**Experimenting with Climate Governance**

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Abstract:
Stalemate in the multilateral climate governance process is not equivalent to a lack of a response to climate change. On the contrary, we have recently witnessed the emergence of climate governance initiatives—governance *experiments*—at multiple levels of political organization (e.g. Carbon Rationing Action Groups, the C40 organization of major cities, emissions trading venues like the WCI, and corporate initiatives like the Carbon Disclosure Project). People and organizations inspired by frustration with the multilateral process, a sense of urgency about climate change, and even profit and power are taking climate change into their own hands, refusing to cede governance authority or responsibility solely to the multilateral treaty negotiations. As a result a number of new actors and processes have begun to challenge the traditionally exclusive authority of nation-states to create rules and manage transnational problems through international treaty making. This paper chronicles the emergence of these experiments and seeks to understand their practical implications.

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The conventional mode of responding to climate change through universal, interstate negotiations has essentially been stymied over the last decade with yawning gulfs separating the negotiating positions of major states. While the election of Barack Obama in the United States has rekindled optimism for a global agreement, there remains significant concern that the multilateral process will not, and perhaps cannot by itself, deliver the deep cuts in carbon dioxide emissions required to avert the most serious impacts of climate change. Yet stalemate and slow progress in the multilateral negotiations is not equivalent to a lack of a response to climate change. On the contrary, diverse climate governance initiatives—governance *experiments*—have emerged at multiple levels of political organization. Consider that all of the following are currently in operation:

- *Carbon rationing action groups (CRAGs)* are transnationally linked local community groups in the UK, US, and Canada that negotiate and self-impose Kyoto-like carbon emission reductions.
- *The Cities for Climate Protection Program* This program of the International Council for Local Environmental Initiatives coordinates over 600 cities in their efforts to protect the climate and reduce greenhouse gas emissions at the municipal level.
- *Carbon emissions trading systems* Venues like the Western Governor's initiative and the Regional Greenhouse Gas Initiative have blossomed in North America, providing simultaneously subnational and transnational carbon markets.
- *The Asia-Pacific Partnership for Clean Development and Climate Change and the Major Economies Process for Energy Security and Climate Change* are multilateral alternatives to the Kyoto process are variously described as undermining or complementing the UN negotiations

People and organizations inspired by frustration with the multilateral process, a sense of urgency about climate change, and even profit and power are taking climate change into their own hands, refusing to cede governance authority or responsibility solely to the multilateral treaty negotiations. As a result a number of new actors and processes have begun to assert authority over climate change, creating rules and attempting to manage the problem themselves. Far from lacking climate governance in the face of multilateral deadlock, the world is rather awash in governance initiatives shaping how individuals, communities, provinces, regions, corporations, and nation-states respond to climate change.

We currently do not fully grasp how these initiatives emerge and, perhaps ultimately more importantly, how they fit together into a broader global response to climate change. A growing number of works examine individual climate change initiatives that go beyond the UN process (e.g. Paterson 2001; Betsill and Bulkeley 2004; Rabe 2004; 2008; Moser 2007; Kolk, and Pinske 2007; Kern and Bulkeley 2009), but few recognize the phenomenon of experimentation or pursue understanding of the current flurry of activity in a comprehensive way (Bulkeley 2005; Adger 2001; Selin and Vandeveer 2005 are notable exceptions). Such a pursuit is important because climate governance experiments are not simply disparate innovations—interesting, but ultimately independent and relatively small-scale, initiatives. While individual experiments arise for idiosyncratic reasons, experiment*ation* is a broader, patterned process. Further this process is driving significant innovation and collectively initiatives beyond the Kyoto process are now a key aspect of the global response to climate change.

This paper explores experimentation in four sections. Section one provides an operational definition of climate governance experiments and explores the demographics (the when, who, and where) of experimentation. Section two develops a way to make sense of experimentation conceiving of it as self-organized activity that can be understood by examining the co-evolution or mutual constitution between actors and their governance context. One implication of this self-organization is

that experiments form the basis for a nascent "organizational shadow" (Smith and Stacey 1997) beyond the multilateral process that is engaging an increasing and diverse number of crucial political actors in the response to climate change. Section three of the paper examines the contours of the emerging shadow governance system. The nascent structure of the shadow system of governance combines a liberal environmental (Bernstein 2001) foundation with three distinct models of experimental governance. Though the implications of experimentation have yet to fully mature, the concluding section provides initial conjectures on the practical significance of experiments in the overall global response to climate change.

**Definition and Demographics**

Given the broad scope and contested nature of climate change, setting boundaries that define climate governance experiments is a challenging endeavor. Most human activities have an impact on climate change and therefore virtually all attempts to govern human activity could conceivably be considered climate governance. An operational definition of a climate governance experiment is thus crucial. The point is to gather climate change initiatives of a particular sort that capture crucial dynamics of both governance and experimentation. The term governance has grown in popularity in recent decades (Ba and Hoffmann 2005; Hewson and Sinclair 1999; Rosenau and Czempiel 1992; Murphy 2003; Avant, Finnemore and Sell 2009) and with popularity has come a proliferation of meanings. Yet, at its core, 'governance' remains a relatively simple expression that implies steering or rule-making in political spaces that lack formal and centralized authority (Hoffmann and Ba 2005). Governance is about making rules above, below, and between established political authorities. Experimentation implies innovation and trial and error (rather than the more formal controlled laboratory definition) with new forms of governance unrelated or only loosely connected to the traditional governance mechanism of multilateral treaty negotiations.

In order to count as a climate governance experiment, a climate related initiative must meet three criteria.[1] First, climate governance experiments are **primarily engaged in *explicitly* making *rules* that shape how communities respond to climate change**. There are a number of initiatives that deal indirectly with climate change in directly pursuing sustainable development goals or energy policy. However, unless ameliorating or adapting to climate change could be reasonably considered a primary objective and unless it was stated as such, an initiative is not included. To be clear, there is no *a priori* criteria for what actually counts as addressing climate change—uncovering different framings of this issue is precisely the point—but an initiative must profess to be addressing climate change to count. In addition to focusing on climate change, there must be a conscious intention to create/shape/alter behavior by setting up rules (broadly conceived as principles, norms, standards, and practices) for a community of implementers (whoever and whatever they may be) to follow. For this book, intentionality and authority over a community is a key marker of governance experimentation.

Second, climate governance experiments are **independent from the Kyoto process or national regulatory measures.** Initiatives that are designed to aid states in meeting Kyoto goals or national regulations are not experiments. This sorting rule is crucial so as to capture innovations that are outside the multilateral process. Nation-states have come up with an interesting array of climate initiatives designed to either make the Kyoto Protocol process work or to enhance national climate action. These are crucial aspects of the global response to climate change. They are, however, not experimental for this paper.

[1] My research assistant and I gathered a number of possible experiments and evaluated them independently on each of the criteria discussed here to arrive at the list of eligible experiments.

Third, climate governance experiments **cross jurisdictional boundaries of some sort.** The initiative in question must be designed to function and/or be implemented across jurisdictions, whether vertically (local-regional-national-transnational) or horizontally (networks of similar actors across boundaries). This third classificatory rule significantly constrains the population of experiments, ruling out, for example, many municipal climate action plans. Hundreds, if not thousands, of cities have developed climate action plans and this is an innovation because climate policy has generally been the purview of national governments. However, for both practical and theoretical reasons individual municipal initiatives (and other single jurisdiction initiatives) are not included.

This is a practical matter because without this rule, capturing any reasonably coherent picture of experimentation would be near impossible—there would simply be too many possible experiments. This limiting rule is important theoretically as well because my focus is on examining experiments that are rule-making endeavors in non-traditional political spaces, what Hajer calls policy making in the absence of a polity (Hajer 2003). While taking on climate change is innovative for cities, these actors have well-developed means for making rules—for governing. Experimentation is rather a process of making rules outside well-established channels. While individual city initiatives are not included, networks of cities like C40 do count as climate governance experiments. I am most interested in initiatives that have to make governance rules from whole cloth. For example, there is no established institution for US states and Canadian provinces to cooperate and make climate agreements. Yet, the Western Climate Initiative, the Midwestern Governors Association's proposed emissions trading system, and the Regional Greenhouse Gas Initiative have all been forged through the cooperation of these actors across a national border and without the input or facilitation of the national governments of Canada and the US.

With the operational definition in hand, identifying eligible governance experiments proceeded through a systematic search of two sources:

1. Examination of side event rosters for the UNFCCC Conference of the Parties for 2006-2008. The side events are populated by a variety of non-state actors discussing and publicizing their climate activities. It was an ideal source because experimenters tend to come to the UNFCCC meetings in order to take part in the larger governance process.
2. Media search using Dow Jones Interactive database from 1990 to 2008. As interest in climate change has increased in the last two decades, the media has taken to reporting not just the international negotiations, but also initiatives beyond the multilateral process.

In addition to these systematic searches, a number of potential experiments were suggested to me by colleagues and experts in the field of climate policy and some were discovered simply through dumb luck (e.g. reading the morning newspaper). Table 1 lists the fifty-eight eligible experiments.

**Table 1: Climate Governance Experiments**[2]

| **Experiment** | **Brief Description** |
|---|---|
| **2degrees** | Social networking platform for actors working in corporate environmental sustainability, climate change and green technologies |

[2] Given the nature of the search for eligible climate experiments I cannot and do not claim to have gathered either the entire population or a representative sample of climate governance experiments that meet my three criteria. The search for governance experiments was bounded by language (mainly restricted to initiatives that have publicized their actions in English), access to the UNFCCC process, and media. It cannot be a representative sample, because I do not know the extent of the population of experiments meeting my three criteria.

| | |
|---|---|
| **Alliance for Resilient Cities** | An Ontario-based network of municipalities focused on adaptation to climate change. |
| **American Carbon Registry** | Apparently the world's first private emissions registry, started in 1997 as the GHG Registry. |
| **American College & University Presidents Climate Commitment** | Pledge to eliminate US campus greenhouse gas emissions. |
| **Asia Pacific Partnership on Clean Development and Climate** | Voluntary partnership among select countries to cooperation on technological development and implementation. |
| **Australia's Bilateral Climate Change Partnerships** | Agreements and partnerships signed between Australia and other countries (developed and developing) to take action on climate change |
| **Business Council on Climate Change** | Partnership of San Francisco Bay Area businesses committed to reducing their green house gas emissions. |
| **C40 Cities Climate Leadership Group** | A network of the world's largest cities created to share best practices and develop collaborative initiatives to do with city-specific issues. |
| **California Climate Action Registry** | Voluntary GHG registry now operating under the Climate Action Reserve. |
| **Carbon Disclosure Project** | Resource/database for institutional investors to inform their investment choices based on emissions reported by the world's largest corporations |
| **Carbon Finance Capacity Building Programme** | Partnership to encourage the use of Carbon Finance to reduce greenhouse gas emissions in cities, in particular emerging mega cities of the South. |
| **Carbon Rationing Action Groups** | Network of local groups to support and encourage one another in reducing individual carbon footprints. |
| **Carbon Sequestration Leadership Forum** | Framework agreement between governments to promote and develop CCS technology |
| **CarbonFix** | Both a new labelling standard (CarbonFix Standard) and CO2 offset supplier/tree planting program |
| **Chicago Climate Exchange** | CCX is a cap and trade system whose members make a legally binding emission reduction commitment. |
| **Climate Alliance of European Cities with Indigenous Rainforest Peoples** | Association of European cities and municipalities that have entered into a partnership with indigenous rainforest peoples. |
| **Climate, Community, and Biodiversity Alliance** | Partnership between companies, NGOs and research institutes to create a new certification standard to evaluate land-based carbon mitigation projects in the early stages of development. |
| **Climate Neutral Network** | A web-based platform for networking and the sharing of best practices on reducing and offsetting greenhouse gas emissions. |
| **Climate Savers** | Corporate partnership between major corporations, organized by the WWF, to increase efficiency in operations/products to voluntarily reduce their GHG emissions |
| **ClimateWise** | An association of insurance-related companies/organizations established to collaborate on climate issues. |

| | |
|---|---|
| **Clinton Climate Initiative** | Program of the Clinton Foundation that seeks to provide direct assistance to individual cities and facilitating the sharing of best practices to do with climate. |
| **Community Carbon Reduction Project** | A UK-based network of local community partners that engage in education, research, and outreach to cut their CO2 emissions to meet a target of 60% reduction by 2025. |
| **Conference of New England Governors and Eastern Canadian Premiers Climate Change Action Plan** | Voluntary agreement to pursue coordinated actions on climate change in the region. |
| **Connected Urban Development Programme** | Partnership between Cisco and cities to create urban communications infrastructures to reduce carbon emissions. |
| **Cool Counties Climate Stabilization Initiative** | Network of counties created to address climate change. |
| **Covenant of Mayors** | Commitment by European cities to go beyond the objectives of the EU energy policy in terms on reduction of CO2 emissions through enhanced energy efficiency and cleaner energy production and use. |
| **e8 Network of Expertise for the Global Environment** | The e8 is a non-profit international group of nine major electricity companies from G8 countries, promoting sustainable development through electricity sector projects and HCB activities worldwide. |
| **Edenbee** | Web-based social network (a la facebook) designed to encourage users to reduce their carbon footprints |
| **EUROCITIES Declaration on Climate Change** | Agreement by European cities to fight climate change at the local level |
| **Evangelical Climate Initiative** | An agreement by evangelical leaders to motivate their followers to protect the climate. |
| **Global GHG Register** | A global, corporate-wide emissions registry for companies based in developing or other countries (i.e. US) not subject to Kyoto Protocol obligations . |
| **ICLEI Cities for Climate Protection Campaign** | Campaign that seeks to promotes the development and implementation of GHG emission reduction strategies among local and municipal governments. |
| **Institutional Investors Group on Climate Change** | A forum for collaboration between pension funds and other institutional investors to address the investment risks and opportunities associated with climate change. |
| **International Climate Action Partnership** | International forum of governments and public authorities that are engaged in the process of designing or implementing carbon markets |
| **Investors Group on Climate Change** | Collaboration of Australian and New Zealand investors focus climate-related investment risk. |
| **Investor Network on Climate Risk** | A $7 trillion network of investors geared toward integrating climate risks into investment decisions. |
| **Klimatkommunerna** | Association of Swedish municipalities, counties and regions working actively on climate issues |
| **Major Economies Forum on Energy and Climate** | A “complementary” process to Kyoto framework that brings together leaders of the world's 17 largest economies to discuss climate |

| | |
|---|---|
| **Memoranda of Understanding on Climate Change initiated by the State of California** | MOU b/w California and various international states and subnational units/states/provinces |
| **Methane to Markets** | A framework agreement between countries to promote methane recovery internationally. |
| **Midwestern Greenhouse Gas Reduction Accord** | Policy framework to develop a market based cap-and-trade mechanism to achieve the reductions |
| **National Association of Counties County Climate Protection Program** | Project to provide counties with best practices, tools and resources to assist them in developing and implementing successful climate change programs. |
| **Network of Regional Governments for Sustainable Development** | International network of sub-national regional governments based on partnerships and bilateral cooperation agreements among members. |
| **North South Climate Change Network** | Network of an NGO, university, and local communities with the goal of improving the Ontario's knowledge of, and response to climate change. |
| **Ontario-Quebec Provincial Cap-and-Trade Initiative** | Inter-provincial cap-and-trade program |
| **Regional Greenhouse Gas Initiative** | Regional cap and trade program among Northeast and Mid-Atlantic states in the US. |
| **Renewable Energy and Energy Efficiency Partnership** | International NGO that works in partnership with business, civil society, and government actors to reduce the barriers to the uptake of renewable energy and energy efficiency technologies and projects. |
| **Southwest Climate Change Initiative** | Framework agreements between two Southwest US states to coordinate emissions reductions. |
| **The Climate Group** | An independent, nonprofit organization dedicated to advancing business and government leadership on climate change. |
| **The Climate Registry** | A collaboration between U.S., Mexican, Canadian and Native American organizations aimed at developing and managing a consistent North American greenhouse gas emissions reporting system |
| **Transition Towns** | Network/set of principles that encourages communities to "relocalize" all essential elements that the community needs to sustain itself |
| **Union of the Baltic Cities Resolution on Climate Change** | Resolution among Baltic cities to combat climate change and make plans for adaptation |
| **US-China Memorandum of Understanding to Enhance Cooperation on Climate Change, Energy and the Environment** | Bilateral Climate Change MOU between the US and China. |
| **U.S. Mayors Climate Protection Agreement** | Agreement by US Conference of Mayors to advance the goals of the Kyoto Protocol in the US. |
| **UK Bilateral Climate Change Agreements with US States** | Formal agreements between UK government and various US states |
| **West Coast Governors' Global Warming Initiative** | Collaboration between three Western US states that produced a set of recommendations on cooperative strategies. |

| | |
|---|---|
| **Western Climate Initiative** | Network of states and provinces in the United States, Canada, Mexico presumably intended to provide the foundation for a national/North American cap-and-trade system |
| **World Business Council for Sustainable Development** | CEO-led, global association geared toward sharing of best practices and knowledge on climate change. |

After identifying experiments[3] data was gathered to characterize each experiment both in terms of demographics (date of initiation, the location of the experiment, the identity and type of actor(s) that initiated the experiment, and the identity and type(s) of actors that implement the rules) and rules. Part III below will focus on the rule data in analyzing the kind of global response to climate change entailed by experimentation, but a brief examination of the demographic data provides a broad sense of what climate governance experimentation consists of.

First, experimentation is a recent phenomenon. While climate change has been the focus of international governance efforts since the late 1980s, experimentation was slow to develop. Figure 1 displays the temporal sequence of experiment initiation. The early 1990s saw only 1-2 experiments initiated each year. 2001-02 was a watershed for both the multilateral process and experimentation. While only five experiments emerged in these years, experimental activity in subsequent years exploded. Forty-six of the 58 experiments in the database were initiated after 2001-2002 perhaps the nadir for the process in the aftermath of the American withdrawal.

Second, experimentation is a Northern phenomenon with a global reach. Fifty-one of the 58 experiments were initiated by actors in the North, with the remaining seven having been initiated by actors in the North and South in partnership. None of the 58 experiments identified were initiated in the South alone. Yet, the scope of experimental activities is quite diverse in terms of scale. Figure 2 reports where experiments are being implemented.

Third, experimentation is being undertaken by a diverse set of actors both in terms of initiating actors and implementing actors. Actors at multiple levels of political organization have decided to experiment with climate governance, from small groups of individuals through networks of the largest state economies on the planet. Figure 3 is a visual representation of this diversity. To be sure, this figure is not weighted by size of initiative thus potentially problematically equating the Major Economies Forum with Edenbee, a social networking experiment with just 2500 members in its online community. Yet the diversity is interesting in and of itself. Almost any actor can conceive of itself as a player in climate governance and seek to influence the response to climate change.

Diversity amongst initiating actors is matched in implementing actors (Figure 4). There is simply no single idea as to which actors should be responsible for carrying out responses to climate change. One interesting aspect of these experiments is that while a slight majority of experiments have matching initiating and implementing actors (30 of the 58 experiments are initiated and implemented by the same type of actor), a not insignificant number (28 out of 58) are attempts by one type of actor to govern other types (or multiple to govern multiple)--see Table 1. This trend varies by actor type. Most governments (regardless of level) do not like to implement rules that they did not initiate, an aversion that grows with the size of the government. Nation-states and major sub-state units (e.g. US states and Canadian Provinces) only implement experiments they initiated themselves. Cities are more amenable to external facilitation with 5 of the 11 experiments implemented by cities having been initiated by other actors. Corporations are also often the target of experimentation with six of the 14 corporate-implemented experiments being initiated by non-corporate actors and the rest a form of self-regulation.

[3] A process cut-off in July of 2009.

**Figure 1: Experiment Initiation**

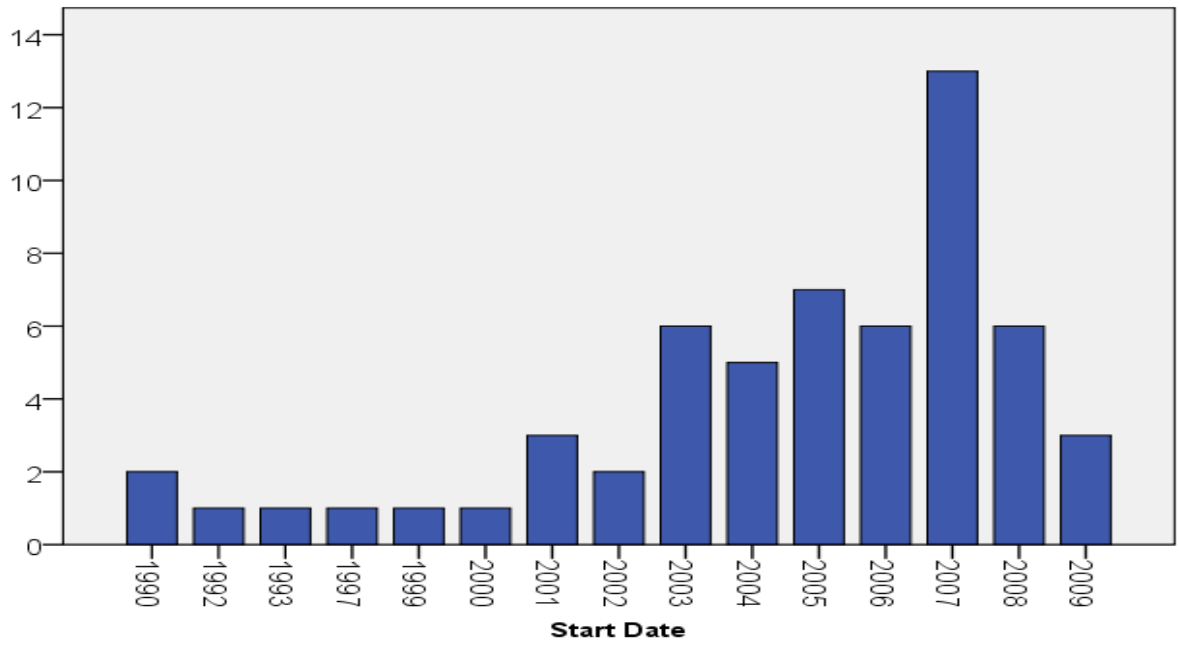



**Figure 2: The Scope of Experimentation**

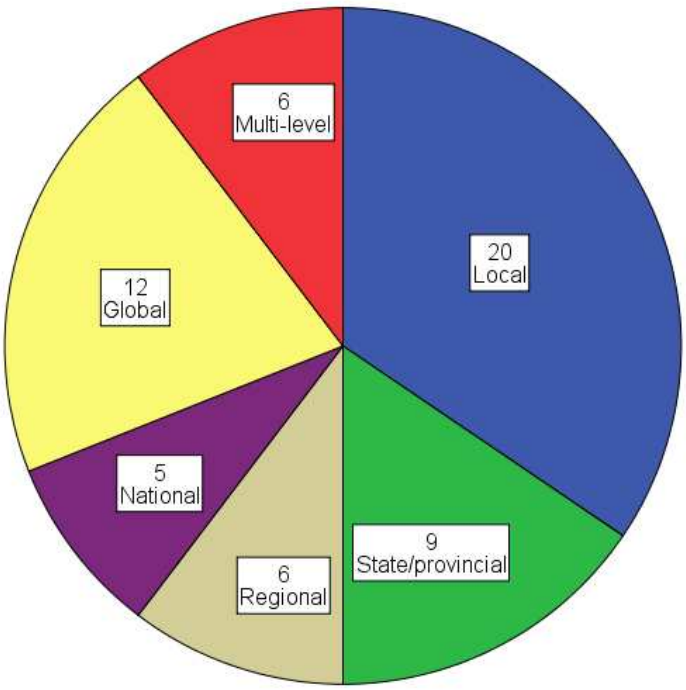


**Figure 3: Initiating Actors**

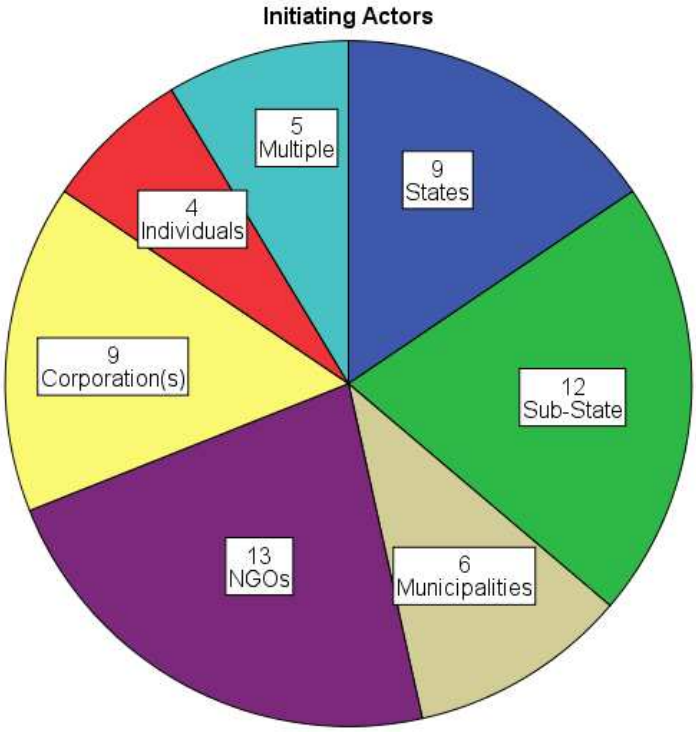



**Figure 4: Implementing Actors**

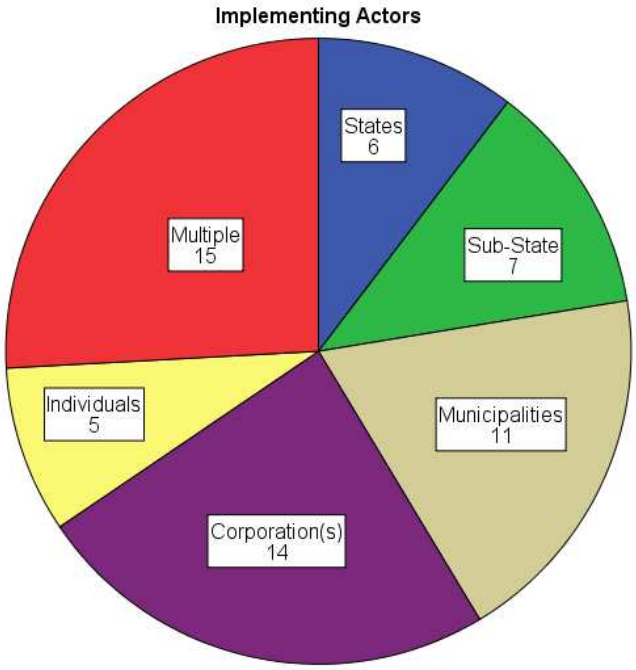


**Table 1: Initiating and Implementing Actors**

| Initiating Actor | Implementing Actor | | | | | | |
|---|---|---|---|---|---|---|---|
| | States | Sub-State | Municipalities | Corporations | Individuals | Multiple | **Total** |
| States | 6 | 0 | 1 | 0 | 0 | 2 | **9** |
| Sub-State | 0 | 6 | 0 | 3 | 0 | 3 | **12** |
| Municipalities | 0 | 0 | 6 | 0 | 0 | 0 | **6** |
| NGOs | 0 | 1 | 2 | 3 | 0 | 7 | **13** |
| Corporations | 0 | 0 | 0 | 8 | 1 | 0 | **9** |
| Individuals | 0 | 0 | 0 | 0 | 4 | 0 | **4** |
| Multiple | 0 | 0 | 2 | 0 | 0 | 3 | **5** |
| **Total** | **6** | **7** | **11** | **14** | **5** | **15** | **58** |

**Making Sense of Experimentation**

Experimentation is a recent phenomenon, initiated in the global north by diverse actors, and implemented by diverse actors at many scales. Explaining the emergence of experimentation in this form requires understanding how a wide variety of actors came to conceive of themselves as authoritative in the response to climate change. As natural as it may seem today given the diversity of actors participating in the response to climate change, in the early 1990s it was conventional wisdom that governing climate change required *mega*-multilateralism, i.e. multilateral treaty making through a negotiation process that included all nation-states (Hoffmann 2005; 2007; Dowdeswell and Kinley 1994; Barret 1992; Bodansky 1994). Everyone knew that states were the appropriate actors to deal with a transnational environmental problem. Everyone knew that the proper solution was an international treaty. With few exceptions, NGOs oriented their activities toward convincing states to take action in the negotiations (Auer 2000; Newell 2000; Betsill and Corell 2001). Cities and provinces had very little in the way of climate policy (Bulkeley and Betsill 2004). Individuals and corporations looked to their states to take action and urged either restraint or boldness depending on how they understood the urgency of the problem. While the content of international negotiations that produced the UN Framework Convention on Climate Change and Kyoto Protocol was vociferously debated, the mega-multilateral model of governance permeated was widely taken for granted.

Conventional wisdom has changed. As the previous section outlined, climate governance is no longer solely a matter of multilateral negotiations and national implementation. Cities and

states/provinces in North America are leaders in the response to climate change, NGOs and corporations are making rules to respond to climate change in addition to trying to influence the negotiation/regulation process. Individuals are taking climate action into their own hands. Even states are experimenting with new ways of cooperating. Mega-multilateralism is no longer an overwhelmingly dominant climate governance model and the climate governance experiments listed above are both symptoms and drivers of this erosion.

It is possible to make sense of this transition, and thus the emergence of experimentation if we consider political actors to be adaptive actors (Rosenau 1981; Hoffmann 2005) embedded in a co-evolutionary (Kaufman 1995; Holland 1997) or mutually constitutive (Ba and Hoffmann 2003; Wendt 1999; Adler 1997) relationship with their governance context. Paraphrasing John Ruggie (1998), at any particular point in time, actors know what counts as governance—they understand their governance context which specifies who the authoritative actors are, how they make rules, and the general contours of the rules. This knowledge constitutes actors, enabling them to place themselves in the world and define their interests and desired actions. But actors are not merely passive receptacles, they react and adapt to governance outcomes continually updating their understanding of the governance context, while in turn the actions they take serve to reinforce or change that same governance context. Simply put, there is a constant feedback between actors' beliefs, interests, and actions on the one hand, and collective understandings of appropriate governance, the governance context, on the other. Because of these feedback dynamics, the stability of the governance context is always uncertain and is predicated on continued actions that reinforce it.

In the early 1990s this co-evolutionary or mutual constitutive process enhanced the stability of mega-multilateral governance processes in climate governance. Through the 1990s, actors understood that climate governance must proceed through mega-multilateral channels and enacted this dominant model making it obvious that mega-multilateralism counted as governance in climate change. Everyone knew that mega-multilateralism defined the global response to climate change because most actors acted in a way that defined mega-multilateralism as the global response to climate change. By attending the negotiations, and orienting their discourses and practices towards this mode of governance, states, NGOs, MNCs, and even publics and academics reinforced the idea that the mega-multilateral process was *the* way to respond to climate change. By acting on what everyone knew, everyone reinforced the idea that mega-multilateralism was *the* way to address climate change

Yet there is nothing inevitable about mega-multilateralism as a response to climate change. The way actors adapted to their governance context and climate governance outcomes in the late 1990s and early 2000s provided the opening for actors to consider themselves as authoritative actors in climate change and experiment with governance, contributing to the ongoing transition away from a single, mega-multilateral mode of climate governance. Instead of reinforcing the appropriateness of the mega-multilateral model, adaptive actors began acting in ways that eroded the appropriateness of this model. Ultimately the decision to experiment in any particular instance was taken for a host of idiosyncratic reasons, yet it is possible to identify three enabling conditions that enhanced the possibility that such decisions would be made.[4]

Many observers of globalization and global governance agree that we are in the midst of a general global shift toward the fragmentation of governing authority. Scholars from multiple perspectives invoke such terms as global civil society, devolution/downloading, patchwork quilt of authority, private authority, or neo-medievalism to convey the sense that the authority of the state, and consequently that of interstate institutions (like mega-multilateral treaty-making), is eroding and/or diffusing to other levels of politics (Rosenau 1990; 1997; Hewson and Sinclair 1999; Ba and Hoffmann

[4] See Hoffmann (forthcoming) for more detail on the specific decision process in selected cases.

2005; Biersteker and Hall 2002; Haufler 2003). This tendency has been observed in finance and the global economy (Sinclair 2003; Haufler 2003); security (Avant); and the environment (Betsill and Bulkeley; Bernstein and Ivanova 2007). The overall erosion of the authority of states and state-centric governance models makes it easier for a variety of actors to envision themselves as authoritative actors who actively design rules for responding to climate change. This is a background condition that shapes how adaptive actors understand climate governance, opening up the possibility of a shift in which actors are considered authoritative and consequently a move away from the dominance of the mega-multilateral model.

This general trend towards fragmentation in governing authority interacted with the signing of the Kyoto Protocol in 1997, which ironically served to enhance the possibility for experimentation and erosion of the dominance of mega-multilateralism. The enormity of the task of responding to climate change was laid bare in the text of the Kyoto Protocol and this served as motivation to start conceiving of ways to respond to climate change. The probability that carbon dioxide emissions would be regulated in a serious way was a spark for innovations to figure out how to do so at many scales and, as importantly, how to profit from engaging in the response to climate change. A key example of this catalytic process is the emergence of the GHG Registry (now the American Carbon Registry). When Environmental Defense and the Environmental Resources Trust observed the key place for market mechanisms like emissions trading in the Kyoto Protocol (an option they strongly advocated through the negotiation process), they saw a need to develop the infrastructure that would make emissions trading effective. A significant part of this is to measure and account for emissions reductions that would be traded amongst regulated entities and to get companies ready to calculate their carbon footprints. They thus launched the GHG Registry in 1997 as an experimental initiative, taking it on themselves to devise rules to shape how corporations would conceive of carbon emissions, measure reductions, and ultimately trade the reductions undertaken or purchased from other actors.[5] Crucially, though motivated by and loosely connected to the Kyoto Process, this governance initiative was not directly tied to the treaty process. It was, instead, a set of civil society actors seizing the authority to shape the response to climate change.

Of course from 1997-2001 as the international community continued to negotiate the details of implementing the Kyoto Protocol at its annual conferences of the parties only a few experiments emerged and they were not necessarily revolutionary in terms of a transition away from mega-multilateralism—they were instead anticipatory, building the infrastructure to implement the climate actions promised in the agreement (Betsill and Hoffmann 2008). Yet they institutionalized the possibility of governance mechanisms outside the dominant mega-multilateral process. If the Kyoto Protocol had turned out to be an effective agreement, engaging the major players and serving as the focal point for a stringent climate regime, extra-Kyoto mechanisms would likely be viewed as part of the implementation process and only significant as evidence of the need for wide buy-in from a range of societal actors necessary to fully address climate change. Such was not the case. The Kyoto Protocol process moved steadily towards stalemate in the late 1990s, exacerbated by the withdrawal of the US in 2001, a condition in which it remains mired today. This stalemate provided a second, and more significant catalyst for adaptive actors, who could now conceive of assuming authority over climate change, to experiment.

When the legitimacy and efficacy of the prevailing governance model is called into question, the uncertainty in the governance context, already present because of globalization, increases. Dismissal and critiques of the Kyoto Protocol grew in the late 1990s and early 2000s. The most optimistic analysts worry that progress has been too slow (Grubb 2004). Less generous observers have harsher words for

[5] Personal Interviews with Environmental Defense and American Carbon Registry staff members.

the UN process. Depledge (2006: 1) soberly observes that the Kyoto process "has not only got 'stuck' but is digging itself into ever deeper holes of rancorous relationships, stagnating issues, and stifling debates." This "ossifying" regime cannot produce the rules and innovations necessary to meet the climate challenge (Ibid: 3; see also Victor 2006; McKibben and Wilcoxen 2002; Haas 2008). The fact that "since the negotiation of the Kyoto Protocol, more than fifty proposals for an international climate policy regime have been published" does not speak well of the confidence or esteem in which the Kyoto process is held (Michealowa 2006: 61). The negative reaction to the Kyoto Protocol process from actors and observers served to increase the uncertainty surrounding the dominant mega-multilateral governance model as the accepted procedure for enacting climate governance.

When uncertainty goes up the potential for experimentation also increases. Some experimenters are explicit about this process. The US Mayor Climate Protection Agreement was an outright repudiation of the US withdrawal from the Kyoto Process. Others, while not thinking explicitly in these terms, do refer to the vacuum left by stalemate in the Kyoto process as a key motivation to innovate.[6] The spike in experimentation seen in figure 1 post 2001-02 is thus no surprise from this perspective. Adaptive actors, emboldened by a broad context of fragmenting governing authority and awakened by the Kyoto Protocol to the need for or opportunities available in responding to climate change , were motivated by the stalemate in the multilateral process to take action onto themselves. A quick uptake in experimentation was the result—mainly in the global North as a way to either move beyond what states had agreed to do (i.e. Europe) or to act in the face of national inaction (i.e. North America).

Viewing experimentation as the result and impetus of a co-evolutionary process provides a sense of why experimentation emerged in the way evident in section 1. This perspective also provides insight in the implications of experimentation. First, mega-multilateralism ceases to be the sole governance model deemed appropriate for responding to climate change. What had been a centripetal cycle of feedback reinforcing the stability of the mega-multilateral model transitioned into a centrifugal cycle that eroded this stability. This does not imply that mega-multilateralism will disappear or that it is no longer important. On the contrary, the experimentation seen to date is still relatively small-scale and significant energy is still committed to finding a multilateral solution—witness the near hysteria in the environmental community over the possibility that the 2009 Copenhagen COP will not produce a replacement for the Kyoto Protocol. Yet, mega-multilateralism is no longer the singular model for climate governance.

Second, the adaptive process that created the transition is not just one of erosion. The experiments that actors engage in are also productive of a new governance context that allows for different models of governing climate change. Actors are actively constructing new ways to conceive of authoritative actors and appropriate actions that define the global response to climate change. Students of complex adaptive systems call this process self-organization (Cederman 1997; Bak and Chen 1991). The process whereby uncertainty in a social context translates into self-organized experimentation has explored within organization science studies of innovation. Gemmil and Smith (1985: 755) note that when a system is in disequilibrium or as uncertainty in a governance context increases, "it is crucial that some mechanism be in operation that will generate new forms or configurations around which the system can reorganize" (755). Smith and Stacey (1997: 80) posit self-organization in the face of uncertainty results in the development of an "organizational shadow" that "generates innovation and new strategic direction." Adaptive actors form groups "each following its own rules of behavior" in order to "acquire information, to learn, to conduct political activity, and to change the system they are a part of" (ibid: 85). Rosenau (1997; 2003) has identified this drive for innovation in global governance, noting

[6] Personal Interview with staff member of an experimental initiative.

that "the number of new entities that draw people…seems to proliferate as the complexity of the emergent epoch deepens" (2003: 296). This self-organization includes networking, a combination of competition and cooperation, the emergence of communities of practice and the development of redundancy in the system (Smith and Stacey 1997). All of these dynamics are evident in climate change amongst climate governance experiments. A nascent shadow system of governance is actively being constructed through experimentation. What remains to be seen is if the shadow system has some coherence and what happens as mega-multilateralism ceases to be the singular model for climate governance.

**The Contours of Experimentation**

A return to the climate governance experiments database facilitates addressing this issue. Data was gathered describing the kind of response to climate change that was encompassed in the experiments—their rules. Analysis of the rules experiments embody reveals that a master model of shared characteristics has emerged amongst experiments *and* that distinct governance models are being built on this common foundation. Thus there is both a shared conception of what counts as governance in the shadow system beyond the Kyoto Protocol and the emergence of differentiation across experiments.

*Common Foundation*

Put simply, climate governance experimentation is taking place within the bounds of what Steven Bernstein (2001) has described as "liberal environmentalism." Experiments are generally voluntary enterprises, oriented toward market activities, that focus on mitigation rather than adaptation.

A full 54 of the 58 experiments have been coded as voluntary initiatives. This coding reflects whether or not implementing actors have a choice about participating in the experiment—all 58 are voluntary in the sense of arising through the voluntary association of initiating actors. Initiatives outside the mega-multilateral process and beyond traditional polities simply do not have the authority to command participation. This is the essence of making policy without a polity (Hager 2003)—participation in governance tends to be voluntary. The four exceptions to the voluntary rule are emissions trading venues initiated by subnational governments (US states and Canadian provinces): the Western Climate Initiative, the Regional Greenhouse Gas Initiative, the Midwestern Governor's Association Greenhouse Gas Reduction Accord (proposed, not yet officially agreed to), and the Ontario-Quebec cap and trade venue (ultimately abandoned as these provinces joined the WCI). These experiments buck the voluntary trend, in a way, because while the initiating actors (US states and Canadian Provinces) have come together voluntarily to form these initiatives they have the political authority to make participation for *implementing* actors mandatory. These traditional polities are making rules in a novel way—there is no set institution within which US states and Canadian provinces collaborate—but they are able to use their traditionally sourced authority to make implementation mandatory.

The other experiments in the database either lack this coercive authority or, as in the case of alternative multilateral initiatives like the Asia Pacific Partnership or Methane to Markets program, choose not to exercise it when designing and implementing climate initiatives. Another way to consider the voluntary nature of governance experiments is to look at enforcement mechanisms. It may be voluntary to join an experiment, but perhaps once in, implementing actors are required to abide by the rules. While sixteen of the 58 experiments have provisions for some kind of monitoring of participants, only 7—the four emissions trading venues mentioned above and Carbon Rationing Action Groups, the

Chicago Climate Exchange, and the European Covenant of Mayors—have explicit enforcement rules with some penalties for non-compliance. The world of climate governance experimentation is a largely a voluntary one.

Yet, this aspect of the shadow governance system may not be as clear cut as it first appears. While virtually all experiments are voluntary, some experimental designs look to harness the political authority of various governmental actors to implement voluntary measures in an authoritative manner. The political authority of sub-state actors makes them an attractive venue for the experimental designs of other actors, like NGOs. Experiments like ICLEI's Cities for Climate Protection and the Climate Group's cities, states, and regions program look to network and facilitate sub-state action precisely because they have the political authority to take substantial action on climate change. The Climate Group fully recognizes how cities and states can serve as useful laboratories for climate technology and that these entities have a unique ability to scale up technological deployment.[7] This is a relatively well-understood dynamic of environmental politics in the US federal system. Barry Rabe (2004; 2008) has chronicled the role of state bureaucrats in the evolution of US climate policy and those involved in designing state-level emissions trading venues at the World Resources Institute stress that environmental policy in the US grows from the state to national levels.[8]

Coercive authority is also not the only kind of authority. Compliance with experimental rules can arise from a range of sources (Avant, Finnemore and Sell 2009) and many of these experiments represent the coming together of like-minded actors in ways that require less coercion. In addition, while strict oversight and enforcement is the exception rather than the rule, public reporting and accountability are becoming part of the governance experiment world. Many experiments promote public reporting of implementation actions and monitoring/accountability are clearly of concern amongst the actors initiating experiments. The Partnership for Climate Protection (Canada's version of the CCP) is working to convince member cities that monitoring and reporting their climate activities is good for them and further that such accountability is increasingly demanded by those that fund climate initiatives.[9]

The second common characteristic across the governance experiments is market orientation. Market mechanisms—taxes, emissions trading, incentives, focus on efficiency—dominate the way that experiments answer the question of how climate change should be appropriately addressed. Most experiments engage in either a "carrot approach" that seeks to demonstrate how there can be a material benefit to taking action on climate change (e.g. The Climate Group's "Carbon Down, Market's Up" mantra)[10] or in an approach that stresses efficiency, stable carbon pricing, and/or technological development. Of the 45 experiments where an orientation could be ascertained, 40 have a market orientation or call for a mix of classic regulatory measures along with market measures. Only 5 experiments were coded as solely regulatory in nature and these tend to be carbon registries—which regulate the disclosure of information most often used in subsequent market-oriented activities like trading, investment decisions and insurance calculations. The American Carbon Registry is technically coded as regulatory because it sets standards that regulate what kind of emissions reductions can be registered. Yet, the registry has a wholly market-oriented purpose—it's entire raison d'etre is to provide infrastructure for a carbon market. The world of climate governance experimentation is a market-oriented world.

[7] Interview with staff member from The Climate Group.
[8] Interviews with WRI staff members.
[9] Interview with ICLEI staff member.
[10] Interview with staff member from the Climate Group.

Finding this convergence around voluntary, market-oriented initiatives amongst climate governance experiments is not surprising. This is classic liberal environmentalism (Bernstein 2001: 4)—a compromise that "predicates environmental protection on the promotion and maintenance of a liberal economic order." The general trend towards this mode of governance and consideration of the nature-society relationship clearly permeates climate governance experimentation. As such on this dimension at least, the foundation of experimentation may not be a revolutionary challenge to established governance mechanisms. Observers have noted the underlying market/liberal orientation of multilateral environmental governance found in discussions of sustainable development, public-private partnerships, and the climate negotiations themselves (Clapp and Dauvergne 2005; Levy and Newell 2002). While there are certainly calls for radical rethinking of the nature-economy-society relationships, by and large they do not substantially influence the experimental governance system.

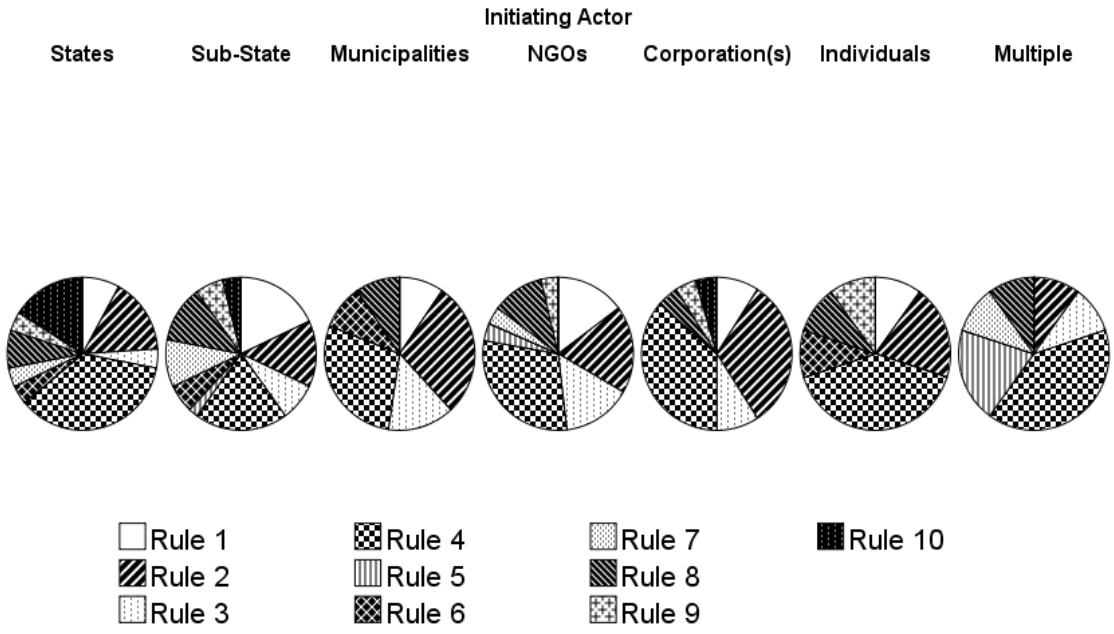
Finally, mitigation of climate change is the overwhelming focus of experimentation. Thirty-eight of the 58 experiments focus exclusively on mitigation, while another 18 pursue a mix of mitigation and adaptation rules. This is not surprising either. First, there is a selection bias here caused by the definition of a climate governance experiment. Where adaptation efforts exist, they are often not couched explicitly in climate change terms. They fall into the fuzzy area of sustainable development or are more focused on specific problems like flood control, soil erosion, land management, emergency response, or even health. A rubric designed to find specific climate initiatives is less likely to pick these up. Second, adaptation has only recently emerged as a key feature of climate governance (in the multilateral level or beyond). While many actors in the international system, especially small island states, have consistently advocated for more attention on adaptation, only in the last few years has some spotlight shown on this aspect of responding to climate change—especially amongst city-led and implemented initiatives and experiments coming from insurance and investor groups (Paterson 2001; Adger 2001).

The master narrative for climate governance experimentation thus comes into focus. Climate governance experimentation is a liberal phenomenon that emphasizes voluntary, market-oriented, mitigation as the global response to climate change. Yet additional analysis of the rules that experiments are making reveals that this commonality underpins significant diversity. Simply put, actors are trying an enormous range of actions, within the boundaries of liberal environmentalism, to respond to climate change. The experiments were all coded for constitutive rules—rules that define the essence of the experiment. The 10 rules coded for represent relatively specific categories of activities that the experiments could pursue. Table 2 reports on how many experiments utilize each of the 10 types of actions. The experimental nature of these initiatives goes beyond just the diversity of rule use. It turns out that there is *no* correlation between constitutive rules and initiating actors (see Figure 5). We might expect corporate innovations to engage with certain actions and municipal initiatives another set. In fact, however, both the visual representation of rule usage in Figure 5 and a simple Chi Square analysis of rules employed compared to initiating actors demonstrates that these variables are independent. The identity of the initiating actor provides no prediction or understanding of the kind of activities likely to be employed by an experiment. Thus, not only do we see experimentation in the macro sense—many initiatives with lots of possible rules—we also see it in the micro sense—similar actors trying out different strategies.

**Table 2 – Rule Use**

| Rule Category | Number of Experiments |
|---|---|
| 1. Catalogue Emissions/Undertake Inventory | 20 |
| 2. Set Targets/Formulate Action Plan/Do Risk Assessment | 32 |
| 3. Efficiency Measures or Offsetting | 15 |
| 4. Education/Information and Best Practice Exchange/Regular Meetings | 49 |
| 5. Certification Standards/Set Funding Criteria | 4 |
| 6. Mandate emissions reductions | 7 |
| 7. Emissions Trading | 8 |
| 8. Monitoring | 16 |
| 9. Enforcement | 7 |
| 10. Technology Development | 7 |

**Figure 5: Rules employed by Experiments Across Initiating Actors**




This diversity is not without pattern, however, and there is coherence to the shadow governance system beyond the common master narrative. When cluster analysis is performed on the database emergent governance models are uncovered. Cluster analysis is a means of inductively revealing patterns in a set of data appropriate when the goal is to ""identify a set of groups which both

minimize within-group variation and maximize between-group variation."[11] The challenge is choosing variables to define the clusters as there are few a priori means of doing so. As noted above, the database contains a number of possible demographic and rule variables. However, including all the variables in the cluster analysis is untenable because too many defining variables renders it impossible to define stable clusters. In addition, I am interested in what kind of response to climate change is entailed by experimentation and thus I used the rule data to define the clusters. After running a significant number of trial cluster analyses, I focused on aggregate constitutive rules as the means for defining the clusters, grouping the 10 rules 4 master types:

> **Planning** (Rules 1,2,5) Experiments that undertake activities designed to prepare actors for significant climate reduction activities are coded as engaging in planning. These activities include: cataloguing emissions, setting targets, creating action plans, undertaking risk assessments, producing certification standards, or setting funding criteria.
> **Networking** (Rule 4) Experiments that engage in networking are concerned with linking their constituent members and information diffusion. Specific actions here include: education, information exchange, best practice exchange, direct negotiations, and regular meetings.
> **Direct Action** (Rule 3, 6, 7, 10) Experiments coded as engaged in direct action develop and implement rules designed to directly reduce emissions amongst constituent members. These activities include: efficiency measures, offset production, production chain improvements, rationing, mandating reductions, trading emissions, technological development.
> **Oversight** (Rule 8,9) Experiments that engage in oversight include means of gauging members' actions. These activities include monitoring, provisions, and enforcement of group rules.

Cluster analysis using these aggregated rules returned six stable clusters that were useful in identifying three distinct governance models.[12]

*Model 1 – The Networkers*

Experiments in this cluster of governance responses to climate change are based around the concept of networking. The experiments in this cluster engage solely in networking, putting forward the idea that an appropriate response to climate change is found in the diffusion of information and the linking of actors interested in addressing climate change. These groups share best practices and exchange information, but tend not to mandate that members undertake action through these experiments. Action may not be part of the experiments themselves, but all are designed such that the networking that takes place has the potential to lead to action from the implementing actors and beyond. The networkers are:

- 2degrees
- Alliance for Resilient Cities
- Asia Pacific Partnership on Clean Development and Climate
- Connected Urban Development Programme

[11] http://faculty.chass.ncsu.edu/garson/PA765/cluster.htm

[12] With the exception of three experiments, the governance models were constructed by combining clusters into larger groups that made analytic sense. The three exceptions are the Institutional Investor Group on Climate Change, Klimatkommuerna, and Methane to Markets which were technically classified as Model 3 experiments by the cluster analysis, but lack any action-oriented rules (they do planning, networking, and oversight). These experiments were placed in Model 2.

- Edenbee
- Evangelical Climate Initiative
- International Carbon Action Partnership
- Network of Regional Governments for Sustainable Development
- North South Climate Change Network
- Renewable Energy and Energy Efficiency Partnership
- The Climate Group
- World Business Council for Sustainable Development

*Model 2 – The Infrastructure Builders*

Experiments in this cluster all engage in planning and networking (Model 2a) or solely in planning (Model 2b). What is evident is a set of experiments that are laying the groundwork for significant action on climate change whether that means the development of climate action plans and investment strategies (Model 2a) or the construction of standards and carbon registries (Model 2b). The infrastructure builders are:

Model 2a

- Business Council on Climate Change
- Carbon Sequestration Leadership Forum
- Climate Neutral Network
- Community Carbon Reduction Project
- ICLEI Cities for Climate Protection Campaign
- Institutional Investor Group on Climate Change
- Investor Network on Climate Risk
- Investors Group on Climate Change
- Klimatkommunerna
- Methane to Markets
- National Association of Counties County Climate Protection Program
- Southwest Climate Change Initiative
- Transition Towns
- Union of the Baltic Cities Resolution on Climate Change

Model 2b

- American Carbon Registry
- Carbon Disclosure Project
- CarbonFix
- Climate, Community, and Biodiversity Alliance
- California Climate Action Registry
- Climate Savers
- Global GHG Register
- The Climate Registry

*Model 3 – The Direct Actors*

While the first two models can be considered ways of building foundations for more tangible action on climate change, the third cluster of experiments engage directly with actions to reduce greenhouse gas emissions in addition to planning and networking. The main difference between experiments in this model is whether actions are called for without obvious means of accountability (Model 3a—Voluntary Actors), or if oversight is a key component of the experiment's activities (Model 3b—Accountable Actors).

Model 3a

- American College & University Presidents Climate Commitment
- Australia's Bilateral Climate Change Partnerships
- Carbon Finance Capacity Building Programme
- Climate Alliance of European Cities with Indigenous Rainforest Peoples
- ClimateWise
- Clinton Climate Initiative
- Conference of New England Governors and Eastern Canadian Premiers Climate Change Action Plan
- Cool Counties Climate Stabilization Initiative
- e8 Network of Expertise for the Global Environment
- EUROCITIES Declaration on Climate Change
- Major Economies Forum on Energy and Climate
- Memoranda of Understanding on Climate Change initiated by the State of California
- United Kingdom Bilateral Climate Change Agreements with US States
- US-China Memoranda of Understanding to Enhance Cooperation on Climate Change, Energy, and the Environment
- US Mayors Climate Protection Agreement
- West Coast Governors' Global Warming Initiative

Model 3b

- C40 Cities Climate Leadership Group
- Carbon Rationing Action Groups
- Chicago Climate Exchange
- Covenant of Mayors
- Institutional Investor Group on Climate Change
- Methane to Markets
- Midwestern Greenhouse Gas Reduction Accord
- Ontario-Quebec Provincial Cap-and-Trade Initiative
- Regional Greenhouse Gas Initiative
- Western Climate Initiative

These governance models provide a good sense of the archetypes of governance responses to climate change that characterize the emergent shadow governance system. Rather than being a random collection of initiatives, governance experiments are patterned with a common liberal foundation and distinct categories of responses to climate change. But using the term 'system' implies interaction, not merely a categorization. The cluster analysis only indicates that there are logical groupings of experiments, the questions that thus remain is whether this nascent coherent structure has any practical implications for the overall response to climate change.

**The Implications of Experimentation**

This paper began with the puzzle of multiple climate change initiatives recently emerging from across the spectrum of actors. The co-evolutionary/mutual constitution framework explains how mega-multilateralism ceased to be the singular governance response to climate change and how a shadow system of governance is emerging through self-organized experimentation. Experimentation seems to have a nascent coherent structure with distinct governance models being built on a liberal foundation. Full analysis of the implications of such a recent phenomenon is premature, but if the explanation for the emergence and characteristics of experimentation is compelling, then the analysis of the shadow governance system provides some fascinating fodder for conjecture about the practical significance of experimentation. Two possible futures seem possible for climate governance experimentation—it could form the basis for an alternative to or complement for mega-multilateral governance processes.

*Eclipsing Multilateral Governance*

To be clear, no one is predicting the imminent demise of multilateral climate governance. The system of international treaty-making is a constitutive feature of the international system (Denemark and Hoffmann 2008) and states will continue to strive for a global treaty for the foreseeable future. Further, no one involved in experimentation with whom I have talked claims that experiments can ultimately solve the climate change problem in the absence of an effective global treaty. Yet the rapidity and breadth of climate experimentation evident in this paper behooves us to at least consider the possibility that the shadow system could become more prominent than the multilateral governance processes that, in part, spawned it. Such a development could occur along either a positive or negative path depending on how one interprets the patterning of experiments.

On the positive path, the governance models could be seen as a developing division of labor and the harbinger of an actual governance *system.* There are signs that this is emerging organically in parts of the shadow governance system and already within a decade of the emergence of experiments we see developing specialization and linkages between experiments especially in the development of voluntary carbon markets. Climate registries, for instance have been explicitly designed to provide the raw materials that will facilitate the action of other actors. The American Carbon Registry, claims that "We add value by helping Members to position themselves in the voluntary market and to earn early-action credit towards future federal and international GHG regulatory programs."[13] Linkages are apparent as well. The Climate Group partners with a number of other experiments including the Carbon Disclosure Project, ICLEI, NRG4SD, WBCSD, and the Connected Urban Development Alliance.

One could easily envision these linkages growing and specializations being used to exploit efficiencies and synergies. Infrastructure builders like registries and investor networks provide the information necessary to make decisions about carbon and measure the changes in greenhouse gas emissions. Networkers make ensure that best practices and the most up to date information about technology can spread quickly. Action-based experiments draw on the foundation set by other experiments to proceed with specific cuts to greenhouse gas emissions and deployment of climate friendly technologies (tailored to their particular level of political authority). If synergies are created/exploited such that efforts are explicitly linked and scaled up such endeavors could potentially eclipse a global treaty. These are the kinds of efforts that will be necessary even if a global treaty is ratified (see below). The quantum leap necessary in how governance is conceived is the direction of causality. We generally conceive of international treaties as setting the standard and then other

[13] http://www.americancarbonregistry.org/aboutus/about (accessed October 14, 2009)

activities flow from it. Experimentation as an alternative dominant governance mechanism would turn that on its head. The extent of emissions reductions would not be mandated at the global level (a centralized mechanism that has had little success to this point), but would instead emerge from the bottom up dependent on how the nascent aspects of the shadow system are linked and scaled.

Yet the success of a decentralized replacement for mega-multilateralism based on a division labor emerging from experimentation is not imminent. The prospects for scaling up are uncertain, and the linkages necessary to develop a fully functional division of labor remain nascent. Perhaps most potentially concerning is the very nature of decentralized action itself. While the different governance models may look like a division of labor from the outside and experiments may fulfill different roles in the shadow system, specialization may have a more negative implication. The categories produced by the cluster analysis might reflect Tiebout (1956) style sorting rather than a division of labor. The model was originally proposed to explain how public goods could be efficiently provided when competing localities attracted citizens from a heterogeneous society by offering different amenities/taxation levels. People would move to locales that matched their preferences. Institutions that promote Tiebout sorting are good for democratic accountability because successful sorting mechanisms will tend to align micro preferences of actors with the macro structures of communities (Kollman, Miller, Page 1997).

The observed governance models may be the result of just this kind of sorting. With the opening and fragmenting of climate governance, actors are able to 'move'—i.e. create and/or join experiments that suit them and their preferences best. Every actor can strategize about what is best materially and/or what kind of response to climate change is a good match their values. In a Tiebout voting model, the more effective an institution is at sorting, the better represented people will be. However, in the case of climate experimentation, this sorting action may be detrimental. For instance, the US was at the forefront of pushing voluntary, small-group multilateralism focused on research and development of technology (Asia Pacific Partnership, Major Economies Forum, Methane to Markets) during the Bush administration because it fit their interests in moving slowly on climate change. Every actor may find an experiment to suit its interests, but this does not necessarily equal an effective response to climate change. Individual actors' needs may not coincide with the requirements for an effective response to climate change and thus the ability to find an experiment that suits ones preferences may end up being damaging to the overall goal of addressing the problem.

*Complementing Multilateral Action*

The more likely significance of experimental activities is that they will feed into or complement whatever international agreement(s) are reached in the coming years. This would not be a diminishing of the significance of climate governance experimentation. On the contrary, experimentation may prove to be crucial to the success of any global treaty that is eventually negotiated and ratified.

Climate governance experiments could end up setting the agenda for national and global action on climate change. Again, this is a well-known dynamic of domestic environmental policy in the US. States are known as laboratories of democracy (Rabe 2004; 2008) and often go further and faster than national regulation can or will. In addition, Selin and Vandeveer (2005; 2007) and identify four "pathways to policy change" through which initiatives like climate governance experiments can influence national and in this case global policymaking: "(1) the strategic use of demonstration effects, (2) market pricing and expansion, (3) policy diffusion and learning, and (4) norm creation and promulgation" (Selin & VanDeveer, 2005). The experiments discussed in this paper are already on each of these paths and the different models provide innovations in multiple areas of climate governance. C40 continually repeats the mantra that "Cities Act" and makes the claim that city action provides proof

that an effective climate policy is possible.[14] The Climate Group is active in attempting to scale up the market for climate-friendly technology, using their network to push LED lighting, for instance.[15] Standards set in the voluntary carbon market, like the forestry offset project standards of the Climate, Community, and Biodiversity Alliance are candidates to diffuse into US federal legislation on a national cap and trade system.[16]

In fact, more than complementing global negotiations, experiments may be providing the very innovative ideas that are eventually enshrined in a global treaty and the infrastructure for implementing it. Whatever the scientific validity of this cliche, it has become a well-accepted truism that effectively addressing climate change will require action from all corners of societies across the globe. Climate governance experiments are actively preparing a full range of actors for the strictures that will (hopefully) eventually emerge from multilateral and state-level processes.

Ironically, the more that the shadow system of governance develops as if it is an alternative to the traditional multilateral approach, the more likely that it is to be an effective complement to the multilateral approach. In fact, this may be just what the global response to climate change needs. Climate governance experiments are innovative. They are pushing the envelope of what is possible. They are actively seeking out gaps in the response to climate change and attempting to fill them. Experimentation will continue to shape what counts as the global response to climate change. The challenge that remains for policy-makers, experimenters, and those concerned about solving this problem is envisioning ways to bring experimentation and traditional approaches together in a way that provides an effective response.

[14] Interviews with municipal officials participating in C40 activities.
[15] Interview with staff member of the Climate Group
[16] Interview with CCBA Staff member

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