

Introduction

A Global Turn to Greenhouse Gas Emissions Trading? Experiments, Actors, and Diffusion

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The policy instrument of greenhouse gas (GHG) emissions trading has gained prominence since the early 2000s. At the end of 2016, twenty-one distinct GHG emissions trading systems (ETSs) covering thirty-five countries were operating worldwide (ICAP 2017). China has announced the launch of a national ETS for the second half of 2017, which is expected to become the world's largest carbon market. A number of other countries and subnational jurisdictions, including Thailand, Mexico, and Oregon, are considering the adoption of a GHG ETS. Hence, it is increasingly important to improve our knowledge about the forces that shape the initiation, design, and functioning of such systems, whether internal or external to the jurisdictions. This includes the interactions among individual systems and the precise ways in which ETS policy diffuses. With the increasing spread of GHG ETSs around the world over the past decade, sufficient empirical cases and variation are now available to provide a good knowledge base, and these warrant a thorough analysis.

This special issue of *Global Environmental Politics* contributes to our knowledge and understanding of the expanding turn to GHG emissions trading. In particular, we aim to investigate the role and detailed unfolding of diffusion processes in the emergence of various GHG ETSs globally, with a particular focus on the interaction between external influences and domestic

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dynamics within jurisdictions that newly design and adopt a GHG ETS. Since all GHG ETSs that have emerged so far have their own particular design, the global turn to emissions trading seems more complex than a simple policy diffusion account can explain. Domestic factors seem to be of great importance for understanding the growing adoption of ETSs in widely different jurisdictions.

Establishing a market is accompanied by uncertainty, and its functioning cannot be fully predicted. To deal with the uncertainty associated with such complex policy instruments as emissions trading, the initial phase of these schemes is frequently characterized by experimentation and learning through “pilot schemes” and “test phases.” An ETS may need to be adjusted in response to new experiences and unanticipated events, such as an economic downturn or a low degree of trading activity. For this reason, one way to analyze ETSs is to conceive of them as experiments that produce information about successes and failures. Indeed, we have witnessed a remarkable level of testing and experimentation with GHG ETSs over recent years. One example of explicit experimentation is the seven pilot schemes that China launched in 2010. Another is the European Union’s first trading period (2005–2007). These domestic experiments generated lessons tailored to a specific jurisdiction, since individual systems are developed in a particular context, which we could label *islands of experimentation*.

Conversely, policy-makers may also turn to the experiences of other jurisdictions, which suggests diffusion and interdependent policy-making. Indeed, previous and emerging research points to the importance of diffusion dynamics in developing specific ETSs (Biedenkopf 2012; Müller and Slominski 2016; Wettestad and Gulbrandsen 2017). From a global perspective, this raises the question of how experiments and experiences in different jurisdictions may inform and interact with each other, potentially contributing to the creation of a future international carbon market through a bottom-up process. This connects to the rich discussion in political science on policy diffusion (for an overview, see Gilardi 2012). Underdal, Victor, and Wettestad (2015) distinguish the main mechanisms that underpin diffusion processes: competition (ratcheting up or lowering standards in response to economic interdependencies), learning (from the perceived policy successes and failures of others), and emulation (decisions based on norms and the logic of appropriateness).

Creating a market for GHG emission allowances requires a number of measures that are likely to be shaped by the features of the economy and the political preferences of the jurisdiction in which they are applied. For this reason, a carbon market is not a policy instrument that can be transferred easily and unchanged from one jurisdiction to another (Knox-Hayes 2016). Political controversies remain about the ways in which carbon markets should be organized, the role that they should play, and the objectives that they should achieve.

The bottom-up proliferation of GHG ETSs has led to a fragmented global system. Currently, these different systems are not operationally linked, apart from a few exceptions such as the EU-Norway and California-Quebec links. There are other types of linkages, however, most notably in the form of sharing experiences and lessons, and capacity building. For example, the EU, Norway, and California all support China in various aspects of its subnational ETS pilot projects and in its development of a national system (see Biedenkopf et al. article, this issue). Oftentimes, the processes seem to be driven by a clear demand from the jurisdiction wishing to design an ETS (see Gulbrandsen et al. article, this issue).

This introduction to the 2017 special issue of *Global Environmental Politics* first charts some of the key insights and findings pertaining to the experimentation and diffusion of GHG emissions trading. The second part introduces the individual contributions to this special issue. We then conclude with some reflections on future research needs.

What Have We Learned?

Mirroring the growing relevance of emissions trading, a number of insightful studies have been conducted on the evolution, design, and functioning of specific ETSs, including the EU's ETS (e.g., Ellerman and Buchner 2007; Ellerman et al. 2016; Skjærseth and Wettestad 2008; Wettestad and Jevnaker 2016), US subnational ETSs (e.g., Ellerman and Harrison 2003; Ruth et al. 2008), and the Chinese pilot schemes (e.g., Han et al. 2012; Lo 2013; Lo and Howes 2013). Few studies have looked at diffusion (e.g., Biedenkopf 2012), direct linking of individual ETSs (e.g., Müller and Slominski 2016), and indirect linking through the Clean Development Mechanism (CDM) (e.g., Belis and Kerremans 2016).

The role of experimentation and learning from one's own and others' experiments as part of the design process of a GHG ETS has not received much academic attention so far. Addressing this gap in existing research, the contributions to this special issue cover diverse variants of emissions trading in seven different jurisdictions—Australia, California, China, Kazakhstan, New Zealand, Thailand, and Vietnam. Some of these cases are mature systems while others are early in development, which provides for empirical richness and variation. The case studies provide valuable new knowledge, including on under-researched ETSs such as those in New Zealand, Kazakhstan, Thailand, and Vietnam. What is more, by considering the ways in which these different ETS experiments interact with each other, this special issue also provides a “macro-picture” of the interconnections among the different systems and jurisdictions. Mapping these links sheds light on their role in facilitating a globally linked carbon market through bottom-up processes and networks. For each of the ETSs studied in this special issue, the authors consider the main external reference points that played a role in their development.

A number of important observations can be made from analyzing the links established by GHG emissions trading in different jurisdictions. First, it becomes apparent that as the number of jurisdictions experimenting with GHG emissions trading increases, we also witness an increase in the number of actors that promote this policy externally by supplying expertise, capacity building, and policy solutions to other jurisdictions. Promoting the proliferation of carbon markets can generate benefits for those who already have an ETS, since it increases the possibilities for different kinds of linkages and the legitimacy of emissions trading as a suitable climate policy. Accordingly, we are increasingly facing a situation in which multiple jurisdictions seek to exert influence on other jurisdictions and to promote their own distinct variants of a GHG ETS. For instance, the capacity-building projects identified in the case study on China involve twelve different external financiers (Biedenkopf et al. article, this issue). The majority of these external financiers are national and subnational governments that have their own ETSs in place, but they also include international organizations such as the World Bank and research institutes. A similar complexity can be observed in the case of Thailand, which has been experimenting with a number of different bilateral, regional, and international market mechanisms that involve a broad range of external actors (Smits article, this issue).

The research articles in this special issue show that we are certainly not faced with a situation of isolated experiments or knowledge silos. On the contrary, we are witnessing a growing range of actors becoming involved in the process of building capacity and sharing of expertise information, knowledge, and lessons across borders. This interaction among a growing number of jurisdictions and types of actors appears to facilitate bottom-up dynamics that may benefit the building of a global carbon market as part of the Paris Agreement on climate change (Christoff 2016). Still, the availability of multiple suppliers of policy advice, knowledge, and technology does not necessarily translate into a collective and coherent effort that will lead to synergies and complementarity. It might also result in greater complexity and involve duplication and competition, since jurisdictions that provide policy advice and capacity building on emissions trading abroad frequently seek to promote their own variants of that policy (Biedenkopf et al. article, this issue).

Second, the contributions to this special issue show that even though there is considerable communication between different jurisdictions experimenting with emissions trading, such linkages do not necessarily facilitate greater policy convergence. While previous studies have convincingly demonstrated that international diffusion processes can lead to an increase in policy convergence, these studies have generally considered rather general factors, such as the portfolio of environmental policy measures adopted by a country and the stringency of the policies adopted (Holzinger et al. 2011). Moreover, diffusion studies have a tendency to focus on the decision to adopt a policy, while significantly less attention is often paid to questions of policy development, the choice of specific design elements, and policy implementation.

However, policy diffusion is not limited to the decision to adopt a certain policy; the narrowness of this focus fails to capture the dynamic nature of policy development and the evolution of the particular design features that determine the effectiveness and efficiency of complex policies like GHG emissions trading (Inderberg et al. article, this issue).¹

The question of convergence and divergence with respect to policy development in different jurisdictions is also acutely relevant for GHG ETSs. Importantly, it has clear relevance for the ways in which different ETSs can be linked or integrated in the future. Here, divergences across jurisdictions can make it very complex and challenging to attain deep linkages, entailing the risk of a “balkanized” global trading system that could erase many of the economic and environmental advantages of flexible, market-based approaches to pollution control (Bang et al. article, this issue).

It is certainly fair to say that the idea of emissions trading has spread around the globe. The establishment of ETSs by pioneering jurisdictions, most notably the EU, has facilitated the decision to adopt GHG emissions trading elsewhere, reducing uncertainty and enhancing the argumentative power of proponents of emissions trading. Similarly, the Kyoto Protocol has been identified as an important driver of the diffusion of emissions trading around the globe by means of the CDM. Accordingly, the international trend toward emissions trading over recent years can easily appear to be a convergence process driven by international dynamics.

However, if we move beyond the principled decision to adopt an ETS and look at specific design features and policy implementations, policy convergence becomes more elusive. In part, this can be explained as the result of policy-makers trying to learn from the shortcomings and mistakes of others, in particular when a receiving jurisdiction seeks to avoid problems experienced with emissions trading elsewhere. For instance, policy-makers in Australia and New Zealand deliberately sought to avoid the problems experienced in the EU ETS, which played an influential role in the development of their own domestic schemes (Inderberg et al. article, this issue; Müller and Slominski article, this issue). In certain cases, however, the impact of negative lessons might be just temporary, since over time, suppliers of policy solutions such as the EU also seek to advance their own systems and correct past mistakes. This could lead to an international dynamic of mutual ratcheting up and improving other (sub)national GHG ETSs.

An even greater challenge for achieving similarity of policies on emissions trading across jurisdictions is the fact that international processes interact substantively with domestic political and economic systems in the receiving

1. The literature on policy transfer, by contrast, has been more attentive to the different stages of the policy cycle in a receiving jurisdiction. However, this literature’s focus on the transfer of a policy from one jurisdiction to another has resulted in a situation in which scholars have predominantly relied on the detailed qualitative analysis of one or very few cases (see Marsh and Sharman 2009). Although the policy transfer literature has facilitated more nuanced analysis, it faces difficulties with generalizing its findings.

jurisdictions. These interaction dynamics can reach considerably beyond what has been suggested by conventional wisdom in diffusion studies—that is, that a new policy inspired by policy solutions from abroad must be adjusted to the particular historic, cultural, and institutional context prevailing in the receiving jurisdiction (the “goodness-of-fit” argument; see, e.g., Marsh and Sharman 2009). As Müller and Slominski (this issue) and Wettestad and Gulbrandsen (2017) remind us, policy diffusion is much more than a technical function of government; it involves not only learning from abroad, but also negotiations and bargaining among political actors and the accommodation of many different interests.

Hence, decisions pertaining to specific policy design elements cannot be reduced to considerations of policy effectiveness and inspiration by successful policies abroad. Rather, the case studies presented in this special issue show that policy development is frequently shaped by the interests of powerful domestic stakeholders and the ideological and political preferences of leading policy-makers. Here, learning easily becomes politically motivated, with political actors cherry-picking the features of a foreign program or of programs from different places that they consider politically opportune (Müller and Slominski, this issue).

Third, we observe that the EU ETS has served as a particularly important reference point for other jurisdictions experimenting with GHG emissions trading. As the world’s first and biggest GHG emissions trading system, the EU ETS has played an influential role in the development of ETSs in all seven jurisdictions studied in this special issue. The EU ETS was the main external source of inspiration for developing emissions trading in Australia and Kazakhstan, and it was a key external reference point in developing the ETSs in California (together with RGGI) and New Zealand (together with the Australian Carbon Pollution Reduction Scheme). The EU and its member states are also principal sponsors of the capacity-building projects studied in China, as well as important contributors to multilateral initiatives such as the World Bank’s Partnership for Market Readiness (PMR). The PMR provides a platform for sharing knowledge and experiences with market-based mitigation instruments and has played an important role for such countries as Thailand, Vietnam, and China.

Even though the EU ETS has been an important reference point, the *ways* in which the recipient jurisdictions have engaged with the expertise and experience provided have often caused them to depart from the EU template with regard to key design elements. The EU may have experienced its biggest success in achieving approximation of its own ETS design in Kazakhstan, which borrowed key elements from the EU ETS even without the EU actively promoting them (see Gulbrandsen et al., this issue).

The Global Diffusion of Emissions Trading

The individual contributions to this special issue build on the literatures of policy diffusion and policy transfer to explore how international dynamics have

impacted the evolution of GHG ETSs in the selected jurisdictions. Moving beyond policy adoption, which has been the main focus of much previous research of international policy diffusion, to a detailed analysis of policy development over time, the authors find themselves confronted with growing complexity. On the one hand, they face a growing range of actors supplying emissions-trading-related expertise, capacity building, and policy solutions. On the other, they confront a situation in which international dynamics interact considerably with domestic factors in the recipient jurisdictions. While an integrated analysis of the international diffusion dynamics and domestic factors affecting the development of emissions trading certainly increases the complexity of researchers' work, it also promises a more profound understanding of the international and domestic influences. At the same time, it mitigates the risk of overstating the impact of international influences, which must work their way through domestic politics in the recipient jurisdictions to have an impact on policy development.

The contributions to this special issue focus on different aspects of the interactions between international and domestic dynamics in the diffusion of GHG emissions trading policies, which have not received sufficient attention in previous research (see, e.g., Müller and Slominski 2016). The article by Bang et al. examines the origins and operation of California's cap-and-trade system from two broad sets of theoretical frames: research on international policy diffusion and on the local political economy. It investigates the process of diffusion and active learning as policy agents and organized interest groups sought to identify and apply lessons from other trading systems when designing and adjusting the California emissions trading program. At the same time, Bang et al. acknowledge that such processes are intrinsically complex and responsive to many different actors, interests, administrative arrangements, institutions, and ideas. They argue that California "learned" a few lessons from early actors—mainly about dangers to avoid, such as overallocation of permits and the risks of generous offset rules—but then proceeded largely into uncharted territory. Simultaneously, local political concerns were important mediating factors in the diffusion process. Local concerns have shaped the design of the cap-and-trade program. For example, overcoming the opposition of the state's politically well-organized oil industry was crucial to expansion of coverage to include the transport sector in the second compliance period (2015–2017), and strategies to overcome and redirect organized environmental and community interests were crucial to creating a cap-and-trade system in the first place.

The article by Inderberg et al. explores how diffusion and learning from other ETSs can explain the adoption, design, and revision of climate policy in New Zealand. The article specifically distinguishes how diffusion dynamics interact with two types of domestic factors: on the one hand, interaction motivated by learning between jurisdictions, and on the other, scrutiny aimed at avoiding material disadvantages that could result from miscalculations in climate policy design. The article also pays attention to the temporal dimensions of climate

policy development to account for how diffusion and domestic influences may change during policy adoption, design, and revision. It also shows the relevance of domestic lenses—shaped by experiences with related policy problems—for the evaluation of different approaches to climate policy. Specifically, it shows that the key actors involved in developing the New Zealand ETS already had experience with designing both regulated and deregulated markets, and considered a carbon market as merely another, not particularly complex, extension of this process.

The contribution by Müller and Slominski discusses the development of an ETS in Australia. As a starting point, the article criticizes the literature for often treating learning from abroad as a way to improve the effectiveness and problem-solving capacity of public policy at home. Conversely, little attention has been paid to how policy-makers strategically employ learning from abroad to advance their domestic policy preferences. Building on the notion of political learning, the article refines this concept by distinguishing between “learning as an argumentative resource,” “selective learning,” and “learning about policy design.” Even though—at least for the time being—the Australian ETS has failed, it provides an illustrative case of how government policy-makers have used political learning from abroad to promote emissions trading in a polarized domestic climate of adversarial ideas and competing interests. More generally, it highlights the fruitfulness of an integrative analytical approach that studies the interaction of international diffusion dynamics with domestic politics in the receiving jurisdiction.

The article by Smits analyzes past and emerging experiments with carbon market mechanisms in Thailand and Vietnam in the context of their domestic political economies and the shifting dynamics of the global climate governance regime. It shows the changing roles of government, the private sector, civil society, and donors and multilateral actors in these countries. Moreover, the article identifies key factors that play a role in the further development of carbon market mechanisms: the generation of domestic demand for carbon credits; building and keeping human capacity and adequate data; creating space for civil society; ensuring coordination within the government and between sectors, notably the energy sector; and establishing further linkages with regional (i.e., Asian) and global carbon market mechanisms, such as those in China, Japan, and South Korea. While Thailand and Vietnam can be regarded as cases of dynamic carbon market experiments, the article also points to domestic and international challenges that have inhibited the development of significant carbon market schemes in those countries, such as uncertainty about the climate governance regime, the marginal role of civil society, and limited domestic demand.

Biedenkopf, Van Eynde, and Walker analyze the ways in which capacity-building projects can be a vehicle for fostering policy diffusion. They demonstrate that capacity-building projects should, however, not be considered as exclusively externally driven. The receiving jurisdiction’s receptiveness and leverage to adapt the designs of those projects can be crucial to infusing different

external policy experiences into a domestic policy design and implementation process. Biedenkopf et al.'s article shows that, in the case of GHG emissions trading, the Chinese National Development and Reform Commission plays a gatekeeping role in steering capacity-building efforts by external financiers. This contribution analyzes both the interaction among capacity-building projects financed by different external financiers and the role that gatekeeping actors and brokers can play in the complex structure of interacting projects.

The Gulbrandsen, Sammut, and Wettstad article, on the ETS in Kazakhstan, examines the role of international policy diffusion in the adoption and design of emissions trading in Kazakhstan. They find that the overall framework for the ETS in Kazakhstan was inspired by the EU ETS, with many of its design elements based on the EU system. Two closely related diffusion mechanisms—emulation and learning—explain particular design similarities, such as the systems' allocation mechanisms, coverage, and monitoring, reporting, and verification procedures. Gulbrandsen et al. also find that domestic political concerns were central mediating factors in the diffusion process that helped shape the design of the Kazakh ETS. These concerns led the Kazakh authorities to go for some design choices quite different from those of the EU ETS, regarding the time periods/phases, fundamental ambition level, and offset rules. While conventional wisdom holds that the outcome of diffusion processes is policy convergence, this case shows that diffusion processes may result in both policy convergence and, more indirectly, divergence.

Lederer's forum piece highlights four questions to which all articles presented in this special issue speak. These questions are: Why have carbon markets been set up in the first place? What are the current regulatory trends that we can observe on the national level? What are the global aspects of emission trading? Who benefits from carbon trading? Lederer argues that carbon trading is a highly political multiactor and multilevel process.

Given the growing relevance and diffusion of GHG ETSs, we expect to witness a significant increase in scholarly research dealing with the issues outlined above in the years to come. This special issue can serve as a source of reference for other scholars who wish to investigate the remaining research gaps. The missing pieces that deserve more attention in the future include a number of questions. First, the operation of bottom-up dynamics in a post-Paris Agreement world will raise broader comparative questions about whether we can identify certain patterns among various domestic schemes in terms of their interactions and policy designs. For instance, what are the relevant similarities and differences in the ways in which individual ETSs are introduced? Why do different ETSs have similar or different design elements? The latter point is of particular relevance to questions about how individual ETSs can or should be linked to form a multijurisdictional, or even global, carbon market (Green 2017).

Second, there has been a clear lack of research on those countries that have only recently begun to experiment with GHG ETSs. While this special issue discusses new ETS experiments in Kazakhstan, Thailand, and Vietnam, we will

need more research before we can understand the various dynamics that underpin the global turn to GHG emissions trading in countries not just from the Global North, but also from the Global South. This research should not limit itself to cases of successful ETS implementation, but should also include cases in which the establishment of an ETS has encountered considerable domestic opposition or has not been feasible at all.

Third, the roles of both international organizations and private actors in polycentric climate governance and ETS diffusion remain under-researched. Given the interplay between top-down and bottom-up approaches in climate change politics, it will be interesting to know what role international organizations can and should play in the ever-denser web of GHG ETS experiments. Similarly, understanding the ways in which nongovernmental actors facilitate or inhibit the establishment and working of domestic ETSs is a recent but highly important research area. We hope that this special issue will inspire new research in this vital and dynamic area of international climate governance.

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