixed cap. Whatever renders the cap more sensitive to change in the TNAC increases both the emission impact of immediate abatement measures but also the extent to which pre-announced efforts backfire. The MSR adjustments proposed by the EC as part of the "Fit for 55" package would do the latter. As long as existing parameters are only tweaked and the channel of interaction between the MSR's short-run supply adjustment mechanism in the form of the TNAC remains, incoherence will persist as well.

Cap adjustments that respond in the same and coherent way to both immediate and pre-announced overlapping climate policies need to respond to the allowance price rather than the TNAC (Gerlagh et al., 2021; Perino et al., 2020). Such a price-based cap adjustment would also respond much better to technology shocks and other sources of uncertainty (Karp & Traeger, 2021; Traeger et al., 2020). A price-based cap adjustment is not restricted to price floors or corridors (Flachsland et al., 2020). It extends to all (weakly) upward-sloping supply curves for allowances. For example, it could define that for a particular price increase, the number of allowances be extended or contracted by a specific amount or percentage. This is very much in line with the mechanism contained in Art. *1*(7) of Decision 2015/1814 in conjunction with Art. *29a*(1) of Directive 2003/87/EC (European Union, 2003, 2015). However, this price-based approach serves as an emergency mechanism only, i.e., it is very unlikely to be triggered and activation is, unlike the TNAC-based interventions, not automatic but conditional on approval by a committee.

While the current MSR makes it practically impossible to reliably predict the emission and price impacts of overlapping climate policies, a price-based supply adjustment would transparently specify these impacts, as they are determined by the slope of the allowance supply function—which is the same regardless of the source of the change in allowance demand. The latter is very much in contrast to today's MSR, where the size and direction of the cap adjustment depends primarily on the timing of the overlapping policy (Perino et al., 2020). Importantly, such a price-based cap adjustment can be designed to be consistent with the requirements for qualified majorities in the EU legislative process (Perino et al., 2021).

4. Conclusion

Until the end of 2022, the EU will decide how to reform the European carbon market in accordance with the broader legislative agenda under the Green Deal. Credible and stable pricing is needed to sustainably steer socio-economic transformation towards a decarbonised future, yet the MSR both destabilises the market and obscures participants' and MS' elicitation of causal links between a change in demand and market outcomes (Perino et al., in press). Instead, well-intended unilateral action by MS to increase abatement is weakened or even backfires, leading to higher than optimal compliance costs (Perino et al., 2020; Zaklan et al., 2021).

As the historically amassed TNAC dwindles over the next few years and an increasing number of overlapping policies enter the policy mix, expectations about future scarcity will dominate price and TNAC movements ever more strongly. Then, the incoherence of the climate policy mix in the ETS sector caused by the MSR will also become more prominent. A first glimpse of this was seen

in May 2021 when allowance prices defied the Covid-induced recession and exceeded 50€ for the first time, after having roughly doubled in the previous months. At the same time, the Commission announced the most recent TNAC value that triggered a substantial further reduction in the supply of almost 380 million allowances, second only to the figure of 397 million announced in May 2019. Cancelling allowances in response to a recession is fine in principle; however, if this is done at a time when other events dominate the allowance market, as reflected in the price rally, additional cancellations destabilise it. It will become even more important to guarantee that climate and related policies passed by MS do not impede the cost-effectiveness of the EU ETS, that the EU ETS does not impede on the abatement effectiveness of MS' policies, and that the latter do not impede each other through their connection through the shared cap and price mechanism of the carbon market.

However, changes to the EU ETS proposed by the EC in the "Fit for 55 Package" on 14 July 2021 are confined to tweaks of parameters leading to minor improvements in the functioning of the market but do not address the underlying problem of structural incoherence emanating from the MSR. On the contrary, the same flaw in the design is bound to impair the second ETS envisioned for the transport and housing sectors, as the EC proposes a slightly different yet equally incoherent TNAC-triggered reserve (European Commission, 2021a, 2021b). Taking a deeper look into the Impact Assessment Report to observe the EU's Better Regulation Toolbox in action, one learns about coherence with horizontally overlapping policies, such as looking at complementarities between extending the scope of the carbon market and energy efficiency measures, yet the more prevalent vertical aspects are left out of the discussion (European Commission, 2021a, p. 11). Then again, the MSR is supposed to generally enhance coherence with overlapping policies by mitigating demand fluctuations (European Commission, 2021a, p. 144). What becomes clear by this reading is the disparity between aspiration and result, and the lack of insight into the structural flaw of the system's current design, which afflicts overlapping policies no matter whether they interact horizontally or vertically with the EU ETS. What is needed is the replacement of the TNAC as the indicator for scarcity. As proposed in Section 3, a price-based supply adjustment mechanism would not dismantle the fundamental logic of the carbon market and cap-and-trade but rather turn currently backfiring interactions into conflicting to neutral ones with the degree open to choice by the regulator. As a possible obstacle, it would require the EU to transparently specify how to trade off reductions in total emissions against reductions in the financial burden borne by firms and households, which is exactly what the price-responsiveness of the cap determines. If Wettestad and Jevnaker (2019) are correct in their assessment that the recent rules are a result of "smokescreen politics" aiming at obscuring key trade-offs, chances for such a move towards an EU ETS design that enables rather than undermines the coherence of the EU climate policy mix seem dim.

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Conflict of Interests

The authors declare no conflict of interest.

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Article

China's Carbon Market: Potential for Success?

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Abstract
What lessons emerged during the development of China's national emissions trading scheme (ETS)? It was launched in late 2017 and started operation in July 2021, beginning with online trading of emissions permits. The preceding decade was used for preparing and testing, including seven pilot markets. It was decided to start with the power sector, the largest-emitting sector, and initially cover coal- and gas-fired power plants. This article offers theory-oriented and empirical contributions to domestic-level learning, and asks what happens after a policy has "landed." We employ an analytical concept originating from diffusion theory—*learning*—and view *internal learning* as a key mechanism. We argue that having a slow and well-prepared start contributes to the potential success of the ETS; further, that the lengthy preparatory period enabled China to address various obstacles, providing a strong basis for success, singly and as part of the national mitigation policy complex. *Internal learning* has proven crucial to the development of the ETS in China, with the learning process continuing as the national ETS becomes operative. We also discuss the possibilities for linking China's carbon market with other markets, which should heed China's ETS experience and emphasize learning.

Keywords
carbon market; China; Emissions Trading Scheme; internal learning; linking carbon markets

Issue
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1. Introduction

Carbon markets are emerging worldwide. In 2011, China announced its plans for a domestic emissions trading scheme (ETS). The ensuing decade was used for preparing and testing, including operating seven pilot markets. Despite concerns that development took longer than expected, and that China's ETS might fail to curb emissions ("Can China's new carbon market take off?," 2021; Liu & Kan, 2021), we argue that the slow, well-prepared start has contributed to the success potentials of China's ETS. With a hasty start, important issues might have been dealt with on an ad hoc basis as they arose—detrimental to achieving the solid foundation needed for an effective policy instrument. We hold that the preparatory period has enabled China to address foreseen and unforeseen obstacles, offering a strong basis for the success potential of its ETS, singly and as part of the national mitigation policy complex. In examining the ETS process in China, we employ an analytical concept originating from diffusion theory: *learning*. Expanding this concept, we identify *internal learning* as a key mechanism.

This article is empirically founded on document analysis and on expert interviews. We have followed ETS developments closely since the announcement in 2011, with interview rounds in China each year, supplemented by participation in ETS workshops and conferences, and personal work experience in multilateral carbon market development projects in China. Our main sources of documentation, in Chinese and English, are government records and specialist news articles. Following a review of the literature and a presentation of our analytical

approach, we turn to China's ETS and its development, showing how learning emerged. In the conclusion, we direct our attention outwards, linking China's market with other markets, noting that such markets should heed China's ETS experience, and emphasize learning.

2. Learning as a Mechanism for Policy Change and Research Status

The international aspects of knowledge transfer and diffusion of climate policies and ETS to China are well-documented (Biedenkopf et al., 2017; Carrapatoso, 2011; Cheng, 2020; Heggelund et al., 2019). Diffusion—"a set of processes characterized by interdependent, but uncoordinated, decision making" (Elkins & Simmons, 2005, p. 35)—concerns how the same policy may occur in several jurisdictions in a relatively short time-span, usually across national borders. Often-cited diffusion mechanisms are *coercion* (when a country sees no option but to adopt the policy), *competition* (the policy is adopted to gain a comparative advantage), and *learning* (discussed in Gulbrandsen et al., 2018, pp. 18–19). All these are evident in the diffusion of ETS to China. Learning—"a deliberate attempt to adjust the goals or techniques of policy in response to past experience and new information" (Hall, 1993, p. 278)—can be said to have occurred if the process brings about policy changes.

As governments today face many of the same intermestic problems, including climate change, learning from the experience of others is a practical step for policymakers (Dodds, 2013, pp. 250–251). Diffusion mechanisms have influenced China's carbon markets, with emulation of and sophisticated learning from the EU ETS; competition was more prominent during the planning period and before commencing the national market (Heggelund et al., 2019, p. 185). The intense efforts of several countries to share their experiences and facilitate learning for the pilots led authors to label it not as "diffusion," but "infusion": "a process through which a mixture of external experiences is infused into the domestic policy process of one specific jurisdiction" (Biedenkopf et al., 2017, p. 92). These processes occurred simultaneously with internal learning, but are not the focus of this article.

Dealing with the domestic factors of policy development poses a challenge to diffusion theory, however (Elkins & Simmons, 2005, p. 38). Other studies have investigated the influence of domestic factors on carbon markets in China—including the policy implications of China's sectoral emissions pattern for the national ETS (Jiang et al., 2017); how the relationship between policymakers and key market players influences market efficiency (Lo & Howes, 2013); and whether the enrolled companies understand emissions trading mechanisms sufficiently to engage as market actors (Yang et al., 2016). Many studies have covered China's ETS pilots, with recommendations as to lessons to be drawn for the national ETS (Goron & Cassisa, 2017; Wang et al., 2019; Wu et al., 2014; Yi et al., 2018). However, they lack the conceptualization of this learning process employed in our article.

We offer a theory-oriented contribution to domestic-level learning, and ask what happens after a policy has "landed." There are several possibilities: The policy could remain dormant if other policies addressing the same issue gain traction—or it could end in stalemate. Assuming that the policy is adopted, if uncontroversial or without much at stake, it may be implemented without much interference. However, if certain actors or groups stand to gain or lose much, the policy may be altered to accommodate various political interests, perhaps ending up as a patchwork of political bargains. Yet another possibility is that the policy is implemented on a small-scale trial basis for a limited time, with planned reviews before continuation. This is what we call *internal learning*: "the deliberate and focused process" (Stensdal et al., 2018, p. 181) of educating the polity on better policy options. (We intentionally avoid the term "best practices," which implies that the choices cannot be further improved.) The polity may include society in general, but will normally involve the policymakers, implementers, and the actors affected by the policy. Internal learning involves at least one phase of trials and revisions. This phase may include a time dedicated to review, or be less structured, with adjustments as lessons are drawn from experience.

It is always possible to draw lessons and make improvements to a policy. What distinguishes internal learning from other ad hoc enhancements or evaluations (and possible amendments) of policies is the period set aside for experimenting and drawing lessons from the trial period. For a policy to be subjected to internal learning it is not necessary that all challenges are expected upfront. Identifying unanticipated problems involves taking time for trials and correcting errors. Internal learning, then, is a mechanism not just for intended policy change, but also for intended policy *improvement*. That does not mean that the policy will be optimal after the internal learning period. New challenges are likely to arise over time. There might be aspects that were overlooked or not addressed during the internal learning period—or the "wrong" lessons might have been drawn (Hall, 1993, p. 293, note 20). The point about internal learning is that deliberate efforts are made to improve the knowledge-base for decision-making. Piloting and experimenting are two common features of Chinese policymaking (Heilmann, 2008), and have been cornerstones in the development of climate and energy policies (Zhao et al., 2016), including the national ETS.

3. Emissions Trading Scheme in the Larger Energy and Climate-Policy Complex

Before turning to China's specific learning experiences, we offer a glimpse at the larger policy context in which the national ETS is happening. China is the world's largest emitter, accounting for nearly 29.7% of global emissions

in 2018 (Crippa et al., 2019). Coal dominates the energy mix, responsible for 56.8% of total energy consumption in 2020 (National Bureau of Statistics, 2021). Coal consumption is the main source of carbon emissions as well as serious air-pollution incidents, with smog and ultrafine particles of less than 2.5 microns (PM2.5) concentrations reaching dangerous levels in some regions (Ahlers & Shen, 2018). China's ETS is intended as one of several policy tools for reducing carbon emissions (Heggelund et al., 2019).

China has introduced various energy and climate policies which partially supplement each other and aim to address air pollution and reduce carbon emissions. One such policy is that of *dual control*: targets on energy consumption and energy intensity introduced in the 12th Five-Year Plan for Energy Development (2011–2015; State Council, 2013). A shift has taken place in recent years towards technology innovation and renewables. Policies promoting renewables are picking up speed, such as "Made in China 2025," aimed at promoting innovation in 10 core industries, including the power sector—renewable energy like solar photovoltaic and wind, new energy vehicles (Korsnes, 2020). According to the New Energy Vehicle Industry Development Plan 2021–2035, electric vehicles will account for 20% of total sales of new cars by 2025 (State Council, 2020). Indeed, by the end of 2020 China had decreased its CO_2 emissions per unit of GDP (carbon intensity) by 48.4% against 2005 levels—thereby achieving the objective of 40–45% reduction in carbon intensity by 2020, as per the 2009 Copenhagen Accord, ahead of schedule (State Council Information Office, 2021). Reducing coal consumption is a cornerstone task in reducing carbon emissions. Having constituted more than 70% of China's energy consumption in earlier decades and as lately as 2011 (China Statistical Bureau, 2021), coal is now stipulated to make up no more than 56% of the energy mix for 2021 (Xu & Singh, 2021). Reducing the share of coal share is positive—but as total energy consumption has increased over the years, so have carbon emissions. President Xi has announced that coal use is set to peak in 2025, and be reduced thereafter (Stanway, 2021).

Importantly, China has set "30.60" dual decarbonization goals peaking carbon emissions by 2030 and reaching carbon neutrality by 2060 (Heggelund, 2021). It has enhanced the Nationally Determined Contribution goal of reducing GDP carbon intensity by at least 65% compared to 2005, an increase from the previous goal of 60–65% ("Full text: Remarks by Chinese President," 2020; National Development and Reform Commission [NDRC], 2015). In addition comes the Action Plan for peaking CO_2 emissions, with targets and preparation at the province level and some major emitting sectors announced at the National People's Congress in 2021 (State Council, 2021). The national ETS is seen as one of several policy tools for reducing greenhouse gas (GHG) emissions, as a key policy supplemented by other policies to promoting emissions mitigation.

4. China's National Emissions Trading Scheme

China has continuously adjusted its policy in the preparatory process to its ETS, and internal learning has already led to revised, possibly improved, policies. The national ETS, under preparation for the last decade, has moved from the planned capacity-building phase to the first compliance phase. The first few years of the national system were initially seen as a period for capacity-building and learning, particularly through pilot projects (Stensdal et al., 2018, p. 181).

4.1. Development and Status of the Carbon Market

China decided to establish a carbon market in the 12th Five-Year Plan (2011–2015), as part of its policy to "let the market play a fundamental role in resource allocation" (NDRC, 2011). According to the 2015 China–US Joint Presidential Statement on Climate Change, China planned to start its national ETS in 2017, covering such key industry sectors as iron and steel, power generation, chemicals, building materials, paper-making, and nonferrous metals. A notice and a plan were issued which set the course for the coming years (NDRC, 2017a, 2017b). Later it was decided to begin with the largest-emitting sector—power—and initially cover coal- and gas-fired power plants (International Energy Agency [IEA], 2020; NDRC, 2017a, 2017b). The plan outlined a test period which would run until 2020, with one year to set up the system and another year to simulate the market before real trading began: This was termed "construction period" by some (Hove et al., 2021; NDRC, 2017a). The ETS finally started operation in July 2021 and began online trading of emissions permits. The first phase covers 2,225 companies from the power sector, with a minimum of 26,000 tCO_2 equivalents each in annual emissions in any year during the period 2013–2019 (Ministry of Ecology and Environment [MEE], 2021). Initially, the ETS will cover nearly 40% of China's CO_2 emissions in the power-generation sector (Liu, 2021). In December 2020, having solicited public opinion, the Ministry of Ecology and Environment (MEE) issued trial rules for its national ETS, "Administrative Measures for Carbon Emissions Trading (Trial)," on these measures (MEE, 2021). Further, the MEE issued the "2019–2020 Cap Setting and Allowances Allocation Plan (Power Generation Sector) of China's National ETS" (MEE, 2020). The Administrative Measures, effective as of 1 February 2021, provide the regulatory basis, marking a significant step towards operationalization (MEE, 2021; Reklev, 2021a). The first compliance cycle, January 2021 to December 2021 (Chen & Qian, 2021, p. 11), will cover emissions from 2019 and 2020 for power-sector companies. The trading platform is based in Shanghai, perhaps because of its role as a financial centre as well as its continuous compliance rate (International Carbon Action Partnership, 2021). The registry is situated in Wuhan, Hubei, a major city in central China. They were

selected through a bidding process. Both Shanghai and Hubei were pilots since 2013, and have provided valuable lessons as to setting up a national carbon market.

4.2. Governance Structure for the National Emissions Trading Scheme

According to the Administrative Measures (MEE, 2021a), China's national ETS is to have a multi-level governance system: a CO_2-intensity-based trade scheme with unified rules for all province-level regions. The central authority will issue the regulations and overall allocation targets/quotas, while the provinces have responsibility for implementation and distribution of allowances to the enterprises, in accordance with rules established by the central authority. Responsibility for overseeing compliance with rules is assigned mainly to the province authorities.

In the 2018 governmental reshuffle, the MEE was given responsibility for the climate portfolio, including the carbon market ("China to establish ministry of ecological environment," 2018). The National Development and Reform Commission (NDRC) had been in charge of climate policy and the development of the carbon market from 2011 to 2018, laying much of the ground for ETS in China. Particularly important was the personal involvement of the then-NDRC vice-chairperson Xie Zhenhua, China's climate-change envoy. As the head of the State Environmental Protection Administration (now the MEE), he was also responsible for the SO_2 trading pilot in the late 1990s and early 2000s (Hart & Ma, 2014; Zhang et al., 2016). Although the SO_2 pilot was not deemed a success, it may have provided some lessons/experience relevant to the ETS, particularly for the MEE, now in charge of the ETS. The 2018 decision was reversed in May 2021, and responsibility for coordinating the efforts for dual carbon targets was returned to the NDRC, which was to take the lead in preparing a plan for emission cuts, and roadmaps with goals for cleaning up carbon-intensive sectors ("China puts most powerful agency," 2021). This included establishing an office for a "leading group" of high-level officials, like one Vice Premier, the Ministers of Ministries and Commissions such as Finance, the NDRC, Science and Technology, Ecology and Environment, Industry and Information Technology, and the state-owned Assets Supervision and Administration Commission, among others ("China puts most powerful agency," 2021; "High specifications!," 2021). The MEE would retain responsibility for the carbon market.

On the one hand, the reorganization/creation of the MEE and local environmental authorities entailed some delays: Staff responsible for climate change moved over to the MEE from the NDRC, and new capacity-building needs arose because the staff of the local authorities were not familiar with the ETS and lacked relevant capacity. As the MEE was charged with both climate change and environmental issues, the intention was for the ministry to coordinate the two areas, even contribute to better/stricter enforcement of climate policies in general. With its inspection and monitoring experience in the provinces, the MEE would be able to follow up closely on implementation. Additionally, the consolidation of environmental responsibilities in one ministry would help to align various environmental strategies and policies, including the carbon market. One concern that was raised was that the responsibility for energy policy remained with the NDRC and the National Energy Administration (NEA)—necessitating close coordination among the MEE, the NDRC, and the NEA. The NDRC has considerable influence on climate policy through its macro-economic, social development, and energy policy (Hart et al., 2019). Now, with the recent change, and the NDRC back at the helm of carbon work in China, some of the coordination challenges might perhaps diminish.

4.3. Learning From Pilots: Market Design and Regulations

In China it is common to run pilot schemes—an institutionalized *internal-learning* mechanism: "Any major policy to be implemented nationwide must first be piloted in certain regions to test its applicability and to identify possible improvements to be made" (Duan et al., 2017, p. 59). Seven pilots were launched in 2013 and 2014: in Beijing, Tianjin, Shanghai, Guangdong, Shenzhen, Chongqing, and Hubei, representing a range of economic, social, and geographic criteria. The intention was to gain experience and learning from different ETS designs to inform the design of the national ETS. The pilots were stand-alone markets with differing designs based on local conditions. These piloting regions were granted full flexibility, thus ensuring diversity. Local economic and energy circumstances influenced many design details, particularly in choices on sector coverage and allocation approaches (see Heggelund et al., 2019, Table 1). Moreover, the pilots received extensive capacity-building training from international partners, which has been found to facilitate diffusion and policy transfer (see Biedenkopf et al., 2017, Table 2).

A few examples of lessons from the pilot systems into the national system: *Permits* are to be handed out mainly for free at the beginning, with a benchmarking approach based on actual output of the installations covered. Using real output rather than historical output for allocation enables adaptation to other industrial development policies such as phasing-out of over-capacity, and has been widely tested in the pilots. The shift from historical output-based benchmarking and the grandfathering approach to actual output-based benchmarking approach in some pilots also affected the choice of free allocation approaches in the national system (Deng et al., 2018). Companies would be less reluctant to join the national market if the burden were low initially. *Auctions* were tested in some pilots, but were not used in the national ETS, although they may be introduced gradually (Hove et al., 2021, p. 62) Additional costs of buying

allowances through auctions entail increased costs for enterprises (Slater et al., 2020, p. 39, text box). Some pilots, as in Guangdong, tried to earmark auction revenues for low-carbon development purposes but found this very difficult due to objections from the local finance authorities, who preferred to include the revenues in the general budget. This has also been experienced concerning the design of China's national system.

Further, *regarding price fluctuations control*, the national ETS introduced a price-stability mechanism to limit the daily price swing to within 10% (Liu, 2021). In 2015, Shanghai changed the rules for dealing with rapid drops in allowance prices, which resulted in the Exchange limiting the daily price variation from 30% volatility (the price was not allowed to decrease/increase more than 30% in one day) to 10% volatility (Heggelund et al., 2019, Table 1; Stensdal, 2020).

As to *compliance enforcement*, most pilots tested a comprehensive set of rules, including financial penalties. Due to legal constraints, the highest financial penalties for non-compliance in pilots (except Beijing and Shenzhen) have been very limited, necessitating the use of other forms of punishment. This proved a wise choice, laying a solid practice foundation for the development of a national system which would face the same legislative challenge (Duan & Zhou, 2017). The national ETS Administrative Measures (MEE, 2021a, Art. 39) set fines between 10,000 and 30,000 CNY for non-compliance and/or falsified information. In the draft ETS regulations, much higher penalties are proposed, in line with the market value of the outstanding allowances, in the case of a sufficient number of allowances not being surrendered.

The *Monitoring Reporting and Verification* (MRV) *system* has been developed gradually; by 2016, there were 24 sectoral guidelines for accounting and reporting of emissions from enterprises (Duan et al., 2017). In the development of these guidelines, MRV rules in the pilots have been an important reference, and the experiences and lessons learnt during their implementation have been taken into consideration, mainly through the intensive involvement of relevant pilot experts. The MRV rules in the pilot projects have undergone a continuous process of improvement; new experiences and lessons have also been taken into account in fashioning MRV rules for the national system, including the March 2021 Guidelines for Accounting of GHG Emissions and Reporting for Power Generation Units and the Guideline for Verification of Enterprise GHG Emissions Report (MEE, 2021b).

Also the *legal basis* for ETS has evolved gradually, based on learning experiences. To prepare the ground for the ETS, the NDRC issued Interim Management Rules on Emissions Trading in December 2014 (NDRC, 2014). In early November 2020, the MEE issued a draft of the "Administrative Measures for Carbon Emissions Trading (Trial)" for public comment; the measures were formally announced in December 2020 following consultations (MEE, 2021a). This document clarifies/adds several design aspects of the national carbon market not specified previously, such as the ratio of offset credits for company compliance and the financial penalties for non-compliance (Slater et al., 2020, p. 1). However, both the Interim Management Rules and the Administrative Measures are ministerial decrees, low in the legal hierarchy, and cannot establish certain rules, e.g., high financial penalties for non-compliance. Both the NDRC and the MEE when acting as the ETS authority have been pushing hard for a State Council regulation on the national ETS. The NDRC submitted to the State Council a proposed version of the State Council Regulation in 2015, but no significant progress was made until the government restructure in 2018. In 2019 the MEE submitted its proposed version of an interim State Council Regulation. After intensive consultations between the MEE and the Ministry of Justice, responsible for the drafting of State Council regulations, and other relevant ministries, the State Council included in its work plan for 2021 the drafting of an interim regulation on the national ETS, indicating the high possibility of release of the interim regulation in 2021. In the process of drafting both the ministry decrees and the proposed (interim) State Council regulation, pilot experiences concerning ETS legislation have been given careful consideration, also through written input and workshops.

4.4. Key Learning Points Going Forward

China began planning for a national ETS more than a decade ago. From the beginning, a stated intention has been to learn and draw on experiences in the pilots for the national ETS. Now the national ETS has begun real trading. Here we raise four matters of relevance to the implementation process.

First, after having indicated that eight sectors would be covered, it was eventually decided, in 2017, to begin with the power sector. This would seem a good decision as the national ETS will initially cover nearly 40% of China's CO_2 emissions in the power-generation sector, which amounts to 15% of global CO_2 emissions (Liu, 2021). It underlines the importance of management of the coal sector that will be essential if China is to meet its climate goals and other sustainable energy goals (IEA, 2020). The statistical system in the power sector is relatively complete, making the availability and quality of data in the sector needed for ETS design and operation better than those in the other sectors. Further, the power sector consists of many state-owned enterprises, that might be easier to control in an initial phase. Gas plants are exempted from surrendering allowances in the first compliance period, but may be asked to do so later (MEE, 2021b; Refinitiv, 2021b). With a few years of internal learning based on the power sector, it is important to include other sectors as soon as possible; otherwise, ETS efficiency in curbing emissions will be reduced accordingly. There is no specific timeline for including seven additional selected sectors, but cement and electrolytic

aluminium producers seem likely to be included during 2022 (Reklev, 2021b).

Moreover, the power sector, where substantial reforms are being implemented in parallel with the carbon market, may affect carbon trading (IEA, 2020). The power-sector reform was launched in 2015, and if not carried out effectively, it could impact negatively on the ETS. The sector is still largely managed by administrative mechanisms, and is not market-based (Liu, 2021). Experts recognize the need to speed up power-sector reforms to enable a good start for the ETS (Liu, 2021).

Second, unlike the case of other carbon markets, the initial emissions cap of China's national ETS is intensity-based, not absolute. Here the pilots' experiences provide examples that "cap-and-trade" systems can function in China too. The reasons for choosing an intensity-based cap probably stem from efforts to ensure cohesion between the ETS and other climate and energy policies, as described in Section 3. Also, according to Slater et al. (2020, p. 4), the government has deemed carbon intensity "as best suited to achieve the dual demands of economic growth and emissions reduction." However, an absolute cap is expected to be introduced before 2030 (Refinitiv, 2021b). This also relates closely to the next point: carbon price.

Third, the carbon price has been in focus, as a low price would undermine the ETS. China's pilot projects have greatly varying experiences with price levels, but none had prices high enough to incentivize changing the companies' emissions trajectories. The lesson for the national ETS is that the carbon price should be higher than the case in the pilot markets (ranging from 2–60 CNY per September 2021). It is not possible to borrow allowances from the national system; moreover, regional allowances may not be used in the national system. As such, the pilots are closed circuits, and will not link to the national market, although enterprises in the power sector that are based in pilot regions will be included in the national ETS. In the national market, allocations are free now, but this could change, as described in the Measures (MEE, 2021a, Art. 15). This may be a lesson from the pilots: Easing companies into the scheme makes for more willing participants than if there are additional expenses (like buying allowances) from Day One. The first allowances in the national market traded in July 2021 were a batch of 160,000 tonnes of emissions at 52.78 CNY (€6.8) each, totalling 7.9 million CNY (Refinitiv, 2021a), but prices have since dropped to around 40 CNY/t (€5.2/t). Several aspects influence the carbon price, and including the other sectors might impact positively. Also, setting an absolute cap is likely to increase the price (Refinitiv, 2021a).

Finally, coordination is essential. Being subnational entities, the pilot markets could not offer in-depth lessons on organizational coordination. The national scheme is managed by the national bureaucracy, and implemented by the provincial authorities. The NDRC is now back at the helm of national carbon efforts, with responsibility for leading some key carbon mitigation and energy issues. The NEA retains responsibility for the energy sector, and active coordination with the MEE is essential on the carbon market. The shifts regarding responsibility for China's climate-change portfolio have entailed certain costs, such as time delays, staff movements, and need for additional capacity-building. Furthermore, attention must be paid to competing policies with the ETS, such as the trade in energy-use rights in four pilot regions. If successful, national expansion would allocate energy-consumption quotas to companies, which will have to eliminate outdated capacity or buy extra quotas if they exceed the limit (Slater et al., 2020, p. 42).

In sum, despite some delays, the preparatory decade has been used well, demonstrating the flexibility and dynamics of the system. As to company readiness for the ETS, the carbon pricing survey (Slater et al., 2020, p. 33) finds that companies in the pilot projects that were given training are now prepared for the ETS. This underscores the importance of learning and capacity-building in the preparatory period. Moreover, the implementing period still centres on learning and experience aimed at improving the ETS.

5. Concluding Remarks: Potential for International Success?

Good policies frequently take time. Often the lag is caused by political brokering and differences, and not a deliberate period of education and learning. This has also been the case with the ETS in China. Some delays have been due to differing interests and bargaining among stakeholders, organizational reshuffling, and, more recently, Covid-19. However, *internal learning* has remained crucial to the development of China's ETS. This learning has involved dedicated learning, as well as unplanned learning along the way. At some point, any policy must enter into force in order to address the policy issue, despite possible shortcomings. The authorities should continue the "learning mentality" into national ETS operations. Learning will also be central in case China decides to link internationally.

International markets are seen as a cost-effective way of reducing GHG emissions. The market mechanisms in Article 6 of the Paris Agreement are still under negotiation, but existing markets have linked up. Examples include the EU and Swiss ETS systems, and the Western Climate Initiative, covering markets in California, Nova Scotia, and Quebec. China's ETS, as the largest emissions trading programme in the world, will be pivotal in any international market. Indeed, there is interest in linking with China. Since 2016, China has participated in trilateral talks with Japan and South Korea on a linked East Asian market (World Bank, 2016), although little has materialized as yet. Furthermore, the EU, which devoted nearly €3 million to the EU–China Clean Development Mechanism Facilitation Project 2007–2010, has been keen to ensure the success of China's ETS (Biedenkopf

et al., 2017, p. 102), and research has studied potential effects of linking the Chinese and EU markets (Li et al., 2019).

Wisely, Chinese officials have stated that China is currently more concerned with its domestic market than with linking (Timperley, 2018). As discussed in Heggelund et al. (2021), linkage at some point in the future seems more feasible. Future international markets will not depend solely on China: Several other factors are crucial for making linked markets. The uniform carbon price and reduced carbon leakage offer advantages for cost-effective emissions reduction and levelling the playing field for industries cross-nationally, but there are challenges as well. The economic and political costs can be high. Power distribution among the linked authorities may be imbalanced, in turn affecting operation of the linked markets. China is a major country, also in terms of its ETS. Countries differ in their purchasing power, so linking may entail strong distributional effects. As an ETS is usually not the only mitigation policy, other regulations such as taxes and subsidies may impede the levelling of the playing field that linkage provides. Creating an ETS is complicated—linking two or more markets is an even more complex endeavour. Here, China's domestic process can offer lessons. China's ETS has been 10 years in the making, with emphasis on internal learning, time, and communication; likewise, learning between the markets' governments is a condition for successful linking. Such a learning period should include surveys of other relevant policies of the participating countries, discussions of distributional effects, and how to deal with future possible challenges.

The East Asian trilateral talks facilitate learning across the three countries, and may prove invaluable, should they decide to link their markets. Further, linked markets need to be compatible in such aspects as price and supply management, and offset regulations. If one market is already operating and another is under development, it may make sense to adapt to the existing market. If two or more markets are already operating, a slow, stepwise process of convergence, with a focus on learning, may help to lay the foundations for success.

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Conflict of Interests

The authors declare no conflict of interests.

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Article

Carbon Pricing in the US: Examining State-Level Policy Support and Federal Resistance

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Abstract
Carbon pricing is a key policy instrument used to steer markets towards the adoption of low-carbon technologies. In the last two decades, several carbon pricing policies have been implemented or debated at the state and federal levels in the US. The Regional Greenhouse Gas Initiative and the California cap-and-trade policy are the two regional policies operational today. While there is no federal policy operational today, several carbon pricing proposals have been introduced in Congress in the last decade. Using the literature on interest group politics and policy entrepreneurship, this article examines the carbon pricing policies at the subnational and federal levels in the US. First, the article explores the evolution of two main regional carbon pricing policies, the Regional Greenhouse Gas Initiative and California cap-and-trade, to identify how interest groups and policy entrepreneurs shaped the design and implementation of the respective policies. Second, the article details the federal carbon pricing policy proposals and bills discussed in the last decade. Third, it examines the factors that limit the prospects of realizing an ambitious federal carbon price for pursuing deep decarbonization of the US economy. The article finds that federal carbon pricing in the US suffers from the lack of any natural and/or consistent constituency to support it through policy development, legislation, and implementation. While interest group politics have been mitigated by good policy entrepreneurship at the subnational level, the lack of policy entrepreneurship and the changing positions of competing interest groups have kept a federal carbon pricing policy from becoming a reality.

Keywords
allowance allocation; cap-and-trade; carbon price; carbon tax; clean energy standard; deep decarbonization; green new deal; interest group politics; policy entrepreneurship; revenue allocation

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1. Introduction

Since the establishment of the United Nations Framework Convention on Climate Change in 1992, many countries have implemented climate mitigation policies to promote the innovation, production, and consumption of clean energy technologies. Several countries favor market-based policy instruments such as carbon pricing to decarbonize their energy systems. As of 2020, more than 40 national and 20 subnational jurisdictions worldwide have priced carbon explicitly by implementing emissions trading systems (ETS) or carbon taxes (World Bank, 2021). The world is, however, replete with less stringent carbon pricing systems, in which price signals are not high enough to trigger the structural transitions necessary to limit global temperature rise to the 1.5 °C agreed in Paris. The average global price on carbon among countries with an explicit carbon pricing policy

stands at just $2 per ton of greenhouse gas (GHG) emissions (World Bank, 2021). Besides, the mere existence of a carbon price is being used as an excuse by fossil-fuel-based business interests to remove other regulatory and fiscal policies that play a crucial role in decarbonizing an economy (Markard & Rosenbloom, 2020).

In this context, the article discusses how interest groups and policy entrepreneurs shape the likelihood and stringency of a carbon pricing policy, with examples drawn from the US experience. The article explores how the alignment or misalignment among business and environmental interest groups, and the extent or lack of policy entrepreneurship, shapes the likelihood of implementing a new carbon pricing policy or increasing the stringency of an existing carbon pricing policy at the federal and state level in the US. This article first provides an overview of how interest groups and policy entrepreneurs shaped the two most established subnational carbon pricing systems, the California cap-and-trade program, and the US Northeast Regional Greenhouse Gas Initiative (RGGI). Second, it assesses the role of interest groups and policy entrepreneurs around other carbon pricing proposals introduced at the federal level in the US but not enacted. Third, the article compares how similar interest groups shape policy outcomes differently at the subnational and federal levels. Finally, the article discusses the prospects for a federal carbon pricing policy under the current Biden administration and for deep decarbonization of the US economy.

2. Theory and Methodology

Scholars have looked at the political economy factors that determine a polity's choice between a carbon tax and an ETS (Skovgaard et al., 2019; Steinebach et al., 2021) and the design elements that help build public support for a specific carbon pricing instrument (Drew, 2010; Raymond, 2019). Scholars have also emphasized the policy traditions and political history that shape climate policy in a country (Anderson et al., 2020; Wettestad & Gulbrandsen, 2017). Few studies, however, have looked at how various "political forces" shape the prospect and evolution of carbon pricing policies (Ike, 2020; Jevnaker & Wettestad, 2017; Markard & Rosenbloom, 2020; Meckling, 2011; Rabe, 2016; Skocpol, 2013). This article contributes to this growing literature by studying various carbon pricing policies and proposals at the subnational and federal levels in the US.

"Political forces" in climate policy comprise various business and environmental "interest groups," climate "policy entrepreneurs," and "veto actors" with the power to push or pull a policy through the policy-making process. The literature on "interest groups" generally considers business interests to be more cohesive and influential than environmental interests, perhaps due to their role in the economy and their potential to create value and employment (Jevnaker & Wettestad, 2017). Markard and Rosenbloom (2020) use the European Union (EU) ETS to show that business interests are also divided and actively struggling to decide the course of climate policymaking. Jevnaker and Wettestad (2017) argue that EU ETS reform became possible primarily due to differing positions among business interests and alliances between members of the business community and policy entrepreneurs. Rabe (2016) argues that RGGI's success was primarily attributable to the expertise and efforts of "policy entrepreneurs" who seized political opportunities to implement the program and ensured that program benefits reached multiple business and environmental "interest groups." Nevertheless, Ike (2020) shows how a small cohesive set of "veto actors" were able to dismantle Australia's carbon tax policy.

Comparing the efforts to pass the Waxman-Markey cap-and-trade bill with the comprehensive healthcare reform bill in the US, Skocpol (2013) argues that the lack of an advocacy group to mobilize support for the cap-and-trade policy was the main reason for its failure to pass in Congress. By studying several carbon pricing policies and proposals over time, we find that while many advocacy groups have emerged and supported various carbon pricing proposals in Congress since Waxman-Markey, the constellation of supportive actors has been inconsistent over time. While the constantly changing interest group politics have been managed by good policy entrepreneurship at the subnational level, a lack of this policy entrepreneurship, combined with the increasing complexity of interests within and between different interest groups, has kept a carbon pricing policy from becoming reality at the federal level in the US.

We conduct a document analysis of academic articles, government reports, and media mentions of carbon pricing policies and bill proposals in the US to identify the constellation of interest groups that support or oppose a particular policy or bill proposal and how well policy entrepreneurs have managed interest group politics to implement carbon pricing at the subnational and federal level. We also look at public statements and reports by industry and environmental groups to assess their support or opposition to a carbon pricing policy or proposal. We use Wilson's typology of optimal policymaking to explain how interest groups and policy entrepreneurs shape the likelihood of a carbon pricing policy at the subnational and federal levels in the US. Wilson's typology of optimal policymaking defines the conditions under which various political forces influence policymaking (Wilson, 1980; see Table 1). When the cost of a policy is dispersed, it leads to *client politics* or *majoritarian politics* depending on whether the benefits of a policy are concentrated or dispersed, respectively. However, when the cost of a policy is concentrated, it gives rise to *interest group politics* and *entrepreneurial politics* depending on whether the benefits are concentrated or dispersed.

Scholars have argued that the cost of a carbon pricing policy is often concentrated on specific industries based on their: (a) "asset specificity" (i.e., industries

Table 1. Reinterpretation of Wilson's typology.

Benefits of Regulation	Cost of Regulation	
	Concentrated	Dispersed
Concentrated	interest group politics	client politics
Dispersed	entrepreneurial politics	majoritarian politics

Source: Wilson (1980).

that have invested in durable physical assets and natural resource endowments; Jenkins, 2014), and (b) emissions intensity and exposure to trade (Aldy & Pizer, 2015). In addition, such industries in the US are concentrated in specific regions (Broekhoff et al., 2021) giving rise to region-specific interests and politics (Skocpol, 2013). While some industries pass the cost on to the consumer in the form of higher prices for goods (Jenkins, 2014), emissions intensive and trade exposed (EITE) firms lose market share to international competitors who operate in a jurisdiction without a carbon price (Aldy & Pizer, 2015). Nevertheless, scholars have shown that EITE firms can also disperse their costs with the help of supplementary policies (Dobson & Winter, 2018). While protection for EITE firms may be warranted due to the legitimate concerns of carbon leakage (Dobson & Winter, 2018), policy design calibrations and supplementary policies arise from policy entrepreneurs engaging with different industry stakeholders over time, making the Wilson typology an appropriate framework for studying how interest groups and policy entrepreneurs work together to shape policy design and implementation. While interest groups attempt to get economic benefits in return for the policy costs incurred, policy entrepreneurs help direct the economic benefits of a carbon pricing policy through policy design calibrations such as the creation of specific allowance allocations and redistribution of revenue to certain actors, thereby weakening the cohesion of interest groups and stimulating the emergence of diverse interests (Patashnik, 2014; Wilson, 1980).

3. Carbon Pricing in the US

This section first introduces the two subnational carbon pricing policies in the US and then evaluates the attempts to implement federal carbon pricing legislation over the last three decades.

3.1. Regional Greenhouse Gas Initiative

RGGI, the first cap-and-trade policy in the US for regulating carbon dioxide (CO_2) emissions, covers power sector CO_2 emissions in eleven northeastern states—Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, New Jersey, Rhode Island, Vermont, and Virginia. RGGI is a good example of gubernatorial policy entrepreneurship in the US (Biedenkopf, 2017). In 2003, then Governor George Pataki of New York invited his counterparts from northeastern states to discuss the possibility of curbing CO_2 emissions (Regional Greenhouse Gas Initiative [RGGI], 2021a). Discussions between the states and subsequent negotiations with public and private stakeholders led to signing a Memorandum of Understanding (MOU) between the original seven northeastern states in December 2005 to secure respective state legislative and regulatory approvals for a regional cap-and-trade program (RGGI, 2021b).

3.1.1. Program Design

RGGI set a goal of stabilizing CO_2 emissions from the power sector at 2009 levels (based on the modelling assumptions made in 2005) through 2014 and reducing emissions by 10 percent (2.5 percent every year) by 2019 (Kretzschmar & Whitford, 2012). In 2006, environmental agency officials from various RGGI states reached an agreement to ensure that each state auction at least 25 percent of its allocation of emission allowances. Allowances were distributed through quarterly auctions conducted in a sealed-bid and uniform-price format (International Carbon Action Partnership [ICAP], 2021a). To avoid bidder collusion and ensure revenue generation, RGGI set a reserve price of $1.86 in 2008, increasing it to $2.26 in 2019 (Kretzschmar & Whitford, 2012). Allowance holders were allowed to bank them for future use, and no single party was allowed to purchase more than 25 percent of emission allowances in a single auction to avoid potential market manipulation. In a show of gubernatorial entrepreneurship in 2006, Governor Pataki decided to auction 100 percent of New York's allowances, motivating other RGGI state legislatures to endorse the full auctioning of emission allowances before beginning the first auctions in September 2008 (Huber, 2013). Between 2008 and 2019, RGGI states sold about 80 percent of the emission allowances through 44 auction rounds, generating more than $3.2 billion in revenue and retired the unsold allowances (Ramseur, 2019).

RGGI policy entrepreneurs exploited the cleavages within the US power sector interest groups and introduced allowance auctioning. While power generation companies complained that auctioning would impose a substantial cost on them and pushed for grandfathering of allowances, restructured investor-owned utilities like National Grid supported the sale of allowances, with proceeds from the sale benefiting consumers through electricity bill rebates or other means (Cook, 2010).

RGGI policy entrepreneurs decided to allocate the auction revenues to improve energy efficiency, mitigate ratepayer impacts, and promote renewable technologies (ICAP, 2021a). This garnered the support of environmental interest groups, who were often searching for state funds to support energy efficiency improvement initiatives (Huber, 2013). Besides, large industrial users of electricity that were not regulated under RGGI liked the idea of benefiting from energy efficiency programs, even if their electricity rates increased.

3.1.2. Program Evolution and Politics

Since the program's start in January 2009, RGGI policy design has changed little, except for the 44 percent cap reduction for the 2014–2030 trading period (from 165 to 91 mtCO_2 relative to 2012 emission levels) to account for the reduction in demand from energy efficiency improvements and the economic recession of 2009 (Narassimhan et al., 2018). While RGGI has operated for more than a decade without significant changes to its design, there have been uncertainties in terms of subscription. Driven by state-level partisan politics, states have moved in and out of the program, highlighting the vulnerability of a voluntary regional cap-and-trade program with a legal basis residing in the respective states. Policy entrepreneurship motivated by political ideology, however, has brought states back into RGGI. In 2005, Massachusetts left RGGI despite signing the MOU. Republican Governor Mitt Romney directed the state's environmental regulators to develop a stand-alone cap-and-trade policy instead (Cook, 2010). Subsequently, Democratic gubernatorial candidate Deval Patrick used RGGI as a wedge issue in the 2006 elections and brought back Massachusetts into RGGI in January 2007 after becoming governor (Bausch & Cavalieri, 2007). New Jersey and New Hampshire faced significant interest group pressure, specifically from electric power generators opposing the full auctioning of emission allowances, with state legislative votes on the issue being far more contentious and closer than in any other state joining RGGI (Huber, 2013). In 2011, Republican Governor Chris Christie of New Jersey pulled the state out of RGGI, forcing RGGI to temporarily reduce the emissions cap (RGGI, 2021c). After nine years, Democratic Governor Phil Murphy reenrolled New Jersey in RGGI in 2020, with a 30 percent reduction in the overall cap for the state from 2020 to 2030 (Center for Climate and Energy Solutions, 2021). Finally, Maine's Republican Governor and the state legislature passed legislation that would remove the state from the program if most member states exited (Huber, 2013).

The Trump administration's reversal of federal climate policies also motivated more states to take climate action at the subnational level. In 2020, Virginia enacted the Virginia Clean Economy Act and directed its state pollution control board to adopt RGGI regulations to create a cap-and-trade policy. Similarly, Democratic Pennsylvania Governor Tom Wolf directed the Pennsylvania Department of Environmental Protection to pass a rule that will enable the state to join RGGI in 2022 (Bell & Mallinson, 2021). The Republican state legislature has condemned the governor for executive overreach as well as indifference towards the livelihoods of Pennsylvania citizens (Bell & Mallinson, 2021), indicating the risk involved in a policy pathway that relies upon executive branch regulatory authority and could be overturned should the governorship change parties.

Finally, while RGGI is expanding its geographical coverage, state-level electoral politics continue to constrain its ability to increase the stringency of the emissions cap or expand coverage to other GHG emitting sectors. The prevailing carbon price of \$8.38 per ton of CO_2 emissions is just one-sixth of the \$51 per ton social cost of carbon at a 3 percent discount rate in 2020 as recommended by the current US government to justify the costs and benefits of climate regulations (Chemnick, 2021). Despite low prices, CO_2 emissions from the electricity sector in the RGGI states have fallen 60 percent between 2009 and 2021, perhaps due to the long-term policy signal created by the ETS and recycling of auction revenues to finance energy efficiency programs. Other complementary policies to promote energy efficiency and low-carbon investments have likely also played a significant role (Murray & Maniloff, 2015). Nevertheless, the long-term policy signal created by the RGGI establishment seems to have convinced stakeholders in the region that decarbonization was inevitable, so high-carbon power plants have consistently been replaced by lower-carbon alternatives.

3.2. California Cap-and-Trade Program

The cornerstone of California's almost two-decade-long efforts to reduce economy-wide GHG emissions is the state's cap-and-trade program. Since the program's inception in 2012, it has undergone numerous regulatory and legislative changes that have expanded and altered the program's scope. These changes have largely been in response to business, environmental justice, and community stakeholder lobbying (Bang et al., 2017). The enabling legislation for the program is the state's Global Warming Solutions Act (Assembly Bill [AB] 32), passed in 2006 and signed by Republican Governor Schwarzenegger, requiring California to reduce emissions to 1990-levels by 2020 (California Global Warming Solutions Act of 2006, 2006).

3.2.1. Program Design

The program has a declining annual cap on covered emissions, covering roughly 80 percent of the state's GHG emissions. It has expanded over each compliance period to include additional GHG sources, with downward revisions in the cap, the implementation of various price controls, and changes to offset certification practices. The first pilot compliance period began in 2013 and

covered 36 percent of the state's overall emissions from large industrial facilities, large stationary combustion sources, CO_2 suppliers, in-state electricity generators, and, notably, imported electricity (ICAP, 2021b). This early decision to cover imported electricity, which was 45 percent of the state's electricity emissions at the time, was the first and only instance to date of a cross-border carbon adjustment mechanism (California Air Resources Board [CARB], 2021a). Subsequent compliance periods have expanded the scope of covered economic sectors to include natural gas suppliers and fuel and petroleum suppliers, and today covers roughly 500 entities. With competitiveness concerns and pressure from industry interest groups (Schmalensee & Stavins, 2017) and despite the opposition of environmental NGOs (Climate Hawks, 2017), policy entrepreneurs used a hybrid approach of allowance allocation with free allowances for EITE industrial facilities. Allowances are allocated freely to industrial facilities on an adjusted basis depending on their leakage risk, a function of a firm's emissions intensity and trade exposure. Total free industrial allowance allocation has declined through each subsequent compliance period but represented 31 percent of 2021 allowances (CARB, 2021b). Electric distribution utilities and natural gas suppliers make up the remainder of allowances, receiving free allowances that must be auctioned on behalf of ratepayers and used for emission reduction activities. The program has generated proceeds of $15.8 billion (CARB, 2021c) that have been allocated to numerous state environmental, transportation, and air quality improvement projects (California Climate Investments, 2019).

3.2.2. Program Evolution and Politics

The program has undergone several legislative revisions because of interest group politics. It has been subject to both state and federal lawsuits challenging its legality. Early state lawsuits sought to invalidate the law, claiming that the auctioning of allowances by the California Air Resources Board (CARB) was an illegal tax, due to a state requirement that new state taxes require a two-thirds legislative vote, and that the program's enabling legislation did not give them the authority to implement the cap-and-trade program. This lawsuit failed, with plaintiffs ultimately appealing to the state Supreme Court in June 2017, which declined to review previous state appellate court decisions, holding that the cap-and-trade program was legal and that auctioning of allowances did not represent an illegal tax (California Case Chart, 2021).

In 2017, the program was significantly altered with the passage of AB 398 by a two-thirds supermajority vote in the California legislature, which included Republican support. CARB and state legislators successfully conducted political negotiations among business groups, environmental justice organizations, and other stakeholders to design AB 398 (Arrieta-Kenna, 2017). Notably, groups that had opposed the program in the past, such as oil and gas industry groups, came out in support of AB 398, while over 50 environmental justice and progressive economic justice groups opposed the bill's continued reliance on free allowances and preemption of local air quality regulatory control (Climate Hawks, 2017; Mason & Megerian, 2017). AB 398 extended the program through 2030, providing greater market certainty. In recognition of the controversial nature of carbon offsets, the bill lowered the offset cap from 8 percent of compliance obligation to 4 percent between 2021 and 2025 and 6 percent from 2026 onward. The legislation required that no more than 50 percent of offsets come from projects that do not have a direct environmental benefit within California (California Global Warming Solutions Act of 2006, 2017). These qualitative changes to the types of offsets allowed represent a significant political victory for state environmental justice groups that argued that out-of-state offsets allowed for continued air emissions and environmental justice degradation in the state (California Environmental Justice Alliance, 2017). Business and oil interest groups lobbied successfully for benefits as well. The bill allowed for the continuation of free allowances, included provisions for businesses to preempt local air district regulation of GHGs, and limited the ability to regulate GHG emissions from oil refining to within the cap-and-trade program. The program also implemented an allowance price ceiling, beginning at $65 per allowance in 2021, increasing 5 percent annually plus inflation (CARB, 2021d).

Besides pressure from state-level interest groups, the program was challenged by the Trump administration. In May 2012, California had initiated the process to link with Québec's cap-and-trade market beginning in 2014 (CARB, 2021e). This represented the first international linkage between two subnational carbon markets, with the partners overcoming linguistic, regulatory, and national differences. The Trump administration, however, sued California in the US District Court for the Eastern District of California, claiming that the linkage between California and Québec was an attempt by the state to pursue independent foreign policy and was thus unconstitutional (US Justice Department, 2019). The US District Court rejected the government's argument in March 2020, finding that the linkage agreement between California and Québec was not a treaty and did not violate the Treaty or Compact clauses of the Constitution, further ensuring the viability of the program (US Justice Department, 2020).

While it is difficult to disaggregate state-wide emission reductions that result from the state's cap-and-trade program and other state policies, total emissions declined by 5.3 percent during the program's first compliance period between 2013 and 2017 (CARB, 2019). The lack of impressive reductions can be attributed to the fact that the electricity sector was already decarbonizing due to regulatory policies, including the first moratorium on new coal fired power plants and California's policies to support in-state renewable

power generation (California Energy Commission, 2021; California Legislative Information, 2005). On the other hand, the industry and transport sectors continue to be less sensitive to status quo carbon prices because technological alternatives such as green hydrogen for industries (Ball & Weeda, 2015) and electric vehicles for transport (Breetz & Salon, 2018) are not price competitive with their fossil fuel counterparts.

3.3. Federal Carbon Pricing Initiatives

3.3.1. Early Attempts at a Federal Carbon Price

The most successful application of market-based pollution pricing in the US was the cap-and-trade system to regulate SO_2 emissions established under the US Clean Air Act Amendments of 1990 (Stavins, 2008). The program created a robust market for SO_2 allowance trading and helped reduce SO_2 emissions by 94 percent between 1990 and 2005 (15.7 to 0.95 million tons; Environmental Protection Agency, 2019). Yet, attempts at implementing a pricing mechanism for CO_2 emissions have bedeviled policymakers for more than three decades. The first carbon tax bill was introduced in 1990 after the Intergovernmental Panel on Climate Change's First Assessment Report and faced bipartisan opposition, with some arguing that the data and science of global climate change were yet unsettled (US House of Representatives, 1990). Since then, more than 50 distinct pieces of carbon pricing legislation have been introduced in Congress. Efforts to craft bipartisan carbon pricing legislation picked up momentum in the wake of President George W. Bush's decision not to implement the Kyoto Protocol. In both the 108th (2003–2004) and 109th (2004–2005) Congress, there were numerous bipartisan efforts to pass a national economy-wide cap-and-trade system, but none gained significant traction.

With the election of President Obama in 2008, Congressional efforts to create a federal cap-and-trade policy picked up steam (see Figure 1). The House American Clean Energy and Security Act, widely known as the Waxman-Markey cap-and-trade bill (see Table 2), successfully passed the House in June 2009 but failed to pass in the Senate due to insufficient support. The House bill passed by just seven votes, garnering eight Republican votes out of a minority of 179 Republicans. But 44 Democrats voted against the bill out of a majority of 255 Democrat representatives. Besides the lack of an advocacy group to promote the bill (Skocpol, 2013), Congressional Democratic leadership and President Obama failed to navigate multiple interest groups successfully. Experts criticized the White House for failing to engage more forcefully in the legislative politics seen as necessary to passing landmark legislation (Lizza, 2010).

Electricity industry groups such as the Edison Electric Institute came out in support of the legislation, as did large utilities such as Duke Energy and chemical maker DuPont (Weiss & Wagener, 2009), while environmental groups such as Greenpeace opposed it because of its free allowance allocation, among other concerns (Greenpeace, 2010). The bill included several carve-outs, concessions, and subsidies to fossil and electricity interest groups (Broder, 2009). Free allowances made up more than 85 percent of the total allocation through 2026, leading President Obama's budget director at the time to remark that the bill represented "the largest corporate welfare program that has ever been enacted in the history of the United States" (Wessel, 2009). Despite several concessions, traditional business trade organizations, most notably the National Association of Manufacturers, the US Chamber of Commerce, and the Business Roundtable, and fossil fuel industry trade groups, including the American Petroleum Institute and American Gas Association, came out in strong opposition to the Waxman-Markey bill (Union of Concerned Scientists, 2013). Labor groups, such as the United Mine Workers Association, who lobbied for carve-outs in the House bill, ended up opposing the bill in the Senate (American Federation of Labor and Congress of Industrial Organizations, 2009).

3.3.2. Subsequent Federal Carbon Pricing Attempts

Subsequent Federal Carbon Pricing Attempts After the failure of Waxman-Markey, the Obama administration shifted towards regulatory policies implementable through executive authority granted under laws, most specifically the Clean Air Act (Reilly & Bogardus, 2016). Obama's tactical shift to a regulatory approach and the increasing public support for climate action induced a few Republicans to reevaluate their opposition to market-based policies such as carbon pricing. In 2017, two former Republican secretaries of state, James Baker and George Shultz, launched the Climate Leadership Council, an advocacy organization calling for a carbon tax of $43 per ton to halve US GHG emissions by 2035, with revenue recycled back to citizens in the form of a carbon dividend (Table 2). The proposal also includes provisions to simplify the existing Environmental Protection Agency's regulatory authority and to impose a carbon border adjustment tax to protect vulnerable EITE industries.

Congressional efforts have continued since, with 15 separate bills introduced during the 115th (2017–2019), 116th (2019–2021), and 117th (2021–2023) Congressional terms, with four bills having both Democrat and Republican co-sponsorship (see Table 2 for the most discussed bills with supporting and opposing interest groups identified; see the Supplementary Material for all bills introduced during the 115th 116th, and 117th Congressional terms; Hafstead, 2021). Table 2 builds on Hafstead (2021) data to identify business and environmental interest groups that support or oppose these federal carbon pricing bill proposals by looking for reports or public statements made by them. Almost all of these bills are carbon taxes but differ in their stringency and allocation of revenue.

Public interest in carbon taxes is evident from the Google search interest spiking around 2016 for the term "carbon tax" (see Figure 1). It is possible that given the failure of the Waxman-Markey cap-and-trade legislation or because of the inherent complexities and avenues for political rent-seeking in cap-and-trade programs, only a tax-based carbon pricing mechanism is seen as politically viable. A notable feature of all recent carbon tax proposals is the inclusion of carbon border adjustments. Scholarly evidence shows that carbon leakage is

Table 2. Subnational and federal carbon pricing policies in the US.

Policy/Bill Name; Policy Type; Year started	Prevailing or Proposed Price/ton GHG)	Policy Entrepreneurs	Interest Groups	Allowances and Revenue Use
		Subnational Policies		
• RGGI • Cap-and-trade; 2009	$8.38	Policy experts from state-level environment departments; State Governors.	• Support: Power utilities; non-power industry groups; environmental NGOs. • Opposition: Power generators.	• 100 percent allowance auctioning. • Revenue used for energy efficiency, clean energy projects, and ratepayer benefits.
• California cap-and-trade • Cap-and-trade; 2013	$17.80	CARB; State legislators.	• Initial support and subsequent opposition: Environmental justice and protection NGOs. • Initial opposition and later support: Oil and gas industry groups, power generators and utilities.	• 70 percent auctioning. • Revenue used for clean energy R&D, manufacturing, rebates to low-income communities.
		Federal Proposals and Bills		
• Waxman-Markey cap-and-trade bill • Cap-and-trade; 2009	N/A	Congressmen Markey and Waxman.	• Support: Electricity industry groups. • Opposition: Oil and gas industry groups; environmental NGOs.	85 percent free allowances until 2026.
• Climate Leadership Council (Proposal; Not a Bill) • Carbon tax; 2017	$43	Former Republican Secretaries of State James Baker and George Shultz.	• Support: Energy intensive manufacturers; electric utilities; some environmental organizations. • Opposition: Center for Progressive Reform (CPR)	Carbon dividends.
• Energy Innovation and Carbon Dividend Act • Carbon tax; 2019	$15 starting in 2020, increases $10/year.	Rep. Deutch (D-FL), 85 Democrat, 1 Republican co-sponsor.	• Support: Citizens Climate Lobby; Center for Climate and Energy Solutions (C2ES); Trout Unlimited; Evangelical Environmental Network; Business Climate Council. • Opposition: Center for Biological Diversity.	Carbon dividends.

Note: Refer to the supplementary material for all bills introduced during the 115–117th Congress. Sources: Hafstead (2021), ICAP (2021a, 2021b).

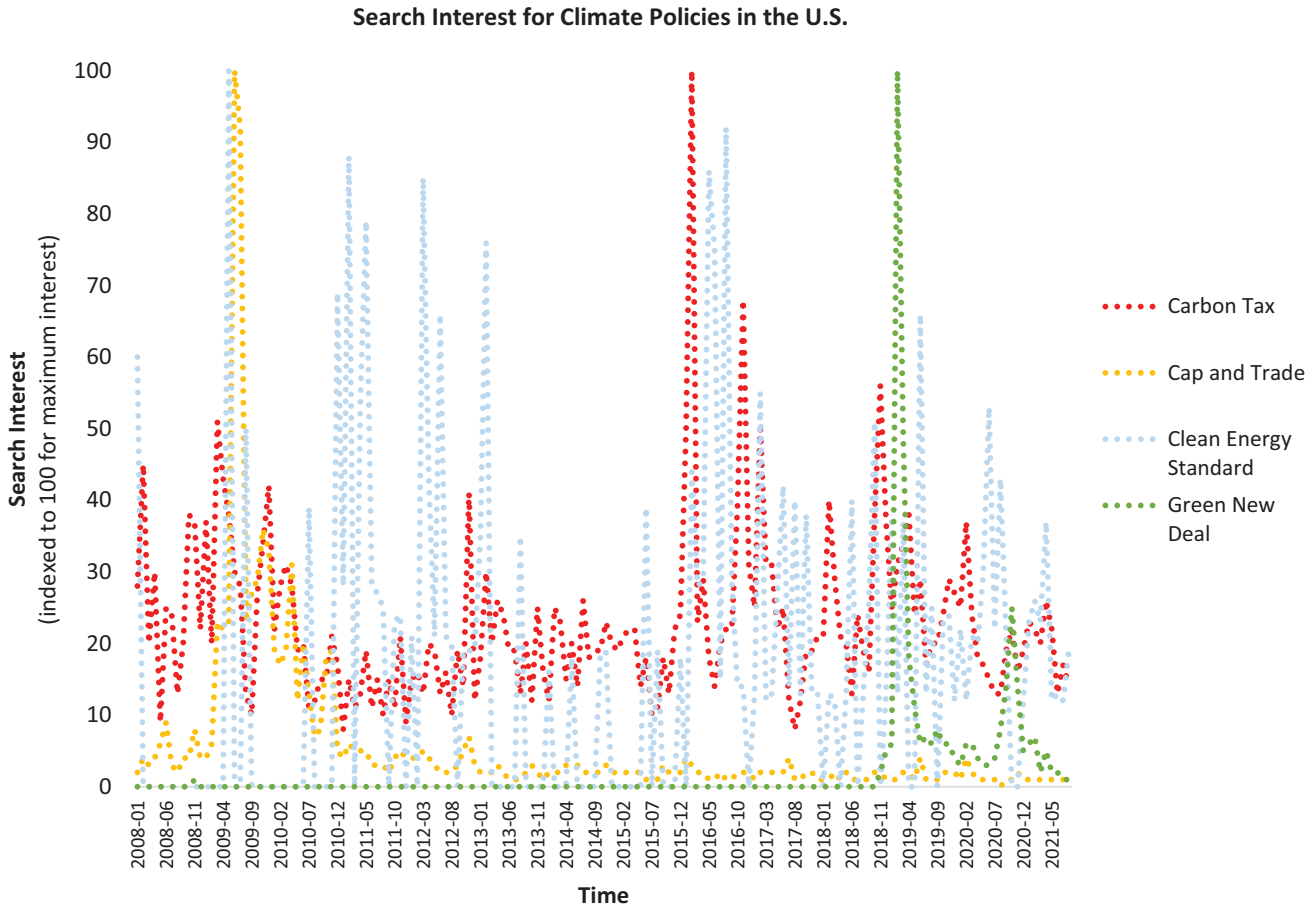

Figure 1. Search interest around key federal policies. Source: Google Trends (n.d.).

a significant problem in jurisdictions with a carbon price (Bushnell & Chen, 2012; Dobson & Winter, 2018; Fischer & Fox, 2012). Providing relief to EITE industries through supportive policies such as carbon border adjustments is seen as a political necessity in all proposed legislation to date (Venmans et al., 2020), indicating how business interests' lobbying to mitigate the cost of carbon pricing policy is met with policy entrepreneurs' legitimate concern for addressing carbon leakage.

3.3.3. Changing Political Support for Carbon Pricing at the Federal Level

Support from environmental and business interests has also evolved. In the 2000s, environmental NGOs and the carbon pricing epistemic community, including many academics and environmental think tanks, had strong links. Carbon pricing lobbies like the International Emissions Trading Association, the Citizens Climate Lobby, and the Carbon Markets and Investors Association pushed for aggressive expansion of carbon pricing coverage and reduction in emissions alongside some environmental organizations led by the Environmental Defense Fund (Paterson, 2012). Whereas in the past, environmental groups and Democratic Congressional leaders were likely to see carbon pricing as the linchpin to any national climate strategy, there was a conspicuous absence of any mention of carbon pricing in the nonbinding House Resolution that laid out the framework for the Green New Deal in 2019 (US House of Representatives, 2019). Several environmental justice groups oppose a federal carbon price because they object to the notion that polluters can pay a tax and continue to pollute near low-income minority communities, sometimes referred to as "sacrifice-zones," which already bear the burden of fossil fuel infrastructure (National Association for the Advancement of Colored People, 2021). Environmental advocates also worry that depending on how the policy is implemented, a carbon price can be regressive, disproportionately hurting low-income people (Cronin et al., 2019).

At the dawn of the Biden administration, the politics of carbon pricing underwent yet another shift. Besides a few lone Republican politicians, many more business interests came out in support of a carbon price, fearing that the administration would gravitate towards the Green New Deal and the use of non-market-based regulations such as clean energy standards (CES). A CES is a policy that mandates a minimum amount of electricity to be generated from clean energy resources. Figure 1 shows that interest in CES has increased since 2020. The American Petroleum Institute, the

Chamber of Commerce, and the Business Roundtable, who all opposed federal carbon pricing policies previously (Meyer & Neuberger, 2021), now support carbon pricing, with policy caveats such as the removal of federal emission regulatory authority or streamlining permitting requirements. Some commentators note that this offers an opportunity for fossil fuel and traditional business groups to harness their political influence to push for market-based policies (Meyer & Neuberger, 2021). However, these shifting positions may be either political manipulation or worse, disingenuous policies that are too weak to have significant emissions benefit or have no realistic chance of passing due to the many veto actors in the US legislative process (350.org, 2021). This fear was reinforced in June 2021, when an ExxonMobil lobbyist was caught in a sting operation admitting that the company's support for carbon pricing was largely a political ploy and that a "carbon tax is not going to happen" (McGreal, 2021).

4. Discussion: State-Level Embrace and Federal Resistance

This article finds that carbon pricing in the US at the federal level suffers from the lack of a consistent constituency to support it through policy development, legislation, and implementation and faces key veto actors that have consistently managed to block it. While interest group politics have been mitigated by good policy entrepreneurship at the subnational level, the lack of a consistent constituency combined with the increasing complexity of interests at the federal level have kept a carbon pricing policy from becoming a national reality. Moreover, with the shrinking timeline for climate action, interest groups have changed their positions over time and continue to be misaligned with one another when it comes to realizing a federal carbon price or ratcheting up the stringency of existing subnational carbon prices.

4.1. Policy Entrepreneurship and Interest Group Politics

The evolution of RGGI shows that policy entrepreneurship played a crucial role, winning over the interest groups with a pragmatic and initially less ambitious carbon pricing policy. RGGI policy entrepreneurs limited the program's policy space to CO_2 emissions from the electricity sector, enabling regional expansion. The electricity sector in the northeastern states has common characteristics due to shared power generation and transmission resources. Through active stakeholder engagement across RGGI states, policy entrepreneurs understood the cleavages within the electricity sector (power generators, transmission, and distribution utilities) and other industry groups indirectly affected through higher electricity rates from a carbon price. By auctioning all the emission allowances and mandating the use of auction revenues for ratepayer benefits, energy efficiency programs, and other strategic energy purposes, they ensured the support of residential and industrial consumers as well as environmental interest groups.

Policy entrepreneurship at the gubernatorial level also played a crucial role in keeping the RGGI states in the cap-and-trade system, particularly because RGGI depends on either state-level legislative support or executive environmental and air quality departments. Pennsylvania, for example, is working to join RGGI, but due to Republican majorities in the state legislature, the governor has relied on an executive branch regulatory approach, with Republican lawmakers moving to block the state from joining (Cann, 2021). Nevertheless, RGGI is vulnerable to defections if it tries to tighten the emissions cap or expand its emissions coverage to sectors beyond electricity, limiting the scope of the cap-and-trade regime as it stands today. This challenge is evident from the recent pull out of Connecticut, Massachusetts, and Rhode Island, three states with Democratic legislative leadership, from the Transportation and Climate Initiative, a cap-and-trade-like program proposed for reducing transport sector GHG emissions in the RGGI states (Roberts, 2021).

Unlike RGGI, which covers only the power sector across northeastern states, California took a more ambitious approach by implementing a comprehensive economy-wide cap-and-trade program covering all GHGs. However, the combined power of California's electricity and other industry interest groups meant that it could not capitalize on the divisions between different industry interests as RGGI did. Hence, policy entrepreneurs used a hybrid approach of allowance allocation with free allowances for EITE industries, much to the dismay of environmental NGOs. Nevertheless, the cap-and-trade policy faced several court challenges from business and oil and gas industry groups claiming it was an illegal tax. AB 398, the latest legislative update extending the program until 2030, provided significant tax breaks (funded from auction revenues) for industries, including the electricity sector. While environmental justice groups fought to get more rebates for low-income California residents and curb industrial pollution near low-income communities, policy entrepreneurs succumbed to industry pressure in the interest of the long-term stability of an economy-wide cap-and-trade. While this article did not discuss Washington state's failure to implement a carbon tax in 2016 and again in 2018, it was also an example of policy entrepreneurship succumbing to changing interest group politics and advocacy support. While both business and environmental interests opposed the policy in 2016 for its stringency and revenue allocation, respectively, a few businesses and fossil fuel interests derailed it in 2018 (Carbon Tax Center, 2018; Reed et al., 2019).

At the federal level, neither a narrow sector-focused nor an economy-wide carbon price exists today. Unlike RGGI and California, the multiplicity of veto actors at the federal level, such as the requirement for supermajorities in the US Senate to pass legislation to avoid the filibuster, makes the prospects of a carbon pricing policy

bleak. For instance, the Waxman-Markey cap-and-trade bill, introduced when Democrats held the presidency and majorities in both House and Senate, only narrowly passed in the House and failed to be brought to a vote in the Senate, with then-Senate Majority Leader Harry Reid noting that "it's easy to count to 60 [the required number of votes to overcome the Senate filibuster]…we know we don't have the votes" (Davenport & Samuelsohn, 2010). The limited success of Democratic policy entrepreneurs to convince members of their party indicates the power of multiple veto actors, as was evident in the cancellation of the carbon tax policy in Australia (Ike, 2020). The multiplicity of interest groups is also an important factor. RGGI and California's industry mix is significantly different from the mid-western and southern states which are more fossil-fuel intensive, making federal politics dominated by more industry interests than environmental groups (Energy Information Administration, 2019). Hence, any environmental legislation at the federal level in the US is likely to be a watered-down version of corresponding subnational efforts.

4.2. Shrinking Timelines and Misaligned Interests

Besides the lack of policy entrepreneurship and the multiplicity of interest groups, the priorities of different interest groups have changed over time. Previously aligning themselves as pro- and anti-climate, interest groups now align themselves as pro-climate and climate-indifferent. Industry interest groups have determined that it may be good business to theoretically support a carbon price even if they do not proactively lobby for a carbon tax or cap-and-trade system. When the Waxman-Markey bill was introduced, several industry groups unfamiliar with carbon pricing saw the policy as anti-business. Thanks to the exhaustive scholarship produced by epistemic communities over the last decade, business groups now are more familiar with the policy and understand that it provides more business certainty in the long run and is likely cheaper than complying with regulatory policies. More cynically, the business and fossil fuel industry may also be using carbon pricing as a "Trojan Horse," a strategy to divert attention from, and fend off, more ambitious climate action (Markard & Rosenbloom, 2020).

While industry interest groups increasingly favor carbon pricing legislation at the federal level, many environmental groups have changed their position to instead support the use of regulations, given the shrinking timeline for climate action. Public attitudes also favor regulations over carbon pricing policies, given the stigma associated with taxation and the growing concern about climate change (Nowlin et al., 2020). The lack of stringency in subnational carbon pricing policies and failure to implement one at the federal level has convinced many environmental groups that any carbon pricing legislation is unlikely to result in substantial emissions reduction because politically acceptable carbon prices are too low to seriously disincentivize carbon emissions (Stokes & Mildenberger, 2020) and any pricing policy is likely to include contemporaneous compensation of incumbent and/or EITE industries (Dolphin et al., 2020). Environmental organizations now tend to prefer regulatory approaches such as CES, which usually provide assurances that emissions will decrease. And, finally, environmental justice groups are concerned that a carbon price continues to allow polluters to pay a fee and pollute low-income communities without significant emission reductions.

5. Concluding Remarks: Implications for Carbon Pricing in the US

Prospects of an ambitious federal carbon pricing policy in the US appear bleak, given the contestations among industry groups and environmental organizations, the politicization of climate change, and public opinion strongly divided along partisan lines (Bryant, 2016; Nowlin et al., 2020). The urgent need to pursue deep decarbonization and reach net-zero GHG emissions by mid-century makes it unlikely that relying primarily on carbon pricing policies is a good strategy for climate advocates (Tvinnereim & Mehling, 2018). As energy journalist David Roberts wrote in a *New York Times Opinion* article in July 2021, Congressional Democrats are determined to act rapidly and at a massive scale to avoid the worst consequences of climate change (Bokat-Lindell, 2021). Actions to date under the Biden administration likewise have avoided carbon pricing. First, the administration's press release on climate action on April 22, 2021 did not mention a carbon pricing policy (The White House, 2021). Second, the administration announced a social cost of carbon of $51 per ton of carbon in regulatory policy, increasing it from the $1 to $7 per ton used by the Trump administration (Chemnick, 2021). The Biden administration wanted to show leadership before COP26 in Glasgow by passing a CES, which ultimately did not pass before the conference in November 2021 (Renshaw et al., 2021). While the CES is less cost-efficient than a carbon price, it is more targeted and was more likely to pass, given public support for regulatory approaches over tax policies (Leiserowitz et al., 2021). Given these developments, it is clear the Biden administration has sidelined, at least for now, the carbon tax proposals supported by several Democrats, Republicans, and industry interest groups, in favor of more stringent regulatory policies.

This article examined the politics of carbon pricing at the subnational and federal level in the US from the perspective of policy entrepreneurship and interest group politics. The politics of carbon pricing in the US is complicated by numerous diverse interest groups and greater public climate skepticism than in other parts of the world. The multiplicity of American interest groups and veto actors combined with the lack of effective policy entrepreneurship all make federal carbon pricing unlikely, but there is continued promise for carbon pricing at the subnational level. RGGI has managed to attract

two more states, Virginia and Pennsylvania, to its cap-and-trade regime and is now exploring a cap-and-trade system for the transportation sector. California has managed to expand its emissions coverage, increase the percentage of auctioned allowances, and link with another cap-and-trade regime in Québec, Canada. On the other hand, the subnational trading regimes have struggled to increase their policy stringency due to political opposition, which has resulted in relatively low effective carbon prices and, in turn, relatively weak price incentives to reduce emissions. These weaknesses have led to growing disenchantment with carbon pricing among environmental advocates even while private sector actors increasingly embrace carbon pricing as a policy measure to decarbonize. American labor unions have consistently been ambivalent about carbon pricing but have embraced the idea of a just transition in the context of a Green New Deal. In conclusion, carbon pricing is likely to remain but one important policy tool of many others in the US and it is more likely that fiscal and regulatory policy tools will prevail at the federal level.

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Supplementary Material

Supplementary material for this article is available online in the format provided by the author (unedited).

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Article

Anchoring Policies, Alignment Tensions: Reconciling New Zealand's Climate Change Act and Emissions Trading Scheme

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Abstract
Climate Change Acts (CCAs) seek to anchor national climate policy by establishing long-term targets and lines of accountability that guide the development of other climate policy instruments. However, counter-pressures to modify CCAs can occur where tensions exist with the provisions of already-established policies that enjoy substantial political and stakeholder support. Such tensions can be especially pronounced where CCAs necessitate major changes to emissions trading schemes (ETSs) that have formed the mainstay of efforts to reduce national emissions. This article employs a novel anchoring policy framework to examine the dynamics of aligning ETSs with CCAs. We investigate debates on reforms to the New Zealand Emissions Trading Scheme following the introduction of the Zero Carbon Act in 2019 to examine how alignment pressures between anchoring and subordinate policies are negotiated. The analysis reveals several tactics used to increase the acceptability of reforms to the New Zealand Emissions Trading Scheme and protect the Zero Carbon Act's integrity. The article concludes by arguing that a greater understanding of alignment pressures between anchoring and subordinate policies is essential in enabling both CCAs and ETSs to contribute to achieving decarbonisation goals.

Keywords
anchoring policies; climate change acts; emissions trading; New Zealand; policy alignment

Issue
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1. Introduction

In 2019, New Zealand joined the UK and a number of other countries in adopting a framework climate change act (CCA) to guide the development of its national climate strategy (Muinzer, 2021). Although New Zealand had already introduced general climate legislation under the Climate Change Response Act (CCRA) of 2002, Nash and Steurer (2019, p. 1053) describe CCAs as a new breed of "legislation…that lays down general principles and obligations for climate change policymaking…with the explicit aim of reducing greenhouse gas emissions in relevant sectors through specific measures to be implemented at a later stage." CCAs are thus seen as distinctive from the majority of national climate laws adopted during the 2000s that lacked the legal force to exert a systematic or lasting impact on greenhouse-gas emissions and played little role in whether and how governments progressed climate mitigation policy (Casado-Asensio & Steurer, 2016).

CCAs can take multiple forms but are typically distinguished by the following attributes: a legal duty for governments to act; a binding long-term emissions target; the adoption of carbon budgets to ensure progress towards the target; and the establishment of independent bodies to monitor progress and advise governments on climate policy (Fankhauser et al., 2018). CCAs rarely contain detailed provisions on how to reduce emissions

(Muinzer, 2021). Their intention instead is to define overarching premises and accountabilities that anchor the development of other policies and regulatory practices introduced to reduce emissions in specific sectors (Bailey et al., 2021; Swidler, 2001). The negotiation of anchoring policies (APs) can consequently be keenly contested but, once adopted, they are expected to remain stable and implementing policies are expected to respond to their requirements (Karlsson, 2021). The focus on long-term stability and high thresholds for future governments to amend CCAs is another feature distinguishing CCAs from other national climate laws that may be more susceptible to politically motivated changes (Muinzer, 2020). For these reasons, the anchoring capacity of CCAs is seen as critical to delivering the emissions cuts pledged by national governments under the Paris Climate Agreement. However, alternative dynamics may arise, especially during attempts to align established climate policies with newly introduced CCAs, where existing agreements, institutional practices, and vested interests may impede alignment and create counter-pressures on the AP. CCAs may come under particular pressure where tensions surface with emissions trading schemes (ETSs) that have operated as flagship policies for pricing and reducing emissions (Wettestad & Gulbrandsen, 2018).

Pressures on other CCAs, particularly the UK CCA, have been discussed extensively in the literature (Gillard, 2016; Lockwood, 2013, 2021), and reveal that CCAs have largely succeeded in steering other national climates policies towards their goals (Climate Change Committee, 2021). However, New Zealand offers an important lens for analysing alignment pressures where attempts have been made to bring a previously-dominant climate policy—the New Zealand emissions trading scheme (NZETS)—into line with the requirements of a newly-established CCA, the Zero Carbon Act (ZCA). The NZETS was introduced in 2008, 11 years prior to the ZCA, and was for many years the country's main policy for reducing greenhouse-gas emissions. The scheme was heavily criticised for creating weak incentives and exempting biogenic emissions from agriculture but was defended by the National Party government and many industry groups (Inderberg & Bailey, 2019; Inderberg et al., 2017). The ZCA—with its legal commitment to achieve net-zero emissions by 2050—created opportunities for sweeping reforms to the NZETS. However, although alignment has occurred in many areas, other measures remain contested, particularly biogenic agricultural emissions (Bailey et al., 2021).

In this article, we investigate how such alignment tensions are managed politically, the factors influencing how tensions between policies are navigated, and the implications of these tensions for CCAs as guiding frameworks for national climate mitigation policy. To achieve this, we use a novel analytical framework to explore interactions between national CCAs and ETSs from anchoring and path-dependency perspectives, then examine political techniques used to reconcile pressures between New Zealand's ZCA and NZETS. The following sections outline these perspectives and provide a brief background to New Zealand climate policy, before discussing the main alignment pressures between the ZCA and NZETS. The article then refines the framework utilising insights from the New Zealand case and offers conclusions.

2. Policy Hierarchies: Anchoring and Path-Dependency Perspectives

An extensive literature exists on the integration of environmental and climate considerations into other policy spheres (Adelle & Russel, 2013; Jordan & Lenschow, 2010; Matti et al., 2021) and how climate policies interact with other climate or energy policies (Boasson & Wettestad, 2013; del Río & Cerdá, 2017). Various approaches have also been used to explain institutional change, ranging from analyses of changes to formal structures, procedures, and policy relationships to cultural conceptualizations of "institutional" and norm-based changes (Aberbach & Christensen, 2001; Mahoney & Thelen, 2010; Peters, 2019). However, beyond the examination of "formal structure" effects (e.g., Christensen & Peters, 1999), few analytical frameworks explore how the relative statuses of formal policies affect these interactions when a new policy is introduced. "Policies" in this sense can be understood as written plans, principles, support schemes, laws, or regulations issued by a government that create explicit expectations, goals, and rules and regulations that define some combination of what needs to be done, by when, by whom, and through what mechanisms (Christensen & Peters, 1999). To address this knowledge gap, we employ a novel framework to provide a formalised exploration of policy relationships examining: *Anchoring-policy perspectives*, where subordinate policies (SPs) adapt to an AP; and *path-dependency perspectives*, where institutionalised SPs create pressures to modify the AP. We sketch the broad outlines of the framework in this section, then refine it later in the article based on New Zealand's experiences.

The term "anchoring policies" (APs) is used throughout to describe official policies and regulations that seek to define and embed the key premises for SPs. Their "anchoring" function thus refers to their influence over the design of SPs that provide the detailed regulations and levers for achieving the AP's goals (Inderberg, 2020). APs logically occupy a higher place in the hierarchy of policies affecting a policy area by virtue of the fact that they are introduced to establish general goals, principles, and rules that shape more targeted instruments introduced to achieve these goals. APs may thus express paradigmatic ideas that help APs to resist change and specify their logical and functional links to other policies (Hall, 1993; Inderberg, 2020).

In ordinary circumstances, APs would be expected to place alignment pressure on SPs following similar

dynamics to those suggested by goodness-of-fit theory and alignment between EU and national policies (Bailey, 2002; Börzel & Risse, 2003). Similarly, the AP perspective enables a focus on the functional relationship between policies and the potential for alignment gaps where APs and SPs contain inconsistencies. The larger these discrepancies, the higher the pressure is, under ordinary circumstances, to align SPs with the AP's principles and goals (Peters, 2019). This is illustrated in Figure 1 by the unidirectional relationships between the AP and SPs (1–4).

Alternative dynamics and mechanisms may occur, however, where political actors whose interests or ideas are affected by action in the policy area seek to influence specific instruments or the AP. The literature on vested interests and policy fields indicates that established political and economic actors with interests aligned with the economic and policy status quo will resist, or seek to modify, policies to defend their interests (Fligstein & McAdam, 2012; Kungl, 2015). Such resistance can delay new policy programmes years after their adoption or distort their implementation. This is especially the case where economic actors are supported by political parties, as occurred with Danish energy reforms in the 2000s and carbon pricing in Australia (Bailey, 2017; Eikeland & Inderberg, 2016). This may also generate feedback loops, where established policies create biased preferences among dominant actors towards the SP (Pierson, 2004). In such situations and where policy stances are entrenched (Fligstein & McAdam, 2012; Inderberg, 2020), alignment pressure may be heightened on the AP. Figure 1 indicates this distinction for SP no. 5 as the reversed relationship direction B.

The ZCA established new principles, goals, and rules for New Zealand climate policy that are consistent with features of a national climate AP, while the NZETS's now theoretically functions to deliver emissions targets articulated in the ZCA. However, the NZETS's status, prior to the ZCA, as New Zealand's flagship climate policy indicates two alignment possibilities: an *anchoring outcome*, where the NZETS is aligned with the ZCA's goals and rules; and a *path-dependency outcome*, where established interests and status quo bias lead to resistance to alignment and, potentially, revisions to the ZCA to alleviate tensions with the NZETS.

Where alignment pressures occur, political strategies are needed to resolve them. Several options are examined later in the article, including: *pre-emptive concessions* to avert a potential threat to the AP; *incremental adaptation*; *deferring decisions*; the use of *political safety valves*; and *exploiting ambiguities* in AP requirements to ease tensions. Having outlined the general analytical framework, the next section provides a background to climate-policy debates in New Zealand to inform analysis of the alignment pressures that have occurred between the ZCA and NZETS. The analysis is based on the scrutiny of parliamentary debates, government papers, consultations, and Climate Change Commission (CCC) reports on the two policies. The main analysis covers 2018–2021, the focal period of debate on the two policies. The short time creates some uncertainties, as clear outcomes on the ZCA–NZETS relationship may take time to unfold. However, multiple decisions affecting the NZETS's design features were made during this time and areas of ongoing debate are noted.

3. Background to Climate Policy in New Zealand

New Zealand has an export-oriented economy with strong representation from the primary industries, especially livestock, dairying, forestry, and viticulture. New Zealand's gross emissions were 82.3 million tonnes CO_2e in 2019, 48% of which came from agricultural methane and nitrogen-based fertilisers (Ministry for the Environment, 2021a). Until 2008, the country had few mandatory emissions-reduction policies and relied mainly on informational and voluntary measures (Bührs,

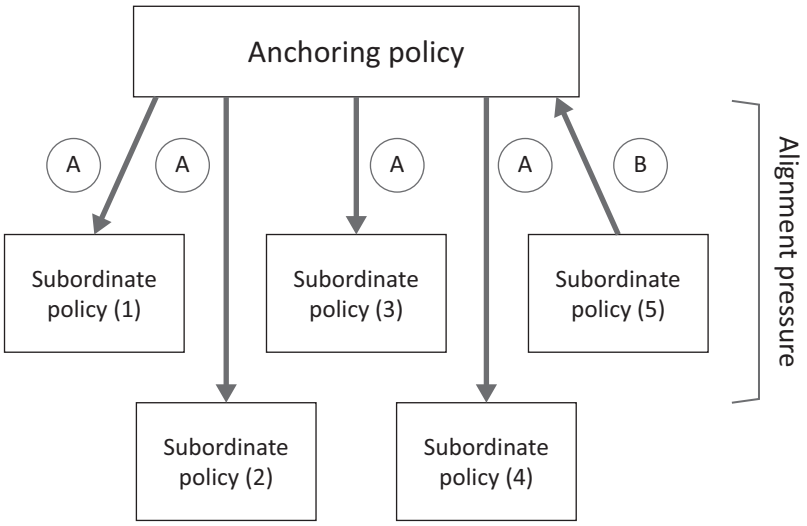

Figure 1. Alignment pressures between anchoring and subordinate policies.

2008). However, a 24.7% increase in emissions between 1990 and 2005 and the entry of the Kyoto Protocol into force in 2005 prompted political debate on the adoption of a carbon tax or an ETS. The latter was introduced in 2008 and market-based instruments are generally viewed within New Zealand's neoliberal political and economic culture as effective and economic ways of reducing emissions (Inderberg et al., 2017). New Zealand's political system operates mixed-member proportional voting, with governments typically led by the left-leaning Labour Party or centre-right National Party. The voting system has made coalition government and compromise politics a consistent feature of New Zealand government and other parties involved in coalitions at various times include the Green Party, New Zealand First, Māori Party, and the libertarian ACT.

3.1. The New Zealand Emissions Trading Scheme

The NZETS was introduced in 2008 under the CCRA, New Zealand's pre-existing legal framework for climate policy. Despite general support for market-based climate policies, the National Party opposed the introduction of the NZETS, arguing that emissions reduction was technologically and economically difficult in key industries and that mandatory emissions pricing for agriculture and other energy-intensive trade-exposed industries (EITEIs) conflicted with national economic interests (Bailey & Inderberg, 2016; Inderberg et al., 2017). In making these arguments, the National Party identified these sectors' interests as critical considerations for New Zealand climate policy (Driver et al., 2018). The National Party decided not to repeal the NZETS following its 2008 election victory but introduced reforms in 2009 and 2012 that weakened the scheme's emissions-reduction capacity (Inderberg et al., 2017). The government was able to make these changes because New Zealand adopted a relatively undemanding target under the Kyoto Protocol (to return emissions to 1990 levels rather than reducing them below this level) and the CCRA contained few provisions to prevent economic objectives from dictating national climate policy (Russell et al., 2014). In particular, the CCRA lacked the ambitious long-term target, carbon budgets, and scrutiny requirements normally associated with CCAs. The scheme's more contentious provisions and revisions included (Bertram & Terry, 2010):

- The absence of a defined ETS emissions cap, the logic for which was to enable New Zealand to make unlimited use of forest sequestration and international allowances to meet its Kyoto target. However, this meant the NZETS gave no certainty about the emissions levels within which the national economy must operate.
- A \$25 tonne^{-1} price ceiling on emissions allowances (New Zealand Units [NZUs]) that muted the price incentive for emissions reduction.
- A dispensation allowing EITEIs to submit one NZU for every two tonnes of emissions, which effectively halved the abatement incentive for New Zealand's main industrial emitters.
- Free NZUs allocations to 26 EITEIs based on output and emissions-intensity benchmarks. This provision, combined with the lack of an overall scheme cap, created few incentives for industrial emitters to invest in emissions-reducing activities.
- Weak incentives and high potential liabilities for carbon sequestration from forestry as a route for meeting emissions targets.
- Indefinite deferral of agricultural biogenic emissions from the ETS.

Although the "two-for-one" scheme ended following further reforms in 2015 and New Zealand lost the right to participate in Kyoto international carbon markets after it decided not to ratify the Kyoto II agreement (Diaz-Rainey & Tulloch, 2018), disputes continued over the NZETS because the scheme's dominance in the national climate-policy portfolio meant that it underpinned the credibility of New Zealand's climate strategy.

3.2. The Zero Carbon Act

Support for framework climate legislation grew in New Zealand from 2015 onwards, fuelled by campaigning by Generation Zero, a youth-based environmental organisation, efforts by GLOBE-NZ, a cross-party parliamentary body created to build cross-party consensus on climate change (Graham, 2018), and the election in 2017 of a Labour-led government, whose leader, Jacinda Ardern, made climate change a key election issue (Bailey et al., 2021; Hall, 2020). Following a country-wide consultation in 2018, the ZCA was approved by the House of Representatives in November 2019 with the support of all political parties except ACT. In becoming the country's new climate AP, it established new goals and measures for New Zealand climate policy:

- A legal target to reduce all domestic emissions, except biogenic methane, to net zero by 2050.
- Reduction targets for biogenic methane of 24%–47% below 2017 levels by 2050, and 10% below 2017 levels by 2030.
- Five-year carbon budgets to provide a pathway towards the net-zero target.
- An independent CCC to provide impartial advice and monitoring to keep future governments on track to meet the ZCA's goals (New Zealand Parliament, 2019a).

Cross-party support came at the calculated cost of the lower target for biogenic emissions, however, and in overall terms, the ZCA constituted a balance between the views of different parties, including the National Party, New Zealand First (Labour's coalition partner),

and the Greens, whose co-leader, James Shaw, was given the role of Minister for Climate Change under a "confidence-and-supply" agreement. Despite this, the National Party expressed reservations about aspects of the ZCA, including the biogenic methane target and agriculture's involvement in the NZETS (Bailey et al., 2021). Reflecting its importance to achieving the ZCA's goals, reforming the NZETS became the government's next climate-policy priority. These reforms were legislated under the Climate Change Response (Emissions Trading Reform) Amendment Bill (ETR Bill) in 2020 (New Zealand Parliament, 2020a). The next section discusses the research strategy before Section 5 charts the main debates on aligning the NZETS with the ZCA, including emissions caps, price controls, international allowances, agricultural emissions, and forestry.

4. Research Strategy

The research informing this analysis was undertaken over three phases between 2015 and 2021. The first phase (2015-2017) consisted of secondary document analysis and semi-structured interviews with 23 representatives from New Zealand's main political parties, government departments, businesses, NGOs, and independent analysts. Its aim was to secure a cross-party and cross-sectoral perspective on factors shaping New Zealand climate politics and the design of the NZETS, focusing particularly on tensions over target- and price-setting, agricultural emissions, forestry, and international emissions allowances. The interviews accordingly probed the design and reform of the NZETS, the main actors involved in discussions, and the political processes accompanying its development (Inderberg & Bailey, 2019; Inderberg et al., 2017).

The second phase centred on the politics of negotiating the ZCA and subsequent reforms to align the NZETS with the ZCA (Bailey et al., 2021). Empirical material was drawn mainly from public documents, complemented by an interview with a leading NGO campaigner for the ZCA exploring the formal and informal processes involved in the negotiation of the ZCA and NZETS reforms. Seventy-eight documents from the following sources were used to map the positions taken by different actors during the policy process and the main arguments used to justify their stances:

- Publications by organizations promoting the ZCA.
- Consultations and reports on the ZCA and ETR Bill, including government documents produced to accompany the ZCA consultation; submissions from industry, NGOs, and other groups and individuals; and analyses of consultation findings.
- Texts of the Bills and Supplementary Order Papers.
- Hansard records of the bills' parliamentary readings.
- Redacted cabinet papers and regulatory impact analyses of measures to manage livestock and fertiliser emissions; and industry submissions proposing alternatives to mandatory pricing of these emissions.

The final stage of research involved further scrutiny of previously analysed documents supplemented by analysis of more recent ministerial, business, and independent reports, consultations, and media analyses, including the New Zealand CCC's advice to the government on the ZCA's first three carbon budgets and reforms to the NZETS (Climate Change Commission [CCC], 2021). The goal was to gather a broader perspective on discussions and decisions on how to reform key elements of the NZETS to achieve compatibility with the requirements of the ZCA.

5. Policy Alignment Between the Zero Carbon Act and the New Zealand Emissions Trading Scheme

The following section analyses the main alignment activities and pressures that have occurred between the ZCA and NZETS and the political dynamics that have shaped attempts to resolve areas of tension. The section accordingly examines the ZCA's impact on the main design features of the NZETS: emissions caps; allowance allocations and price controls; the use of international units; and the management of agricultural emissions and forestry.

5.1. Emissions Caps

Although net-zero emissions formed the backbone of the ZCA, the decision to adopt a split target between long-lived and short-lived greenhouse gases indicated early tensions between the ZCA's intent to anchor other climate policies and the need to secure the support of the National Party and New Zealand First for the ZCA (New Zealand Parliament, 2019a). To achieve this, ZCA campaigners accepted the need for the ZCA to recognise the distinctive greenhouse-gas forcing characteristics of methane to protect agriculture from excessive costs even before the ZCA was drafted, though it was never intended to lead to a lower target (Bailey et al., 2021). However, even the split target failed to quell National Party concerns about the ZCA:

> The primary area of difference…is in relation to the methane target. There is…no satisfactory basis for setting the targets in 2030 and 2050 as high as the Government has chosen to do…in terms of methane and agriculture…that change is literally in the last three, four, five years before [the first] target is to be met in 2030. (New Zealand Parliament, 2019b)

Despite these reservations, rejecting the ZCA target for methane would have been politically risky for the National Party given the strength of support for climate action across New Zealand. However, questions remained over how it would translate into NZETS

emissions caps. The government centred on establishing caps that would align the scheme with ZCA budgets, while the opposition focused on the effects of tighter caps on businesses and households during the Covid crisis:

> The new cap on the ETS of 160 million tonnes of carbon dioxide….What does that mean for the price of fuel, electricity, and goods?...what that means for everyday New Zealanders in a post-COVID world…[who] have lost their livelihoods, is a completely different thing. (New Zealand Parliament, 2020b)

The passage of the ETR Bill nevertheless enabled the government to cap NZETS emissions in line with ZCA budgets. The CCC's advice, published in early 2021, of a carbon budget of 278 $MtCO_2e$ for 2022–2025 represented a major reduction from New Zealand's current emissions and recommended a first ETS cap of 167 $MtCO_2e$ to reflect this increased ambition (CCC, 2021). However, the anchoring pressures created by the ZCA were underlined further when a group of 300 climate-concerned lawyers launched a legal challenge against the CCC's budget, arguing that it represented an annual increase of 2 $MtCO_2e$ from a provisional budget published in 2019 and was therefore inconsistent with the goals of the ZCA (McLachlan, 2021).

5.2. Allowance Allocations and Price Controls

The NZETS initially allowed 90% free allocation of NZUs to industrial facilities set against a 2005 emissions baseline, with no expansion for new entrants, and was scheduled for phasing out between 2019 and 2029. However, the 2009 reform adopted an "output-and-emissions-intensity" model that gave EITEIs between 60% and 90% free allocations with no overall quantity limit and the phase-out rate was slowed (Leining et al., 2019). Again, demonstrating the ZCA's anchoring effect, the ETR Bill introduced quarterly allowance auctions from March 2021 and an accelerated phase-down of industrial free allocations between 2021 and 2050 (New Zealand Parliament, 2019a). The National Party claimed that this placed sectors like steel, cement, and aluminium businesses at a competitive disadvantage internationally, while Labour Party argued that the NZETS was unworkable without lower free allocations (New Zealand Parliament, 2019a). However, the government's majority was sufficient for the measure to remain and for the ZCA to guide the redesign of this element of the NZETS.

Neither the ZCA nor the ETR Bill specifies upper or lower prices for NZETS allowances. Instead, the ZCA steers NZU prices indirectly through its target and carbon budgets. However, the ETR Bill requires the climate minister to set price controls for five-year periods informed by advice from the CCC on the prices needed to meet future carbon budgets (New Zealand Parliament, 2020b). It also influences NZU prices through rules preventing allowances from being auctioned at unacceptably low prices that might inhibit clarity on the profitability of low-carbon investments. The Commission's recommended floor price of \$30 $tonne^{-1}$ for 2022 (from \$20 $tonne^{-1}$ in 2021), followed by annual increases of 5% plus inflation to 2026, and a cost containment price of \$70 (from its \$50 2021 price), followed by annual increases of 10% plus inflation, again represented a major increase in price signals from those previously generated by the NZETS (Ministry for the Environment, 2021b).

5.3. International Units

The loss of access to international carbon markets in 2015 theoretically created an opportunity to introduce a permanent ban or limits on international units. However, the ZCA instead established the more malleable principle that emissions budgets must be met through domestic emissions reductions and removals *wherever possible*. There also remains an opening for the limited use of international units in the event of significant changes in circumstances that alter the basis of emissions budgets or affect New Zealand's capacity to meet emissions budgets domestically. In such circumstances, the ZCA requires the government to consult the CCC on whether overseas units are necessary to meet budgets or control the NZETS's economic impact. The government's proposal, published in April 2021, recommended a limit of zero international allowances between 2021 and 2026 to reduce a stockpile of Kyoto units accumulated when the NZETS was open to international trading (Ministry for the Environment, 2021b). The CCC nevertheless left the door open for international allowances by calling for New Zealand to adopt more ambitious emissions targets and by recognising that the pace of change in achieving targets through domestic action alone would have substantial social and economic impacts (CCC, 2021). However, it also stressed the need for international units purchased by New Zealand to have high environmental integrity.

5.4. Agriculture and Forestry

Of all the NZETS' provisions, the management of biogenic emissions from agriculture has arguably posed the sternest challenge to the ZCA (Inderberg & Bailey, 2019; Taylor, 2020). Agriculture was originally scheduled to enter the NZETS by 2013 but its inclusion was deferred indefinitely in 2012 (Inderberg et al., 2017). During a parliamentary debate in 2017, David Parker, the Labour minister who oversaw the NZETS's introduction in 2008, declared that: "If we are elected, agriculture will be coming into the ETS very fast. We have always said it should…[because it] will drive so much other change" (New Zealand Parliament, 2017). Cross-party support for the ZCA appeared to clear the way for negotiations on the issue but the Primary Sector Leaders Group remained wary of ETS pricing and submitted counter-proposals

for a sector-government agreement (*He Waka Eke Noa*) as its preferred route for reducing emissions and building capacity for pricing methane and fertiliser within (or outside) the NZETS (Primary Sector Climate Action Partnership, 2021).

Regulatory impact analysis by the Ministry for the Environment indicated that processor-level pricing of livestock and fertiliser emissions from 2021 offered better guarantees of meeting emissions targets because the Primary Sector Leaders Group agreement did not accept pricing unconditionally and lacked detailed costings (Ministry for the Environment & Ministry for Primary Industries, 2019a). A consultation in mid-2019 on a sector-government agreement and pricing farm-level livestock and processor-level fertiliser emissions from 2025 (potentially with processor-level pricing of both between 2021 and 2025) also showed support for pricing provided all on-farm emissions removals counted towards targets (Ministry for the Environment & Ministry for Primary Industries, 2019a). Ministerial briefings nonetheless advised the climate minister to reassure agricultural leaders that the government would introduce measures to alleviate the social impacts of emissions pricing (Ministry for the Environment & Ministry for Primary Industries, 2019b).

In October 2019, the Climate Minister sought cabinet agreement for processor-level livestock and fertiliser pricing in the ETS from 2021 to provide clear investment signals and comparable regulation to other sectors. He nevertheless acknowledged that loss of industry goodwill remained a threat if NZETS involvement was imposed and the cabinet opted to pursue the industry agreement while maintaining a schedule to introduce NZETS farm-level livestock and processor-level fertiliser pricing from January 2025. The measures also included 95% free allocation of NZUs to honour a coalition agreement with New Zealand First but retained provisions for processor-level pricing on livestock emissions from 2025 if farm-level pricing had not been implemented.

Although this compromise only changed the delivery mechanisms for the agricultural emissions component of the ZCA rather than its fundamental goals, the National Party voted against the ETR Bill, arguing that insufficient time was being allowed to assess the Bill's socio-economic implications. The government rejected this accusation, arguing: "Every time there is an economic downturn…the National Party says, 'Let's defer action on climate change'….I'm afraid…climate change does actually have a time frame" (New Zealand Parliament, 2020c). The government also rejected allegations of imposing solutions and stressed its partnership with the primary sector: "We trust farmers…that's why we've entered into a historic agreement with them" (New Zealand Parliament, 2020a). "I haven't been advised that they foresee any significant delay…because of Covid-19." (New Zealand Parliament, 2020c)

Forest carbon sequestration theoretically provides an alternative route to ease tensions between the ZCA and NZETS through the generation of low-cost emissions reductions and new revenue streams for farmers who plant trees on their land. However, two main problems have hindered forestry's involvement in the NZETS. First, participation is voluntary for forests planted after 1989 but the $25 price ceiling gave limited incentives to plant or retain forests and only 45% of eligible forests were registered in the NZETS in 2017 (Leining et al., 2019). Second, owners of pre-1990 forests incurred emissions liabilities if they harvested more than two hectares of non-exempt forest in any five-year period but could not receive NZUs for increasing forest stock (Carver et al., 2017).

Reforms to the NZETS since the adoption of the ZCA have sought to address these issues in three ways. First, the raising of the NZETS's cost containment reserve has increased financial incentives for afforestation and the CCC (2021) anticipates that a $35 NZU price could encourage 1.1 million hectares of new forest plantation. Second, changes in carbon accounting rules have reduced deforestation liabilities. Third, owners of pre-1990 forests can now harvest and replant forest without liability, though they still do not receive additional NZUs for forest stock increases (Manley, 2020). Despite these attempts to build synergies between the ZCA and NZETS, other political concerns have been raised that increased planting on farmland could damage agricultural livelihoods and "devastate rural communities" (New Zealand Parliament, 2019c). The government has pledged to avoid this, but the issue's sensitivity was underlined by New Zealand First's insistence that the social impacts of forestry be considered if high carbon prices encouraged higher-than-projected new planting (New Zealand Parliament, 2020b). More structurally, the CCC (2021) has argued that overreliance on forests could divert action from emissions reduction in other sectors and make it more difficult to maintain net-zero beyond 2050. The long-term effects of these reforms remain to be seen but the example nevertheless highlights the potential for tensions to resurface where policy safety valves and alternative solutions are used to ease alignment pressures.

6. Discussion: Exploring Alignment Pressures

The adoption of the ZCA has challenged the NZETS's status as New Zealand's pre-eminent climate policy by establishing an overarching goal of net-zero emissions and new requirements and accountability mechanisms to guide the development of other New Zealand climate policies, including the NZETS. In so doing, the ZCA has triggered processes to transform the NZETS from a policy instrument that was vulnerable to "political whim" (Hall, 2020, p. 87) into a key delivery mechanism for the ZCA's goals (Hall, 2020, p. 87; Taylor, 2020). In keeping with the *anchoring-policy perspective*, the ZCA has succeeded in influencing many aspects of the NZETS, including its emissions caps, price controls, and rules for international units. More broadly, it has shifted the paradigmatic logic of New Zealand climate policy from one that prioritised

economic efficiency over-ambitious targets to the pursuit of net-zero emissions as a normative and practical goal (Inderberg et al., 2017).

Evidence of resistance to the anchoring pressure applied by the ZCA nonetheless necessitates and enables refinement of the *anchoring-policy/path-dependency framework* through reflection on the different approaches used by governments to navigate tensions between anchoring and SPs and their implications for the integrity of APs.

The first technique involves *pre-emptive concessions* to APs to avert potential threats. The split emissions target was a precondition for the National Party supporting the ZCA and was justified by evidence that stabilising short-lived methane emissions would help to prevent increases in atmospheric greenhouse-gas concentrations (Ministry for the Environment & Ministry for Primary Industries, 2019b). However, others contend that it has perpetuated uncertainty about the government's commitment to 1.5 °C because methane's potency and short lifespan mean that tighter methane targets would produce rapid atmospheric cooling (Hall, 2020; Taylor, 2020), while lower targets for agriculture may also increase burdens on other economic sectors (Leining et al., 2019).

The second is the *incremental adaptation* of other policies to ease alignment tensions, for instance, through the progressive reduction in free allowances for EITEIs and periodic reviews of ETS price controls to ensure they remain consistent with emissions budgets but avoid imposing excessive costs on affected sectors. A third involves *hedging against uncertainties*, for example, through provisions allowing carbon budgets to be adjusted and increases in the use of international units if future circumstances impede New Zealand's capacity to achieve budgets through domestic action alone. Related to this is the use of *safety valves* to defuse inflammatory issues, in this case by retaining conditional access to international units and enhancing incentives for forest sequestration to help farmers meet emissions liabilities and access alternative revenue streams.

A fifth approach involves *deferring decisions* (or ignoring misalignments) to protect the integrity of the AP. This approach could be said to characterise the government's approach to agriculture, where the commitment to pricing biogenic and fertiliser emissions remains but decisions on the role of industry agreements and pricing methods have been adjourned until firmer evidence exists on the performance of alternatives to ETS involvement (Bailey et al., 2021).

A final strategy is to create and *utilise lack of prescriptiveness* (Christensen & Røvik, 1999) in the mechanisms APs use to influence SPs. The ZCA's authority rests mainly on general obligations and principles rather than detailed measures. The domestic net-zero target, carbon budgets, and the obligation to explain departures from the advice of the CCC could all be described as serving background roles for steering discussions on the NZETS while giving flexibility over how obligations are achieved.

One risk of such strategies to reduce alignment pressures is if APs degenerate into symbolic policies that give the appearance of action while being stripped of their anchoring capabilities. If, as our analysis indicates, AP–SP relationships are typified by tensions between anchoring and path dependency, it provides a reminder that CCAs are not unshakable: "Ultimately, the[ir] task is to create enduring legislation that translates international commitments into domestic goals that are implemented and achieved" (Taylor & Scanlen, 2018, p. 68). This can make them major targets during their negotiation and attempts to reform SPs that enjoy strong stakeholder and political support. Defence of their integrity ultimately rests on securing public, stakeholder, and political support for reforms, while another important factor holding the authority of climate APs together is the expectations of the Paris Agreement as an international AP for the ZCA and other national climate strategies.

Summing up, the various strategies identified above share the objective of managing political pressures that might otherwise lead to zero-sum games and policy polarisation. The anchoring-policy perspective's prediction that SPs will align with the requirements of APs provides plausible explanations of reforms to the NZETS's emission caps, allocation and price controls, and, to some degree, the use of international units. However, the factors influencing the ZCA's influence on agriculture and forestry are more complex and indicate the continuing influence of path-dependency dynamics. The ZCA has generated pressure to include biogenic and fertiliser emissions in the NZETS, but support for the land-use sector (organised through the Primary Sector Leaders Group and National Party) deflected the Labour-led government's ambition by pressing for the *deferral of a decision* on pricing agricultural methane and fertiliser emissions in the NZETS and proposing *alternative solutions* for reducing these emissions. The first illustrates the contribution of path-dependency perspectives to understanding the dynamics of AP—SP relationships where interests are well-defined and settled, though the ZCA's carbon budgets restricts the viability of this as a way of reducing alignment pressure in the long run.

The latter—alternative solutions—draws attention to the utilisation of *safety valves* as a political compromise to defuse tensions between APs and SPs, but also illuminates an analytical weakness in examining the anchoring potential of an AP through its relationship with a single SP. In this case, the anchoring effect of the ZCA on the NZETS remained uncertain during the analysis period but the ZCA has still generated momentum for alternative solutions beyond the scope of the ZCA–NZETS relationship. As such, the *He Waka Eke Noa* agreement does not corroborate the path-dependency contention that alignment tensions will create reverse pressure to adjust the AP; it simply indicates the potential opening of an alternative route. Pressure on the ZCA might accumulate if the implementation of the agreement raises doubts about the technological and economic feasibility

of reducing biogenic emissions, but the ZCA nevertheless retains the overall power to drive the development of other SPs.

The longer-term failure to meet targets for biogenic emissions would potentially be more damaging to the ZCA but the evidence to date indicates that the ZCA has increased pressure for reforms to the NZETS and shifted the wider dynamics of New Zealand climate policy. Unless it is dismantled at some point, its requirements are likely to continue to exert normative, discursive, and political pressure for more stringent climate policies even if these impacts remain difficult to quantify during its earlier stages.

7. Conclusions

This article has employed a novel framework to investigate how alignment pressures between CCAs and other climate policies are managed politically, the factors influencing how tensions between policies are navigated, and the implications of these tensions for CCAs as guiding frameworks for national climate mitigation policy. Analysis of the New Zealand government's attempts to align an established emissions trading scheme with a newly-introduced CCA, the ZCA, indicates that the ZCA's legal obligations, emissions targets, and scrutiny by an independent CCC have exerted strong anchoring effects during debates on reforms to the NZETS. However, resistance to some reforms led the government to use a range of techniques to reduce tensions, including: pre-emptive concessions, incremental adaptation of other policies, deferring decisions, policy safety valves, and lack of prescriptiveness in how the ZCA's goals should be achieved. The majority of these techniques are consistent with the AP's perspective that alignment pressures will lead mainly to the modification of SPs and that CCAs will generally withstand pressures, even where SPs enjoy strong political and stakeholder support. The main potential exceptions are if pre-emptive concessions erode the credibility of CCAs even before they are introduced or if deferring decisions leads to further concessions. Other risks include the possibility that policy safety valves and hedging provisions will be used later to reinterpret the core goals of CCAs.

Established theories of policy change have made important contributions to understanding how institutional processes, learning, policy entrepreneurship, and discursive processes can catalyse shifts in policy norms and practices. Anchoring-policy and path-dependency perspectives offer a useful complement to these theories by directing attention towards the political dynamics of relationships between policies and, in particular, the capacity of CCAs to influence the introduction and design of other climate policies through the specification of overarching premises and accountabilities. The distinctive changes in climate policy and politics created by CCAs remains an emergent area of investigation and further comparative analysis of how alignment tensions between CCAs and other climate policies are managed in different political settings is essential to developing a fuller understanding of the politics of CCAs and their contribution to achieving decarbonisation goals.

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Conflict of Interests

The authors declare no conflict of interests.

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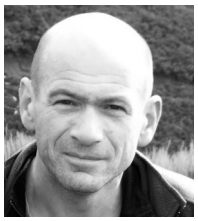

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