

The Contours of “Cap and Trade”: The Evolution of Emissions Trading Systems for Greenhouse Gases

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Abstract

This article documents the evolution of “cap and trade” as a policy response to global climate change. Through an analysis of 33 distinct policy venues, the article describes how the cap and trade policy domain has developed along spatial, temporal, and institutional dimensions. This discussion demonstrates that following initial discussions of cap and trade in the Kyoto Protocol negotiations, the idea quickly spread to other policy venues, creating a complex system of multilevel governance, where many questions about how to govern emissions trading remain contested. The analysis contextualizes recent questioning of emissions trading as an appropriate mechanism for controlling GHG emissions, as well as the ongoing debates about who should govern cap and trade and how it should be carried out. The findings highlight the value added of a domain-level perspective and suggest the need for future research on the sociopolitical nature of cap and trade policy debates.

KEY WORDS: cap and trade, emissions trading, Kyoto Protocol

In recent years, “cap and trade” has become a touchstone for both climate policy and controversy over the global response to climate change. On the one hand, emissions trading has emerged as a central policy mechanism for addressing global climate change. There are active cap and trade systems in Europe, North America, and the Asia/Pacific region, with many other systems under consideration. These systems are organized across a range of political jurisdictions and involve both the public and the private sectors. While the UN negotiations at Copenhagen in December of 2009 floundered, parallel discussions on the development and future of carbon markets and emissions trading demonstrated that momentum remained behind this means of addressing climate change (Bernstein, Betsill, Hoffmann, & Paterson, 2010). Until recently, emissions trading appeared poised to become the central piece of the global response to climate change.

Since early 2010, cap and trade has faced significant criticism and some loss of impetus. In the U.S. Senate, the much anticipated Kerry–Lieberman proposed legislation lost its key Republican sponsor (Lindsey Graham) and was eventually buried, raising doubt about prospects for a federal cap and trade system. Australia announced that its cap and trade initiative will be delayed until at least 2013 because the government could not obtain legislative approval. The Western Climate Initiative, looked on as a bright spot in North American climate policy, has suffered setbacks with the withdrawals of Arizona and Utah from the cap and trade aspect of the initiative. Even the European Union’s emission trading system, the largest functioning cap and trade system, has faced charges of corruption and fraud, along with challenges in getting the cap correct during a financial crisis.

Recent events raise questions about the future development of cap and trade systems and their role in the ongoing evolution of the global response to climate change. This article situates current debates in a broader historical context by providing a descriptive account of the evolution of the cap and trade “policy domain” in the period 1996–2008 (Table 1). Policy domains consist of multiple venues, issues, and organizations “organized around substantive issues” (Burstein, 1991, p. 328; see also Guiraudon, 2003; May, Sapotichne, & Workman, 2006). We map the contours of the cap and trade policy domain through the analysis of 33 distinct venues in which cap and trade was proposed, under development, and/or operational during this period. To our knowledge, this is the first effort to examine the cap and trade policy domain comprehensively along spatial, temporal, and institutional dimensions. This descriptive exercise reveals interesting patterns in the evolution and use of cap and trade and areas of contestation that have characterized cap and trade politics throughout the period, demonstrating that current debates are both a continuation of and a break from these historical patterns. In addition, our policy domain approach provides a useful starting point for examining the nature of policy convergence around cap and trade, as well as questions of governance.

We begin by elaborating on the “policy domain” approach and clarifying why it might be helpful in understanding the evolution of cap and trade as a central mechanism in global climate change governance. We also introduce our methodology for mapping the cap and trade policy domain. The majority of the article then consists of a descriptive account of the cap and trade policy domain in the period 1996–2008. This exercise traces discussions of cap and trade as they moved from the Kyoto Protocol negotiations to other policy venues. We then identify some of the patterns revealed through this descriptive exercise. Individual cap and trade venues are neither all the same (i.e., there is significant variation across the population of proposed and implemented venues) nor randomly designed (i.e., there are patterns to the diversity in the proposed and implemented venues). This has implications for our understanding of cap and trade as an element of global climate change governance and the significance of recent debates about the future of cap and trade. In the conclusion, we present a research agenda for analyzing the cap and trade policy domain as a social space in which actors construct the meaning of cap and trade and its role in governing climate change.

The Policy Domain Approach

The ascendance of cap and trade as a key tool for addressing climate change has been rapid. Cap and trade mechanisms were developed in the 1980s to address the problem of acid rain in North America and Europe (Raufner & Feldman, 1987; Voß, 2007), but were not introduced into discussions of climate change until the Kyoto Protocol negotiations in the mid-1990s.¹ At the insistence of the United States and many business interests—and over the objections of the European Union, many developing countries, and environmentalists—this “flexible mechanism” was included in the Protocol as one tool for states to achieve their emissions reduction commitments (Andresen & Agrawala, 2002; Betsill, 2008; Engels, 2006; Hoffmann, 2005; Yamin, 1998). However, the Kyoto Protocol and subsequent Marrakesh

Table 1. The Cap and Trade Policy Domain (1996–2008)

Subnational	National	International	Private
<ul style="list-style-type: none"> • Australian States and Territories • California • Florida • Illinois • Massachusetts • Midwestern Greenhouse Gas Reduction Accord (transnational) • New England Governors/Eastern Canadian Premiers (transnational) • New Hampshire • New Jersey 	<ul style="list-style-type: none"> • New Mexico • New South Wales Greenhouse Gas Reduction Scheme • Ontario-Quebec • Oregon • Regional Greenhouse Gas Initiative (transnational) • Tokyo • Western Climate Initiative (transnational) 	<ul style="list-style-type: none"> • E.U. ETS • Kyoto Protocol • North Atlantic Free Trade Agreement • Commission for Environmental Cooperation 	<ul style="list-style-type: none"> • British Petroleum • Chicago Climate Exchange • PEMEX • Shell

PEMEX, Spanish Petróleos Mexicanos.

Accords provided little guidance on how emissions trading should take place. In other words, the Kyoto Protocol catalyzed the development of cap and trade as a governance mechanism for climate change, but it did little more than open space for developing this mechanism. In the intervening decade, actors at multiple levels (cities, states and provinces, corporations, and individual nation-states) have taken up the challenge of designing and implementing cap and trade systems.

These developments raise interesting questions about policy convergence and the governance of cap and trade (Dolowitz & Marsh, 2000; Holzinger, Knill, & Arts, 2008). Does the spread of cap and trade policy discussions to multiple venues indicate convergence around the idea that cap and trade is an appropriate response to climate change? To the extent there is convergence, what is the nature of that convergence? Is there agreement about the rules that should govern carbon markets and/or who should make those rules? Does the emergence of cap and trade as a central policy instrument challenge the centrality of the multilateral treaty system in the global governance of climate change? Unfortunately, the existing academic literature on cap and trade provides little insight on these questions.

Many scholars, especially economists, often treat cap and trade as a technical policy instrument, marked by what Lascoumes and Le Gales (2007) refer to as a “functionalist orientation.” Cap and trade is seen to be a pragmatic approach to solving the problem of climate change, one of many instruments “at our disposal” to control greenhouse gas emissions, and the primary concern is its effectiveness in economic and environmental terms. This is true whether scholars focus on the underlying economic logic of cap and trade, comparisons between cap and trade and other policy measures, analyses of individual trading systems, or possibilities for linking systems (Aulisi, Farrell, Pershing, & VanDeveer, 2005; Ecoplan/Natsource, 2006; Grubb & Kneuhoff, 2006; Nordhaus, 2008; Nordhaus & Danish, 2003; Point Carbon, 2007; Soleille, 2006; Victor & House, 2006). These approaches tend focus on the technical aspects of market design while overlooking the social and political nature of rule making, which is central to market development and questions of governance (Engels, 2006; Fligstein & Sweet, 2002; Newell, 2008; Newell & Pater-son, 2010; Rabe, 2008). Recent events have clearly demonstrated how fraught the politics of cap and trade really are, especially in a context of financial crisis, rising skepticism about climate science, and increasingly polarized politics in countries like the United States, Canada, and Australia

A number of studies do analyze sociopolitical dynamics related to the develop-ment of individual cap and trade systems (Bailey, 2010; Grubb, 2009; Heinmiller, 2007; Hovi & Skodvin, 2008; Selin & VanDeveer, 2005, 2007; Skjærseth & Wettestad, 2008, 2009; Svendsen, 2005; Zapfel & Vainio, 2002; Zhang, 2007). These studies begin to illuminate the governance aspects of cap and trade by providing detailed accounts of political debates about rules and authority in particular places at particular times. However, the bulk of this literature focuses on just a few venues (the E.U. Emissions Trading System and the Regional Greenhouse Gas Initiative in particular), and thus provides an incomplete picture of the broader cap and trade policy debate. Many scholars look at cap and trade systems in relative isolation, while others consider relations between venues in a limited sense. For example, Skjærseth and Wettestad (2009) analyze the influence of the international regime on rule-making processes in the European Union, and Grubb (2009) discusses the

politics of linking systems through the transfer of permits. But overall, this body of literature is inadequate for considering broader questions of policy convergence and governance, because it reveals little about the relationships between venues and the importance of venue-level dynamics in shaping the broader context for cap and trade debates throughout the policy domain.

In contrast to existing studies, we view cap and trade as a “policy domain” within the broader system of global climate change governance. We contend that the cap and trade policy domain is a social space in which actors in multiple venues construct the meaning of “cap and trade” and its role in governing climate change through debates about the nature of the climate change threat, the relationship between greenhouse gases and the economy, and questions of authority. With a domain level perspective—examining the population of venues that have engaged with cap and trade—we can apprehend whether there are ideational and institutional connections that link cap and trade systems into a loose whole and begin to explore the nature of the emerging governance complex around cap and trade.²

We argue that this more holistic view provides insight into the emergence of cap and trade as a central policy instrument in global climate change governance and how the market might face its current challenges and develop in the future.³ We do not seek to argue for or against emissions trading as an appropriate strategy for controlling greenhouse gas emissions, or to analyze cap and trade in comparison with other policy instruments such as carbon taxes, efficiency measures, or regulation. Whether or not cap and trade is the best option, economically or environmentally, our observations of global climate change politics and extensive investigation of carbon markets over the past several years convinces us that cap and trade will remain an aspect of the global response to climate change. We seek to understand how this came to be and what it ultimately means for global climate change governance. By examining the cap and trade policy domain broadly, we aim to take the first steps towards this greater understanding and lay the foundation for future research.

In this article, we map the contours of the cap and trade policy domain to see what this reveals in terms of the development of cap and trade as a central policy instrument in the global governance of climate change. Do we observe convergence around a set of ideas about the appropriateness of cap and trade as a climate policy response and how cap and trade should be governed? We began by identifying the 33 distinct policy venues that constitute the cap and trade policy domain through a review of reports from Point Carbon and the International Emissions Trading Association (IETA), as well as news sources such as *The New York Times* and Environment & Energy publishing. Because we are interested in how *ideas* about cap and trade have developed and spread, our analysis includes venues in which trading has occurred, as well as venues where trading has been considered but not (yet) implemented.⁴ Student research assistants collected data for each venue from official websites (where they exist), media reports, and secondary sources. We conducted 14 semi-structured interviews with key individuals involved in cap and trade debates. Finally, we engaged in participant observation at carbon market side events during two Conferences of the Parties to the UN Framework Convention on Climate Change (COP 13 and COP 15), and the Fall 2009 Point Carbon conference in New York City.

Our data allow us to explore the spatial, temporal, and institutional dimensions of the cap and trade policy domain. The spatial data illuminates “where” cap and trade policy debates take place, a task complicated by the multilevel nature of this policy domain. For instance, the Western Climate Initiative is being designed by sub-national polities (U.S. states and Canadian provinces) across national borders. The temporal data consist of five key dates that track the evolution of debates through three phases of the policy process. The *deliberation* phase begins when the idea of cap and trade is first introduced onto the formal political agenda (Date 1) and continues until a decision is made about whether to use cap and trade as a tool for addressing climate change (Date 2). This marks a transition to the *design* phase, which continues until policy makers have worked out the specific rules and operational details (Date 3). A venue moves to the *operational* phase when it enters its first commitment period (Date 4). The database also includes an end date (Date 5), which indicates that the discussion within a venue has ended, perhaps because policy makers were unable to resolve political disputes or because the deliberations shifted to another venue. A venue is considered “active” in a given year if it is in one of the three policy phases. Finally, the institutional data identify design elements being considered in cap and trade venues, such as gases covered; emissions targets; economic sectors covered; means for allocating permits; permissibility of offsets, banking, and/or borrowing as strategies for achieving commitments; and rules for noncompliance.

Describing the Cap and Trade Policy Domain

Our database allows us to generate a general picture of how the cap and trade policy domain has evolved across space and time, as well as how ideas about the specific rules of cap and trade have developed. What becomes clear is that following initial discussions of cap and trade in the Kyoto Protocol negotiations, the idea quickly spread to other policy venues, creating a complex system of multilevel governance, where many questions about how to govern emissions trading remain contested. There had been convergence (at least in the industrialized world) around the idea that emissions trading is an appropriate mechanism for controlling GHG emissions, but ongoing uncertainty about who should be responsible for setting the rules for cap and trade as well as what those rules should be. It should be noted that we have not yet fully analyzed explanations for this convergence/lack of convergence, although we do attempt to speculate on possible explanations in the discussion below. In the conclusion, we note that this would be a fruitful area of future research that could build upon our policy domain approach.

Spatial Distribution

There are both geographic and political dimensions of where cap and trade takes place. Geographically, discussions about cap and trade have been largely confined to the global North (Figure 1). Only two of the policy venues in the database are from non-Annex I countries: PEMEX (the Mexican state-owned petroleum company; Petróleos Mexicanos) and South Korea. Mexico was a participant in cap and trade discussions within the NAFTA Commission on Environmental Cooperation, but its role was discussed largely in terms of providing offset credits to

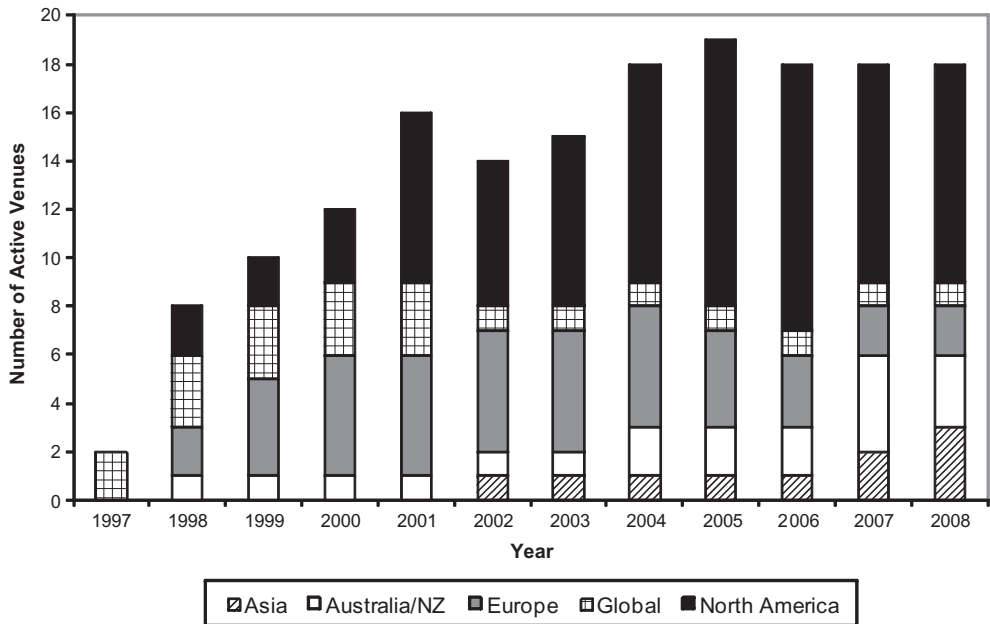


Figure 1. Active Policy Venues by Geographic Region

regulated entities in the United States and Canada (Betsill, 2009). This is consistent with the historical trend toward viewing the global South as a source for offset credits rather than as an active participant in a global trading system. The European Union Emissions Trading Scheme (E.U. ETS) and the Japanese Voluntary Emissions Trading System (JVETS) allow regulated entities to purchase Certified Emissions Reductions through the Clean Development Mechanism (CDM), while the Chicago Climate Exchange (CCX) funds activities in Latin America as part of its offset program. In addition, the supply of carbon credits from the global South has been a significant area of discussion in both U.S. federal discussions and in the UN negotiations.⁵

The political debate around cap and trade has been most prominent in North America and Europe. Policy makers in Asia have been slower to consider cap and trade as a policy response to climate change. This is not particularly surprising, given differences in the general use of market mechanisms for environmental protection between these regions (Schreurs, 2003). In Europe, there has been a downward trend in the number of active venues over time, reflecting consolidation as venues like the U.K. Emissions Trading Scheme, Norway, and Denmark integrate into the E.U. ETS (Figure 2). In contrast, there has been an upward trend in the number of active venues over time in North America. In the Northeast United States, there was some consolidation around the Regional Greenhouse Gas Initiative (RGGI) in 2003, but this was followed by expansion as consideration of cap and trade spread to new venues. Another round of consolidation appears to be occurring around the Western Climate Initiative (WCI) in the Northwest.

There are good economic reasons behind consolidation of cap and trade systems. Larger cap and trade systems are more economically efficient because there are more participants in the market, and they have fewer problems with leakage (where

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<u>EUROPE</u>	BP Shell UK Norway	BP Shell UK Norway Denmark EU	BP Shell Denmark UK Norway EU Switz.	BP Shell Denmark UK Norway EU Switz.	Denmark UK BP, Shell Norway EU Switz.	Denmark UK BP, Shell Norway EU Switz.	Denmark UK BP, Shell Norway EU Switz.	Denmark UK BP, Shell Norway EU Switz.	Denmark UK BP, Shell Norway EU Switz.	Denmark UK BP, Shell Norway EU Switz.	Denmark UK BP, Shell Norway EU Switz.
<u>NORTH AMERICA</u>	Canada	Canada	Canada New Jersey CCX	Canada New Jersey CCX MA NEG-CP NH NAFTA	Canada CCX MA NH NAFTA US Cong RGGI NEG-CP NJ	Canada CCX MA NH NAFTA US Cong RGGI NEG-CP NJ	Canada MA NH NAFTA US Cong RGGI NEG-CP NJ	Canada MA NH NAFTA US Cong RGGI NEG-CP NJ	Canada MA NH NAFTA US Cong RGGI NEG-CP NJ	Canada NH NAFTA US Cong Florida RGGI NEG-CP NJ, MA	Canada NAFTA US Cong Florida Ont-Que RGGI NEG-CP NJ, MA, NH
<u>ASIA-PACIFIC</u>	NSW	NSW	NSW	NSW Japan	NSW Japan	NSW Japan	NSW Japan Aus States	NSW Japan Aus States	NSW Japan Aus States	NSW Japan Aus States Aus Fed S. Korea NZ	NSW Japan Aus States Aus Fed S. Korea NZ

Figure 2. Active Venues and Consolidation Over Time (Bold Indicates Operational Venues)

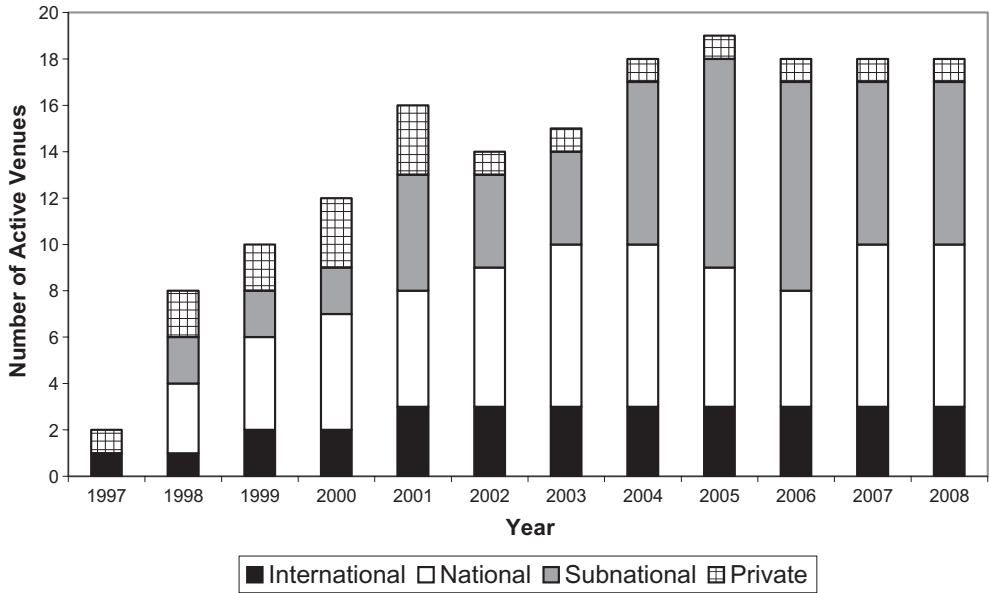


Figure 3. Venues by Political Jurisdiction

emissions may move to entities outside the market structure). RGGI organizers have long recognized that a federal cap and trade system would be preferable (provided it is comparable in design) (RGGI, 2005). In the absence of a federal system, states seek to include as many of their neighbors as possible in regional initiatives to avoid competitive disadvantage for their industries and avoid leakage (Rabe, 2008). However, knowing that larger cap and trade systems are the most efficient does not translate directly or quickly into reality. As Russell Mills from Dow argued at an IETA side event in December 2009, “the ideal is to move to one” market, but in reality, there will be a transition period where separate systems will develop.⁶ This is due at least in part to disagreements about who should govern cap and trade.

The geography of cap and trade is complicated by variation in political jurisdiction. The majority of cap and trade policy debates occur in the public arena (Figure 3). Only four of the 33 venues are located in the private sector, and they were most active early in the evolution of the policy domain. BP began deliberating about the use of cap and trade to reduce its internal emissions before the Kyoto Protocol negotiations were concluded, and was the first venue to implement a trading system in 1998. Shell also briefly implemented an internal trading system before both companies suspended trading in 2002, and shifted to become participants in other operational venues such as the E.U. and U.K. emissions trading schemes. Following the BP example, PEMEX (Mexico’s state-owned oil company) briefly considered an internal trading system but never moved beyond the deliberation phase (although discussion has recently been revived). The CCX is the only private operational cap and trade system today.⁷

While the vast majority of political debates around cap and trade take place in the realm of government, there is less consensus on which level of governmental authority should be responsible for rule-making around cap and trade. Most of

the cap and trade policy venues involve national or subnational authorities. The number of active subnational venues has grown steadily since 2003, with all but one located in North America and Australia (Table 1). In these cases, subnational discussions of climate change in general and cap and trade in particular are justified as a necessary response to federal inaction (Rabe, 2008). Until 2007, Australia and the United States were the only two industrialized countries not party to the Kyoto Protocol, and the Canadian government has had a rocky relationship with the international regime. A particular feature of North American subnational activity is the interest in transnational cooperation. Canadian provinces and U.S. states are currently involved in three different initiatives to establish transnational markets: RGGI, WCI, and the Midwestern Greenhouse Gas Reduction Accord (MGGRA).

Temporal Trends

Interesting patterns related to how individual venues move through the policy process emerge in the temporal data. Table 2 displays if and when venues reached each of the three policy phases (deliberation, design, and operationalization). The first observation is that most venues never get to (or have yet to get to) the operational phase. Of the 33 venues analyzed, 13 have evolved into operational cap and trade markets, although only eight are actively trading today. Historically, North American venues have been less likely than European venues to become operational.

There are many possible explanations for why venues never become operational. In some cases, actors fail to resolve political debates during the deliberation or design phase and the process simply fades off the agenda (Canada, NAFTA). In others, there is an explicit decision made to stop the process during one of these phases, either because actors are unable to resolve the political debates or because the process shifts to another venue (Australian States and Territories, California, Illinois, New England Governor's, New Hampshire, New Jersey, New Mexico, Ontario-Quebec, Oregon, Massachusetts). In some cases, venues that were operational cease trading and become subsumed in other operational venues (BP, Shell, Denmark, United Kingdom, and Norway). We anticipate that many of the active venues today will not become operational in the future precisely because larger is understood to be better *when possible*. In the United States, for example, it was thought that a federal cap and trade system might be in place before a market could be established in the WCI or MGGRA venues.

There also is considerable variation in the amount of time it takes to move from deliberation to operation across the venues. However, with such a small number of cases, it is hard to draw generalizable conclusions. The E.U. ETS and RGGI cases suggest the process may take longer when complex coordination games are involved. In these cases, policy makers had to reconcile competing interests from participating national (E.U. ETS) and subnational (RGGI) authorities. The Norwegian case was closely linked to the development of the E.U. scheme, so policy makers had to wait until specific design details were agreed upon in another venue, thereby slowing down the process.

An important turning point in the evolution of the cap and trade policy domain occurred in 2000/2001. Of the 12 venues that had initial discussions before 2001, 10

Table 2. Movement Through Policy Phases

Venue	Initial Discussions (Deliberation)	Reached Design Stage ^a	Trading Begins (Operation)	Years from Deliberation to Operation
Kyoto Protocol	1997	X	2008	11
British Petroleum	1997	X	1998	1
New Jersey	1998			
Shell	1998	X	2002	4
United Kingdom	1998	X	2001	3
Canada	1998			
Norway	1998	X	2005	7
New South Wales	1998	X	2003	5
Denmark	1999	X	2000	1
European Union	1999	X	2005	6
Chicago Climate Exchange	2000	X	2003	3
Switzerland	2000	X	2008	8
Massachusetts	2001			
New England Governors	2001			
New Hampshire	2001			
North Atlantic Free Trade Agreement	2001			
Japan	2002	X	2005	3
U.S. Congress	2003	X		
Regional Greenhouse Gas Initiative	2003	X	2009	6
Australian States and Territories	2004	X		
Western Climate Initiative	2004	X	Set to begin 2012	
Oregon	2004			
New Mexico	2005			
California	2005	X		
Illinois	2006	X		
Australia (Federal)	2007	X		
Florida	2007	X		
Midwestern Greenhouse Gas Reduction Accord	2007	X		
New Zealand	2007	X	2008	1
South Korea	2007	X		
Ontario-Quebec	2008			
Tokyo	2008	X	Set to begin 2010	
PEMEX	2009			

^aWe do not include a specific date for the design phase because of the difficulty in assigning a clear date when the discussion transitioned from *whether* to engage in cap and trade to *how* a system should be designed. An “X” in this column denotes that the venue reached the design phase successfully.

engaged in explicit design activities, and all 10 went operational. In contrast, only 13 of the 21 venues initiated in 2001 and later began designing a cap and trade systems, and thus far only three have gone operational. In many of the early venues, proposals for cap and trade were justified in terms of gaining practical experience with trading in anticipation of an international trading system centrally organized through the Kyoto Protocol. New Jersey and the Netherlands signed a Memorandum of Understanding in 1998 agreeing to cooperate to design a credit banking system for adoption in the multilateral regime (New Jersey, 1998). BP and Shell implemented internal trading systems so that they would be well-positioned to participate in an internationally organized trading system (Hoffman, 2006; Scott, 1998). Skjærseth and Wettstad (2008, p. 68) argue that “the [European] Commission expected international trading to become operational under the climate regime from 2008,” and that trading within the E.U. would be a way to gain practical experience in preparation.

This changed around 2001, as venues in the United States and Australia began to consider setting up alternatives to the Kyoto system, and as uncertainty grew about the long-term viability of the Kyoto Protocol following the U.S. withdrawal. After 2000, venues rarely justified proposals for cap and trade in terms of Kyoto and setting up a centrally organized global market. Rather, jurisdictions used cap and trade discussions to signal their progressiveness on climate change. The Memorandum of Understanding that officially launched RGGI in 2005 makes this explicit, noting in its preamble that the signatories “wish to establish themselves and their industries as world leaders” (RGGI, 2005). The more recently initiated cap and trade systems are often justified as a means for achieving local (rather than global) policy objectives, like economic and technological development and local emission targets. But with less certainty about the ultimate goal of initiating cap and trade and the appropriate jurisdiction, venues have been slower to move into design and operation.

Instead of looking to *join* a global cap and trade system, policy makers now often talk about *creating* an international trading system from the bottom up by linking markets organized in different political jurisdictions. For instance, the three major regional cap and trade venues in the United States have recently begun meeting to discuss linking their efforts and presenting a united front in talks about the potential U.S. federal legislation.⁸ Rick Saines of Baker and Mackenzie argued in front of a Point Carbon conference audience that linkage of domestic emissions trading systems was likely to continue *regardless* of the status of international treaty making.⁹ Through our descriptive exercise, we are able to identify the point at which the cap and trade policy domain began to break away from the multilateral treaty regime and contribute to the reconfiguration of global climate governance into a fragmented system involving multiple policies, practices, actors, and rule systems (Andonova, Betsill, & Bulkeley, 2009; Betsill & Bulkeley, 2006; Bulkeley & Newell, 2010; Hoffmann, 2011; Okereke, Bulkeley, & Schroeder, 2009; Pattberg & Stripple, 2008).

Rules

There is considerable variation in proposals for how a cap and trade system should be designed across the policy venues.¹⁰ Frequently, this variation appears to reflect venue-specific circumstances rather than any general spatial or temporal trends, though possible instances of learning across venues and lineages of connected venues are evident (see Figure 2 above). Distinctions between venues that are or have been operational and nonoperational venues suggest ambitious proposals often have to be scaled back when venues implement trading. In other words, there is often a gap between the optimal policy design suggested by economists and political feasibility (Rabe, 2008; Zapfel & Vainio, 2002). On the issue of which gases should be covered by a trading scheme, there is a nearly even split between a model limited to CO₂, which is easier to monitor, and a model covering CO₂ plus other gases (often all of the six greenhouse gases listed in the Kyoto Protocol), which gives regulated entities greater flexibility to achieve emissions reductions. While there is no obvious temporal trend, there is a tendency for venues located in Japan and Europe to prefer the limited model, while those located in North America and the

Pacific tend to prefer a model that covers all six Kyoto gases. Venues that have never been operational skew (7 and 3)¹¹ toward the “CO₂ plus” model, while venues that are or have been operational are evenly split (7 and 6) between the two models. It is interesting to note that only three of the operational venues include all Kyoto gases (CCX, New South Wales, and New Zealand). All but one of the European venues limits coverage to CO₂ only. The U.K. system gave regulated entities a choice between CO₂ only or all Kyoto gases. BP and Shell both included CO₂ and methane. The more limited coverage model may be more politically expedient and technically feasible in that fewer technical details need to be resolved.

The majority of the systems regulate multiple economic sectors, although the specifics vary and seem to reflect the local context (both in terms of what is and what is not politically feasible). Only two venues (RGGI and Denmark) are single sector, and two venues (BP and Shell) covered emissions within a single multinational corporation. The power generation sector is the most frequently regulated sector, reflecting its significant contribution to the emissions profiles of most venues in the industrialized world, and perhaps the development of standardized protocols for monitoring and reporting emissions in this sector.

There is ongoing debate about whether participation should be mandatory for regulated entities. In nonoperational venues, proposals for mandatory arrangements are more prominent than those for voluntary trading schemes (8 and 1), and no venue initiated after 2002 has proposed a voluntary arrangement—again reflecting the dynamic where venues initiated in the early post-Kyoto phase were intended to garner experience relevant for participation in a global trading system. Once that possibility evaporated, voluntary participation became less attractive for venues that would need to be more than learning opportunities. The analysis reveals a mix of voluntary and mandatory arrangements at the national level in Asia and Europe. In contrast, there is a strong tendency toward mandatory sub-national systems in the United States and Australia (where most of the venues were initiated after 2002). Seven of the 13 operational venues involve voluntary obligations, often with explicit rules making these voluntarily obligations legally binding as in the case of the CCX, Switzerland, and the U.K. ETS. This may be another example where ambitious goals (mandatory regulation) have to be scaled back in the face of political opposition.

One of the most contentious issues in designing cap and trade systems is how permits are distributed—free allocation or auctioning. Today, all nonoperational venues call for (at least some) auctioning, with the exception of Tokyo, which is slated to go operational in 2010. However, with the exception of RGGI, all of the venues that are or have been operational began with free allocation of permits (the Kyoto emissions trading system delegates allocation decisions to individual states), which may suggest the need to quiet political opposition from those who will be regulated. Speaking at an IETA side event at COP 15, Lorraine Stephenson of Ernst and Young Australia acknowledged that the proposed initial 65–70% free allocation in the Australian federal system to emissions intensive industries such as coal generation would be necessary for political compromise.¹²

There is, however, a temporal trend toward convergence around auctioning. Only one venue (Norway) initiated since 2003 has proposed free allocation at the outset. As mentioned above, this can be explained by the fact that Norway was

explicitly designing its system to follow the E.U. model. The preference for auctioning since 2003 likely reflects lessons learned from the E.U. ETS experience during Phase I, where free allocation, along with an overallocation of permits, led to a dramatic collapse in permit prices. Since then, policy makers tend to prefer that at least some permits be auctioned in order to send a clear price signal, and to avoid charges of windfall profits. Discussions of the proposed Australian federal cap and trade system at the recent Copenhagen conference congratulated Australia on learning from the E.U. experience and including auctioned allocations from the inception of the system.¹³ Auctioning has become broadly accepted, although the specific details about what percentage and how to spend the proceeds are hotly contested as demonstrated in recent (2009–10) debates in the U.S. Congress.

There appears to be convergence around the use of offsets and banking while borrowing is not yet widely accepted. The vast majority of venues that get to the design or operational phase allow regulated entities to use credits purchased from offset projects to meet their commitments. We do not find evidence that offsets were allowed in the BP or Denmark systems, but these venues were among the earliest operational trading systems when the offset market was in its infancy. Where offsets are allowed, there is wide variation in the specific rules governing their use. Some venues, such as the E.U. ETS and JVETS, allow the use of CDM credits (although often on a limited basis in terms of sectors or percentage of total emissions covered). Others place specific limitations on the geographic locations where offset credits may be generated. For example, in RGGI, the majority of offset credits must come from within the United States unless a price trigger is met. All of the venues for which we have data allow regulated entities to bank allowances for use in future commitment periods, while about half (5 of 12) allow borrowing from future allocations.

Decisions about compliance mechanisms come very late in the design phase of the policy process, thus the database contains compliance information for only 12 venues (10 of which were or are operational). Half of those venues require a monetary fine for noncompliance, often expressed in a specific price per ton of CO₂ equivalent. In Switzerland, participants must pay the alternative carbon tax, and in Japan, participants must repay government subsidies they receive to alleviate the cost of emissions reduction measures.

Insights from a Policy-Domain Perspective

A policy-domain perspective provides important insights about the development of emissions trading as a climate policy tool that go beyond existing analyses that take a more functionalist orientation and/or focus on a single venue. First, acceptance of cap and trade has grown in ways that make it difficult to conceive of a global response to climate change without cap and trade, even given the current difficulties. Second, there is a major fault line concerning the appropriate jurisdiction for governing cap and trade, which complicates the global response and makes the growth of a global carbon market vulnerable to specific pockets of opposition. Third, there appears to be a great deal of learning going on about how to do cap and trade. Finally, diverse cap and trade systems will complicate the task of linking systems and building a global market from the bottom up. These observations and

conjectures are both practically and theoretically relevant, and suggest there is value-added in taking this broader view of cap and trade.

Cap and Trade as Central to a Global Policy Response

That cap and trade is increasingly viewed as an appropriate response to global climate change was not a foregone conclusion when emissions trading was introduced into the Kyoto Protocol negotiations. Thirteen years later, we identify 32 instances (in addition to the Kyoto Protocol) where policy makers have given serious consideration to cap and trade. The fact that the majority of those discussions move to the design phase indicates that cap and trade has gained legitimacy as a climate policy instrument. Significantly, *none* of the venues that began discussing cap and trade ultimately abandoned the policy entirely (NAFTA and Canada have come the closest, with Canada especially closely aligning its climate policy with that of the United States and its bleak prospects for a U.S. federal cap and trade system). This may represent policy diffusion through changes in reputational payoffs. According to Simmons and Elkins (2004, p. 173), “As growing numbers of important actors articulate theories and implement practices that reflect a normative consensus, the legitimacy of these ideas gathers steam.”

This is not to say that cap and trade has been universally embraced or that it is replacing other climate policy tools (a number of jurisdictions are developing carbon taxes—British Columbia and France are key examples). Our methodology offers little insight on what percentage of all possible policy venues have debated cap and trade. We can, however, note that of the 37 countries with emissions reduction targets under the Kyoto Protocol, only Russia, Ukraine, and Iceland have not deliberated about the use of cap and trade (as far as we know). Although not captured in our database, a number of developing countries, such as China, India, and Brazil, have recently initiated discussions about developing their own cap and trade systems (Mukherjee, 2009; Oster, 2008).¹⁴

Even in the current doldrums for climate policy writ large and cap and trade specifically, there are signs that opposition is not so much to cap and trade as it is to climate policy in general. In Australia, while cap and trade was the policy targeted, the deeper motivation for opposition was to delay climate action of any kind. While the Green Party did object to cap and trade itself, the bigger obstacle arose because the main opposition party elected a climate skeptic as its leader (Adam, 2010). The cap and trade program was delayed, but the opposition was to serious action on climate change. Similarly in the United States, the troubles that the legislative proposals in the House and Senate are having have little to do with the market mechanism (the Kerry–Lieberman proposal essentially included a form of cap and trade by another name), and more to do with the broader political context—a toxic one for doing anything on climate change at the national level in the United States. Utah’s withdrawal from the cap and trade aspect of the Western Climate Initiative could be read as evidence of a cap and trade backlash, because Utah remained a member of the Western Climate Initiative. But again, the real opposition seems to be about climate action, not cap and trade. In February, the Utah legislature urged the governor to withdraw from the Western Climate Initiative, because it questioned the validity of climate science (Utah State Legislature, 2010).

Cap and trade is being targeted now, but perhaps not because of the nature of cap and trade, or any real opposition to this specific mechanism for addressing climate change. Instead, it is being targeted because it is the policy option that has been widely chosen and has had the most momentum. This observed convergence around the appropriateness of cap and trade as a climate policy response may be linked to a broader “marketization” of global environmental governance, which privileges solutions that are consistent with norms of liberal environmentalism (Bernstein, 2002; Newell, 2008). Relatedly, convergence may reflect the growing power and authority of the transnational network of financial actors and practices that have proliferated in recent years to support the growing carbon markets (Bernstein et al., 2010; Newell & Paterson, 2010). In either case, we might expect that cap and trade will continue to play an important role in global climate change governance, especially if the U.S. Senate decides to move on climate change and/or if Australia comes back to climate policy in a serious way. In fact, at the June 2010 Carbon Expo, the International Emissions Trading Association and European regulators have put forward a proposal to rejuvenate the global carbon markets and reinforce the cap and trade mechanism (*New York Times*, May 24, 2010).

Who Governs?

The key question of who should govern cap and trade remains contested. The vast majority of debates about cap and trade take place in the public arena, suggesting convergence around the idea that governments ought to play a central role in governing emissions trading. Strictly speaking, cap and trade is not an instance of private governance, but rather reflects the changing nature of environmental regulation where governments adopt policy instruments designed to employ market forces to achieve environmental objectives (Jordan, Wurzel, & Zito, 2005). Cap and trade systems are unique in that the commodity being traded (permits to and promises not to emit) only exists once an emissions cap has been set. Carbon market observers repeatedly suggest that governments have the greatest authority to set credible caps, the experience of the CCX notwithstanding.¹⁵ This is consistent with the literature on the sociology of markets, which emphasizes that markets require authoritative rules and that market actors typically look to states to provide these rules (Fligstein & Sweet, 2002).

At the same time, there is little consensus on the appropriate political jurisdiction for setting cap and trade policies. The international community seems to have moved away from the assumption that cap and trade should be governed through the multilateral treaty process. However, there is ongoing debate about whether national or subnational governments ought to be responsible for governing cap and trade. The policy domain contains several examples of jurisdictional conflicts within individual venues. When New Jersey deliberated about cap and trade in the late 1990s, several stakeholders argued that emissions trading is a matter best handled by national governments (New Jersey Department of Environmental Protection, 2000). In contrast, leaders within RGGI routinely express concern about federal preemption (Daley, 2010; RGGI, 2005). In fact, the Kerry–Lieberman bill in the U.S. Senate expressly forbade the functioning of regional emissions trading systems, an aspect of the legislation that regional systems strongly protested even as

their linkages grew (Daley, 2010; Three Regions Offsets Working Group, 2010). The United Kingdom and Germany initially opposed giving the E.U. jurisdiction over emissions trading in Europe, and today there is resistance to centralizing the allocation process at the E.U. level (Skjærseth & Wettestad, 2008; Wettestad, 2009).¹⁶

This debate over national versus subnational jurisdiction also plays out in discussions about scaling up. The evolution of the cap and trade policy domain includes many instances of “venue shifts,” where debates move from one venue to another, often at a higher level of political organization (see Figure 2 above). For example, Massachusetts and New Jersey terminated discussions about developing statewide systems in favor of becoming part of RGGI. In some cases (e.g., RGGI and WCI), state level policy makers prefer to shift to a transnationally organized venue, where subnational authority prevails because of a vacuum at the federal level. In other cases (e.g., Australia), state decision makers prefer a federally organized system. Clearly, the question of whether national or subnational governments will govern cap and trade remains unsettled.

Recent developments in cap and trade politics have also introduced a new set of concerns into the debate about who governs cap and trade related to the power of (largely private) actors who make up the infrastructure that has been created over the last decade to facilitate market transactions (Bernstein et al., 2010; Hoffmann, 2011; Newell & Paterson, 2010). This infrastructure includes registries that track the exchange and holding of permits, certification schemes that evaluate the integrity and quality of carbon offsets, brokers who act as intermediaries between buyers and sellers of permits, and project developers and financiers who develop emissions reduction projects. The concerns are twofold. First, these infrastructure actors appear to exercise a form of structural or discursive power in the cap and trade policy domain (Barnett & Duvall, 2005). While they do not establish cap and trade regulations, they frequently dictate what emissions are measured and reported and how, thereby constraining the range of design choices available to government policy makers. For example, most cap and trade systems allow regulated entities to apply offset credits to their emissions reduction commitments, often from the voluntary market, where private actors have set the standards to evaluate offset quality. These standards are frequently criticized for failing to give sufficient attention to sustainability criteria. Second, there is concern that market actors, particularly in the financial sector, are profiting from activities that are seen to be environmentally and/or socially dubious. Ironically, both of these critiques may serve to strengthen calls for greater public regulation of the carbon market, perhaps even in the multilateral arena (Bernstein et al., 2010).

Still in a Learning Phase

In several IETA side events in Copenhagen, speakers noted that we are still in the “learning phase” about how to do cap and trade.¹⁷ Within individual venues, policy makers must make choices about how best to reconcile economic and environmental objectives with political realities, often with the expectation that they will be able to come back and make adjustments in the future (Newell & Paterson, 2010). Our domain-level analysis also reveals substantial anecdotal evidence of policy diffusion

through learning (Simmons & Elkins, 2004). In rare instances, decision makers in one venue attempt to borrow a model from another venue (e.g., Norway and the E.U. ETS). More frequently, decision makers appear to survey the landscape for possible design options and adapt design elements to fit the context of their particular venue. RGGI has been a touchstone in North America, with both the WCI and MGGRA taking lessons from the RGGI experience.¹⁸ RGGI, in turn, benefited from the experience of the development of the United Kingdom and E.U. system, as participants in those venues provided technical advice and expertise for developing RGGI.¹⁹ In Copenhagen, Mark Lewis of Deutsche Bank noted that “Australians were keen to learn from the EU and did it very well,” especially about the benefits of auctioning.²⁰

Preliminary analysis suggests that some venues (e.g., the E.U. ETS) are looked to more frequently than others (e.g., CCX), and that there may be important regional effects. Patrick Hogan from Pew stresses that the “RGGI experience was a good learning platform” and that without RGGI, the WCI and MGGRA “would probably not have been as ambitious in scope.”²¹ Regional trading venues in North America are growing even closer with a proposed common offsets policy announced in 2010 (Three Regions Offsets Working Group, 2010). These patterns may be related to the types of communication networks and cultural reference groups linking actors across policy venues (Elkins & Simmons, 2005; Selin & VanDeveer, 2007). Our analysis also suggests that lessons learned are debated and often revised through venue-level political processes shaped by unique constellations of actors, interests, and power relationships. The result is a set of proposed and operational cap and trade systems that loosely resemble one another in broad structure, but differ considerably (though not without pattern) in specific content.

Building a Global Market from the Bottom Up

Instead of a top-down approach situated in the multilateral treaty regime, it is more likely that a global system will emerge, as cap and trade systems in different policy venues are linked to one another so that permits can be traded across systems. This perspective was widely acknowledged in trading discussions at the 2009 Copenhagen conference.²² Economists, financial experts, and international lawyers are now focused on the technical aspects of creating such linkages, suggesting harmonization when possible or explicit contracts about the conditions under which permits generated in one system might be recognized in another system (Ecoplan/Natsource, 2006; Nordhaus & Danish, 2003; Stavins & Jaffe, 2007; Soleille, 2006; Stavins, 2008). In Copenhagen, carbon leakage and border adjustments were major topics of discussion.

Yet linking systems will be complicated by at least two factors unearthed in this analysis. First, new forms of authority (transnationally linked subnational governments) and contests over appropriate jurisdiction have emerged in the policy domain. The cap and trade policy domain is now truly multilevel, increasing the number of interests and institutions involved in the design and operation of emissions trading. Second, the descriptive analysis demonstrates how political expedience and feasibility play a significant role as venues move through the policy process. If the design of individual systems reflects political compromises, it is

reasonable to expect that any efforts to link systems may revive political debates, as stakeholders seek to ensure that their interests are promoted by linking. For instance, E.U. policy makers oppose linking the E.U. ETS to a federal trading system in Australia because the Australians propose to allow regulated firms to meet up to 100 percent of their reduction commitments through offsets purchased on the voluntary market. E.U. ETS limits are much lower, and decision makers fear that linking with the Australian system could drive down allowance prices in the E.U. system. Proposals for linking trading systems to create a global cap and trade market must anticipate and account for the political debates likely to arise from these dynamics and consider options for resolving such debates. This point was acknowledged in a 2009 special issue of *Climate Policy*, but requires further investigation (Flachsland, Marschinski, & Edenhofer, 2009; Grubb, 2009; Sterk & Kruger, 2009; Tuerk, Mehling, Flachsland, & Sterk, 2009).

Recent events also illuminate the challenges inherent in building a global carbon market through linking by demonstrating the power of the cliché that a chain is only as strong as its weakest link. Because the global market now relies on the development of multiple cap and trade systems all over the world, its development is vulnerable to specific opposition like that evident in the United States and Australia. Beyond the difficulty of linking functioning systems, the uncertainty about systems that are still in development is a significant challenge.

Conclusion: A New Research Agenda on Cap and Trade

This article suggests that analyzing cap and trade as a policy domain provides unique insights on the development of cap and trade as a central mechanism in global climate change governance. In looking at cap and trade as a set of interconnected venues, issues, and organizations, we were able to reveal convergence around a number of issues: the appropriateness of cap and trade as a climate policy instrument, the authority of governments to develop rules for cap and trade, some aspects of market design (e.g., auctioning and the use of offsets), the development of a global trading system from the bottom up. At the same time, we found ongoing contestation on which level of government should govern cap and trade and some aspects of market design (e.g., gasses and sectors covered, the types of offsets allowed).

The domain perspective also uncovered interesting trends that have been overlooked in the existing literature, such as regional consolidation of cap and trade systems, venue shifts, and instances of policy learning. Based on this descriptive exercise, we suggest that the cap and trade policy domain is more than the sum of its parts and that further attention to domain-level dynamics will enhance our understanding of this aspect of climate change governance especially as a global carbon market evolves through the fraught process of bottom up linkages. The domain level analysis also helps put recent challenges to cap and trade in a broader context.

Future research can build on the descriptive analysis developed here in a number of ways. First, scholars can use the domain perspective to examine different explanations for policy convergence. For example, is the general preference for allocating permits through auctioning a response to similar internal conditions in

different venues, the result of coordinated action through particular actors or networks operating across venues, or an instance of decision makers in one venue taking the decisions of others into consideration (Elkins & Simmons, 2005)? Each set of explanations comes with different expectations about where we should observe convergence and divergence within the policy domain. Understanding the reasons behind convergence in the cap and trade policy domain could help analysts and policy makers identify areas where convergence is possible in the future, a particularly important issue in linking cap and trade systems.

Second, future research could investigate the dynamics underlying some of the observed trajectories and lineages within the cap and trade policy domain. For example, can the patterns in the number of active venues across time be explained in terms of policy diffusion? Are the identifiable mechanisms linking the decisions by actors in different policy venues to initiate discussion about cap and trade or are these independent responses to the common problem of climate change (Simmons & Elkins, 2004)? There appear to be clusters of interdependent venues centered in North America (individual U.S. states converging into regional/transnational/subnational venues with possible further convergence into a federal system), Europe (individual nation-state and corporate venues converging into the E.U. ETS), Australia (subnational venue morphing into a federal system), and the Asia-Pacific region (national venues developing in Japan, New Zealand, and South Korea). To what extent are these regional clusters connected to one another, and by what mechanisms might they be linked? There are also trajectories and lineages in terms of employment of rules—prominence and design of auctioning, banking, borrowing, and offset use. Examining the mechanisms behind these trajectories uncovered in our descriptive analysis is key to anticipating the future evolution of cap and trade as a policy mechanism and where friction is likely to emerge in the construction of a global carbon market.

Finally, a policy domain perspective highlights the need to consider the interaction of local interests and transnational trends. The cap and trade policy domain provides an important context that potentially shapes (and is shaped by) policy debates in individual venues, as well as how design ideas are translated into practice. We hypothesize that prevailing ideas, networks, and practices operating at the level of the cap and trade policy domain play a significant role in shaping the terms of the debate in any given venue and narrowing the range of possible outcomes. At the same time, we expect that specific constellations of ideas, interests, and power within a particular venue will influence the specific policy outcomes, and that these specific outcomes will in turn reshape elements of the policy domain. To analyze this dynamic, we need to go further in examining individual venues and their development over time. Such an analysis could help identify zones of agreement where compromise and linkage are possible.

The descriptive analysis presented in this article lays the groundwork for this research agenda. Having established the contours of the cap and trade policy domain, future research can move forward with the goal of illuminating the social and political processes through which cap and trade has become a central policy mechanism in the global response to climate change, and its future prospects as an element of global climate change governance.

Notes

- 1 For a review of early discussions about cap and trade in the climate change issue area, see Newell and Paterson (2010).
- 2 Engels (2006) and Voß (2007) also go beyond individual venues in their analyses of cap and trade. Our analysis extends even further by including venues in which emissions trading has been considered but not implemented, which provides a broader foundation for examining questions of rule-making and authority.
- 3 In the interim between the research/writing of this article and its publication the widespread Republican victories in the U.S. midterm congressional elections significantly increased these challenges, at least in the U.S. federal context.
- 4 For the purposes of this analysis, we treat each venue equally in terms of its potential role in developing ideas about cap and trade. In order to evaluate the effectiveness of cap and trade as a way to reduce greenhouse gas emissions, it would be necessary to differentiate venues in terms of volume of emissions covered. This is beyond the scope of our initial analysis.
- 5 Multiple side events at COP 15 were dedicated to reporting on ways for Southern countries to monetize carbon assets and to fully participate in emerging carbon markets (especially in the context of reduced emissions from deforestation or REDD). For at least the near term, with no commitments to reduce their own emissions, we expect that most states in the global South will participate in carbon markets as suppliers of credits. Author observations, December 2009.
- 6 Author observation, December 2009.
- 7 CCX ceased carbon emissions trading in fall 2010, but remains active in the offset markets.
- 8 RGGI, the MGGRA, and WCI met in July and November of 2009. Interviews with Patrick Hogan (Pew Center for Climate Change), Nicholas Bianco (World Resources Institute), and Franz Litz (World Resources Institute), October 2009. See also Three Regions Offsets Working Group (2010).
- 9 Author observation, November 2009.
- 10 This data is available from the authors upon request.
- 11 The availability of rules data for the “never operational” venues varies significantly from rule to rule depending on developments in the design phase.
- 12 Author observation, December 2009.
- 13 Author observation, December 2009.
- 14 Author observations, December 2009.
- 15 Author observations, November and December 2009.
- 16 Tim Kragenow presentation at IETA side event on auctioning, December 9, 2009.
- 17 Author observation, December 2009.
- 18 Interviews with Franz Litz and Nicholas Bianco (World Resources Institute) and Patrick Hogan (Pew Center for Global Climate Change), October 2009.
- 19 Interview with Franz Litz and U.K. official (anonymous), October 2009.
- 20 Presentation at IETA side event on the Australian emissions trading system, December 10, 2009.
- 21 Interview with Patrick Hogan, October 2009.
- 22 Author observation, December 2009.

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