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Katja Biedenkopf, Sarah Van Eynde, Hayley Walker*

Global Environmental Politics, Volume 17, Number 3, August 2017, pp. 91-114
(Article)

Published by The MIT Press



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Abstract

Capacity-building projects can be a vehicle for fostering policy diffusion. They should not, however, be considered as exclusively externally driven; the receiving jurisdiction's receptiveness and leverage to steer the design of those projects can be crucial factors, shaping the process of infusing different external policy expertise and experiences into domestic policy design and implementation. This article shows that the Chinese National Development and Reform Commission (NDRC) has played a key role in steering the capacity-building efforts of external financiers in the case of greenhouse gas (GHG) emissions trading. The focus here is twofold: analyzing, on the one hand, the interaction among capacity-building projects financed by different external financiers, and on the other, the role that central actors and brokers can play in the complex structure of interacting projects.

Capacity-building projects can be a vehicle for fostering policy diffusion. They should not, however, be considered as exclusively externally driven; the receiving jurisdiction's receptiveness and leverage to steer the design of those projects can be crucial factors, shaping the process of infusing different external policy expertise and experiences into domestic policy design and implementation. This article shows that the Chinese National Development and Reform Commission (NDRC) has played a key role in steering the capacity-building efforts of external financiers in the case of greenhouse gas (GHG) emissions trading. The focus here is twofold: analyzing, on the one hand, the interaction among capacity-building projects financed by different external financiers, and on the other,

* We thank Floriane Libbrecht, Min Ji Kim, and Marie Lorent for their excellent research assistance, Guri Bang, Diarmuid Torney and three anonymous reviewers for their helpful comments on earlier versions of this article, as well as all interviewees for sharing their expert insights. A first draft of this article was presented at a workshop funded by the COST Action IS1309 'INOGOV'. The research was funded by the KU Leuven Research Fund (Bijzonder Onderzoeksfonds KU Leuven).

the role that central actors and brokers can play in the complex structure of interacting projects.

Not only is the supply of policy lessons and technical expertise decisive for the process of infusing external policy experiences into a jurisdiction's policy process, but so is its interaction with the demand in the receiving jurisdiction. Additionally, the interaction among multiple suppliers of policy advice and capacity building can increase the effectiveness of project financiers' efforts to infuse certain policy elements, but it can also render some efforts ineffective, in the case of conflictive interaction among capacity-building projects. In this article, we analyze all externally financed capacity-building projects in China in the domain of GHG emissions trading. Given China's significant share of almost 30 percent of global CO₂ emissions (Olivier et al. 2016, 20) and its planned national emissions trading system's (ETS's) coverage of a large share of national industrial emissions—likely making this ETS the largest globally—China is a crucial case for the analysis of climate mitigation policy.

Policy diffusion studies generally examine how a policy spreads from one pioneering source to a number of other jurisdictions (Börzel and Risse 2012a; Gilardi 2012; Wettstad and Gulbrandsen 2015, 4). However, once various jurisdictions have adopted the policy, they can also become active promoters of their own variants—in the case that they have adjusted some of the elements, which seems likely in the case of a complex policy such as GHG emissions trading. This raises the question of what happens when varying sources of policy experience and knowledge exist at the same time and when different actors engage in promoting their particular experience and knowledge in one and the same external jurisdiction. This question has not received much attention in the policy diffusion literature so far. This article seeks to make a contribution by focusing on the process of infusing policy from various external sources into one jurisdiction's policy-making.

This article's analytical focus is situated between policy diffusion and transfer. It analyzes the situation in which policy from various sources is infused into one jurisdiction: China. Policy transfer studies center on the transfer of a policy from one individual jurisdiction to another. The policy diffusion approach, in contrast, studies a set of transfers from one source to a multitude of jurisdictions (Holzinger et al. 2007, 13–17). This article focuses on a case in which multiple policies from different jurisdictions have exerted influence on one specific jurisdiction. It can be labeled *policy infusion*, since it describes the mirror-inverted process of policy diffusion—namely, a process through which a mixture of external experiences is infused into the domestic policy process of one specific jurisdiction. Figure 1 below illustrates these different analytical foci.

Conflict and competition among external actors can cancel out their respective influences, whereas coordination and cooperation can mutually enhance their impacts. This aspect seems highly important for understanding the extent to which a given policy has been influenced by a multitude of external

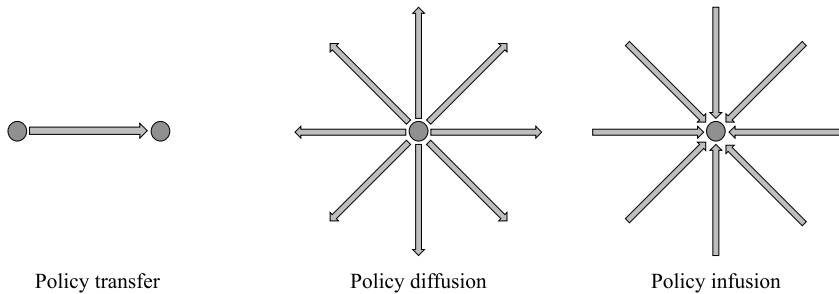


Figure 1
Policy Transfer, Diffusion, and Infusion

sources and actors. A detailed mapping of the external actors, their activities, and their interaction is essential to understand the complex processes involved in GHG emissions trading infusion. This article aims to contribute insights into those processes by analyzing the effects of externally funded capacity-building projects on GHG emissions trading in China.

The transfer, diffusion, and infusion of a policy do not only depend on the political decision to adopt this policy. They also require sufficient knowledge to enable informed design decisions, along with the capacity to devise and implement the policy. Nonetheless, capacity building has rarely been analyzed as a separate mechanism; rather, it has largely been subsumed in the broader category of positive and negative incentives that manipulate jurisdictions' utility calculations to compel them to adopt a certain policy (Börzel and Risse 2012a; Börzel and Risse 2012b; Carrapatoso and Well 2013). This conceptualization neglects the fact that capacity building can also support and enable learning by actors who have already taken the principled decision to adopt a policy that is inspired by policy in another jurisdiction. This article strives to make a contribution to the policy transfer and diffusion literature by highlighting and singling out the role that capacity building can play in those processes.

Capacity building aims at enhancing the capability of a jurisdiction to take effective (climate) action. Externally supported capacity-building projects can be a decisive factor in supporting the infusion of a policy into a jurisdiction—especially in cases in which the adopting jurisdiction does not have much experience with related policies, the necessary technical and infrastructural capacity, or a solid knowledge base pertaining to the policy that it seeks to adopt. Awareness and knowledge of external jurisdictions' policies is a precondition for their infusion. Actors who are familiar with the details of the original policy innovation and its implementation can play an important role in transmitting information and their experiences to jurisdictions that are interested in adopting a similar policy.

The interaction between external and domestic actors is an important element of capacity building, which requires the willingness of the receiving jurisdiction to engage in the process of developing a GHG ETS (Foot 2010, 229). External-domestic actor interaction has been neglected by many diffusion studies, which have instead focused on either the external or the domestic influences (Gilardi 2012), or have considered the external and domestic factors as two separate blocks (Lenschow et al. 2005) but have not systematically conceptualized their interaction. By analyzing the entire chain involved in capacity-building projects, this article will provide new insights into the interaction among external and domestic actors in diffusion and infusion processes, stressing the central role of local coordinators in the recipient jurisdiction—which are often state agencies, ministries, or other policy-makers—and the brokerage role of some implementing consultants.

We focus here on externally funded capacity-building projects. In preparation for the adoption of a national GHG ETS, China also increasingly encouraged internally organized capacity-building initiatives, through the establishment of training centers and interaction between some pilot project areas and other regions and municipalities that were new to operating a GHG ETS (Carbon Pulse 2016). These developments are not part of this article's analysis. Rather, it focuses on the activities of external actors and their interaction with Chinese actors.

The following section outlines the contours of GHG emissions trading, in general, and of developments in China, specifically. This leads to a discussion of the capacity-building projects, where we differentiate four types of their interactions: synergistic, complementary, duplicative, and competitive. Through their involvement in capacity-building projects, and through formal and informal contacts, external and Chinese actors are connected in a network in which a small set of actors hold central positions that provide them with leverage over other actors and their interactions. In the case of GHG ETSs in China, a particular gatekeeping role was assumed by the NDRC, but the Chinese consultancy SinoCarbon and Tsinghua University were also key brokering actors. Using a mix of data sources—mainly expert interviews, an online survey, and desk research—we then present a qualitative analysis of the interaction among GHG ETS capacity-building projects and the actors involved in the case of China. The concluding section proposes a research agenda that could build on this article's findings.

Greenhouse Gas Emissions Trading and Its Infusion to China

The idea of reducing harmful emissions by setting a ceiling for certain emissions and permitting emitters to trade emission allowances first emerged in the 1960s (Coase 1960; Dales 1968). Its implementation as a policy instrument to reduce GHG emissions started in the early 2000s and has diffused to a number of jurisdictions globally at a slow but relatively steady pace (Wettestad and

Gulbrandsen 2015). China started engaging in GHG ETS policy-making in 2010, when it launched the process of developing seven pilot projects. It is an interesting case for the infusion of a market-based policy instrument, given China's characteristics of both a nontraditional market economy and an emerging economy (Lo and Howes 2013).

In an ETS, a maximum emissions limit or—as in the case of China—a carbon intensity target is set for a defined group of emitters. This contrasts with a command-and-control approach of prescribing limits for each individual emitter. The emitters covered by an ETS obtain emission allowances for free or can purchase them in auctions or from other emitters. For predefined periods of time—generally one year—emitters must render to authorities the number of allowances that matches their actual emissions during that time. Surplus allowances can be sold or banked (in most systems). The price of a ton of carbon is determined by the supply and demand of allowances but some systems additionally contain price-control mechanisms. An ETS is a market-based policy instrument whose proclaimed advantages are cost-effectiveness, innovation fostering, and flexibility in achieving an overall emissions reduction goal, since it allows for investments in emission reduction measures where they are most cost-effective. When the allowance price is higher than the costs of investing in low-carbon technology, an ETS provides incentives for decarbonizing innovation (Dales 1968; Tietenberg 2006; van Asselt 2010, 126).

A number of jurisdictions have embraced GHG ETSs as part of their climate policy mix, starting in the early 2000s. By the end of 2016, twenty-one distinct systems covering thirty-five countries were operational globally at different levels of governance, from the supranational European Union (EU) level to the subnational, cross-border level of the linked systems of California and Quebec (ICAP 2016). The EU pioneered the field when it launched its ETS in 2005 (Ellerman and Buchner 2007, 67–69; Skjærseth and Wettestad 2008; Skjærseth and Wettestad 2009; Wurzel and Connelly 2011, 7–8), followed by New Zealand in 2008, and the subnational Regional Greenhouse Gas Initiative (RGGI) in the Northeastern United States in 2009 (Biedenkopf 2012).

China joined this development in 2010 when it launched the process of developing seven pilot GHG ETSs, the first of which started operating in 2013 (Biedenkopf and Torney 2015). These ETS pilots were implemented in five cities—Beijing, Tianjin, Shanghai, Chongqing, and Shenzhen—and two provinces—Guangdong and Hubei (Lo 2013). One of the stated purposes of the pilot ETSs was to pave the way for a national GHG ETS, whose launch has been announced for the second half of 2017 (NDRC 2016). This launch is expected to establish the largest carbon market globally in terms of the amount of CO₂ emissions covered, and will most likely apply to eight sectors and fifteen subsectors that together consume over 10,000 tons of coal equivalent annually, including the petrochemical, chemical, building material, iron and steel, nonferrous metal, paper, power generation, and aviation sectors. The GHG ETS is anticipated to initially cover 7,000 to 8,000 entities (ICAP 2016; Lo and Howes 2013, 387; Swartz 2016, 17).

Newly devising a GHG ETS is a complex undertaking that requires significant amounts of financial, technical, and knowledge resources. Creating a market for an artificially constructed commodity—emission allowances—requires the establishment of a number of processes, procedures, and infrastructures, some of which depend on the features of the economy in which the system is established (Bogojević 2013; van Zeven 2012). These include reliable systems for the measurement, reporting, and verification (MRV) of GHG emissions from all sources covered by the ETS, fair and effective mechanisms for allocating allowances and trading modalities, and competent institutions that can effectively regulate and monitor the market. Such design and implementation challenges require an elevated level of administrative and technical capacity and, in some cases, also the transformation of the regulator's understanding of their role in the process of effectively implementing an ETS (Goron and Cassisa 2017).

The design and capacity challenges are particularly pronounced in China, whose characteristics as a nontraditional market economy and emerging market have implications for the design of its GHG ETS (Lo and Howes 2015, 74–77). In the late 1980s and early 1990s, those challenges rendered the implementation of a similar policy instrument—namely, emissions trading for sulphur dioxide (SO₂)—difficult. The SO₂ ETS generally has been deemed unsuccessful (Biedenkopf and Torney 2015, 32–33; Hart and Zhong 2014). Strong state control of critical industries and commodity markets poses a challenge for designing a market-based policy, which usually relies on the involvement of nonstate economic and market actors (Lo and Howes 2013, 387; Munnings et al. 2014, 10). Given the national government's control of electricity prices, companies cannot easily pass on the cost of carbon to their customers (Lo and Howes 2013, 397; Munnings et al. 2014, 9). In the pilot GHG ETSs, allowance prices failed to react to market changes such as decreasing coal consumption, slowing GDP growth, and forced closure of industrial overcapacity (Goron and Cassisa 2017).

China's challenges also include its MRV capacity for historical and future GHG emissions (Jotzo and Löschel 2014, 7; Munnings et al. 2014, 14; Swartz 2016, 18; Wang 2011, 8–12) and the limited availability of accredited auditors for independently verifying emissions data (Carbon Pulse 2016). Capacity-building needs exist among government institutions, companies that are or will be covered by emissions trading, verification bodies, and other market participants. Provincial governments will be in charge of allocating allowances and ensuring compliance, and the NDRC will set the rules for the national carbon market.

Designing a market is always accompanied by uncertainties, such as the actors' investment decisions and the economic developments that may impact on GHG emissions (Callon 2009). The functioning of a carbon market cannot be predicted with certainty, and most experiences so far have shown that creating a price signal for emission-reducing investments is challenging (Koch et al. 2014). Using other jurisdictions' experiences when newly designing a GHG ETS thus seems highly relevant with regard to this particular policy, even though

China's particularities require adjusting others' models and experiences to its specific context. This highlights the importance of interaction between external actors, who have already gained positive and negative experiences with designing and implementing a GHG ETS, and the actors who seek to adopt such a policy. The usefulness of sharing experiences and building capacity extends to private actors—in particular, to companies. The following section outlines a framework for analyzing the interactions among the different projects and actors involved in the policy infusion process.

Project Interaction and the Role of Central Actors in Policy Infusion Processes

In this section, we first discuss the role of externally funded capacity-building projects and their role in policy infusion. Second, we differentiate four types of project interactions that can have important implications for the effective implementation of capacity-building projects, and thereby for the process and extent of policy infusion. The third subsection conceptualizes the role that central actors (such as state agencies and ministries) and brokers (such as consultants and research institutes) can play in the complex structure of interacting projects and policy infusion.

Externally Funded Capacity-Building Projects

Capacity building entails the systematic provision of expertise, technology, and finance with the aim of enhancing people's, governments', and nonstate organizations' capabilities to pursue a certain policy objective or implement a particular policy effectively. Capacity is the ability to identify and solve problems. A lack of knowledge, weak organization, and insufficient material and/or legal resources can all limit a jurisdiction's capacity (Buntaine and Parks 2013, 67). Capacity building aims to identify and overcome those obstacles and enhance the ability to achieve sustainable results. It supports a process of modernization in which new stages of problem-solving capacity are institutionalized and internalized (Weidner and Jänicke 2002, 1–2). Many capacity-building efforts aim to build capacity in ministries and government agencies, but nonstate actors such as businesses and NGOs can also be the target audience (Sagar and VanDeveer 2005, 15).

The sharing of knowledge, technology, and infrastructure can support policy infusion because it can enable jurisdictions to design a solid policy. In this way, capacity building can be a means to influence policy in another jurisdiction (Andonova et al. 2009, 64; Carbone 2010, 15). It involves cooperation between external and local actors that leads to the development of suitable solutions to identified problems. Capacity building differs from policy dialogues and regulatory cooperation—which are the mutual exchange of experiences and joint agreement to change particular policies—in its unidirectional character, aimed

at (policy) change in one target jurisdiction. Nonetheless, it still involves collaboration between the provider and the recipient of the intervention, and therefore requires at least a certain degree of receptiveness and interest in adopting a policy within the recipient country (Foot 2010, 229; Müller and Slominski 2016; Torney 2014). Capacity building is thus a facilitative activity that can support transfer, diffusion, and infusion through the intense sharing of information about a specific policy and by enabling a jurisdiction to adopt and implement that policy by means of infrastructure, technological, and financial support.

A range of different actors are involved in capacity-building projects: Financiers or donors provide the financial resources, usually motivated by the goal to steer a certain (policy) change in the recipient jurisdiction. The financier generally hires implementing agents or consultants who will design and implement the project. The required qualification is that these agents should be experts in the tasks necessary to achieve the financier’s objectives. Such implementers are often external actors, but they can also originate from the jurisdiction that is receiving the capacity-building service. A third actor group involved in capacity-building projects provides local coordination. This role is generally filled by a local government agency or part of the government, but it can also be a nonstate actor. Coordinators are involved in devising the modalities of the project and maintaining a dialogue with the financier and (some of) the consultants. A fourth group are the actual addressees and participants in the capacity-building measures; however, they are not the focus of this article, which centers on the design of capacity-building projects. Figure 2 below depicts the three actor groups that are crucial for understanding not just the design of a capacity-building project, but also the interaction among projects—which can be steered by individual actors from different groups—and, ultimately, policy infusion.

Capacity-building projects can entail various activities, ranging from a series of workshops and teaching modules to intense interaction at the technical level, which can include embedded experts in certain government departments or agencies. Given the intensity of the latter activity, it seems more likely to

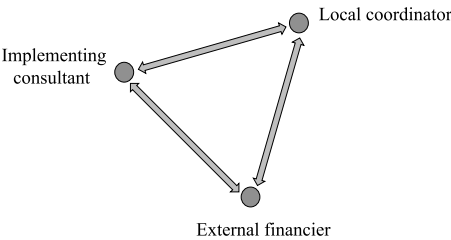


Figure 2
Capacity-Building Project Actor Groups

exert an enduring influence on a particular policy than, for example, a series of workshops, which entail only a limited number of contact moments. Now that this subsection has outlined the contours of a single project, the following one can focus on the interaction among a number of externally financed capacity-building projects and its consequences for policy infusion.

Project Interaction

When multiple actors have an interest in promoting certain policy changes in a given jurisdiction, they can interact with each other in mutually beneficial or detrimental ways, which has implications for the infusion of policy. The proliferation of capacity-building projects can result in inefficiencies and can increase the costs for both financiers and the partner jurisdiction, due to duplications and conflicts (Delputte and Orbie 2014, 676–677), but it can also generate efficiency gains in the case of joint efforts that pursue a harmonized strategy.

Four project interaction types can be differentiated: synergistic, complementary, duplicative, and conflictive. When external promoters of certain policies and policy designs collaborate to the extent that they pursue a harmonized strategy, their individual efforts can be strengthened and rendered more efficient (i.e., synergistic interaction). A similar mutually strengthening and efficiency-increasing effect can be achieved by means of complementary activities and the promotion of complementary policy elements through a division of labor (Gehring and Faude 2014). In both of these cases, the interaction is a conscious activity—*interaction management* (Oberthür and Pozarowska 2013)—in the first case a joint, and in the second a unifocal, one. When external actors independently and uncoordinatedly promote identical policies and designs, the effects of their efforts can still be mutually reinforcing (van Leeuwen and Kern 2013), but at a higher cost to the individual project financiers, since efforts are duplicated. When external actors independently and uncoordinatedly implement capacity-building projects that aim to promote contradictory or conflicting policies and designs, the different efforts can cancel each other out or severely undermine each other's efforts (Biermann et al. 2009; Johnson and Urpelainen 2012; Zelli and van Asselt 2013). Table 1 below summarizes these four types of project interaction.

The different types of project interaction have implications for the infusion of policies. The first three types support policy infusion, but with a varying degrees of efficiency from the financier's point of view. In the case of conflictive interaction, the effectiveness of some or all external actors can severely be undermined by the activities of their competitors. Conflictive interaction can lead to skepticism in the recipient jurisdiction, which can undermine the perception of the provided capacity-building service's authoritativeness and credibility (Andonova et al. 2009, 64) and can hamper or impede the policy infusion process.

Table 1
Types of Project Interaction

	<i>External Actor Interaction</i>	<i>Target Actor Within Recipient Jurisdiction</i>	<i>Project Objectives and Content</i>
Synergistic	Harmonized strategy	Same	Same
Complementary	Coordination and consultation	Same	Different but mutually reinforcing
		Different	Same
Duplicative	No coordination	Same	Same
Conflictive	No coordination	Same	Different and contradictory

The mere presence of capacity-building projects does not thus provide insights about their effectiveness and impact on policy infusion. Moreover, project interaction makes it difficult to identify the actual source of the infused policy.

Gatekeepers and Brokers

This subsection links the two previous ones by adding an actor-level perspective—based on the different actors groups identified above—to the previous discussion of differentiation among different types of interactions at the level of capacity-building projects and their implications for policy infusion. Through their involvement in multiple projects, central actors in the network of capacity-building projects can steer the projects’ content and interactions by acting as brokers and gatekeepers.

Actors’ degrees of centrality in the network of all project actors can indicate their influence on the information flows and types of project interaction (Scott 2012). The members of different actor groups—but especially well-connected consultants and local coordinating agencies or ministries—can act as brokers and can connect projects through structural and informal links by coordinating and steering different project activities (Kramer and Pahl-Wostl 2014; Scott 2012). Structural links emerge when actors are officially involved in multiple projects. Consultants, for example, can be commissioned by more than one financier to implement different projects, and thereby can ensure better coordination by acting as brokers. Also—and probably most importantly—local coordinating actors such as agencies and ministries can be in charge of many or of all projects, which enables them to foster the type of interaction that is in their best interest, acting as gatekeepers. Structural links can also take the form of institutionalized coordination meetings among financiers. Informal links, in contrast, occur through ad hoc contacts and information exchange. The following section examines the case of externally financed GHG ETS

capacity-building projects, investigating the projects' interactions and their implications for policy infusion in the case of China.

Policy Infusion and GHG ETS Capacity-Building Projects in China

Externally funded capacity-building projects found a receptive environment among Chinese policy-makers. Demand for external support in addition to domestic experimentation led to a proliferation of projects, mostly financed by jurisdictions that have their own GHG ETS experiences. The NDRC plays a gatekeeping role in the complex structure of multiple projects, making the infusion process one that is very much based on the interaction between external and Chinese actors. The various capacity-building projects and their financiers fall in the range from complementary to duplicative interaction, which is not the highest level of effectiveness in the aggregate, but is also not particularly ineffective, as would be the case of conflictive interaction.

The unit of analysis of this empirical investigation is organizations rather than individuals. The different external financiers, implementing consultants, and local coordinators are analyzed, as well as their interactions. We focus solely on externally funded capacity-building projects. China-internal capacity building and the activities of local actors such as the Energy Foundation China are not included in the analysis, nor are policy dialogues that fell short of building Chinese capacity.

Multiple information sources and methods were combined. The data were collected by means of intensive desk research, requests for additional information by e-mail, eighteen expert interviews conducted mainly in Beijing in April 2016 and January 2017, and an online survey with twelve respondents. Although the invitation to complete the survey was circulated widely, it proved difficult to encourage a larger number of responses. Interviewees and survey respondents shared their information on the condition of anonymity. For this reason, only some basic information about the interviewees is provided in the online Appendix 1.¹ The collected data were analyzed in a qualitative manner, combining the information from all different sources to paint a realistic picture of GHG ETS policy infusion through capacity building in China. The Gephi software was used to visualize the interactions among different actors in the capacity-building network.

The following subsections first map the externally funded GHG ETS capacity-building projects in China and situate them within the larger Chinese GHG ETS policy-making process. Second, the interactions among GHG ETS capacity-building projects in China are traced, and the implications of these interactions for policy infusion are discussed. The third subsection identifies the brokers and gatekeepers in the web of capacity-building projects, since they are particularly central actors in shaping the policy infusion process.

1. All appendices can be found on the *Global Environmental Politics* website, here: [LINK TO COME](#).

Mapping Externally Funded Capacity-Building Projects

Almost all of the financiers of the capacity-building projects discussed here are national or subnational governments with their own domestic GHG ETSs in place. Australia is the only exception, but it can be explained by that country's initial adoption of GHG ETS plans that were revoked after a change of government (Müller and Slominski, 2017, 51–68). Only a few of the financiers are not governments, but instead international organizations or research institutes. Europeans are the dominant financiers. The European Union, Germany, and Norway fund the largest projects after the World Bank's Partnership for Market Readiness (PMR), which has the largest single project in financial terms, with a budget of €8 million. The PMR's financial resources stem from its thirteen so-called Contributing Country Participants. Eleven of those thirteen countries are part of the European Union's GHG ETS, including Norway and Switzerland, and together they contribute almost 75 percent of the overall PMR financing (Biedenkopf 2016, 141–142). The two other participants are the United States and Australia. The observation that the sources of the largest share of capacity-building projects are actors with their own domestic GHG ETSs strongly supports the assumption that capacity-building projects are one of the prime vehicles for fostering policy transfer and diffusion.

The emergence and proliferation of GHG ETS capacity-building projects in China occurred in the period after the country announced its plans to implement seven regional and municipal pilot projects that would eventually lead to a national ETS. Table 2 plots the durations of the identified capacity-building projects against policy developments in China that pertained to emissions trading. This supports the observation that capacity-building projects require some degree of receptiveness and willingness in the receiving jurisdiction to adopt the particular policy. Capacity-building projects can thus contribute to shaping the policy formulation and implementation phases. They seem less suited for influencing agenda setting, since the initial willingness to engage in the collaborative process of developing a capacity-building project is not yet present at that stage of the policy process.

Table 2 suggests that the initial decision to adopt GHG emissions trading as a climate policy instrument was to a large extent triggered by other external or internal factors, most likely by a combination of the two. External factors that could have contributed to the agenda-setting phase include China's experience from participating in the Clean Development Mechanism (Belis and Kerremans 2016). The EU provided €2.8 million of finance from 2007 to 2010 toward the EU-China Clean Development Mechanism Facilitation Project, which was implemented in the context of the EU-China Partnership on Climate Change. At the 2012 EU-China summit, both jurisdictions agreed to deepen their dialogue on climate policy, including the design of a GHG ETS.

Analysis of the project documentation, including reports and workshop presentations, revealed not only that lessons from external experiences were

Table 2

Timeline of Capacity-Building Projects and Chinese Policy Developments

Financier	Chinese ETS Developments							Announce National ETS	Design National ETS	Implement National ETS
		Agenda-Setting for Pilot Projects	Announce Pilot Projects	Design Pilot Projects	Implement Pilot Projects			Evaluate Pilot Projects		
Financier	Project Title (short)	2010	2011	2012	2013	2014	2015	2016	2017	
European Union	Cooperation on ETS*									
	Supporting the Design									
	ICAP Training Courses****									
	GHG ETS Outreach									
United Kingdom	Prosperity Strategic Fund*									
	Low Carbon Cooperation									
Germany	ETS in China**									
	GHG Monitoring									
Norway	Provincial GHG Inventory									
	National Registry System									
Australia	Market Mechanisms China									
California	ARB Projects on ETS*									
World Bank	PMR I									
	PMR II***									
Asian Development Bank	Beijing Green Finance									
	Pilot ETS in Tianjin									
	Shanghai Carbon Market									
IETA	B-PMR*									
CIFF	China Carbon Pricing (1)									
	China Carbon Pricing (2)***									
Environmental Defense Fund (EDF)	ETS Pilot Training*									
	California-Shenzhen*									
	Mobile Source Emissions**									
ANU	China-Australia									
UNSW	Rise of Carbon									

Abbreviations: IETA: International Emissions Trading Association; CIFF: Children's Investment Fund Foundation; ANU: Australia National University; UNSW: University of New South Wales.

*End period unidentified

**End period: 2019

***End period: 2018

****The Netherlands also contributed to this project

For more detailed information on the projects included in this table, see online Appendix 2.

shared in the capacity-building projects, but also that the focus of most activities was in the specific context of the Chinese pilot projects and the national ETS. The capacity-building activities went far beyond sharing specific lessons learned in external experiences. Most projects targeted the building of capacity in China by focusing on its local context—as demonstrated, for example, by the involvement of not only foreign experts but also Chinese university representatives.

The individual capacity-building projects seem thus to have responded to China's demand and fostered the infusion of the general idea of a GHG ETS while providing tailored expertise on technical details.

Interaction Among the Projects

The expert interviews and online survey revealed that most experts perceived the interaction among the GHG ETS capacity-building projects as being largely complementary, with some instances of duplicative interaction and some competitive elements. Real conflicts as well as synergistic interaction were largely absent, although the case of the World Bank's PMR—in which different countries contributed financially to the same project—could arguably be considered a form of synergistic interaction.² The individual PMR financial contributors' direct involvement in the capacity-building project, however, was limited or indirect.

Table 3 below shows the geographical foci of the different GHG ETS capacity-building projects. It demonstrates that some geographical dispersion made the projects complementary rather than duplicative, with different projects focusing on different pilot regions and municipalities. However, significant overlap can also be noticed. In particular, the larger projects with a sizeable budget increasingly shifted their focus to the national level. This geographical overlap provided the conditions for all four types of interaction.

Among the GHG ETS capacity-building projects implemented in different Chinese geographical regions, conflictive, duplicative, and complementary interactions were conceivable. This was rooted in the link between the pilot projects and the national policy process. Some of the project reports we analyzed refer to the importance of the pilots for generating experience that could guide the design of the national ETS (see, e.g., Asian Development Bank 2013, 4). Capacity building in the pilot regions was thus conceived by some as an indirect way to help shape national GHG emissions trading policy.³ In this way, conflict among the projects implemented in different pilot regions and municipalities could have implications for those projects' effectiveness with regard to the objective of indirectly influencing the national policy design process via the pilots.

Both financiers and implementing consultants engaged in some activities that aimed at avoiding duplication. Those interaction management activities were complicated, however, by the different project cycles, which led to a situation in which projects and their scopes were designed at different points in time.⁴

Coordination and mutual consultation are initiated and conducted by the financiers and implementing consultants, and the interaction management to a great extent is carried out informally.⁵ The European Commission's Directorate

2. Interviews 10, 13, 16; survey responses 6, 8.

3. Interviews 8, 13, 15.

4. Also stated by Interviewee 6.

5. Interviews 4, 5, 6, 9, 10, 15, 17, 18; survey responses 5, 11, 12.

Table 3

Geographical Distribution of the Capacity-Building Projects

Financier	Project Title (short)	Beijing	Tianjin	Shanghai	Chongqing	Shenzhen	Guangdong	Hubei	National ETS	ETSs in General
EU	Cooperation on ETS								X	
	Supporting the Design	X	X	X	X	X	X	X	X	
	ICAP Training Courses									X
	GHG ETS Outreach	X	X	X	X	X	X	X		X
United Kingdom	Prosperity Strategic Fund			X	X		X	X	X	
	Low Carbon Cooperation				X		X	X		
Germany	ETS in China			X		X	X	X	X	
	GHG Monitoring	X	X	X	X				X	
Norway	Provincial GHG Inventory									X
	National Registry System								X	
California	ARB Projects on ETS	X				X	X			
World Bank	PMR I								X	
	PMR II								X	
Asian Development Bank	Beijing Green Finance	X								
	Pilot ETS in Tianjin		X							
	Shanghai Carbon Market			X						
IETA	B-PMR	X	X	X	X	X	X			
CIFF	China Carbon Pricing (1)					X		X		
	China Carbon Pricing (2)								X	
EDF	ETS Pilot Training	X	X	X	X	X	X	X		
	California-Shenzhen					X				
	Mobile Source Emissions					X				
ANU	China-Australia	X	X	X	X	X	X	X		
UNSW	Rise of Carbon	X	X	X	X	X	X	X	X	X

Abbreviations: IETA: International Emissions Trading Association; CIFF: Children's Investment Fund Foundation; ANU: Australia National University; UNSW: University of New South Wales.

General for Climate Action coordinates the EU member state financiers in Brussels by hosting regular meetings of actors who are following ETS developments in China.⁶ The EU Delegation to China also hosts some coordination meetings among the EU actors.⁷ Additionally, informal bimonthly coordination meetings are held in Beijing, which include all major financiers—in particular, the EU, the World Bank, Germany, Norway, and Australia.⁸ As is further illustrated below, in the Gatekeepers and Brokers subsection, the community of actors involved in the GHG ETS capacity-building projects in China is relatively small and well connected by a few central actors, most notably by the NDRC as gatekeeper and some consultants as brokers. This community interacts informally in various fora, such as the China Carbon Forum and the Carbon Market Working Group at the European Chamber of Commerce. However, some interviewees referred to a lack of transparency, which implies that not all financiers may be equally forthcoming with information about their plans early on.⁹ This has implications for policy infusion, since a lack of transparency can render coordination and any resulting effectiveness gains difficult.

A number of interviewees and survey respondents referred to an implicit division of labor, which was not jointly designed but emerged as a lesson learned from earlier incidents of duplication.¹⁰ Interaction management largely takes the form of unilateral adjustment of some projects to the already existing wider landscape of projects. In particular, the smaller financiers seem to have reverted to areas not covered by the large GHG ETS capacity-building projects.¹¹ An evolution toward improved implicit division of labor, thus avoiding duplications, was noted by some interviewees.¹² Nonetheless, some duplicative interaction remains.¹³ An example of the implicit division of labor is the German project's focus on the aviation sector, in response to the observation that the EU project did not cover this sector. The topic of MRV is covered by a number of projects, but informal coordination and adjustment led to attempts to avoid duplication among the participants who attended training sessions. For example, study trips to Europe in the context of the EU and German projects involved very similar itineraries but took different Chinese actors.

The evolution toward increased implicit complementary interaction does not mean, however, that competitive elements are entirely absent. Interviewees noted the existence of a competition for influence.¹⁴ This includes competition among financiers for the Chinese government's and stakeholders' attention.

6. Interviews 10, 13; survey responses 4, 6.

7. Interviews 3, 4, 5, 6, 7.

8. Interviews 4, 5, 6, 7, 8, 9, 13, 15, 17, 18; survey response 4.

9. Interviews 4, 5, 9, 12, 13.

10. Interviews 5, 6, 15; survey responses 4, 5, 6, 11.

11. Interview 6.

12. Interviews 1, 13, 18; survey response 4.

13. Interviews 4, 8, 11, 16, 17, 18; survey responses 5, 6.

14. Interviews 4, 5, 10, 13, 14; survey responses 4, 12.

The ultimate aim of the GHG ETS capacity-building projects is to help shape and facilitate the design and adoption of emissions trading in China. However, between the groups of European and North American financiers, some competition was noted with regard to a few specific concepts and systems that they promote, which are based on their own domestic systems and experiences.¹⁵ This could hinder the infusion process if the financiers provide inconsistent advice and multiple solutions.

Although a competitive element was certainly noticed, outright conflict seems to be largely absent. Rather, competition appears to have occurred at the level of duplicating efforts and, in limited instances, promoting somewhat different concepts and systems. Those activities and messages cannot be characterized as truly conflictive, however, since they are variants of the same overarching concept of GHG ETS. These conditions are relatively favorable for the infusion of ETS policies from various sources to China. Although we could identify some scope for efficiency improvement, the overall project interaction picture seems to have benefited policy infusion and rendered it relatively effective.

Gatekeepers and Brokers

Although external financiers and implementing consultants are often assumed to shape the content and type of the capacity-building projects in which they engage, the local coordinators—who are mostly state agencies, ministries, and policy-makers—should not be neglected. In the case of the GHG ETS capacity-building projects in China, the local coordinator—namely, the NDRC—is a central actor with significant leverage over the design of the projects. However, it does not seem to have used its theoretical leverage and gatekeeping position to the full extent possible.¹⁶ Figure 3 visualizes the central role of the NDRC. It is involved in almost all projects, and certainly in all of the large ones. Given the informal and ad hoc nature of the interaction management among the various financiers and the NDRC's central role in the network of capacity-building projects, it can be concluded that in this case the policy infusion process is shaped to a noteworthy extent by the recipient jurisdiction.

Figure 3 shows that the NDRC plays a role as gatekeeper in the infusion of GHG ETS policy to China. It also suggests that a small number of implementing consultants seem to have acted as brokers among different capacity-building projects, given their involvement in multiple initiatives and their close ties to the NDRC. Those actors appear in key structural positions—in addition to NDRC—to broker interactions among the different GHG ETS capacity-building projects, so as to steer them toward complementary interaction and foster effective infusion.

15. Interviews 10, 18; survey response 4.

16. Interviews 5, 11, 12, 15, 16.

The NDRC's central role in the project network has created opportunities for it to play a coordinating role and harmonize the different GHG ETS capacity-building projects, so as to increase the level of complementarity and possibly even achieve synergistic interaction. Theoretically, joint discussions among multiple financiers and the NDRC could identify capacity-building needs and lead to the joint development of a strategy for improved project interaction. However, the interviews and online survey revealed that this does not take place to a significant extent.¹⁷ This suggests that the policy infusion process has some potential for effectiveness improvement through interaction management.

The NDRC communicates bilaterally with project financiers and consultants.¹⁸ By doing so, they maintain the gate to their policy-making process and steer the initiatives proposed by external financiers. The NDRC's gatekeeper role consists of matching project activities with domestic demand, often on an ad hoc basis.¹⁹ Strategic coordination across projects seems to have been absent.²⁰ The approach of bilateral communication between NDRC and financiers could even be considered an impediment to closer interaction management among the financiers, given NDRC's leverage in influencing the external projects' content and design. When the first capacity-building projects were launched, the NDRC assigned the same tasks to multiple projects and received duplicative funding for one specific activity, such as developing guidelines.²¹ As time progressed, the NDRC engaged to a growing extent in interaction management to ensure the complementarity of the externally funded projects. However, due to the relatively small number of staff in the NDRC's unit in charge of GHG emissions trading policy, the strategic planning and coordination of all external capacity-building actors is not used to its full potential,²² which has impacted on the policy infusion process.

A few implementing consultants also play a key role by, to some extent, brokering between the NDRC and the external financiers and some of the other implementing consultants. SinoCarbon, a Chinese consultancy firm, and Tsinghua University are involved in a number of the externally funded capacity-building projects and were highlighted by the interviewees.²³ Their close connection to the NDRC transformed them into brokers between external actors and the local coordinator, which give them particular influence on the policy infusion process.

The analysis presented in this section has highlighted the centrality that local coordinators can play in steering capacity-building project design, and thereby in shaping policy infusion. China is, of course, a special case for such

17. Interviews 5, 6, 9, 10, 15, 16, 17; survey response 10.

18. Interviews 1, 2, 5, 6, 10, 12, 13, 15, 16.

19. Interview 13; survey responses 8, 11.

20. Interviews 5, 15, 17.

21. Interviews 5, 15.

22. Interviews 6, 15, 18.

23. Interviews 3, 6, 9, 12, 13, 15, 16, 18; survey response 3.

a scenario, since the external financiers have a great deal of interest in engaging with China. In countries with lower political and economic importance and a smaller share of global GHG emissions, the leverage of local coordinators might be less pronounced since the external interest is lower. Nonetheless, their receptiveness and willingness to engage in policy infusion through capacity building are necessary. Given the comparatively large number of capacity-building projects in China, this country provides a likely case for competitive and conflictive interaction to render policy infusion efforts less effective. Our analysis showed some traces of this, but overall we found the capacity-building project interactions to have largely been complementary and duplicative, which indicates that the effectiveness of GHG ETS policy infusion was relatively good but could have been further improved.

Conclusions

Although it is too early to judge the outcome of GHG ETS infusion from various external sources to China, this article has demonstrated that formal capacity-building projects can be a central element of such processes. Capacity building is more than merely transferring messages; it enables jurisdictions to adopt and implement a policy that has already been adopted elsewhere and to engage in tailoring the design details to local contexts, so as to render the transferred policy effective. Capacity building can foster policy transfer, diffusion, and infusion at the policy formulation and implementation stages. The agenda-setting stage—of taking the principled decision to adopt, first, subnational GHG ETS pilot projects and, subsequently, a national system in China—preceded the surge of capacity-building projects, highlighting the importance of receptiveness as a precondition or trigger for policy infusion through capacity building. A combination of motivations, including those related to international interdependence and emulation, may have driven the decision to place GHG ETS on the Chinese political agenda (Gippner 2014; Gippner 2016).

Capacity building can be a powerful tool to empower developing countries and emerging economies to engage in climate action, and thereby can contribute to the bottom-up dynamics envisioned by the Paris Agreement on climate change. The interaction among externally financed capacity-building projects is, however, a decisive factor for the effectiveness of those efforts. Different actors can engage in interaction management. The analysis presented in this article has highlighted the role of local coordinating agencies as gatekeepers and active influencers of policy infusion processes. Those local coordinators' interaction with the external financiers and promoters of a particular policy design has not received much attention so far in policy diffusion studies. This article has demonstrated that actors such as the NDRC can act as gatekeepers in policy infusion processes. They are well placed to engage in project interaction management, and are therefore important for understanding and influencing the effectiveness of the infusion process.

China has received considerable support in creating a GHG ETS from numerous external financiers. This might set China apart from many other countries, since it is a large, powerful actor whose climate mitigation policy is crucial for achieving the targets set by the international community and enshrined in the Paris Agreement on climate change. Most of the external financiers that engage in GHG ETS capacity building in China have a vested interest in ensuring that the national Chinese GHG ETS be effective. Should the Chinese system be generally perceived as a failure, it will be difficult to argue in favor of the adoption of new GHG ETSs elsewhere. This could halt or impede the further diffusion of GHG ETSs globally and have repercussions for the development of an international carbon market.

The largely complementary and sometimes duplicative interactions among capacity-building projects in China have positive implications for policy infusion's effectiveness there. They may also be an indication of an emerging global consensus on GHG ETS. Although the design details differed in various jurisdictions, the overall idea and structure of GHG emissions trading seems to have been largely uncontested among the actors included in the analysis in this article. Expanding the analysis of whether and how external policy promoters interact with each other from the narrow GHG ETS community to the broader set of climate policies could provide further novel insights into the effectiveness of policy infusion.

China increasingly encourages internally organized capacity-building initiatives through the establishment of training centers and interaction among the pilot project areas and other regions and municipalities that are new to operating a GHG ETS. Further research on the entire complex system of external and internal capacity-building projects and actors could build on the initial analysis provided in this article. Such a study would be capable of investigating to a greater extent the details of the dynamics within China. Moreover, whereas this article was based on an analysis of the roles of organizations, shifting to individuals as the level of analysis could provide important insights to help us understand the complexities of policy transfer, diffusion, and infusion processes.

References

- Andonova, Liliana B., Michele M. Betsill, and Harriet Bulkeley. 2009. Transnational Climate Governance. *Global Environmental Politics* 9 (2): 52–73.
- Asian Development Bank. 2013. People's Republic of China: Developing Tianjin Emissions Trading System. Consultant's Report.
- Belis, David, and Bart Kerremans. 2016. The Socialization Potential of the CDM in EU-Vietnam Relations. *Climate Policy* 16 (8): 1048–1064.
- Biedenkopf, Katja. 2012. Emissions Trading: A Transatlantic Journey for an Idea? KfG "The Transformative Power of Europe" Working Paper 45, Freie Universität Berlin.

- Biedenkopf, Katja. 2016. The EU in Transnational Climate Networks: The Case of the Partnership for Market Readiness. In *The European Union's Engagement with Transnational Policy Networks*, Stephen Kingah, Vivien Schmidt, and Wang Yong, 138–149. Abingdon, UK: Routledge.
- Biedenkopf, Katja, and Diarmuid Torney. 2015. Cooperation on Greenhouse Gas Emissions Trading in EU-China Climate Diplomacy. In *China-EU Green Cooperation*, edited by Etienne Reuter and Jing Men, 21–38. Singapore: World Scientific.
- Biermann, Frank, Philipp Pattberg, Harro van Asselt, and Fariborz Zelli. 2009. The Fragmentation of Global Governance Architectures: A Framework for Analysis. *Global Environmental Politics* 9 (4): 14–40.
- Bogojević, Sanja. 2013. *Emissions Trading Schemes: Markets, States and Law*. Oxford: Hart.
- Börzel, Tanja A., and Thomas Risse. 2012a. From Europeanisation to Diffusion: Introduction. *West European Politics* 35 (1): 1–19.
- Börzel, Tanja A., and Thomas Risse. 2012b. When Europeanisation Meets Diffusion: Exploring New Territory. *West European Politics* 35 (1): 192–207.
- Buntaine, Mark T., and Bradley C. Parks. 2013. When Do Environmentally Focused Assistance Projects Achieve their Objectives? Evidence from World Bank Post-Project Evaluations. *Global Environmental Politics* 13 (2): 65–88.
- Callon, Michel. 2009. Civilizing Markets: Carbon Trading Between In Vitro and in Vivo Experiments. *Accounting, Organizations and Society* 34 (3–4): 535–548.
- Carbon Pulse. 2016. Analysis: Provincial Preparations, Speed Bumps Ahead of China's National ETS. April 13, 2016.
- Carbone, Maurizio. 2010. The European Union, Good Governance and Aid Co-ordination. *Third World Quarterly* 31 (1): 13–29.
- Carrapatoso, Astrid, and Mareike Well. 2013. Interregional Climate Cooperation. EU-China Relations as a Success Story? In *Climate-Resilient Development: Participatory Solutions from Developing Countries*, edited by Astrid Carrapatoso and Edith Kürzinger, 204–226. Abingdon, UK: Routledge.
- Coase, Ronald H. 1960. The Problem of Social Cost. *Journal of Law & Economics* 3: 1–44.
- Dales, John H. 1968. *Pollution, Property & Prices: An Essay in Policy-Making and Economics*. Toronto: University of Toronto Press.
- Delputte, Sarah, and Jan Orbie. 2014. The EU and Donor Coordination on the Ground: Perspectives from Tanzania and Zambia. *European Journal of Development Research* 26 (5): 676–691.
- Ellerman, A. Denny, and Barbara K. Buchner. 2007. The European Union Emissions Trading Scheme: Origins, Allocation, and Early Results. *Review of Environmental Economics and Policy* 1 (1): 66–87.
- Foot, Rosemary. 2010. Strategy, Politics, and World Order Perspectives: Comparing the EU and US Approaches to China's Resurgence. In *US-China-EU Relations. Managing the New World Order*, edited by Robert S. Ross, Tunsjø Øystein, and Tuosheng Zhang, 212–232. Abingdon, UK: Routledge.
- Gehring, Thomas, and Benjamin Faude. 2014. A Theory of Emerging Order Within Institutional Complexes: How Competition among Regulatory International Institutions Leads to Institutional Adaptation and Division of Labor. *Review of International Organizations* 9 (4): 471–498.
- Gilardi, Fabrizio. 2012. Transnational Diffusion: Norms, Ideas, and Policies. In *Handbook of International Relations*, edited by Walter Carlsnaes, Thomas Risse, and Beth A. Simmons, 453–477. London: Sage.

- Gippner, Olivia. 2014. Framing It Right: China-EU Relations and Patterns of Interaction on Climate Change. *Chinese Journal of Urban and Environmental Studies* 2 (1): 1–22.
- Gippner, Olivia. 2016. The 2 °C Target: A European Norm Enters the International Stage—Following the Process to Adoption in China. *International Environmental Agreements: Politics, Law and Economics* 16: 49–65.
- Goron, Coraline, and Cyril Cassisa. 2017. Regulatory Institutions and Market-Based Climate Policy in China. *Global Environmental Politics* 17 (1): 99–120.
- Hart, Craig, and M. A. Zhong. 2014. China's Regional Carbon Trading Experiments and the Development of a National Market: Lessons from China's SO₂ Trading Programme. *Energy & Environment* 25 (3–4): 577–592.
- Holzinger, Katharina, Helge Jörgens, and Christoph Knill. 2007. Transfer, Diffusion und Konvergenz: Konzepte und Kausalmechanismen. *Politische Vierteljahresschrift Sonderheft* 38: 11–35.
- ICAP. 2016. *Emissions Trading Worldwide: Status Report 2016*. Berlin: ICAP.
- Johnson, Tana, and Johannes Urpelainen. 2012. A Strategic Theory of Regime Integration and Separation. *International Organization* 66 (4): 645–677.
- Jotzo, Frank, and Andreas Löschel. 2014. Emissions Trading in China: Emerging Experiences and International Lessons. *Energy Policy* 75: 3–8.
- Koch, Nicholas, Sabine Fuss, Godefroy Grosjean, and Ottmar Edenhofer. 2014. Causes of the EU ETS Price Drop: Recession, CDM, Renewable Policies or a Bit of Everything?—New Evidence. *Energy Policy* 73: 676–685.
- Kramer, Annika, and Claudia Pahl-Wostl. 2014. The Global Policy Network Behind Integrated Water Resources Management: Is It an Effective Diffusor? *Ecology and Society* 19 (4): 11.
- Lenschow, Andrea, Duncan Liefferink, and Sietske Veenman. 2005. When Birds Sing: A Framework for Analysing Domestic Factors Behind Policy Convergence. *Journal of European Public Policy* 12 (5): 797–816.
- Lo, Alex Y. 2013. Carbon Trading in a Socialist Market Economy: Can China Make a Difference? *Ecological Economics* 87: 72–74.
- Lo, Alex Y., and Michael Howes. 2013. Powered by the State or Finance? The Organization of China's Carbon Markets. *Eurasian Geography and Economics* 54 (4): 386–408.
- Lo, Alex Y., and Michael Howes. 2015. Power and Carbon Sovereignty in a Non-Traditional Capitalist State: Discourses of Carbon Trading in China. *Global Environmental Politics* 15 (1): 60–82.
- Müller, Patrick, and Peter Slominski. 2016. Theorizing Third Country Agency in EU Rule Transfer: Linking the EU Emissions Trading System with Norway, Switzerland and Australia. *Journal of European Public Policy* 23 (6): 814–832.
- Munnings, Clayton, Richard D. Morgenstern, Zhongmin Wang, and Xu Liu. 2014. Assessing the Design of Three Pilot Programs for Carbon Trading in China. Resources for the Future Discussion Paper 14–36, Resources for the Future, Washington, DC.
- National Development and Reform Commission (NDRC). 2016. *Notice on Key Works in Preparation for the Launch of the National ETS*. Press Release, January 11.
- Oberthür, Sebastian, and Justyna Pozarowska. 2013. Managing Institutional Complexity and Fragmentation: The Nagoya Protocol and the Global Governance of Genetic Resources. *Global Environmental Politics* 13 (3): 100–118.
- Olivier, Jos G. J., Greet Janssens-Maenhout, Marilena Muntean, and Jeroen A. H. W. Peters. 2016. *Trends in Global CO₂ Emissions: 2016 Report*. The Hague: PBL Netherlands Environmental Assessment Agency.

- Sagar, Ambuj D., and Stacy D. VanDeveer. 2005. Capacity Development for the Environment: Broadening the Scope. *Global Environmental Politics* 5 (3): 14–22.
- Scott, John. 2012. *Social Network Analysis*. Thousand Oaks: SAGE Publications.
- Skjærseth, Jon Birger, and Jørgen Wettestad. 2008. *EU Emissions Trading. Initiation, Decisionmaking and Implementation*. Aldershot: Ashgate.
- Skjærseth, Jon Birger, and Jørgen Wettestad. 2009. The Origin, Evolution and Consequences of the EU Emissions Trading System. *Global Environmental Politics* 9 (2): 101–122.
- Swartz, Jeff. 2016. China's National Emissions Trading System: Implications for Carbon Markets and Trade. ICTSD Global Platform on Climate Change, Trade and Sustainable Energy, Issue Paper No. 6, International Centre for Trade and Sustainable Development, Geneva, Switzerland.
- Tietenberg, Thomas H. 2006. *Emissions Trading: Principles and Practices*. Washington, DC: Resources for the Future Press.
- Torney, Diarmuid. 2014. External Perceptions and EU Foreign Policy Effectiveness: The Case of Climate Change. *Journal of Common Market Studies* 52 (6): 1358–1373.
- van Asselt, Harro. 2010. Emissions Trading: The Enthusiastic Adoption of an “Alien” Instrument. In *Climate Change Policy in the European Union: Confronting the Dilemmas of Mitigation and Adaptation?*, edited by Andrew Jordan, Dave Huitema, Harro Van Asselt, Tim Rayner, and Frans Berkhout, 125–144. Cambridge: Cambridge University Press.
- van Leeuwen, Judith, and Kristine Kern. 2013. The External Dimension of European Union Marine Governance: Institutional Interplay Between the EU and the International Maritime Organization. *Global Environmental Politics* 13 (1): 69–87.
- van Zeven, Josephine A. W. 2012. *Competence Allocation and Regulatory Functioning: A Study of the European Union Emissions Trading Scheme*. Rotterdam: Optima.
- Wang, Xin. 2011. Building MRV for a Successful Emissions Trading System in China. Working Article No. 16/11, IDDRI, Paris.
- Weidner, Helmut, and Martin Jänicke, eds. 2002. *Capacity-Building in National Environmental Policies: A Comparative Study of 17 Countries*. Heidelberg: Springer.
- Wettestad, Jørgen, and Lars H. Gulbrandsen. 2015. The Evolution of Carbon Trading Systems: Waves, Design and Diffusion. FNI Report 9/2015, Fridtjof Nansen Institute, Lysaker, Norway.
- Wurzel, Rüdiger K. W., and James Connelly. 2011. European Union Political Leadership in International Climate Change Politics. In *The European Union as a Leader in International Climate Change Politics*, edited by Rüdiger K. W. Wurzel and James Connelly, 3–20. London: Routledge.
- Zelli, Fariborz, and Harro van Asselt. 2013. The Institutional Fragmentation of Global Environmental Governance: Causes, Consequences, and Responses. *Global Environmental Politics* 13 (3): 1–13.