

# Global Climate Change

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Analysts have struggled to find new and creative ways to describe the scope and complexity of climate change – a problem that finds its sources virtually everywhere, from nearly all kinds of human activity (agriculture, transportation, manufacturing, energy use, land use), and that has effects that are being and will be felt across the globe. Perhaps the most apt characterization has come from Mike Hulme (2009), who eschews the label “problem,” preferring to describe climate change as a fundamental part of the modern condition. Yet, no matter how one conceives of climate change, there is little doubt that it is perhaps *the* global challenge of modern times. If climate scientists are correct in their understanding of the dynamics and impact of climate change, then the world needs to essentially decarbonize energy and transportation systems over the course of this century, with the lion’s share of progress towards this goal taking place by 2050.

Mitigating climate change,<sup>1</sup> taking the steps necessary to avoid its most dangerous potential impacts, is thus at once elementary (in that we know we need to drastically reduce the emissions of greenhouse gases) and infuriatingly elaborate (in that the pathways to such reductions are fraught with small to enormous technical, economic, social, and political obstacles). This chapter examines the global response to climate change from the perspective of this paradox. I first briefly describe the state of knowledge of climate science and argue that while climate scientists can and do tell us about the nature of the problem, they cannot tell us about what *kind* of a problem it is – i.e. what features are important and what we should do. In fact, deciding what kind of problem climate change presents is an inherently political and fraught process.

These decisions about the nature of the problem are not only difficult, they are also consequential because they shape what kind of a response we can and do formulate. I demonstrate this in the next section by comparing the different foundational

understandings of climate change embedded in traditional multilateral and emergent transnational governance responses. These two governance systems differ in how they consider the *global* nature of climate change and in how they focus on proximate (greenhouse gas emissions) or fundamental (carbon dependence) causes of climate change. These differences shape the radically different politics and policy options available in the different processes.

This comparative exercise is not one of whistling past the graveyard or playing a tune as the ship sinks. On the contrary, understanding the foundation of climate mitigation efforts provides context for contemplating and (potentially) hope for developing the paths along which climate governance must (and/or can) proceed in the coming decades. I conclude, therefore, with some brief suggestions for how we can move forward reflexively both in the research and policy-making communities to bring together the two main approaches to climate governance.

### Understanding the “Problem(s)” of Climate Change

Just getting one’s head around the *problem* of climate change is a stiff challenge precisely because the problem can be conceived in multiple ways. There is the science of climate change – how increasing greenhouse gas concentrations affect global temperatures, ocean chemistry, and vegetation and the associated impacts that emerge from these changes. There are the social-economic-political understandings which focus, among other things, on economic development, the energy system, varied interests of states and other political actors. There is also the ethical dimension that concentrates on who faces the costs of climate change (mitigating it and the effects of it) both now and in the future (Gardiner 2004; Roberts and Parks 2007; Vanderheiden 2008). To further complicate matters, none of these dimensions provide objective understandings of the problem, but are rather wrapped up in the process of *framing* the issue in various ways that legitimate and even necessitate types of policy responses (Kahan *et al.* 2010; Hulme 2011). This brief chapter cannot do justice to all of the dimensions of the problem of climate change, thus this section focuses in on the latest understandings of climate science and how this knowledge can only take us part of the way towards understanding what kind of a problem climate change is because of varied political and economic aspects and framings of the problem.

#### *Climate Science*

The scientific logic of the climate change problem is relatively simple to describe (Hoffmann 2011; see also e.g. Maslin 2004; Dessler and Parson 2006; Houghton 2009). The Earth’s atmosphere acts as a greenhouse whereby various gases (carbon dioxide, methane, chlorofluorocarbons, water vapor, and others) absorb solar radiation that would otherwise be reflected back into space from the Earth. This greenhouse effect itself is beneficial as it keeps the planet warm and allows life to flourish in the forms with which we are familiar. However, since the industrial revolution humanity has been emitting more and more greenhouse gases (e.g. carbon dioxide, methane, chlorofluorocarbons), mostly through the burning of fossil fuels, increasing their concentrations in the atmosphere and thus increasing the warming effect. Potential effects of increased greenhouse emissions include ocean acidification,

along with the global warming that will likely engender sea level rise, increases in the frequency and severity of storms and droughts, changed precipitation patterns, altered disease vectors and trajectories, species migration, reduced agricultural productivity, and more.

The 2007 Intergovernmental Panel on Climate Change (IPCC) report laid out the most comprehensive examination of climate change to date. It found consensus in the scientific community that greenhouse gas emissions have significantly increased due to human activity and further that the modest temperature increases we have already experienced are “very likely due to the observed increase in anthropogenic GHG concentrations” (IPCC 2007). Moving forward, even the relatively conservative IPCC language about the likelihood of further warming in the twenty-first century raises alarms when they note that extant climate models predicted between 2 and 4 °C of warming in the coming century (IPCC 2007). Put simply, in 2007, the scientific community considered that human activity was causing increases in greenhouse gas concentrations and that we could expect significant warming and other effects because of it.

Data and models that have emerged since 2007 have consistently produced more dire predictions about the rate of emissions growth and the warming that we are likely to see. In 2011, the National Research Council (2011) in the USA expanded the range of anticipated warming, noting that now scientists are telling us that:

Projections of future climate change anticipate an additional warming of 2.0 to 11.5F (1.1 to 6.4C) over the 21st century, on top of the 1.4F already observed over the past 100 years.

The International Energy Agency (2012: 15) concurs and estimates that if current trends of increasing energy use are not altered, the world is headed for at least 6 °C of warming. The current (political) consensus is that constraining global temperature increases to 2 °C is crucial, but that time is rapidly running out to do so. In 2009 a prominent gathering of climate scientists and policy-makers (Copenhagen Diagnosis 2009) declared what has now become a relatively taken-for-granted understanding: “If global warming is to be limited to a maximum of 2 °C above pre-industrial values, global emissions need to peak between 2015 and 2020 and then decline rapidly.”

Knowledge about expected warming from current and anticipated concentrations of greenhouse gases is increasingly troubling as the climate science community learns more about the kind of impacts we can expect. Here the news is frankly a bit frightening. The possible impacts of climate change are well known – glaciers melting, sea level rise, altered storm pattern and severity, altered precipitation patterns, and more – but it appears as though at least some impacts are coming sooner than anticipated in earlier models and with greater magnitude. Already in 2009, UNEP (2009) was warning that “The pace and scale of climate change may now be outstripping even the most sobering predictions of the last report of the Intergovernmental Panel on Climate Change (IPCC).” Since 2009, a steady stream of reports have detailed how climate change has already begun and that the impacts like the melting arctic ice cap are coming more quickly than anticipated. The juxtaposition in 2012 of a record-breaking warm winter in North America and bizarre cold snaps in Europe have added an experiential element to the notion that we are already experiencing significant climate change.

However, even with increasingly sophisticated climate science, there are still significant uncertainties that complicate scientific understanding of the problem of climate change. Some of these are inherent uncertainties, in the sense that we simply will not be able to know for sure. These include comprehending and tracing:

- the intervening factors between concentrations of greenhouse gasses, temperature increase, and climatic changes like increased severity and frequency of storms, cycles of droughts and floods, and patterns of precipitation;
- how natural variability in the climate can mask and/or exacerbate the effect of anthropogenic greenhouse gas emissions;
- the uncertain magnitude and geographically variable nature of the effects of climate change;
- the role that feedback effects and tipping points play in offsetting or accelerating the impact of global warming. (Hoffmann 2011: 10–11)

### *Beyond Climate Science: What Kind of Problem Is Climate Change?*

Scientifically, then, we have a pretty good sense of the nature of the problem – its causes and consequences and its uncertainties. But even scientific consensus cannot tell us what kind of a problem climate change is: scientific understanding translates uneasily into policy-making at the global or indeed other levels because it does not make political, economic, technological, and social definitions of the problem obvious (Litfin 1994). In fact, scientific uncertainties, in some ways, pale in comparison to the obstacles and uncertainties that come with understanding what kind of problem climate change is from a social-economic-political perspective. Consider the following:

- *Greenhouse emissions arise from virtually every human activity.* Most current industrial, energy, transportation, and agricultural processes produce greenhouse gases. The world's economy significantly runs on fossil fuel use.
- *Dependence on fossil fuels is uneven.* While the global economy runs on fossil fuels, there is disparity between consumers and producers of fossil fuels – in other words some countries produce a lot of fossil fuels, others consume a lot of fossil fuels, and many that consume less would like to consume more.
- *Per capita greenhouse gas emissions vary significantly.* While absolute emissions from India and China rival those found in the USA and EU, the per capita emissions are wildly divergent. According to the International Energy Agency (2009), in 2007 the average person in the USA produced over 19 t. of carbon dioxide, while the average person in India and China produces 1.2 and 4.6 t. respectively.
- *Historical responsibility for greenhouse gas concentrations is different from future responsibility.* The states that contributed most to the current level of greenhouse gas concentrations (USA, EU) are not going to be the same states that contribute the most to the future level of greenhouse gas concentrations (USA, China, India).
- *Protecting the climate promises diffuse benefits in the future, while engendering concentrated costs now.* Put simply, it is difficult to generate political will,

especially across political jurisdictions, to solve a problem when identifiable groups must pay up-front to generate benefits for the whole world sometime in the future. Scientists agree that the world must take action now to change the nature of our economy and wean itself off fossil fuels so that decades or even a century in the future, our climate remains hospitable for the world's great-grandchildren. This creates an enormous incentive to delay and significantly hampers efforts to generate urgent action in the present.

- *Climate impacts will be felt differentially.* Climate changes will be felt locally, regionally, nationally, and internationally, but with significant variation, and many of the poorest countries are likely to suffer the most dramatic consequences. In addition, the capacity to respond to climate changes also varies significantly. This produces wide disparity in the urgency felt about the problem. (Hoffmann 2011: 10–11)

So what is the problem? Is it a problem of overdevelopment or underdevelopment? Is it a problem of Northern historical responsibility or Southern future responsibility? Is it an economic problem or an environmental problem or an energy problem? Is it a problem of mitigation or adaptation? The very fact that climate change is in many ways objectively undefinable means that the framing of the issue *creates* the kind of issue we are actually dealing with (Hulme 2011). How we understand the problem creates the kind of problem that we try to solve.

Deciding what kind of a problem climate change is means focusing on particular aspects of the problem in formulating responses. This is both difficult and political. It is difficult simply because we cannot know which is the “right” decision. We have no means of ascertaining what aspects of climate change we should focus on and what kind of solutions we should devise to best respond to the problem. It is political because the choice of features and responses to focus on have differential costs and benefits for different groups of people. Actors have very different interests in the climate change problem if it is defined as a problem of mitigation or adaptation, for instance. These decisions are therefore consequential in addition to being difficult because they shape the contours of the global response to climate change. In the next section I demonstrate this by comparing the consequences of two aspects of the foundational understandings of climate change embedded in the multilateral and transnational responses to climate change.

## The Global Responses to Climate Change

Traditionally, the multilateral treaty-making process overseen by the UN has been equated with climate governance. Most studies of climate politics are concerned with the negotiation, impact, and effectiveness of this process and center their analyses on the development of major agreements – the UN Framework Convention on Climate Change (UNFCCC, 1992), the Kyoto Protocol (1997), and the more recent attempts to move beyond Kyoto with the Copenhagen Accord (2009) and Durban Agreements (2011). Most public international effort has been directed into this multilateral process as well. Essentially, the UN process has been climate governance, for good or bad, for the last 25 years. More recently, however, a nascent system of transnational governance has emerged to address climate change (Andonova *et al.* 2009; Hoffmann

2011; Abbot 2012; Bulkeley *et al.* 2012). This decentralized approach to climate governance engages multiple actors at multiple levels and is only loosely connected to the multilateral process.

In this section I briefly introduce these two governance mechanisms and compare their understandings of climate change on two dimensions – the definition of the global scope of the problem and whether to focus on proximate or fundamental causes of climate change. This comparison reveals the consequences of choosing what kind of a problem climate change is for politics and policy.

### *Multilateral Governance*

The UN-centered process of multilateral negotiations needs little or no introduction. It has been the key international response to climate change, consisting of annual global conferences and negotiations that produced the UNFCCC, the Kyoto Protocol, and a string of more recent agreements moving towards replacing the Kyoto Protocol. This process has been the subject of intense academic scrutiny, with studies examining, among other areas, the early negotiating phases and regime building (Grubb 1993; Bodansky 1994; Rowlands 1995), the political economy of the negotiations (Grubb 1993; Barrett 2003), the North–South dimensions (Gupta 2000; Roberts and Parks 2007), the rise and inclusion of market mechanisms (Bernstein 2001), and the problems and failures of the process (Victor 2004, 2011; Depledge 2006; Prins and Rayner 2007; Falkner *et al.* 2009). Rather than rehashing a very large literature, this section examines aspects of what kind of a problem climate change is considered to be in the multilateral process and the consequences of that definition.

First, the global scope of the problem has always been emphasized in the multilateral negotiations. From the very beginning of climate change's emergence as an international policy problem, everyone understood that it was a global problem that required a global solution. This seems obvious enough, as climate science tells us that climate change may be the one truly global environmental problem, in that the climate/atmosphere is a global system and that the sources and effects of climate change are found literally everywhere. But this somewhat banal notion of global – of the globe – is an empty signifier that could fit with any number of more specific notions of what kind of a problem climate change actually is. Certainly there may be global effects, but even in the early 1990s, it was fairly clear that at least 75% of the problem could be attributed to fewer than ten states if we consider the EU as a single entity (Hoffmann 2005). Further, even the *global* effects are diversely and differentially distributed regionally and locally. These characteristics of climate change, however, were *not* emphasized when the international community devised a response strategy. Instead, what everyone meant when characterizing climate change as a global problem is that all *states* should participate in the devising of a solution and that all *states* should take responsibility for participating in the solution though the responsibility should be differentiated by development level (Hoffmann 2005).

Second, climate change was clearly defined as an emissions problem. This conception has dominated the global response to climate change in the last 20 years, and the UN process has largely been an effort targeted at negotiating emissions reductions – how far to reduce greenhouse gas emissions, how to distribute reduction commitments, how to achieve reductions, and how to pay the costs of reductions.<sup>2</sup> Clearly

climate change does result from the increasing emissions of greenhouse gases. This understanding of the problem is not inaccurate, but it is a specific type of focus that is not the only way to conceive of the problem. A focus on emissions is a focus on proximate causes of the problem. This may appear to be a subtle difference, to focus on the emissions of greenhouse gases rather than the processes that produce them, but it is more than semantics. Defining a problem based on its symptoms (adaptation efforts work from this definition when they look to deal with the consequences of global warming), or its proximate causes, or its fundamental causes makes for very different policy responses.

In fact, both of these foundational conceptions of climate change as a problem (a particular vision of “global” and equating the problem with its proximate causes) are consequential because they constrain the policy tools and politics of the multilateral process. The debates and options that flowed from the underlying definition have remained remarkably stable over the course of the last 20 years, even while progress on an effective global response to climate change has been agonizingly slow (Depledge 2006). The multilateral governance process was constructed as universal interstate negotiations tasked with essentially distributing costs (i.e. emissions reductions), and devising side payments (i.e. development assistance) and flexibility mechanisms (i.e. market measures like cap and trade) to make such costs palatable. Whether the understanding of the problem as one of proximate causes led to the collective action problems or whether the global, multilateral approach made this understanding of the problem inevitable is an open question not fully explored here (see Hoffmann 2005).

From the beginning, all states (even the negotiations in the early 1990s attracted over 100 states) saw themselves as relevant participants in climate governance. “Global” meant universal, interstate governance through negotiation. The lines of contention over emissions reductions in this governance context were clear and had to do with how different states considered the urgency of climate change and costs of emissions reductions. The Europeans, mostly convinced of the urgency of the problem (and beneficiaries of internal diversity of emissions profiles that would make reductions easier to come by within the EU), and small island nations, facing an existential threat, have consistently pushed for significant emissions reductions. The Europeans wanted binding emissions reductions in the UN Framework Convention on Climate Change, took on the deepest emissions reduction commitments in the Kyoto Protocol, and have pledged a 30% reduction of greenhouse gas emissions even in the absence of a legally binding replacement for the Kyoto Protocol.

On the other side of this debate, we find the USA, large developing countries (China, India, Brazil), and oil-producing states. This set of states was concerned about the significant costs of emission reductions to their economies. The USA was the main obstacle to quick action on emissions reductions in these early negotiations, forswearing any moves to include binding greenhouse gas emissions reductions targets in the framework convention. Though the USA changed course in the mid-1990s and agreed to modest emissions reductions in the Kyoto Protocol, it subsequently repudiated those commitments in 2001 and has since rejected binding emissions reductions in international negotiations. China and India, bolstered by the precedent set in the Montreal Protocol for ozone-depleting substances and the accepted principle of common but differentiated responsibilities, urged Northern states to take the lead on significant actions to address climate change and, until very recently, rejected any calls for emissions reductions from the global South.

The result has been stalemate and, from a political economy perspective, not a very surprising one (Hoffmann 2011: 15; see also Barrett 1992, 2003; Sell 1996; Victor 2004). Given its preeminent position as an energy consumer and carbon dioxide producer, the USA does not want to incur what would be significant costs to its economy to deal with the problem, especially in the absence of action by major economic competitors like China. Large developing countries which have rapidly grown in terms of energy consumption and carbon dioxide emissions (in absolute if not per capita terms) prioritize development over action on climate change and also argue that a problem historically caused in the North should be dealt with by Northern states first. The USA is reluctant, at best, to take significant action. The Europeans and major Southern states push for significant actions by Northern states, and the USA and to a lesser extent Japan, Russia, and Canada, work to both reduce and slow the response to climate change and push for concomitant Southern actions. China, India, Brazil, and other developing states are reluctant, at best, to take significant action. The EU, which has taken significant action, has not been able to convince either side to make significant concessions.

The impasse that was already apparent in 2001 is still shaping the climate negotiations of today. The Copenhagen meetings of 2009 were designed to achieve the next step beyond the Kyoto Protocol (ending in 2012) – the next binding emissions reduction treaty. The fact that it failed to do so was not news, given the stalemate that had persisted for the prior decade. The major difference is that the international community has given up, for the time being, on collective emissions targets. After little success in years of trying to take the next binding step beyond Kyoto, the 2009 Copenhagen Accord and subsequent 2010 Cancun Agreement introduced the idea of National Appropriate Mitigation Activities and allowed countries to pledge their own emissions reductions targets and baseline years (UNFCCC 2009, 2010). The focus is still on emissions reductions, but there will be no collective target until at least 2020. The 2011 Durban Agreement pledged only to negotiate a legal instrument by 2015 that would come into force after 2020 (UNFCCC 2011).

The traditional way we go about the international response to climate change – negotiate a treaty among the entire international community to mandate a collective emissions reduction target that is distributed as various national emissions reductions targets (which will include an enforcement mechanism so countries do not cheat) – has led to the impasse. In some ways, focusing on mandated emissions reductions forces the international community into the box of a collective action problem over a joint public good. In other words we define the problem as one where everyone emits greenhouse gases and we have to measurably restrict those in an enforceable way to solve the problem. This fundamental definition of the problem actually creates many of the intractable debates we have seen in the last 20 years – how much to reduce, who is obligated to reduce, what should we do if someone fails to reduce – because it inherently means distributing something costly (emissions reductions).

The fundamental understanding of the problem embedded in multilateral governance also contributed to the boundaries on the policy options available for the global response to climate change. Flexibility became the key term in the negotiation of the Kyoto Protocol as the USA and others sought low-cost mechanisms for achieving the emissions reductions that were under consideration. In this case, and in line with the dominant worldview of liberal environmentalism (Bernstein 2001), flexibility meant the inclusion of market mechanisms into climate governance. Two



kinds of carbon markets – credit and allowance – emerged as the main policy tools that would dominate the discussions about achieving emissions reductions (Newell and Paterson 2010; Betsill and Hoffmann 2011).

The USA was the biggest advocate of market mechanisms in the multilateral negotiations that produced the Kyoto Protocol, arguing that they would control the costs of reducing greenhouse gas emissions. The idea of using market mechanisms in service of environmental goals was and remains a familiar motif in USA environmental policy and in the OECD writ large (Raufner and Feldman 1987; Bernstein 2001; Engels 2006; Voß 2007; Newell and Paterson 2010; Paterson 2010). The original vision was to have an integrated global carbon market associated with the Kyoto Protocol consisting of a global cap-and-trade system and a global offset system that engaged both states in the global North (Annex I) that were negotiating to take on emission reduction commitments and those in the global South (non-Annex I) that would not be taking on such commitments (Hoffmann 2011: 125).

The cap-and-trade system was to engage Northern states and facilitate their achievement of the negotiated emission reductions (Hoffmann 2011: chapter 6). Along with a cap-and-trade system, the Kyoto Protocol laid out a complementary credit or offset market. In credit markets actors undertake activities or projects to reduce greenhouse gas emissions from some baseline (plant trees, change land use, invest in energy efficiency or renewable energy, etc.). The reductions are turned into emission credits – tons of greenhouse gases reduced and not emitted – that can be sold to consumers who seek to manage their greenhouse gas emissions (either voluntarily or by mandate). The Kyoto Protocol initiated two credit markets that could be used by Annex I countries to meet their emission reduction commitments. The Joint Implementation initiative was for offsets produced in Annex I countries (especially transitional economies in Central and Eastern Europe). The Clean Development Mechanism (CDM) was negotiated as a way for developing countries to participate in the carbon market – producing credits that could be sold to entities with reduction commitments, simultaneously advancing sustainable development goals. A third type of credit market has recently emerged – the Reduced Emissions through avoided Deforestation and Degradation program (REDD) that produces credits for developing countries that protect their forests (Lederer 2011).

The multilateral process has always been founded on an understanding of climate change as a global (read universal and international) problem of negotiating emissions reductions. Treating climate change as this kind of problem had tangible consequences – namely political dynamics focused on the distribution of costly action and the emergence of particular market-oriented policy options. While the original understanding of the problem is not inaccurate, it is certainly not the only way to apprehend the problem of climate change. A different perspective on what kind of a problem climate change is can be found at the foundation of an alternative global response with significant consequences for the shape of that global response.

### *Beyond the Multilateral Process*

The UN process has thus far failed to produce an effective response to climate change. The future of multilateral negotiations also appears dim given the disappointing outcomes of the last three negotiations. Yet far from lacking a response to climate change as the UN process has floundered, the world is, rather, awash with

different approaches (Hoffmann 2011: chapter 1; see also Andonova *et al.* 2009; Bulkeley and Newell 2010; Hoffmann 2011; Bulkeley *et al.* 2012). Global networks of cities are working to alter municipal economies, transportation systems, and energy use. Corporations are forming alliances with environmental NGOs to devise large and small ways to deliver climate-friendly technology and move towards a low-carbon economy. States, provinces, environmental organizations, and corporations are engaged in developing carbon markets that promise low-cost means of reducing emissions. These transnational governance approaches, or what I have called climate governance experiments, are shaping how individuals, communities, cities, counties, provinces, regions, corporations, and nation-states respond to climate change.

These initiatives are more than lobbying efforts looking to shape the multilateral process. On the contrary, they are explicitly engaged in making rules (broadly conceived as including principles, norms, standards, and practices) – and entail a conscious intention to create/shape/alter behavior for a community of implementers (whoever and whatever they may be) to follow. Recent works have explored the emergence and functioning of this new approach to the global response to climate change (Andonova *et al.* 2009; Bernstein *et al.* 2010; Hoffmann 2011; Abbot 2012; Bulkeley *et al.* 2012). Here, I want to explore the foundational understanding of climate change on which this governance approach rests and the implications of this understanding. This is a somewhat more complex task than was the case for multilateral governance because rather than a single, centralized process, transnational governance of climate change is instead a decentralized, networked, self-organized process that does not have a singular focus or direction (Bulkeley 2005). It is a governance approach made up of multiple, often entirely independent, initiatives. That is not to say that the transnational approach is random or chaotic. On the contrary, recent studies have shown that it is fairly structured, with observable patterns in terms of governance functions and activities they engage in (Andonova *et al.* 2009; Bulkeley and Newell 2010; Hoffmann 2011; Bulkeley *et al.* 2012).

This approach to climate governance is founded on a very different understanding of what kind of a problem climate change is. While transnational climate governance also considers climate change to be a global problem, global means something more or different than a universal response by states. Global is understood to mean simultaneously local and global, multilevel. Transnational governance is just as global as multilateral climate governance, it is just global in a very different way and this entails a very different kind of politics. It involves multiple actors and diverse rule-making practices as opposed to set actors (states) and an established, singular means of making rules (multilateral treaty negotiations). It is flexible because there are multiple sites of governance and actors can voluntarily engage in multiple venues where the multilateral process is tied to a formal consensual decision-making. It has areas of questionable political authority instead of the standard authority of international law and sovereignty, but in bringing together like-minded actor around a range of activities, enforcement may be less of a significant issue.

This experimentation entails trying out new configurations and governing political spaces that did not exist before. Transnational climate governance initiatives or experiments function across boundaries whether vertically (local-regional-national-transnational) or horizontally (networks of similar actors across boundaries). Experimentation is thus a process of making rules outside well-established channels. It is

cities forming transnational networks (Betsill and Bulkeley 2004; Bulkeley and Kern 2006). It is US states and Canadian provinces cooperating on climate agreements (Rabe 2004, 2007; Selin and Van Deveer 2009). It is NGOs and corporations forming alliances. This kind of governance is making policy, as Hajer (2003) says, without a polity.

It is near impossible, then, to point to a single set of debates that dominates the transnational governance process. The multilevel, decentralized nature of this experimental approach means that there are multiple kinds of politics taking place. Cities are networking with each other and engaged in relationships with higher levels of jurisdiction (up to the global negotiations), trying to get their work and their plights recognized. Corporations and NGOs are forming alliances like The Climate Group's work with Cisco aimed at implementing information and communication technologies in cities to transform transportation, urban design, and energy delivery (<http://www.connectedurbandevelopment.org/news>). Of course, there is also competition as multiple initiatives work in similar areas like technology deployment in cities, voluntary carbon markets, renewable energy development. The interests (economic and political) are multiplied in the transnational governance system.

Understanding climate change as a simultaneously global and local or inherently multilevel problem is coupled with diverse notions of what counts as addressing climate change. Emissions reductions are not the sole focus. Transnational initiatives are working towards multiple ends. Emissions reductions are certainly one of the goals being pursued by some initiatives, but others goals – changing infrastructure, promoting renewables, developing the green economy, emissions trading and carbon markets (as ends in themselves), and revolutionizing IT infrastructure – are also included in the diverse targets pursued by transnational governance. The proximate cause of climate change (i.e. emissions) is not ignored, but looking across the myriad transnational initiatives, it is joined by a focus on the underlying causes – fossil fuel dependence of the energy system and economy. Individual initiatives might very well focus on emissions, but because of the diversity in the population of experiments, a broader, if decentralized, overall focus is clearly observable. Transformation, not just emissions reductions, is the collective goal of transnational governance.

This more holistic understanding does not ignore emissions reductions, but many initiatives treat them more as a side-effect of other action than the ultimate end. Initiatives in the experimental world are focused on “smaller” problems. The Climate Group is working to get LED lighting to be the norm for large municipalities across the world (<http://www.theclimategroup.org/>). The Voluntary Carbon Standard is working to improve the measurement and accounting of carbon offset credits (<http://v-c-s.org/>). The C40 group of large cities is working on developing building standards and electric public transportation fleets ([www.c40cities.org/](http://www.c40cities.org/)). Ironically by beginning with a substantially “larger” perspective – climate change as a product of the modern economy and energy systems – the collective efforts of the transnational governance system are not hampered by the need to devise a single binding emissions reductions goal that directs their action. Moving beyond a focus on emissions reductions, transnational climate governance initiatives undertake a myriad of responses. A recent study of 57 of these initiatives found 10 broad kinds of policy options being pursued and only a few (7) dealing specifically with mandating emissions reductions (Table 1.1).

**Table 1.1** Experimental governance activity.

<i>Activity</i>	<i>Number of initiatives</i>
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. Set certification standards/funding criteria	4
6. Mandate emissions reductions	7
7. Emissions trading	8
8. Monitoring (of implementing actors)	16
9. Enforcement	7
10. Technology development	7

Source: Hoffmann, Matthew J. 2011. *Climate Governance at the Crossroads: Experimenting with a Global Response after Kyoto*. New York: Oxford University Press: chapter 2.

The advantage here is the diversity of tools available. The disadvantage is the lack of a concentrated target and centralized process of monitoring and enforcement. On their own, almost all of the transnational initiatives are small. Scaling up individual initiatives or coordinating multiple initiatives will be no mean task (Abbot 2012). In addition, with the opening and fragmenting of climate governance, actors are able to create and/or join experiments that suit them and their preferences best. They can strategize by asking what is best for me materially and/or ask what is appropriate for my values. This sorting action may be detrimental. Actors may find just the right kind of experiment that suits their needs and values (Hoffmann 2011). The USA was at the forefront in pushing voluntary, small-group multilateralism during the Bush administration because it fit their interests in moving slowly on climate change. Every actor may find an initiative to suit its interests, but this does not necessarily equal an effective response to climate change. The question that remains is whether open sorting into initiatives that match actors' preferences will provide enough of a response. If sorting occurs in the absence of legally binding enforcement of broader climate change goals and activities – enforcement that can likely only be achieved through international treaties and national laws – it may not provide an effective catalyst for climate action.

Transnational climate governance initiatives (collectively) thus go beyond orthodoxy on multiple dimensions because the notion of what kind of problem climate change presents is understood very differently. This changes the political dynamics and the policy tools available. Climate governance becomes the province of multiple actors working towards multiple goals. It defines climate change as a global problem of transformation towards decarbonization. With a broader understanding of the problem comes a wider variety of policy tools, but also the potential pitfalls of a decentralized approach that includes significant fragmentation of the global response to climate change (Biermann *et al.* 2009, 2010; Zelli 2011).

### **Caught between a Rock and a Hard Place?**

Diagnosing the problem of climate change has not been an obstacle to addressing climate change. If anything the issue is that there are too many possible ways to

diagnose the problem. The clear consensus on key aspects of climate science has told us that there is a problem and given us a relatively clear picture of its characteristics. What it has not been able to do, however, is tell us what kind of problem it is and how to respond to it. The policy options and responses – governance – that can be and have been generated are dependent upon this latter understanding.

This chapter has demonstrated the wide disparity in the foundational understanding of climate change between the dominant multilateral approach and the nascent transnational one. In concluding I will venture two conjectures on what should be done in climate policy and research given this disparity. First, both policy-makers and climate scholars need to re-imagine climate change as a bigger problem than emissions reductions – we need to align our thinking on what kind of problem climate change is with the collective transnational governance approach. Ironically, conceiving of climate change as a problem of widespread transformation makes it easier to address in interesting ways. It allows for tackling various pieces of the problem – decarbonization in the transportation sector, in the energy system, in agriculture, altering building codes and the built environment, and so forth. Further, it moves climate governance out of the realm of distributing costly emission reduction commitments to the realm of seeking out benefits from transformation. There may be enormous value in shifting understanding of the problem to one where there are incentives to cooperate (i.e. engender coordination effects) rather than conceptions of the problem that create obstacles to cooperation (collective action problems) that must be overcome.

Second, let us not abandon the flailing multilateral approach; rather, we should reconceive its role in climate governance (Sanwal 2007). The two systems of governance – traditional multilateral and transnational – have never been entirely independent of one another. In addition, the annual conferences of the parties (COPs) are about more than negotiations. They serve as a focal point for all kinds of actors (NGOs, corporations, students, interested individuals, and media), enhancing the spotlight on this key problem and communicating the sense of urgency that surrounds it. But the role of treaty-making as the primary governance response must change. Multilateral climate negotiations will not and should not be abandoned. I contend that treaty-making must instead be used to ratify and further developments in the transnational governance system. As climate governance experiments innovate in multiple areas and at multiple scales, multilateral approaches can be used to scale up and coordinate, link and further the dynamics bubbling up from below (Abbot 2012).

For policy-making these suggestions mean combining the advantages of both governance approaches while avoiding their respective disadvantages. Prins and Rayner (2007) are substantially correct when they call for a “buckshot” approach rather than a silver bullet – the global response must have the multiple kinds of activities taking place at many scales to be effective. However, coordination and enhancement of these multiple issues will be necessary to ensure that the transnational or experimental approach constitute an effective global response. The central role of multilateral treaty-making should evolve – it should not be relied upon to drive the process, but rather use multilateral treaty-making to make the transnational process better and more effective. For the research community, this analysis implies that we need to focus our energy on how synergies between diverse kinds of activities can be created and exploited. We need to better understand the nature of multilevel authority relationships and governance dynamics. We need to

better understand how transformative pathways (Bernstein and Cashore 2012) can be created.

None of these sets of tasks is small and time is short.

## Notes

- 1 Adaptation to climate change is no less important, but is not the focus of this chapter. Please see Chapter 28 in this volume.
- 2 It seems likely, though difficult to prove definitively, that the close temporal proximity to the ozone-depletion negotiations influenced the international community's understanding in this dimension (Betsill and Pielke 1998; Hoffmann 2005). The ozone depletion negotiations focused exclusively on reducing the emissions of ozone-depleting substances. This gas-centric focus translated easily to the next environmental problem faced by the international community in that climate change also nominally arises from emissions of particular gases.

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