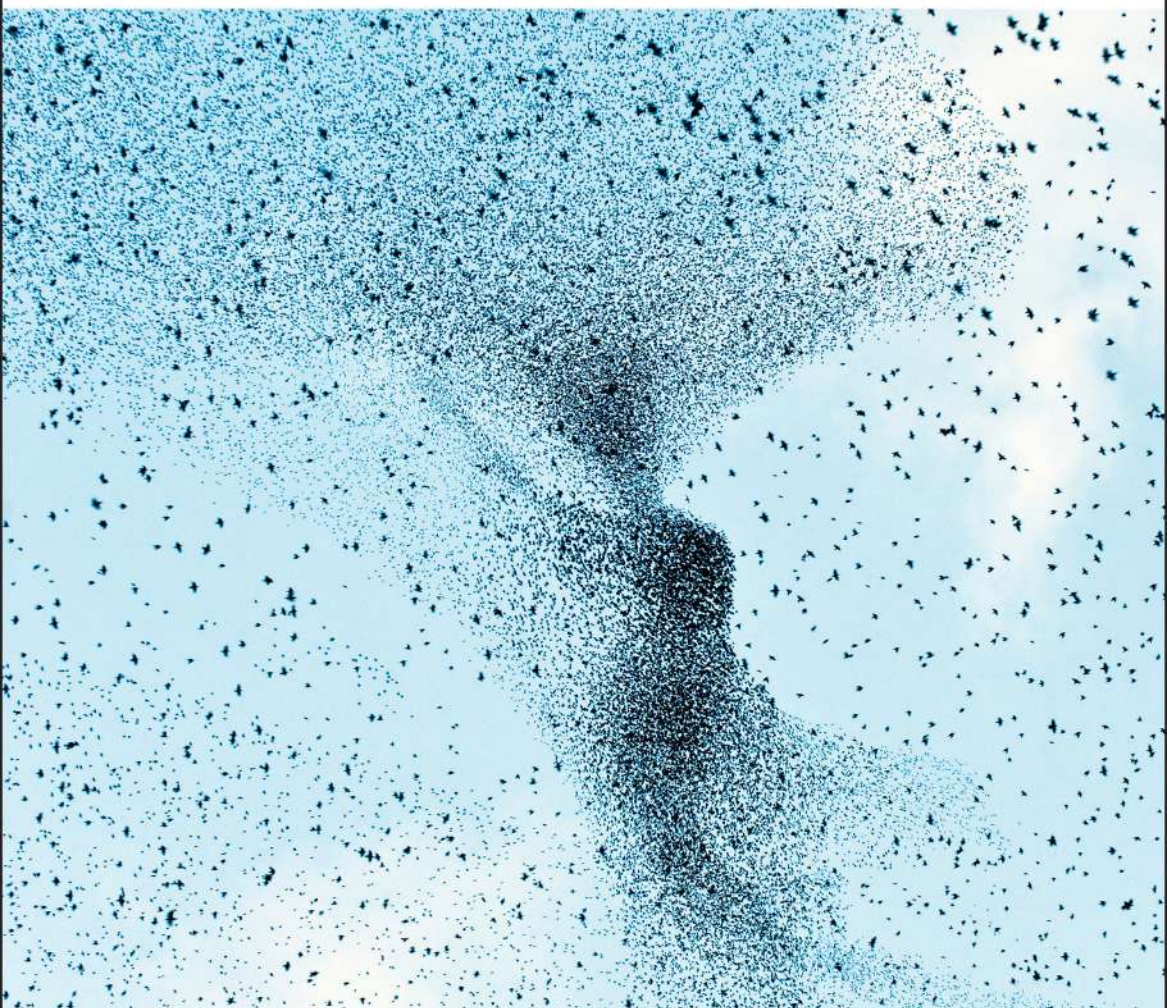
Governing Climate Change

Polycentricity in Action?

Edited by Andrew Jordan, Dave Huitema, Harro van Asselt and Johanna Forster



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GOVERNING CLIMATE CHANGE

Climate change governance is in a state of enormous flux. New and more dynamic forms of governing are appearing around the international climate regime centred on the United Nations Framework Convention on Climate Change (UNFCCC). They appear to be emerging spontaneously from the bottom up, producing a more dispersed and multilevel pattern of governing, which Nobel Laureate Elinor Ostrom famously described as 'polycentric'. This book brings together contributions from some of the world's foremost experts to provide the first systematic test of the ability of polycentric thinking to explain and enhance societal attempts to govern climate change. It is ideally suited to researchers in public policy, international relations, environmental science, environmental management, politics, law and public administration. It will also be useful in advanced courses in climate policy and governance, and for practitioners seeking short, incisive summaries of developments in particular sub-areas and sectors. This title is also available as Open Access on Cambridge Core at http://dx.doi.org/10.1017/9781108284646.

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Preface

Among the very many scholarly contributions made by Elinor Ostrom, the work she partially completed on climate change is the one now attracting increasing attention. Though the concept of polycentric governance was originally coined in the 1960s by her husband, Vincent Ostrom, her attempt to refashion it to understand and influence the everyday practices and study of climate change is inspiring a great deal of new work, including this book.

Climate change is often characterised as a 'wicked' – possibly even *the* most wicked – policy problem. Many decades of multilateral climate diplomacy have arguably resulted in very meagre progress; global emissions have not yet peaked and the probability that warming will eventually exceed two degrees centigrade above pre-industrial levels remains high. When Elinor Ostrom entered the climate governance debate in the late 2000s, the political world was in a very different place from where it is today. Diplomats were still reeling from the unexpected failure of the 2009 Copenhagen conference to adopt a new international climate agreement. Since then, political conflicts have continued to bedevil the United Nations Framework Convention on Climate Change, in spite of the provision of even more scientific information (ably marshalled by the Intergovernmental Panel on Climate Change) on the causes and consequences of warming. The 2015 Paris Agreement was hailed as an unexpected success and a reminder that international diplomacy should not be entirely written off. Yet barely a year later, the fickle nature of politics was powerfully re-emphasised when Donald Trump announced his decision to withdraw the United States from the Paris Agreement, even though it arguably hands states *more* decision-making power than its predecessor, the Kyoto Protocol.

By contrast, Elinor Ostrom's message was a much more hopeful one: do not despair if politics moves slowly at the international and national levels because a diversity of actors and institutions is already self-organising in ways that will help to compensate for the collective action problems at the higher levels. No wonder

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that it resonated so widely and so powerfully amongst scholars and practitioners. Not only was it politically refreshing but it was also conceptually and theoretically unconventional in the way it sought to comprehend climate governance *in toto* rather than from a series of well-established, but partial, perspectives.

Although scholarship on polycentric climate governance has grown exponentially since Ostrom's passing in 2012, nobody has attempted to perform the systematic test of the ideas that she originally envisaged. As polycentricity attracts growing interest, now seems a particularly opportune moment not only to clarify her theoretical claims but to test them out more fully. As we explain in Chapter 1, the fact that the literature has expanded so much in the past decade indicates that this important task is considerably more challenging than she had originally thought, going well beyond what can be realistically delivered by a single research team. This book seeks to address that challenge by combining the expertise of established and upcoming scholars, each drawing on many different bodies of work. In many ways, the production of this book itself became an exercise in polycentric scholarship.

Although many book projects have a long gestation, we have been very fortunate to have worked with a group of very dedicated and responsive experts on climate governance who were able to deliver very rapidly. Their hard work and commitment has made our editorial task an especially pleasant one. Specifically, we would like to thank all the contributors for entering into the spirit of collective scholarship, pushing the boundaries of their existing research and engaging critically with the concept of polycentric governance. We believe that the joint author workshop (and subsequent Spring School) held at the Open University of the Netherlands in Heerlen in March 2017 allowed everyone to start from the same page. We would like to thank Angela Oels, Raoul Beunen, Pia Buschmann, Mimi Crijns, Judith Floor, James Patterson and Danielle Tissingh for their very capable assistance in organising both meetings. Without their work, this book would quite simply never have come to fruition.

This book would not have been possible without the generous funding provided by the Netherlands Royal Academy of Sciences and Arts (KNAW) and the EU's COST programme, specifically its Action IS1309 on Innovations in Climate Governance (INOGOV, 2014–2018). Not only did COST contribute the lion's share of the funding for the workshop, but it also paid for this book to be made available to anyone in the world through an Open Access agreement. It also funded the production of a massive open online course (MOOC) on polycentric climate governance. To download additional copies of this book, complete the MOOC and/or learn more about INOGOV's work, please go to: www.inogov.eu.

A number of other individuals played an important part in the publication of this book. Within the INOGOV core group, Mikael Hildén and Jonas Schoenefeld

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provided very thoughtful comments on various chapters, and Clare Shelton stepped into the breach when one of us, Johanna, took maternity leave from her role as INOGOV's Network Manager. At Cambridge University Press, Matt Lloyd, Emma Kiddle and Zoë Pruce have been very supportive from the early stages. We are grateful to them and the three referees who provided very helpful feedback at an early stage in the production process. The considerable logistical challenge of completing a 20-chapter book involving 40 separate authors was made considerably easier by the tremendous editorial assistance provided by Zoha Shawoo. Zoha – we bet that you will never pick up and 'read' a book in quite the same way ever again!

Finally, we would like to thank our families for their continuous support (and patience!) throughout the writing of this book.

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Abbreviations

APP	Asia-Pacific Partnership on Clean Development and Climate
CBD	Convention on Biological Diversity
CCI	Clinton Climate Initiative
CDM	Clean Development Mechanism
CDP	Carbon Disclosure Project
CEO	Chief executive officer
CFCs	Chlorofluorocarbons
CIF	Climate Investment Fund
CLASP	Collaborative Labeling and Appliance Standards Program
COP	Conference of the Parties
CTCN	Climate Technology Centre and Network
CTI	Climate Technology Initiative
ETS	Emissions trading system
EPA	Environmental Protection Agency
EU	European Union
G8	Group of 8
G20	Group of 20
GEF	Global Environment Facility
GHG	Greenhouse gas
GRI	Global Reporting Initiative
HCFCs	Hydrochlorofluorocarbons
HFCs	Hydrofluorocarbons
ICAO	International Civil Aviation Organization
IEA	International Energy Agency
IFI	International financial institution
IGO	Intergovernmental organisation
IMF	International Monetary Fund

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IMO	International Maritime Organization
IPCC	Intergovernmental Panel on Climate Change
IPEEC	International Partnership for Energy Efficiency Cooperation
IRENA	International Renewable Energy Agency
JI	Joint Implementation
LPAA	Lima-Paris Action Agenda
MLG	Multilevel governance
MP	Marrakech Partnership for Global Climate Action
MRV	Measurement, Reporting and Verification
NAZCA	Non-state Actor Zone for Climate Action
NDC	Nationally determined contribution
NETs	Negative emissions technologies
NGO	Non-governmental organisation
OECD	Organisation for Economic Co-operation and Development
PAS	Publicly Available Specification
REDD+	Reducing Emissions from Deforestation and Forest Degradation
REN21	Renewable Energy Policy Network for the 21st Century
SCE	Solar Climate Engineering
SE4All	Sustainable Energy for All
TCCG	Transnational climate change governance
TEC	Technology Executive Committee
UK	United Kingdom
UN	United Nations
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNSG	United Nations Secretary-General
US	United States
VCO	Voluntary carbon offset
VCS	Voluntary Commitment System
WTO	World Trade Organization

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Part I

Context

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1

Governing Climate Change Polycentrically

Setting the Scene

ANDREW JORDAN, DAVE HUITEMA, JONAS SCHOENEFELD, HARRO VAN ASSELT AND JOHANNA FORSTER*

1.1 Introduction

Climate change governance has been more than 30 years in the making, but it remains a work in progress. The international climate regime, centred on the 1992 United Nations Framework Convention on Climate Change (UNFCCC), has been heavily criticised for being too slow to produce results (Victor, 2011). In spite of all the resources – time, money, personal reputations – that have been painstakingly invested in the climate change regime, global emissions have still not peaked. Scientists have repeatedly sounded the alarm about the significant 'gap' (UNEP, 2016) between current emissions and what is required to ensure that warming does not exceed two degrees Celsius (Jordan *et al.*, 2013).

The argument that the international regime will not fully accomplish climate governance is not a new one (Okereke *et al.*, 2009). Over the years, numerous ideas for reform have been floated, many focusing on the various ways in which governance could and should be made more diverse and multilevel (Rayner, 2010). In the late 2000s, Elinor Ostrom was at the forefront of those arguing that 'new' and more dynamic forms of governing climate change were not just possible or even necessary, but were in fact already appearing around, below and to the side of the UNFCCC. Her message was a positive one: not all aspects of governance would have to be painstakingly designed by international negotiators. New forms were, she argued, emerging spontaneously from the bottom up, producing a more dispersed and multilevel pattern of governing, which she described as 'polycentric' (Ostrom, 2010a).

Since then, many others have made very similar remarks. Keohane and Victor (2011: 12) have, for example, likened the growth in the number of new governance initiatives to a 'Cambrian explosion'. As analysts, we are beginning to learn that much of this 'groundswell' (Falkner, 2016) of new activity emerged in the past decade and is conventional in the sense that it links different forms of state-led

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governing (e.g. government-driven coalitions promoting carbon pricing such as the Carbon Pricing Leadership Coalition, or the European Commission collaborating with mayors in cities through the Covenant of Mayors for Climate and Energy). But it is also becoming clear that many others are adopting more novel, hybrid forms (e.g. international standards developed by non-state actors, or subnational governments collaborating across borders without the involvement of their national governments). Again, Elinor Ostrom's message was unashamedly positive: she suggested that these activities, although initially small in size and few in number, would become 'cumulatively additive' over time (Ostrom, 2010a: 551, 555). Polycentric climate governance had emerged and was 'likely to expand in the future' (Ostrom, 2010a: 555).

Recent developments within the UNFCCC itself appear to confirm the trend towards greater polycentricity. At the 2015 climate summit in Paris, world leaders agreed to establish a more bottom-up system of governance through which states would pledge to make emission reductions, then gradually ratchet them up as part of a process of ongoing assessment and review (Keohane and Oppenheimer, 2016). Crucially, the Paris Agreement also offered strong encouragement to existing and new climate actions by non-state and subnational actors (Hale, 2016), thus underlining the importance of the general trend towards greater polycentricity.

Ostrom's contribution to these debates lays not so much in establishing new theoretical perspectives – she borrowed the term *polycentric* from a much older literature on the governance of local problems in urban American contexts (Ostrom, Tiebout and Warren, 1961) – but in sensing that the climate governance landscape was in transition and asking whether it could be better understood by employing new, i.e. polycentric, terms and concepts. She also directly questioned the way in which the climate governance challenge has conventionally been framed, i.e. how to deliver a global public good (a habitable climate) by coordinating state action through a strong international regime. By contrast, her reference point was *polycentric* systems, which she characterised as

> multiple governing authorities at different scales rather than a mono-centric unit. Each unit within a polycentric system exercises considerable independence to make norms and rules within a specific domain (such as a family, a firm, a local government, a network of local governments, a state or province, a region, a national government, or an international regime).
>
> *(Ostrom, 2010a: 552)*

As can be inferred from this quotation, the logical opposite of a *polycentric* system is a *monocentric* one, i.e. controlled by a single unitary power (Aligica and Tarko, 2012: 244). In the area of climate change, it is hard to pinpoint a pure form of monocentric governance, but the Kyoto Protocol–based approach, involving legally binding international treaties with quantified emission goals, is possibly the

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closest approximation (Osofsky, 2016: 334; for a more extensive discussion, see Chapter 2).

Ostrom's empirical approach to documenting climate governance was also unconventional. Rather than start with the UNFCCC and work downwards, her entry point was the actually existing forms of governance that were being constructed by myriad actors, operating in different sectors and across different scales; her illustrative examples were from the state level in the United States, from several large cities and from the European Union (EU) (Ostrom, 2010a: 553). To be sure, she never claimed that polycentric governance would be perfect or a substitute for international diplomacy; she believed that various governance activities from multiple jurisdictions and levels, arranged in a polycentric pattern, had the potential to be highly complementary (Ostrom, 2010a: 552, 555). She was also rather guarded in her claims on whether polycentric governance would significantly reduce emissions: any reductions may only be 'slowly cumulating' (Ostrom, 2010a: 553). In this vein, she made a strong case for undertaking further empirical work on the actual, long-term impact of the new polycentric initiatives that were appearing. In her own mind, she envisaged a new programme of empirical work on these topics; in fact she thought that an inventory of polycentric actions 'would be a good subject for a future research project' (Ostrom, 2009: 19). Unfortunately, she passed away before she could complete that task.

Even if Elinor Ostrom did not invent the term *polycentric*, and climate change only really preoccupied her during the latter stages of her long career, her interventions in the debate have undoubtedly stimulated others to critically reflect upon various taken-for-granted assumptions in climate governance research and practice. In the late 2000s, the proliferation of initiatives was widely perceived as a negative development – a 'fragmentation' of and possibly a distraction from international efforts (Biermann *et al.*, 2009). Those who actually studied the new initiatives in more detail were more sanguine, but often regarded them as alternatives to the apparently gridlocked global regime (Hoffmann, 2011). Ostrom was more open-minded about the precise relationship between the various levels, units and domains; she saw it as an empirical matter. But among the very many articles and books published since her death, none has really taken forward the broad research programme that she originally envisaged. In fact, such has been the growth in the scale and scope of climate governance in the past decade that such a task could not possibly be accomplished in a single project.

This book is a first attempt to make some headway in addressing this challenge. Our primary aim is to explore what is to be gained by thinking about climate governance as an evolving polycentric system. In a *descriptive* sense, this book investigates what a polycentric perspective adds to our ability to characterise and make sense of climate governance *in toto*. Recent research

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suggests that the various domains Ostrom identified are more interconnected and interlinked than was originally thought (Betsill *et al.*, 2015), but it tends to look only at one or two domains at a time. Crucially, even a combination of partial perspectives is, we think, unlikely to reveal if and how governance functions in a polycentric system.

From an *explanatory* perspective, we have already noted that Ostrom's notion of polycentricity is at odds with the way in which climate governance has traditionally been studied and enacted, with the UNFCCC presumed to be at its 'core' (Betsill *et al.*, 2015: 2). It directly challenges the manner in which academic activities have conventionally been subdivided (into those focusing on international, national and/or subnational levels, or private and/or public spheres). It also has potentially far-reaching implications for our appreciation of important matters such as authority and power, accountability, legitimacy and innovativeness. If governance is more polycentric, where does authority actually reside, is it possible to arrive at an overall measure of effectiveness and how is governing legitimated? Does the apparent dispersal of authority involve greater mutual adjustment between the domains (i.e. a 'race to the top'), or one in which standards are lowered to attract resources such as inward investment (i.e. a 'race to the bottom')? At present, scholars have barely begun to think about these more systemic issues (but see Jordan *et al.*, 2015).

Finally, as a *normative* source of *prescriptions* on how better to govern, polycentric governance thinking provides a rather different starting point to other stock-in-trade terms and concepts. Under the more monocentric or 'Kyoto' model of governing, it was more or less clear who was doing the governing (i.e. states). It was therefore obvious who or what would ultimately be held accountable; what innovativeness in governing meant (a better international regime) and where it was most likely to derive from (namely the UNFCCC, informed by the work of the Intergovernmental Panel on Climate Change);[1] what the chief metric of effectiveness was (reducing emissions); and how governing would be legitimated (through forms of democratic statehood). Thinking about what it means to govern polycentrically entails a revision of these starting assumptions. In addition, polycentric governance thinking is much more tolerant of overlap, redundancy and duplication in governance. The fact that multiple governing units take initiatives at the same time is seen not as inefficient and fragmented, but as an opportunity for learning about what works best in different domains.

The remainder of this chapter unfolds as follows. Section 1.2 charts the changing landscape of climate governance in more detail. It identifies the main actors and forms of governing – a task that is more fully accomplished in Part II of this book. Section 1.3 examines the intellectual origins of polycentric thought in more detail

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and identifies five of its most important propositions. Section 1.4 concludes by outlining the four main objectives of the whole book.

1.2 Climate Governance

1.2.1 A Landscape in Transition?

The conventional way in which shifts in climate governance have been described is to start with the highest level (at least in a spatial sense) – the *international regime* – and work downwards and then outwards. From the perspective of the regime, climate change is first and foremost a *global* problem, requiring states to overcome significant collective action problems principally by negotiating credible agreements. However, as noted earlier in this chapter, recent scholarship has begun to reveal a rather different picture. For example, governance is no longer seen as the prerogative of states or the UNFCCC, thus requiring much greater awareness of the linkages with other regimes governing *inter alia* trade, investment and human rights (Moncel and van Asselt, 2012). Keohane and Victor (2011: 7) have distinguished between a single climate regime and a regime complex 'which [has] emerged as a result of many choices . . . at different times and on different specific issues'. The emergence of interacting (complexes of) regimes has in turn stimulated work on how to address institutional fragmentation (Zelli and van Asselt, 2013). Scholars have reflected on how fragmentation gives actors more opportunities to 'venue shop' and/or engage in credit-claiming and/or blame-avoidance games (Gehring and Faude, 2014: 472). Although the starting assumptions of this work were different, the emerging picture is one that has many similarities with Elinor Ostrom's more polycentric view.

These observations are being taken forward in the wake of the Paris Agreement. Although that agreement emerged from a process of intergovernmental negotiation, it undoubtedly broke new ground (Falkner, 2016). In the past, it was widely assumed that states would only take on emission reduction targets after long and tortuous processes of bargaining. In practice, the targets were unenforceable, and several major polluters (e.g. the United States and Canada) simply walked away. The Paris Agreement tacitly accepted this *realpolitik* – henceforth, states will simply pledge to make emission cuts, enshrined in what are known as nationally determined contributions. Interestingly, non-state actors are developing new ways to evaluate state behaviour in the pledging process, itself wrapped up in a five-yearly global stocktake of all pledges (Schoenefeld, Hildén and Jordan, 2018).

Moving down a level, new insights are also being generated into the public policy–making activities of *states*. Amongst international policy scholars, states are only really important because they negotiate regimes. Since Paris,

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however, their inner workings have become a much more popular object of attention (Jordan and Huitema, 2014a, 2014b; Bang, Underdal and Andresen, 2015). The 'Climate Change Laws of the World' database reveals that by 2017, 1,200 individual climate laws and policies had been adopted (Averchenkova, Fankhauser and Nachmany, 2017), up from only 60 when the Kyoto Protocol was signed in 1997. The most active adopters have up to 20 separate climate laws on their statute books (Averchenkova *et al.*, 2017: 15). Meanwhile, the judiciary within states has also become more active, complementing and on occasions also substituting for national legislation (Averchenkova *et al.*, 2017: 13). These legislative activities also extend to adaptation to climate impacts (Massey *et al.*, 2014).

As Ostrom foretold, many states are evidently not waiting for the international regime to push them to act. In fact, there even appears to be evidence of greater polycentricity within the relatively monocentric domain of state-led policymaking. For example, more than 100 regional governments have committed themselves to reducing emissions by at least 80 per cent by 2050, a target exceeding that of most sovereign states (Averchenkova *et al.*, 2017: 12). States are also not moving forward at the same rate: industrialised countries are more active adopters of climate laws than developing countries, a significant number of whom have failed to adopt a single instrument. Even the type of national policies is quite heavily differentiated between those that are binding (and hence more monocentric) and those that are not (Averchenkova *et al.*, 2017).

If one moves outwards into the domain of *private* governance, yet more forms of governing come into view, again reinforcing the impression that the degree of polycentricity is rising. These include voluntary commitments to reduce emissions, but also highly complex systems for monitoring and trading in emissions, and efforts to disclose the carbon risks for businesses and investors (Green, 2014). It has long been recognised that private actors will eventually deliver a great deal of mitigation and adaptation, but the breadth and ambition of what many are now offering demands greater explanatory attention. Many of the private initiatives are being steered by industry associations and alliances, seemingly independent of state action but at the same time interacting with such action in unknown ways. For instance, the World Business Council on Sustainable Development coordinates Action 2020, an initiative to embed sustainability in business practices, as well as more sector-specific activities, such as the Cement Sustainability Initiative. To give another example, as part of the Science-Based Targets initiative, a partnership formed by the United Nations and several business and environmental organisations, more than 200 of the world's largest and most energy-intensive companies have voluntarily taken on 2050 reduction targets based on their share of the global

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reductions needed to stay within two degrees. These types of private action have been interpreted as yet more examples of polycentricity in action (Cole, 2011).

It was therefore a natural next step for some analysts to explore the linkages and interactions between the various actions and initiatives (Betsill *et al.*, 2015). Such work is revealing that some of the initiatives are linked in ways that bypass state control. Bulkeley *et al.* (2014) have characterised these as hybrid or transnational forms of governance. Some initiatives even perform functions (e.g. standard setting) that have traditionally been monopolised by states (which in practice still need to sanction such standards to enhance legitimacy).

Practitioners too have acknowledged that polycentricity should be taken much more seriously. Some of these efforts date back to the early 2010s, but accelerated prior to the Paris summit (Hsu, *et al.*, 2015; Hale, 2016). In fact, the Paris outcomes actively encourage the development of new forms of governing via annual events and technical expert meetings. An online portal has been established for non-state and subnational actors to register their emission reduction commitments (the Non-state Actor Zone for Climate Action). And two rotating 'high-level champions' have been asked to encourage further action by non-state and subnational actors. Therefore, it seems as though the UNFCCC is itself adjusting, from the setting of global rules to the more polycentric task of facilitating non-state action.

1.2.2 The Struggle to Understand the Changing Landscape

Clearly, the governance landscape is in flux: more actors are engaging in many more activities at significantly more levels of governance. According to Betsill *et al.* (2015: 8), the emerging landscape

> will only get more complicated over time. The ability to work out how its different elements interact, and thus how they may be enabled to interact more effectively, is . . . likely to become an ever more pressing question for both.

How are researchers rising to these challenges? The proliferation of terms suggests that scholars do not yet agree on what constitutes 'the landscape'. Among international scholars, new terms have been coined, including 'regime complexes' (Keohane and Victor, 2011), 'experimentalist' (Sabel and Zeitlin, 2009), 'complex' (Bernstein and Cashore, 2012) and 'fragmented' governance (Zelli and van Asselt, 2013). For those interested in national political systems, state policies are of paramount importance, hence references to climate policy innovation (Jordan and Huitema, 2014a, 2014b), experimentation and the new climate governance (Jordan *et al.*, 2015).

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By consciously selecting the term *polycentric*, Elinor Ostrom sought to unify these debates. As we suggested earlier, she saw a need for a more holistic *description* of the landscape, for more analysis (to understand and *explain* its functioning) and better *prescription* (grounded in a different normative framework). Ostrom (2010a: 552) claimed that polycentric systems are capable of enhancing 'innovation, learning, adaptation, trustworthiness, levels of cooperation of participants, and the achievement of more effective, equitable, and sustainable outcomes at multiple scales'. Some polycentric thinkers have examined parts of the landscape and declared that it is already being governed more or less as she predicted (Cole, 2015), and even that 'effective global governance institutions *inevitably are* polycentric in nature' (Cole, 2011: 396, emphasis added).

But the conditions under which these and other effects are produced is surely a matter for more detailed empirical research. This was certainly Vincent Ostrom's starting position (Ostrom *et al.*, 1961: 831). He asserted that '[n]o *a priori* judgement can be made about the adequacy of a polycentric system of government as against the single jurisdiction' (838). Elinor Ostrom also underlined the importance of studying the strengths and the weaknesses of polycentric governance empirically (Ostrom, 2010a: 555), and with an open and critical eye. But since then, too many researchers seem to have forgotten this, treating her predictions as things to be empirically confirmed rather than rigorously tested for.

In order to treat her claims in the rigorous manner in which she conducted her own work, it is important to be clear about what we mean by governance and, more specifically, *polycentric* governance. To be fair, there is no single, canonical theoretical statement of either term (McGinnis, 2016: 5). Some have argued that the Ostroms were too quick to put aside theoretical-conceptual matters in the quest for empirical verification, leaving the theory somewhat underspecified (Aligica and Tarko, 2012: 248). And then of course work originally conducted by the Ostroms has been taken up and amended by others in the Bloomington School (e.g. compare Aligica and Tarko, 2012: 241–244; McGinnis, 2016). This process of reapplication and refinement has further blurred the three core functions of polycentric thinking (description, explanation and prescription; McGinnis, 2016: 2), to the evident frustration of those who want to engage in new work (Galaz *et al.*, 2012; Dorsch and Flachsland, 2017). For example, absolutely core terms such as 'polycentric', 'polycentricity' and 'polycentrism' are used quite casually in the existing literature. Therefore, the next section tries to unpack the concept of polycentric governance and explicate five of its most important theoretical propositions.

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1.3 Polycentric Governance: Pedigree and Propositions

1.3.1 Origins and Antecedents

Following Kooiman (1993), *governing* can be defined as directed behaviour, involving governmental and non-governmental actors, which is aimed at addressing a particular issue. Governance involves the creation of institutions – rules, organisations and policies – that seek to stabilise (or govern) those behaviours. The term *governance* thus describes 'the patterns that emerge from the governing activities of social, political and administrative actors' (Kooiman, 1993: 2). As noted earlier in this chapter, the climate change governance landscape is populated by a wide variety of forms of national, international, private, state-led and transnational governance.

Polycentric governance systems are essentially those in which 'political authority is dispersed to separately constituted bodies with overlapping jurisdictions that do not stand in hierarchical relationship to each other' (Skelcher, 2005: 89). The key operative word here is 'overlapping'; it means that the scope of the issues that are addressed is not discrete (McGinnis, 2016: 7). However, this broad description could conceivably cover many types of governance. We have already noted that one way to understand polycentric systems is to compare them with monocentric ones. Thus, in polycentric systems, the constituent units 'both compete and cooperate, interact and learn from one another', so that their responsibilities 'are tailored to match the scale of the public services they provide' (Cole, 2015: 114). Decades ago, Vincent Ostrom *et al.* (1961: 831) argued that:

> '[P]olycentric' connotes many centers of decision-making which are formally independent of each other … To the extent that they take each other into account in competitive relationships, enter into various contractual and cooperative undertakings or have recourse to central mechanisms to resolve conflicts, the various jurisdictions … may be said to function as a 'system'.

His definition stemmed from work he had conducted on the delivery of public services (such as clean water and policing) in metropolitan areas in the United States. At the time, there was widespread concern that services were being delivered by too many governmental organisations – they were getting in each other's way (Ostrom, 2010a: 551) – and that scale enlargement was the way forward (Aligica and Tarko, 2012). Vincent Ostrom set out to challenge the prevailing orthodoxy that polycentric systems were inherently chaotic and inefficient by undertaking detailed empirical work. He revealed that often the most effective solution was not to consolidate all the organisations into large 'super' organisations

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(what he termed 'Gargantua'), but to allow a diversity of local approaches to flourish (Aligica and Tarko, 2012: 241).

Polycentricity is not, as Galaz *et al.* (2012: 22) have usefully reminded us, a binary variable. In very general terms, it describes the degree of connectedness or structuring of a polycentric domain and/or system. At one extreme are very loose networks of actors and units that engage in very weak forms of coordination based on sharing information in a very passive manner. The interaction between individual units is very limited, as is the level of trust between actors. Insofar as hierarchical organisations are involved in coordinating the participants (i.e. via forms of network management), it is mainly to function as fairly passive clearing houses (Jordan and Schout, 2006). At the other extreme, we find actors bound together more tightly through more formal systems of coordination. The units actively share information with one another in an atmosphere of greater trust. The participants may even decide to define a common strategy in advance, and have formal, sometimes relatively hierarchical mechanisms to implement it against the wishes of particular units (Jordan and Schout, 2006). They have many similarities with federal or quasi-federal systems such as the EU (Galaz *et al.*, 2012: 23). Finally, it is often assumed that polycentric systems are inherently more multilevel than monocentric ones, but this is widely considered to be an empirical question (Galaz *et al.*, 2012: 29).

1.3.2 Core Propositions

We have already noted the absence of a single, canonical summary of the essential features of polycentric systems (for details, see Dorsch and Flachsland, 2017: 47), or indeed clearly articulated hypotheses (Aligica and Tarko, 2012: 248). Some commentators have responded by focusing less on their constitutive processes and more on their positive and negative features (see Table 1.1).

Although useful, lists such as these struggle to explain why or how the features come about. Some have also noted how polycentric theorists tend to stress the positive aspects over the negative ones (Dorsch and Flachsland, 2017). The fact too that the strengths and weaknesses almost perfectly mirror one another suggests that they may arise from a common set of causal processes. In what follows, therefore, we relate them back to five key propositions in polycentric theory. We discuss each in turn, revealing what they imply for the ways in which climate governance has been – or in future could be – described, explained and designed.

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Table 1.1 *Polycentric governance: examples of positive and negative features*

Positive features	Negative features
Ability to innovate and learn: units experiment with new approaches and learn from one another	Bias towards incremental change: arises from the mutual adjustment amongst units (a 'race to the bottom')
Engender greater trust: by tailoring governance to specific circumstances	Lower trust: actors 'shop' amongst domains, provoking a race to the bottom (e.g. carbon leakage)
More robust: if one element or domain fails, others can step in	Less robust: greater vulnerability to external changes, e.g. reductions in funding or political support
Enhanced accountability and legitimacy: acting locally facilitates direct participation	More contested accountability and weaker legitimacy ('who is in charge?')
More inclusive and equitable: by 'over-providing' services, polycentric systems ensure that no one is left behind	Easily dominated by powerful actors who 'game' the system and are unaccountable
Ability to address big challenges through the steady accumulation of marginal changes by each domain	Inability to deliver significant changes (because of free-riding) or address issues that span domains

Sources: Ostrom (2010a); Liebermann (2011); McGinnis and Ostrom (2011); Sovacool (2011); Galaz *et al.* (2012: 29); and Morrison *et al.* (2017).

Proposition 1 – Local Action
Governance initiatives are likely to take off at a local level through processes of self-organisation.

In many ways, this is the key proposition (Dorsch and Flachsland, 2017: 52). It derives from the work of Polyani (1951), who argued that polycentric systems operate at two levels: that of individual units and that of the collective. Each individual actor in a polycentric system plots their own actions, based on their own preferences, and responds to external stimuli. They are open to information about the experiences of others, and information about the consequences of their actions, both for themselves and for others. In response, they will adjust their behaviour (or 'coordinate') with others. This basic line of reasoning explains why polycentric theorists are less worried about collective action than authors such as Mancur Olson (McGinnis, 2016: 16). Indeed, Vincent Ostrom's early work implied that different public goods can be delivered by different combinations of agencies self-organising on different scales, and that actors (in that case members of the public) will choose accordingly (McGinnis and Ostrom, 2011: 16). Hence, the optimum scale of intervention is not necessarily the same for all services – some may be better delivered at one level, others at another level. Instead of trying to

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remove overlapping jurisdictions (by integrating governing units into larger bodies), polycentric thinkers try to identify how they coordinate themselves through less hierarchical arrangements (Aligica and Tarko, 2012: 242).

Wrapped up in Proposition 1 are a host of related assumptions and truth claims, such as that actors should enjoy the freedom to 'vote with their feet' (i.e. 'Tiebout sorting'; see McGinnis and Ostrom, 2011: 16) and to identify the best fit between problems and particular units of organisation (Ostrom, 2010b: 5). Together they beg *the* most fundamental question of all: how and why does polycentric governance emerge in the first place (Galaz *et al.*, 2012: 23)? First, Proposition 1 does not imply that self-organisation necessarily always produces a socially optimum outcome – only that it emerges from the bottom up (McGinnis, 2005: 14). Second, it does not necessarily imply that all actors have the capacity or the motivation to self-organise, hence the need for facilitators or civic (or policy) entrepreneurs in certain situations (McGinnis, 2016: 12, 16). Third, Proposition 1 does not imply that all coordination challenges magically self-correct, only that self-organisation generates new coordination challenges as well as new means to address them (Peters, 2013: 572).

Elinor Ostrom directly cited Proposition 1 in her very first publication on climate change: 'Part of the problem is that "the problem" [of climate change] has been framed so often as a global issue that local politicians and citizens sometimes cannot see that there are things that can be done at a local level that are important steps in the right direction' (Ostrom, 2009: 15). She cited many examples of actors that had an obvious motivation to self-organise:

> Better health is achieved by members of a household who bike to work rather than driving. Expenditures on heating and electricity may be reduced when investments are made in better construction of buildings, reconstruction of existing buildings, installation of solar panels, and many other efforts that families as well as private firms can make that pay off in the long run.
>
> *(Ostrom, 2009: 35)*

Essentially, she argued that scholars (and practitioners) had become too fixated with the resolution of collective action dilemmas at the international level, when there might be multiple externalities and collective action dilemmas to be addressed at many levels. The *descriptive* implication of Proposition 1 is therefore important: analysts should adopt an actor-centred focus and examine what motivates actors to self-organise across the entire governance landscape.

The *explanatory* implication of Proposition 1 is equally pertinent: analysts should 'get out into the field' and study how governance is actually enacted in practice (McGinnis and Ostrom, 2011: 17; Aligica and Tarko, 2012: 243). In Ostrom's (2009: 14) words: '[i]f there are benefits at multiple scales, as well

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as costs at these scales . . . the theory of collective action . . . needs to take these into account.' Regarding the emergence of polycentric governance, Proposition 1 encourages analysts to be open-minded about the role of states. Are states deliberately pursuing polycentric governance by delegating responsibility down and out to other actors (Hoffmann, 2011: 67) and engaging in forms of orchestration? Or is climate governance genuinely emerging from the bottom up, as non-state and subnational actors fill the cracks in state-fashioned global policy?

Finally, Proposition 1 carries some important *normative-prescriptive* implications. First, local communities possess the skills, (local) knowledge and capacity to overcome many challenges (Aligica and Tarko, 2012: 246), and hence problems should be addressed as close as possible to them (i.e. following the principle of subsidiarity; see Tarko, 2017: 56). Second, community decision-making must follow from an open and democratic process adhering to the rule of law (note the link here with Proposition 5 – overarching rules). Third, it should not be automatically assumed that all actors are necessarily dealing with one problem at a time – hence the importance of understanding what has come to be known as the 'co-benefits' of mitigation (e.g. Stewart, Oppenheimer and Rudyk, 2013). Fourth, governors should not lapse into binary thinking, as this tends to produce panaceas and other naïve prescriptions (Ostrom, 2007). For example, not all coordination problems will necessarily respond positively to polycentric interventions; governance should be about matching problems with the relevant inter-organisational arrangements at the 'right level' (Aligica and Tarko, 2012: 242).

Proposition 2 – Mutual Adjustment
Constituent units are likely to spontaneously develop collaborations with one another, producing more trusting interrelationships.

In a polycentric system, once the constituent units have emerged, they will naturally interact. Vincent Ostrom (1999: 57) even defined polycentric systems in such terms: they have 'many elements [which] are capable of *making mutual adjustments for ordering their relationships with one another* within a general system of rules where each element acts with independence of other elements' (emphasis added). This explains why polycentric systems are often likened to complex adaptive systems (Tarko, 2017: 58): mutual adjustment is what allows them to adapt to changing external conditions, their actions in turn feeding back on other actors. It is understood to mean the way in which units in a polycentric system communicate with one another; the extent to which mutual adjustment is actually capable of bridging significant differences amongst the units remains an important but unresolved matter (McGinnis, 2016: 9). The notion of mutual adjustment carries strong echoes of what Lindblom (1959) referred to as partisan

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mutual adjustment – a concept he also developed from work conducted in the relatively polycentric political system of the United States.[2]

Proposition 2 has important implications for how governance is *described*: attempts to comprehend a particular governance landscape should identify all the constituent units and explore their interconnections.

From an *explanatory* perspective it implies that researchers should seek to understand the boundaries of, and the interactions between, their constituent parts (Tarko, 2017: 64), rather than assume that a particular level or actor is dominant. This speaks to the ongoing debate among polycentric thinkers about the tensions and frictions between a system's mono- and polycentric tendencies (Aligica and Tarko, 2012: 248), as well as between it and cognate systems (which may exhibit similar or very different degrees of polycentricity). The polycentric governance literature is intensely interested in how mutual adjustment comes about. Is it through autonomous couplings between units? If so, do they spontaneously emerge or are they guided by 'higher-level' authorities? Is mutual adjustment mostly a process of voluntary learning, or is there a degree of competition in some cases, and can it possibly even border on coercion?

Finally, the *normative-prescriptive* implication is that governors should seek to liberate the 'error-correcting' capacity inherent in all mutually adjusting polycentric systems (McGinnis, 2016: 9), which also connects to the strong presumption in favour of local action (subsidiarity).

Proposition 3 – Experimentation
The willingness and capacity to experiment is likely to facilitate governance innovation and learning about what works.

Ostrom (2010a: 556) argued that one of the main benefits of polycentric governance is that it allows – even encourages – actors to experiment with different approaches. Over time, common methods for assessing costs and benefits can be established between actors operating in different domains, so that experiments in one setting actively inform experiments in other domains. The presumed importance of learning is something that polycentric theory shares with many other literatures, including those addressing pluralism, localisation and decentralisation. In Lindblom's (1959) theory of partisan mutual adjustment, policymakers were also assumed to move forward cautiously on the basis of tinkering and experimenting, rather than overarching plans and strategies. Crucially, if one intervention fails, the broader system remains robust and better able to respond in the future, having learned from the experience (Cole, 2015).

Proposition 3 has several important implications. *Descriptively*, it implies that analysts should seek to understand what – if any – experiments are taking place and how they function. Some argue that 'a polycentric system of climate policies

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necessarily entails a greater number of discrete policy experiments' (Cole, 2015: 115, emphasis added). By this, they mean that in a polycentric system, multiple approaches to problems are tried out at the same time. A polycentric governance system is thus a quasi-experimental system, which – through its internal diversity – offers the opportunity to see what works and what does not. In a *descriptive* sense, therefore, the emphasis is on the degree to which such a diversity of approaches really exists, the degree to which experiments are grounded in an action theory which is tested and evaluated, and the extent to which the knowledge from experimentation flows freely around and through a system (Huitema *et al.*, 2018).

In *explanatory* terms, however, a crucial issue lies underneath: the term *experiment* is in large part socially constructed; it can be interpreted in various ways. To some, an experiment is anything outside the ordinary (i.e. trying something new), whereas for others, experiments should always include the wish to test the intervention rationale that underpins a particular governance intervention. And for many, the term *experiment* denotes an explicit comparison of the outcome against the status quo prior to the intervention and against the outcomes in a control group where no interventions were made. It would seem that at present, polycentric governance theorists are content to regard any diversity of approaches as an experiment, but conceptual models of how this subsequently translates into more or less learning and innovation are scarce. In the emerging literature on experimentation in climate governance (see e.g. McFadgen and Huitema, 2017), it is becoming clear that: experimentation may stifle innovation when it is used as a tactic to delay action; experimentation may be selective (it is difficult to conduct more than one experiment at a time); and the evaluation of experiments is a highly political process, if only because those initiating them often have a stake in their success. In other words, experimental insights can all too easily be manipulated or even ignored (see also Chapter 6).

Finally, the *normative-prescriptive* implication is that governors should actively encourage decentralised experimentation to determine 'what works best' in particular contexts (Dorsch and Flachsland, 2017: 55). Here one encounters another interesting tension in polycentric governance thinking, because the statement 'what works best' seems to be based on the belief that agreement can be reached on what is best. In practice, the criterion for what is 'best' might differ per community, which may mean that the results of experiments are interpreted in very different ways, and that mutual learning processes go in different directions (leading to greater diversity and a lower degree of polycentricity, facilitated by conflicting evaluative criteria, etc.). As yet, there is little explicit discussion in the literature on how far this jars with the notion of mutual adjustment (Proposition 2).

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Proposition 4 – The Importance of Trust
Trust is likely to build up more quickly when units can self-organise, thus increasing collective ambitions.

In international political theory, states are assumed to be engaged in a struggle to adopt binding emission reductions in a context of great uncertainty, each having highly differentiated response capacities and responsibilities. In general, the level of trust is assumed to be low (hence repeated references to the risk of free-riding). In seeking to reframe the debate, Ostrom (2009: 11) argued that at a more local level, things may work out rather differently. Trust may be in greater supply, born of (among other things) the greater likelihood of face-to-face interactions between actors (Dorsch and Flachsland, 2017: 57). When trust is more plentiful, polycentric thinkers argue that the standard assumption within rational choice theory – that actors maximise their short-term interests – may not apply (Ostrom, 1998).

The *descriptive* implication of Proposition 4 is that analysts should expand their accounts of reality to encompass the relationships between a wider universe of actors operating in and across different levels and units of governance, and that they should focus on processes of trust-building at all of these levels.

From an *explanatory perspective*, the key implication is that researchers should aim to understand whether and how trust varies within and between different units and domains (Dorsch and Flachsland, 2017: 57). Another key question is under what conditions is trust more likely to grow? In general, trust emerges out of repeated interactions and, in particular, when promises are repeatedly fulfilled. Cole (2015: 117) suggests that it grows fast when experiments (see Proposition 3) deliver concentrated benefits at a local level (Cole, 2015: 117). But other parts of the polycentric literature point to the importance of either direct participation (see Proposition 1) or information sharing, through common systems of monitoring (see Proposition 5) (Ostrom, 2010a: 554). Polycentric theorists are undoubtedly eager to understand precisely which activities are being monitored by whom and for what purpose (Schoenefeld and Jordan, 2017). They claim that if the purpose of experimenting is to promote longer-term learning, then trust is more likely to be engendered not by monitoring, but by more participatory forms of ex-post evaluation. If that is the case, the choice of which body performs the evaluation (and hence sets the evaluative criteria) becomes critical (Hildén, Jordan and Rayner, 2014).

Finally, the *normative-prescriptive* implication of Proposition 4 is that various actions should be taken to encourage trust, including local-level working (see Proposition 1), experimentation (Proposition 3) and monitoring and evaluation 'at all levels' (Ostrom, 2009: 39). Article 13 of the Paris Agreement is explicit in this respect. However, with global problems such as climate change, it is less obvious who or what should perform these functions.

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Proposition 5 – Overarching Rules
Local initiatives are likely to work best when they are bound by a set of overarching rules that enshrine the goals to be achieved and/or allow conflicts to be resolved.

References to a set of overarching rules are found in almost all definitions of polycentric governance (e.g. Aligica and Tarko, 2012: 237). They are assumed to provide a means to settle disputes and reduce the level of discord between units to a manageable level. Their primary role is to protect diversity (Proposition 1) and facilitate mutual adjustment (Proposition 2). However, their exact form and function is something on which theorists cannot yet agree (see Aligica and Tarko, 2012: 254ff.). Do they, for example, take the form of informal norms and values within societies – things that ensure a basic level of pluralism? Or are they formal rules and state organisations such as courts that arbitrate when disputes occur, or agencies that engage in monitoring? In principle, the former interpretation seems compatible with the other four propositions, and the latter appears, somewhat counterintuitively, to assume a higher degree of monocentricity than seems possible in purely polycentric systems (McGinnis, 2016: 11; but see Mansbridge, 2014).

The implications of Proposition 5 are therefore potentially far-reaching. *Descriptively*, it suggests that analysts should try to account for the role played by different types of rules. Second, they should be alive to the possibility that as well as maintaining order, rules may represent 'an opportunity structure' through which actors seek to effect change (Tosun and Schoenefeld, 2017). In other words, the overarching rules may be sources of change as well as continuity (i.e. not be completely fixed).

In an *explanatory* sense, it provokes analysts to consider how to study rules empirically. For example, where do they derive from and what form do they take? Do they arise from intergovernmental bargaining, or do they emerge organically from activities at lower levels? Do they focus on or enable greater accountability or transparency? Oberthür (2016: 82) argues that '[t]he Paris Agreement . . . provides some overarching guidance to the overall governance framework.' However, this says nothing about causality – does the UNFCCC process steer local initiatives, or vice versa? In practice, much is likely to depend on whether the rules are perceived as capable of holding powerful actors to account (Huitema *et al.*, 2011). If the overarching rules are not deemed legitimate and actors step back from them (as the United States did in 2001 under President George W. Bush, and has done again under President Donald Trump), they may not be particularly 'overarching'. Also, questions could be asked about the connections between the existence of conflict resolution mechanisms on the one hand and trust-building mechanisms on the other (Proposition 4), the degree to which experimentation (Proposition 3) (and thus deviation) is still possible under overarching rules (especially when these are quite

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rigid) and the degree to which self-organisation (Proposition 1) aligns with the upholding of fundamental democratic principles.

Finally, in a *prescriptive* sense, Proposition 5 provokes analysts and practitioners to think about the most desirable rules, norms and organisations – a potential tricky task given that they may blend elements of monocentricity and polycentricity.

Table 1.2 summarises the five propositions and outlines their most significant implications for analysts and practitioners.

1.4 Plan of this Book

We know that the climate governance landscape is in a state of great flux. Practitioners are intuitively aware that it encompasses many more actors, modes and levels of governance than it did even a decade ago. Simply describing the rapidly evolving landscape constitutes a significant research challenge in itself. In the late 2000s, Ostrom sought to move towards a deeper and more holistic understanding by proposing that analysts study it from a polycentric perspective. Since her death, polycentric thinking has gained a lot more traction within the climate governance community, but for many scholars its embedded assumptions and core propositions are not very well known. For those who have not encountered her work on climate change, polycentric governance is likely to be regarded as lying somewhere outside the mainstream in governance research.[3] We have therefore devoted considerable space in this chapter to better specifying the theoretical claims of polycentric thinkers, by unpacking a number of definitions of polycentric governance and pinpointing five key propositions that emerge from them. We then explored the implications of each for the ways in which governance can be described, explained and prescribed.

In doing so, we have confirmed that polycentric governance offers a distinctly different take on contemporary climate governance. In its framing, it is very different to the standard, international policy approach which reifies interstate diplomacy. It is also distinct from related concepts such as regime complexity, institutional fragmentation and experimentalist governance, for which the main point of reference remains international actors (van Asselt, Huitema and Jordan, 2018). It shares some similarities with certain (so-called Type II) variants of multilevel governance theory and political federalism (McGinnis and Ostrom, 2011: 15), although unlike them, it is more directly concerned with the role of non-governmental units and/or situations in which jurisdictions overlap. It has most in common with theories of networked governance, with which it shares a concern with how and why centralised and decentralised forms of coordination emerge and find some coexistence (McGinnis and Ostrom, 2011: 15).

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Table 1.2 *Polycentric governance propositions and their implications*

Headline proposition	Detailed proposition	Implications		
		Descriptive	Explanatory	Normative-prescriptive
1. Local action	Governance initiatives self-organise	Adopt an actor-centred focus; Embrace the empirical diversity of governance	Challenge the theory of collective action; Explore all forms of state action	Act locally where possible (subsidiarity); Build on local motivations (e.g. co-benefits); Avoid binary thinking (e.g. hierarchies have to be involved)
2. Mutual adjustment	Governing units spontaneously collaborate	Include all constituent units in a landscape	Understand the boundaries of domains; Explore the linkages between domains; Understand the blending of mono- and polycentric elements	Enable error-correcting capacities; Encourage local-level learning; Embrace diversity
3. Experimentation	Experimentation facilitates innovation and learning	Analyse diversity; Study experimentation	Study who experiments, why and how Determine who learns and why	Encourage experiments; Invest in distributed learning; Experiment with distributed forms of monitoring and evaluation
4. Trust	Trust builds up quicker when units self-organise	Account for variations in trust	Explore how trust varies across (parts of) domains; To what extent does monitoring build trust?	Enhance trust through local working
5. Overarching rules	Local initiatives work best when there are overarching rules	Incorporate formal and informal rules into landscape descriptions	How do rules emerge? What form do they take? What function do they perform? How legitimate are they?	Establish appropriate rules; Create bodies that can arbitrate any disputes

The aim of this book is to explore what is to be gained by thinking about climate governance as an evolving *polycentric* system. It does so by bringing together some of the world's leading experts on climate governance, who are very well placed to connect the relevant strands of conceptual and empirical work and view it through the prism of polycentric governance. Together, they address four main questions. First, how polycentric is climate governance post-Paris (both in its totality – as a broad system – and in particular domains)? Answering this question necessitates a better understanding of how specific domains of governing approximate the essential definition outlined by Elinor Ostrom. It also necessitates much greater critical reflection on the relationship within and between different domains. These topics are mainly addressed in Part II of this book.

Second, when, how and why has climate governance become more polycentric, and how do polycentric systems function? Here, the chapter authors evaluate the validity of the five core propositions. This task is mostly addressed by the chapters in Part III.

Third, what are the implications of greater polycentricity for the governance of pertinent and theoretically substantive challenges such as rapid decarbonisation, the transfer of climate change mitigation technologies to poorer countries and adaptation to climate impacts, as well as for the accomplishment of broader, system-wide functions (e.g. innovation, equity, justice, legitimacy and accountability)? This question is directly addressed by the authors of the chapters in Part IV.

Finally, what in summary is the most salient purpose of the emerging framework of polycentric governance? Ostrom (2010a) was confident that it could serve three important purposes: *describing, explaining* and *prescribing*. In practice, these purposes have become somewhat confused in the minds of those studying polycentric governance. In Chapter 20, we critically reflect on how well the chapters address the four questions and consider the promise and potential limits of a polycentric perspective.

Notes

* We are grateful to Mikael Hildén for his perceptive comments on an earlier draft of this chapter.

1. In the UNFCCC, innovation was mostly perceived in the rather narrow sense of stimulating cleaner technologies (Article 9), a pattern repeated in the Kyoto Protocol.
2. Interestingly, some of the criticisms levelled against that approach – neglect of unequal power relationships and a tendency to produce incremental responses (Etzioni, 1967: 387) – have also been levelled at polycentric systems (Morrison *et al.*, 2017).
3. It does not, for example, feature in landmark handbooks on governance (e.g. Bevir, 2011; Levi-Faur, 2014).

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Part II

Actors and Domains of Governance

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2

International Governance

Polycentric Governing by and beyond the UNFCCC

HARRO VAN ASSELT AND FARIBORZ ZELLI

2.1 Introduction

The adoption of the Paris Agreement in December 2015 was portrayed by then United Nations (UN) Secretary-General Ban Ki-moon as 'a resounding success for multilateralism' (UNFCCC, 2015) – after so many years of uncertainty had passed that many had begun to fear that the United Nations Framework Convention on Climate Change (UNFCCC) had become permanently gridlocked. Paris seemingly reaffirmed the centrality of the regime established by the UNFCCC in the international governance of climate change, and its ability to adapt to new challenges.

Although the UNFCCC can be viewed as a form of 'monocentric' governance (Cole, 2015; see also Chapter 7), in the three decades of intergovernmental efforts to address climate change, it has become increasingly clear that it operates as part of a polycentric governance system. Due to the physical and socio-economic interconnections between climate change and a range of other issue areas, institutional overlaps between the climate regime and other international institutions from other domains such as trade and investment, human rights, other environmental issues (e.g. ozone depletion and biodiversity loss) and specific sectors (e.g. aviation and maritime shipping) are inevitable. Scholars have variously pointed to the 'fragmentation' of international institutions in this issue area (Biermann *et al.*, 2009; Zelli, 2011a), to the existence of a 'regime complex for climate change' (Keohane and Victor, 2011) and to 'experimentalist governance' (Sabel and Victor, 2017). In essence, all these terms recognise the increasingly polycentric nature of climate governance.

In this chapter, we systematically sketch the domain of international climate change governance from the angle of polycentricity, focusing on intergovernmental multilateral institutions. We pursue two objectives: characterising this governance system as polycentric, and then discussing to what extent certain manifestations of polycentricity have already materialised in this system. With

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regard to the first objective, this chapter begins by qualifying the claim that the UN climate regime is 'monocentric'. This is followed by an overview of governance through several other intergovernmental regimes and organisations. In doing so, we illustrate how international climate governance itself can be characterised in terms of the first part of the essential definition of polycentric governance offered in Chapter 1 – namely one exhibiting multiple governing authorities that function independently from each other and set rules and norms pertaining to climate change. Next, and addressing our second objective, we assess the extent to which the domain of international climate governance exhibits the suggested features of polycentric climate governance outlined in Chapter 1. The conclusions summarise our main findings.

2.2 International Climate Governance by the UNFCCC

Much ink has been spilt by those seeking to describe the evolution of the international climate regime (e.g. Gupta, 2014; Bodansky, Brunnée and Rajamani, 2017). We certainly know much more about its limitations (e.g. Rayner, 2010; Victor, 2011) than we did 25 years ago. We now know, for instance, that although countries can set lofty long-term objectives (e.g. the goals to keep global temperature increases to well below 2°C and to pursue efforts to stay below 1.5°C), this does not mean that when combined, the individual targets or pledges for the short and medium term made by countries will fulfil those goals (e.g. Rogelj *et al.*, 2016). We know that differentiation between developed and developing countries has been a recurring challenge for the regime, often resulting in 'dysfunctional North-South politics' (Depledge and Yamin, 2009: 443; see also Chapter 18). We know too that although innovations in the regime have been possible, as witnessed for instance by the introduction of market-based mechanisms such as the Clean Development Mechanism, the rules of those mechanisms have had to be carefully designed to prevent countries and private actors from abusing the system (Wara, 2007). We also know that even though a compliance mechanism was incorporated into the regime through its Kyoto Protocol, it was not able to induce Canada, a country that was significantly off target and that ultimately withdrew, to comply (Zahar, 2015). We further know that reaching any agreement amongst more than 190 very diverse parties can be incredibly challenging, as was most visibly underscored by the failure to adopt the Copenhagen Accord in 2009. And finally, we have certainly learned how hard it can be to craft a regime that can keep one of the world's largest greenhouse gas emitters, the United States, fully on board.

Yet these limitations are all too often ascribed to a rather simplistic characterisation of the climate regime as 'top-down' and 'monocentric'. Specifically, the

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approach adopted by the Kyoto Protocol is often wrongly referred to as a quintessential example of top-down international governance (e.g. Rayner, 2010). Under this model, legally binding targets and timetables are set to achieve a common objective in a coordinated fashion, and targets are backed by a strong system of monitoring and enforcement in the form of reporting, review and a mechanism to address non-compliance (Hare *et al.*, 2010: 601).

However, the Protocol never fitted neatly into this ideal type: its legally binding targets and timetables were not imposed 'from above', but rather based on what countries were willing to put forward at the time; the Protocol's common objective of 5.2 per cent greenhouse gas emission reductions between 1990 and 2008–2012 was simply the result of adding up those commitments. Moreover, although the Protocol strengthened the reporting and review system of the UNFCCC and put in place a compliance mechanism, the strength of either mechanism is debatable (Oberthür, 2014; Zahar, 2015). Conversely, the Copenhagen Accord is often seen as an example of a 'bottom-up' approach, characterised by limited or no global coordination, with countries' efforts based on what they are willing to unilaterally commit to, with no strong international mechanism to hold them to account (Hare *et al.*, 2010: 609). Yet this characterisation is also overdrawn. While the Copenhagen Accord asked countries to make unilateral emission reduction pledges that were not the outcome of multilateral negotiations, the Cancún Agreements anchored the Accord's pledge-and-review system in the UNFCCC by elaborating the international reporting and review system developed under the Convention.

In short, the climate regime has always been a hybrid of top-down and bottom-up elements, though it is fair to say that elements of bottom-up climate governance – such as non-legally binding pledges – have gradually moved to the fore. The Paris Agreement both exemplifies and formalises this shift, effectively extending it out to the post-2020 period (Bodansky, 2016). Under the Agreement, countries are no longer subject to legally binding emission reductions as developed countries were under the Kyoto Protocol; instead, the system pins its hopes on a series of procedural obligations and an institutional mechanism to ratchet up national ambitions over time (Bodansky, 2016; Rajamani, 2016).

This ambition mechanism is expected to function roughly as follows: (1) a long-term temperature goal (to stay below a temperature increase of 2°C and to pursue efforts to stay below 1.5°C) and a goal of net zero carbon emissions between 2050 and 2100 determine the 'direction of travel'; (2) countries submit new pledges (known as 'nationally determined contributions', or NDCs) in five-yearly cycles; (3) new NDCs will have to go beyond previous ones and have to reflect a country's highest possible ambition; and (4) countries' efforts are subject to various types of (periodic) review, including a review of implementation through an 'enhanced

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transparency framework' (see also Chapter 12); a review of compliance through an implementation and compliance mechanism; and a review of overall progress through a five-yearly 'global stocktake', starting in 2023. Through an iterative process of submitting and reviewing NDCs, it is hoped, the international community will eventually achieve the Agreement's long-term objectives.

Like the Copenhagen Accord before it, the Paris Agreement is not purely monocentric. But to what extent can the wider international climate governance architecture be considered polycentric? In a first step towards answering this question, the next section shows that the UNFCCC is not the only multilateral international institution addressing climate change.

2.3 International Climate Governance beyond the UNFCCC

Under the definition of polycentric governance put forward in Chapter 1, multiple centres of decision-making authority govern the same problem. In the domain of international governance, this can be observed in practice, with a variety of international institutions beyond the UNFCCC governing climate change directly and indirectly. To illustrate this diversity, this section reviews the main intergovernmental regimes that have begun to address climate change, looking specifically at international environmental, economic, human rights and sectoral institutions.

2.3.1 Other International Environmental Institutions

The causes and impacts of climate change are physically intertwined with various other environmental problems. For example, biodiversity loss can be exacerbated if ecosystems cannot adapt to climate impacts. Yet ecosystems also play a key role in climate change mitigation by either releasing or sequestering carbon (CBD Secretariat, 2009). Formal acknowledgement of these interlinkages has helped to trigger a flurry of activity related to climate change in other international environmental regimes. For example, Parties to the Convention on Biological Diversity (CBD) have adopted a series of decisions addressing biodiversity–climate linkages, among others by proposing biodiversity-related safeguards that should be adopted in the implementation of REDD+ (reducing emissions from deforestation and forest degradation) (van Asselt, 2014).

There are also complex interlinkages between climate change and the problem of stratospheric ozone depletion, with some ozone-depleting substances, such as chlorofluorocarbons (CFCs), as well as its substitutes, acting as greenhouse gases. By directly tackling CFCs, the Montreal Protocol's mitigation benefits have been estimated to be larger than those of the Kyoto Protocol (Velders *et al.*,

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2007). Yet some of its benefits threaten to be negated, as the Montreal Protocol offered incentives through its Multilateral Fund to switch to substitutes – first hydrochlorofluorocarbons (HCFCs) and later hydrofluorocarbons (HFCs) – that also have significant global warming potential. In the end, parties to the Protocol managed to agree on an amendment to accelerate the phase-out of HCFCs (in 2007), followed by an amendment to phase out HFCs (in 2016). The latter, achieved through the Kigali Amendment adopted in the wake of the Paris Agreement, could avoid up to 0.5°C of warming by 2050 (Xu *et al.*, 2013).

2.3.2 International Economic Institutions

Climate change is as much an economic as it is an environmental problem, making various international economic institutions highly relevant for international climate governance. The Group of 20 (G20), a coalition of large economies that is primarily focused on international finance and economic development, is one such institution. Its activities in the area of climate change include its 2009 pledge to 'rationalise and phase out over the medium term inefficient fossil fuel subsidies that encourage wasteful consumption', which helped raise the issue of fossil fuel subsidy reform on the international political agenda, and moved forward activities by other international organisations in this area (van Asselt and Skovgaard, 2016). In addition, the G20 has played a role in strengthening promises to provide climate finance to developing countries (Kirton and Kokotsis, 2015).

Another relevant economic institution is the international trade regime. International trade agreements have at times been viewed as constraining mitigation ambition through a 'chilling effect' on climate policies (Zelli and van Asselt, 2010), as countries may adopt a variety of climate policy measures that may impinge on international trade. And while no rules directly pertaining to climate change have been agreed under the international regime established by the World Trade Organization (WTO), international trade agreements could conceivably also contribute to climate objectives, for instance by liberalising trade in climate-friendly goods and services (Droege *et al.*, 2016).

Finally, a range of international financial institutions play an important role in tackling climate change. A prime example is the World Bank, which hosts several funds for climate change mitigation and adaptation (e.g. the Climate Investment Funds), and which has become a focal point for international initiatives to promote the uptake of market-based instruments such as the Carbon Pricing Leadership Coalition.

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2.3.3 International Human Rights Institutions

Climate change – and policies adopted in response – can affect a wide range of human rights, from the right to a healthy environment to the right to life (e.g. McInerney-Lankford, Darrow and Rajamani, 2011). As such, the issue has been on the agenda of various human rights institutions since the late 1990s. For instance, the Human Rights Council has adopted various decisions throughout the past decade (e.g. HRC, 2015), the Office of the High Commissioner on Human Rights has advocated for adopting a rights-based approach to climate change (OHCHR, 2015), and several Special Rapporteurs have argued that addressing climate change is required under international human rights law (Knox, 2016).

Related to this are various international institutions addressing refugees and migration. Although the labelling of people subject to climate-induced displacement as 'climate refugees' or 'climate migrants' remains controversial (Mayer, 2016b), the mandate of two of the main international institutions governing refugees – the United Nations High Commissioner for Refugees and the International Organization for Migration – was expanded to include climate-related issues (Hall, 2016).

2.3.4 International Transport Institutions

The international climate regime covers greenhouse gas emissions from all sources in principle, but it singles out two sectors because their emissions take place, in part, beyond the territorial boundaries of states: international aviation and maritime shipping. Aviation emissions are still small but growing rapidly, mainly due to the increasing demand for air travel (Lee *et al.*, 2009), while shipping emissions are also forecasted to grow without any additional measures in place (IMO, 2009). The Kyoto Protocol (Article 2.2) requested developed countries to negotiate new rules to regulate the sectors through their respective international organisations, the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO). A similar call was not repeated in the Paris Agreement, but it is likely that any action to address the emissions of these so-called bunker fuels will emanate from the two specialised organisations (Martinez Romera, 2016).

Although progress in both organisations was slow for many years, ICAO eventually adopted a series of measures, including a global goal of improving annual average fuel efficiency by 2 per cent and an aspirational goal of keeping global carbon emissions from 2020 onwards at the same level (i.e. ensuring carbon-neutral growth). In October 2016, within a year of the adoption of the Paris Agreement, the organisation adopted a market-based mechanism – the Carbon

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Offsetting and Reduction Scheme for International Aviation – to offset emissions growth in the sector from 2020 onwards.

Like ICAO, the IMO has adopted a series of measures to address shipping emissions. Following a series of studies, members adopted the mandatory Energy Efficiency Design Index for new ships in 2011, as well as the Ship Energy Efficiency Management Plan for all ships. The measures are expected to yield a significant effect on greenhouse gas emissions, with an IMO study estimating an annual reduction of carbon dioxide emissions of 13–23 per cent compared to business as usual between 2020 and 2030 (Bazari and Longva, 2011).

2.4 Polycentricity in International Climate Governance

The previous sections show that the domain of international climate governance is characterised by multiple institutions governing the same problems. This section now turns to our second objective. We discuss to what extent the five propositions on implications of polycentricity put forward in Chapter 1 – local action, mutual adjustment, experimentation, building trust and overarching rules – have materialised in the domain of international governance.

2.4.1 Local Action

The first proposition suggests that local action will take off in a polycentric governance system. A key question here is: do international regimes (notably the UN climate regime) drive this development (and, if so, how), or does local action emerge fully from the bottom up?

Some suggest that the international climate regime is a driver of climate initiatives at other levels of governance. For instance, observing a 'substantial increase in climate legislation and strategies' between 2007 and 2012, Dubash *et al.* (2013: 662) speculate that 'the international negotiating process may have exerted some influence'. They specifically refer to the Copenhagen Conference of the Parties (COP), which led to a variety of new emission reduction pledges by states (see Chapter 3). Studies of transnational climate governance initiatives likewise document how the number of initiatives has increased since the mid-2000s – a period characterised by dissatisfaction with the limited progress made under the UNFCCC, and thus negative signals from the global level (Hoffmann, 2011; Bulkeley *et al.*, 2014; see also Chapter 4). Hickmann (2017: 445) suggests what is taking place is a reconfiguration of authority, in which 'the effective operation of transnational climate initiatives relies on the existence of an international regulatory framework created by national governments'. These various studies offer some evidence – at an aggregate level – that the international climate regime

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helps to drive action at other levels of governance, which is a slightly different dynamic than what is assumed in polycentric thinking.

However, the causal mechanisms behind this assertion deserve more attention, particularly with respect to actions by non-state and subnational actors. For some non-state actors, Green (2008) has suggested that their actor involvement may be a consequence of *delegation* – in her case, of specific tasks to ensure the functioning of the Kyoto Protocol's Clean Development Mechanism. By contrast, Abbott has argued that a key mode of governance through which the international regime can steer national governments and non-state actors is that of *orchestration*, with one actor (i.e. the orchestrator) enlisting other actors (i.e. intermediaries) to achieve its governance goals (Abbott, 2012; see Chapter 11). Taking his work forward, Hale and Roger (2014) show that international organisations such as the World Bank have indeed played a key role as orchestrators of new climate initiatives.

Whether and for how long the UNFCCC – the COP or the secretariat – has been an orchestrator is an open question (though they could be; see Chapter 11), but it is undeniable that climate action by non-state and subnational actors has become an important part of the intergovernmental discussions before and after the adoption of the Paris Agreement (see also Chapter 4). Before Paris, the role of non-state and subnational action came into the spotlight through a new technical examination process, known as the Non-state Actor Zone for Climate Action (NAZCA), which registers non-state and subnational commitments, and the establishment of an 'Action Agenda' to encourage and support new initiatives. The Paris COP strengthened the connections between international governance on the one hand and non-state and subnational climate governance on the other. Although the Paris Agreement itself says remarkably little about non-state and subnational action (Chan, Brandi and Bauer, 2016), the decision adopting the Agreement encourages such action by prolonging the technical examination processes up to 2020, calling for an annual 'high-level event' to take stock of non-state action and announce new initiatives, and appointing two 'high-level champions' to ensure the successful execution of existing non-state actions as well as encourage new actions (UNFCCC, 2016a).

In short, the international regime has exerted at least *some* influence on the emergence of national, private, subnational and transnational climate governance. But how much influence it exerts – especially compared to other possible driving factors, such as competitiveness or moral concerns, reaping co-benefits, etc. (Jordan *et al.*, 2015) – and through precisely what causal mechanisms remains unclear.

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2.4.2 Mutual Adjustment

The next proposition is that units will develop collaborations with each other, leading to 'mutual adjustment'. This raises the question: to what extent can we observe such spontaneous collaboration in the domain of international governance? And if so, why and how does it take place?

To our knowledge, the phrase 'mutual adjustment' – i.e. activities to order the relationships among governing units (Ostrom, 1972) – has not been applied or explored in the context of international institutions directly or literally, but we see clear parallels with a long-standing body of literature exploring how and with what effects international institutions interact with each other (e.g. Young, 2002; Oberthür and Gehring, 2006; see also Chapter 10). Specifically, mutual adjustment could in principle take the form of what Oberthür (2009) calls 'interplay management' – a term with admittedly monocentric connotations – which can be carried out unilaterally through individual institutions, but also jointly by the various institutions involved.

A first indication of mutual adjustment is the awareness displayed by drafters of other agreements through the making of cross-references to other treaties. Indeed, Kim (2013: 988) suggests this is evidence of a 'rather cohesive polycentric legal structure that forms the backbone of the international environmental governance system'. For instance, drafters of the UNFCCC were well aware of the potential overlap with the ozone regime when they limited the scope to 'greenhouse gases not controlled by the Montreal Protocol' (e.g. UNFCCC, Article 4.1(b)). They also acknowledged the overlap with international trade rules when they suggested that '[m]easures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade' (UNFCCC, Article 3.5). As mentioned earlier, the Kyoto Protocol explicitly singled out ICAO and the IMO to address aviation and shipping emissions. And, more recently, the Paris Agreement (preamble) called on its parties to 'respect, promote and consider their respective obligations on human rights'.

However, mutual adjustment goes well beyond what is specified in the constituent treaties of each regime. It can also be shaped by decisions taken by the governing bodies of different regimes. Parties to the CBD, for example, have adopted a series of decisions on biodiversity and climate change. Some of those decisions were taken in response to ongoing developments on issues of importance for biodiversity conservation in the UNFCCC, notably the development of rules on REDD+ (van Asselt, 2014). In turn, by conducing bargaining amongst great powers, several intergovernmental arrangements helped enhance the legitimacy of UN climate negotiations and reinvigorated the political dialogue therein.

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An example is the G20 summit in Hamburg in July 2017, which reaffirmed the support of 19 members for the Paris Agreement in spite of the announcement by the United States of its withdrawal (see also Chapter 19).

Other possible forms of mutual adjustment include the coordination of scientific research, such as collaboration between the scientific bodies of the climate and ozone regimes, and cooperation between the bureaucracies of regimes, such as the Joint Liaison Group bringing together the secretariats of the Rio Conventions (van Asselt, 2014).

We can thus observe mutual adjustment in practice to some extent. Yet this small sample does not tell us much yet about *why* mutual adjustment takes place. There are no comprehensive studies explaining the drivers of mutual adjustment, though the role of some actors in specific cases has been highlighted. For instance, efforts to link climate change and human rights in the UNFCCC came at the insistence of small island developing states and several non-governmental organisations, who grew weary of the lack of progress under the UNFCCC and instead preferred working through human rights institutions (Limon, 2009). Moreover, following continued advocacy by various human rights bodies and actors, the Paris Agreement referred to a range of human rights in its preamble (Mayer, 2016a). In the case of the climate–biodiversity regime overlap, Jinnah (2011) suggests that actors in the biodiversity regime – including the CBD secretariat and its leadership – played a key role in ensuring that the new rules developed under the climate regime would include adequate biodiversity safeguards, mobilising support for decisions taken by the CBD COP.

By contrast, the impacts of climate change (policies) on biodiversity have not received any sustained attention from the decision-making bodies (van Asselt, 2014). This shows that adjustment is not always 'mutual', and points to the potential existence of cases that do not confirm this proposition. Likewise, there are a series of cases where relationships between the UNFCCC and other intergovernmental arrangements were marked by competition and delegitimation, for instance the now-defunct Asia-Pacific Partnership on Clean Development and Climate (van Asselt, 2014; see also Chapter 19).

While polycentric governance theory cannot fully explain variations in mutual adjustment, let alone the absence or opposite thereof, international relations scholars referred to a series of theoretical traditions to make sense of differences across inter-institutional relations. Scholars like Keohane and Victor (2011), Stokke (2012), Van de Graaf (2013) and Zelli (2011b) drew largely on neo-liberal institutionalism to explain the strategic behaviour of actors across institutions such as forum-shopping or creating rivalling institutions that better suit their interests. Whereas such rationalist approaches have their strengths in analysing institutional conflicts, other theoretical frameworks, especially those

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building on functionalist or differentiation theories, are better suited for explaining incidents of mutual adjustment and cross-institutional synergy. Gehring and Faude (2013), for instance, expect that institutional competition may ultimately lead to optimisation in goal attainment and hence to new functional divisions of labour. Such approaches notwithstanding, the different literatures can still do more to build on each other and to root the study of inter-institutional relations more theoretically.

2.4.3 Experimentation

The third proposition suggests that experimentation can spur governance innovation and learning. This raises the question: to what extent is international climate governance conducive to experimentation?

The international climate regime is not commonly viewed as a source of experimentation. On the contrary, it is usually seen as a rigid and inflexible approach to the governance of a wicked problem. As Cole (2015: 115) puts it, for instance, the UNFCCC 'seems remarkably resistant to change, let alone replacement'. However, just as the characterisation of the UNFCCC as purely monocentric is incorrect, it is also too simplistic to suggest that the international climate regime cannot lead to experimentation in governance. Indeed, governance experiments have emerged from the regime itself. The Kyoto Protocol's market-based mechanisms are a case in point: they offered the first attempt to establish an international market for trading emission reductions (see also Chapter 6). More recently, the development of rules for REDD+ under the UNFCCC can be viewed as a way to try a novel approach to a problem – deforestation – that has for decades defied international solutions.

The broad approach to climate governance the Paris Agreement signifies (and seeks to encourage) can also be labelled experimental, since a larger spectrum of measures can now be tried out by a much wider array of parties, and because outcomes are to be systematically assessed. Some have accordingly labelled the Agreement's pledge-and-review approach a 'high stakes experiment' in multilateral cooperation (Doelle, 2016). Some of the features of the Agreement – such as the global stocktake – are a novel way of assessing the impact of the regime, and could provide opportunities for parties and other actors to learn about what works and what does not. However, to what extent these features will truly result in governance innovation and encourage learning among states and non-state actors remains to be seen.

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2.4.4 Building Trust

The fourth proposition suggests that polycentricity will help build trust. One question in this regard is: how do intergovernmental institutions act as a 'trust catalyst' (Dorsch and Flachsland, 2017)?

For international cooperation, the UNFCCC can probably be viewed as *the* key institution for trust-building. It helps engender trust through the establishment and maintenance of relationships between various actors (Vogler, 2010). Although hard to measure, the ongoing interactions between government officials, business leaders, civil society representatives, scientists and other actors taking place under the umbrella of UNFCCC meetings at least twice a year arguably help build trust among these actors. It can be hard to build trust in a multilateral institution given the number of participants involved. Some have suggested that 'minilateral' institutions – involving a limited set of participants such as major emitters – could overcome this problem (see also Chapter 19). However, minilateralism may also erode the hard-earned trust of participants in the multilateral institution if the minilateral forum is set up to undermine the goals and principles of the multilateral venue (van Asselt, 2014).

One way in which international regimes can help build trust is through their mechanisms to monitor and evaluate the extent to which parties live up to their commitments. In this regard, the infrastructure for reporting and review (i.e. their transparency arrangements) established by the UNFCCC, and refined over the years, is of crucial importance (Aldy, 2014). Following the Paris Agreement, all countries should report on their emissions, as well as the actions taken to implement their NDCs. Moreover, and equally important for building trust, reporting and review also covers the provision of climate finance (Roberts and Weikmans, 2017).

Existing transparency arrangements continue to face problems that may hamper the assessment whether trust is warranted or not. For instance, the reporting record is still patchy – particularly due to capacity challenges in developing countries – and the reviews often abstain from evaluative judgments about a country's performance because they are deemed 'too political' (Gupta and van Asselt, 2017; see also Chapter 12). Nonetheless, the transparency arrangements offer a carefully crafted overview of countries' greenhouse gas emissions and the policies put in place to address climate change. In doing so, they help instil trust and confidence that parties are at least implementing their commitments.

The international climate regime could further act as a trust catalyst by helping to monitor and evaluate the progress made by the variety of governance experiments by non-state and subnational actors (Stewart, Oppenheimer and Rudyk, 2013; Ostrom, 2014). The 2016 Marrakech Partnership – the most recent incarnation of

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the Action Agenda under the UNFCCC – offers an indication that it may do so by tracking progress through the NAZCA platform (UNFCCC, 2016b). However, there is a risk that too much oversight may have the counterproductive effect of stifling the emergence of new initiatives and/or undermining the performance of existing ones (Chan *et al.*, 2015).

2.4.5 Overarching Rules

The last proposition examined here suggests that local initiatives work best when bound by a set of overarching rules that specify goals and/or allow for resolution of conflicts. One of the questions here is: do international institutions put in place such rules and, if so, what form do they take?

Oberthür (2016: 11) notes that the goals and objectives of the UNFCCC can be said to play a key role in the development of an overarching set of rules for the whole governance system. While originally the UNFCCC's broad goal was to 'stabilize greenhouse gas emissions at a level that would avoid dangerous anthropogenic interference with the climate system' (UNFCCC, Article 2), this proved too general; hence, over time, more specific guidance has had to be issued. Initially, this was done through the gradual embrace of the 2°C goal, although this particular goal did not emanate from the UNFCCC as such – the European Union and the Group of 8 (G8) played a key role in promoting the objective well before its inclusion in the Copenhagen Accord (Jaeger and Jaeger, 2011). More recently, however, the Paris Agreement has offered even more guidance, by not only promoting the goal to stay well below 2°C but also adding the 1.5°C goal.

The goal of achieving net zero carbon emissions during the second half of this century also offers further specificity with regard to the 'rules of the game'. In addition to these overall goals, core principles of the UNFCCC could be said to form an overarching set of rules. This includes, for instance, the principle of 'common but differentiated responsibilities and respective capabilities', pointing to the need for leadership by those who are more responsible for the climate problem as well as better capable of dealing with it (in terms of e.g. financial resources) (Rajamani, 2013).

However, the extent to which these goals and principles truly guide efforts by other actors and institutions in the broader system of polycentric climate governance remains rather unclear. For instance, although the 2°C goal has been embraced by several non-state initiatives (van Asselt, Huitema and Jordan, 2018), the manner in which such initiatives have sought to differentiate between developed and developing countries has been variable (Castro, 2016).

Perhaps more importantly, it remains debatable which types of rules should be considered when exploring this proposition. This is particularly challenging to

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identify in case the core norms of different international institutions are in tension with each other – as in the case of the international trade and climate regime (Zelli and van Asselt, 2010). Moreover, it can be questioned whether rules that are crafted through an intergovernmental negotiation process necessarily constitute the rules for the whole polycentric governance system. Although non-governmental actors play a role in the development of rules under the UNFCCC – e.g. through lobbying or the provision of expertise – the rules discussed here are ultimately designed by and for states.

2.5 Conclusions

This chapter has shown that the domain of international climate governance displays some of the features of polycentric governance. With reference to the definition outlined in Chapter 1, we can observe multiple decision-making units (i.e. various intergovernmental regimes) that have overlapping jurisdictions and that are not in a hierarchical relationship with each other.

Focusing more specifically on some of the propositions put forward in Chapter 1, there are indications that actions at lower levels of governance are driven by the international level, but we still cannot say to what extent international institutions drive local action compared to 'local' drivers (but see Chapter 9), and further understanding is needed of the specific mechanisms through which international governance drives action by non-state and subnational actors. Moreover, actors involved in different international regimes seek to manage areas of overlap through activities that amount to 'mutual adjustment', but there is a dearth of research on why mutual adjustment occurs in some cases but not in others. The international climate regime can also be said to be the source of some international governance experiments and, more broadly, be seen as setting the stage for governance experiments at other levels (van Asselt *et al.*, 2018). The regime may further act as a 'trust catalyst' by offering a venue for regular deliberation and establishing a system for reporting and review. However, its trust-building capacity is primarily limited to state-based actions, as its transparency arrangements do not extend to actions by non-state and subnational actors. Finally, while an overarching set of rules can be said to have emerged through the UNFCCC, it has been made first and foremost by states for states. The extent to which there is a set of overarching rules applying to all actors in the system of polycentric climate governance – as well as the contents of those rules – remains an open question.

In conclusion, researchers need to move well beyond the idea that there is or has ever been a single 'monocentric' international climate regime. International climate governance emanates from a variety of international regimes, suggesting that this domain in itself is already polycentric. Moreover, as this chapter has shown, the

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domain of international governance at least partly confirms some of the propositions on polycentric climate governance. What is still needed, however, is a better and more systematic understanding of how exactly international regimes – and the UNFCCC in particular – function in relation to the other domains within the broader polycentric governance system, and where the limits of the suggested positive implications are. A polycentric perspective suggests that existing work conducted by international policy researchers on the linkages within and between other domains be accelerated.

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3

National Governance

The State's Role in Steering Polycentric Action

JOANA SETZER AND MICHAL NACHMANY

3.1 Introduction

The landscape of climate governance has changed considerably in the past decades. From being dominated by scientists on the Intergovernmental Panel on Climate Change (IPCC) and national governments under the auspices of the United Nations Framework Convention on Climate Change (UNFCCC), climate governance is now populated by actors and institutions ranging from businesses, local governments and civil society organisations, to novel hybrid forms including offsetting standards, emissions registries, carbon-labelling schemes and collaborations between cities (Hoffmann, 2011; Bulkeley *et al.*, 2012; Bulkeley *et al.*, 2014; Hale, 2016).

The theory of polycentric governance attempts to explain this dynamic scene by offering a more holistic and inclusive view of climate governance. Chapter 1 identifies three defining features of polycentric governance: (1) it operates at multiple centres of decision-making authority with overlapping jurisdictions, which (2) interact through a process of mutual adjustment and with (3) their interactions generating a regularised pattern of overarching social order. However, some of this scholarship often underappreciates or even entirely neglects the role of the state in polycentric governance. For instance, emphasising the lack of hierarchy in polycentric systems, some scholars suggest that states cannot, or will not, be relied on, because a multitude of other actors will provide alternative mechanisms and solutions (Skelcher, 2005). It is also argued that engaged and autonomous non-governmental actors can enhance the state's capacity to deliver (Hooghe and Marks, 2003; Newig and Fritsch, 2009; Bixler, 2014). The underlying argument is that states are often weak and distant from the societies they govern, and that by providing autonomy to alternative authorities, there is an increase of trust, which in turn improves accountability.

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Others acknowledge the importance of the state and of actions taken at the national level. Within a polycentric approach to climate change, Elinor Ostrom asserted that 'solutions negotiated at a global level, if not backed up by a variety of efforts at national, regional, and local levels . . . are not guaranteed to work well' (Ostrom, 2009: 4). Nation states and their governments are, thus, part of an 'increasingly diversified structure of climate governance, with its multiple actors' (Dorsch and Flachsland, 2017: 47).

We set out to understand the role of the state in an ever-more polycentric setting. Is it simply one of many actors in a non-hierarchical structure, its functions replaceable by those of other actors? Or does it maintain a unique position? As a starting point, we unpack some of the state's more relevant characteristics. We focus on the functions of states' domestic governmental institutions performed by their three branches – the legislative, executive and judicial – and on their interactions with subnational governments, individuals and civil society groups at the national level. These particular features of domestic political structures make the state a polycentric actor in itself, acting within a broader, polycentric environment. In specifying the roles of the state in polycentric climate governance, we examine states as a particular polycentric domain, where state institutions and social actors interact, and we focus our attention on how climate change is – and at times is not – scaled down from national to subnational governments, and from governmental to non-governmental spheres.

In terms of their capabilities, states are both rule-makers and rule-enforcers. States with legitimate democratic mandates represent collective interests and have the power to grant and deny other actors their liberties (e.g. by imprisoning them), to collect and distribute money and to regulate financial flows. States are also significant economic actors, with global public expenditure amounting to an average of 17 per cent of gross domestic product (World Bank, 2017). While no other actor in society can challenge the formal political mandate of the state (Peters and Pierre, 2016), in societies governed by the rule of law, with an independent and impartial judiciary, states can be held accountable for their actions and lack of actions. Moreover, states' legal frameworks, which are rooted in actions taken in administrative, legislative and judicial settings, are then augmented by rule-making decisions taken by individuals in particular settings (Ostrom, 2005: 20).

With respect to climate change, states are a central focal point for the implementation of mitigation and adaptation efforts. This role was further acknowledged by the Paris Agreement (2015) when it made states responsible for formulating, reporting and updating their nationally determined contributions (NDCs). States are also the organisations that are expected to implement the policies to give effect to NDCs (Purdon, 2015), and thus promote the changes in societal processes that will allow climate action and sustainable development to move forward. In turn,

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these actions will influence patterns of consumption and production, encouraging investments in low-carbon technologies, etc. (Boasson, 2015). In a nutshell, states stand out distinctly among the vast number and types of actors in the world of polycentric climate governance.

We approach the participation of the state in polycentric climate governance by focusing on two roles. The first is *regulating*, defined as 'the intentional activity of attempting to control, order or influence the behaviour of others' (Black, 2002: 19);[1] this role is carried out by the legislative, executive and judiciary branches of government. The second is *mobilising* others (such as subnational units of the state and non-state actors) to act. Courts carry out both these roles by holding the state and other actors accountable to regulatory frameworks, and by ruling on cases which set norms and directions for all actors to follow.

In highlighting these two roles, we take the position that *governing* (by national governments) is not opposed to *governance* (by non-state actors), but rather a fundamental building block that establishes structures and frameworks that interact extensively with other actors in the wider, polycentric climate governance landscape. Overall, we assert that, by providing increased regulation and mobilisation, domestic governmental institutions contribute to – and enhance – polycentric climate governance.

3.2 Regulation: Rule-Making by the Legislative and Executive Branches

Using their capacity to set and enforce rules, in the past two decades, legislatures and administrations have been developing, passing and implementing climate legislation and policies (Lachapelle and Paterson, 2013). Since the Kyoto Protocol was adopted in 1997, climate legislation and policymaking has been on a steady rise, and the number of climate laws and policies has increased twentyfold, nearly doubling every five years (Nachmany *et al.*, 2017b). According to the 'Climate Change Laws of the World' database,[2] by mid-2017 there were approximately 1,300 laws and policies in the 175 countries covered in the database. On average, states have almost eight relevant laws or policies; among the least developed countries the average is fewer than six per country, although they are catching up with the rest post-Paris (Nachmany *et al.*, 2017a).[3] The rate of adoption of new laws and policies peaked during the period between 2009 and 2013 at approximately 100 per year. The rate dropped to around 40 new laws in 2016, as the existing body of laws already covers substantive ground.

Since the quantity of laws and policies does not necessarily reflect the quality, depth or even the breadth of the climate actions they govern, it is worth noting some of their characteristics.

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3.2.1 Characterising National Climate Laws and Policies

Some rules are set by laws, passed by parliaments, and others are set by policies, decrees or strategies of similar nature, passed by the executive branch (these not merely implement rules set previously by laws but rather set rules in their own right). More than half of the rule-setting interventions recorded in the 'Climate Change Laws of the World' database are executive, not legislative.

Differences between the types of act can be traced to different phases of the policy cycle, as well as to different regulatory traditions. Legislative action requires high capacities and political will, and hence often occurs at an advanced stage in the policy cycle.[4] Executive action, on the other hand, could be favoured due to centralised political and decision-making authority structures. Alternatively, it may indicate that the country is in an earlier phase of policy development, as many executive policies include the intention to be written into law if and when political conditions permit. An example is Kenya's Climate Change Act of 2016, which developed from the National Climate Change Response Strategy of 2010. Different regulatory cultures may also be accountable for the choice of executive over legislative interventions. In China, for instance, the National Commission for Reform and Development (the government) leads on policymaking (Averchenkova *et al.*, 2016). In many other developing countries, climate policy is often embedded in comprehensive national development plans that rank highly in terms of their political importance.

The scope of climate laws and policies is also quite wide. Some explicitly address climate change mitigation and adaptation, while others facilitate transitions to low-carbon economies, for example by supporting renewable energy or reducing deforestation. Recent laws and policies that have been introduced are generally broad in scope – either creating overarching regulatory frameworks for climate change or incorporating climate change into broader development plans. More than three-quarters of countries have an overarching legislative framework or strategy that addresses climate change. Clare, Fankhauser and Genaioli (2017) find that the passage of a framework law facilitates further regulation. Indeed, in addition to climate frameworks, almost all countries have adopted more specific, topical regulation governing areas such as energy, agriculture, deforestation and transportation. In addition, climate change clauses and considerations are also incorporated into broader thematic regulation, such as green growth plans or development policies. These are particularly important for overcoming the institutional silos which inhibit collaboration between actors in different sectors (e.g. Burch, 2010; Pasquini, Cowling and Ziervogel, 2013).

In the coming years, filling gaps within the body of existing laws and policies, as well as ratcheting up efforts over time as prescribed by the Paris Agreement, is

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likely to result in a small increase in the overall number of laws and policies being adopted. The challenge will lie in ensuring that they strengthen the existing frameworks, pursuant to the long-term aims of the Paris Agreement. Although many national governments started formulating climate policies later, low-income countries are progressively active on climate change legislation.

3.2.2 National Laws and Policies in a Polycentric Governance Context

National laws and policies – even with such variation in the instruments adopted and in their content – are important features of a polycentric governance system. Not only do they enhance incentives for climate mitigation, provide mechanisms for mainstreaming and serve as a focal point for actors (Dubash *et al.*, 2013; Michaelowa and Michaelowa, 2017) but, more generally, national laws and policies constitute 'overarching rules' (see Chapter 1). Here we consider the aspects of laws and policies that make them especially key features of polycentric governance systems.

First, laws and policies create specific policy instruments, which can be used in a variety of ways. Such policy instruments can restrict activities (e.g. emission caps or restrictions on deforestation), mandate activities (e.g. green procurement requirements or a requirement to formulate local adaptation plans) or provide economic incentives for carbon reduction (e.g. emissions trading systems; see Chapter 13). The state also governs the mandatory collection and distribution of funds through its tax and budgetary regimes – a significant power that no other actor possesses.

Second, laws create institutional arrangements that define responsibilities for actors at various stages of the policy cycle. These could include informational responsibilities such as greenhouse gas accounting or risk assessments; policy formulation and reformulation; policy implementation through coordination; monitoring, evaluation and reporting of performance; and finally, reformulation of policies in accordance with the need to strengthen national commitments over time. Creating stable institutions and improving transparency and financial stability not only sets rules of operation but also contributes to developing countries' access to international climate finance. Absent or weak regulatory frameworks and institutions constitute a major risk to flows of climate finance, deepening poor countries' vulnerability to climate change even further. States that are party to the Paris Agreement should specifically mobilise climate finance using 'a wide variety of sources, instruments and channels' (Article 9). In a broader context, regulatory instability weakens the credibility of the commitments taken by states, which may hamper the willingness of other states to take climate action (Averchenkova and Bassi, 2016).

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Third, climate change laws can also facilitate the integration of climate change into different aspects of regulation and mainstream climate considerations into multiple institutions and policies, inside and outside government. As such, states use climate law to orchestrate other actors (see Chapter 11). For example, the Micronesian Climate Change Act makes it compulsory for government offices and departments to mainstream climate considerations into their plans and policies. This model, which creates shared responsibilities amongst specialising actors, can be perceived as a miniature version of polycentric governance – whereby different ministries and agencies are obligated or encouraged to partake in climate action.

Finally, national legislation lends credibility to governments' commitments, making the implementation of international agreements both more likely and more meaningful (Averchenkova and Bassi, 2016). This is particularly clear in the regime established by the Paris Agreement, which relies heavily on national governments to implement mitigation policies voluntarily in line with their NDCs.

These characteristics of national laws and policies suggest that 'overarching rules', both within states and also at the international level, constitute another key feature of polycentric climate governance (see Chapter 1). Although a need for overarching rules may seem at first counterintuitive in relation to other features of polycentric governance (e.g. localism and self-organisation), aspects of monocentricity can and do coexist with polycentricity. In this regard, Aligica and Tarko (2012: 237) even define polycentrism 'as a structural feature of social systems of many decision centers having limited and autonomous prerogatives and operating *under an overarching set of rules*' (our emphasis).

3.3 Mobilisation: Supporting Action by Non-state Actors

In addition to the formal rule-setting capabilities discussed earlier, states are also suited to create and facilitate non-state action. As Kahler (2017) argues, states 'remain prominent governors, setting boundaries and benchmarks as well as engaging as partners with an enlarged and diverse universe of actors'. Similarly, Peter and Pierre's (2016: 5) definition of 'government' takes into consideration both the formal structures of the public sector and the set of actors exercising state power (a state-centric conception of governance), as well as the interaction with – and mobilisation of – other actors in society to perform key governance tasks. States, thus, can mobilise or 'orchestrate' actions across levels of government as well as across types of actors (Hale, 2016; see also Chapters 4 and 11).

The idea of states mobilising non-state action is clearly spelt out in the Paris Agreement (2015). Recognising the polycentric nature of the system, the Paris

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Agreement acknowledges that climate action cannot and should not be taken by states alone. The Agreement specifies that states will operate in a coordinated manner to enhance public- and private-sector participation in the implementation of the NDCs (Article 6). It also recognises that climate adaptation is a challenge with local, subnational, national, regional and international dimensions, and requires the state to take those into account when formulating adaptation strategies (Article 7).

But mobilisation of non-state actors by the state is a hugely difficult task to perform, not least because of the 'increasing complexity of society, and the limited effectiveness of traditional policy instruments to shape social behaviour and markets in the desired directions' (Peters and Pierre, 2016: 11). As a result, the interaction between state and non-state actors may be complementary (Andonova *et al.*, 2017) and reinforcing (Roger, Hale and Andonova, 2017), with states addressing weak capacities and low accountability of non-state action (Widerberg and Pattberg, 2015; see also Chapter 10), yet it can also be contradictory (Cao and Ward, 2017). Acknowledging these difficulties, we now turn to examine how, in a polycentric setting and from a domestic perspective, national governments may mobilise subnational and non-governmental climate action.

3.3.1 Mobilising Subnational Governments

Where vertical types of coordination are observed between different levels of government, national governments often establish national targets and represent the countries' interests in supranational or global forums, while subnational governments implement regulations so that the targets are reached. This is the case in federal structures, where central governments set standards that should be met in each of the jurisdictions, and lower levels of governments make local policies for their own constituencies (Engel, 2005).

In many governance structures, there has been a shift from the national to local levels, with more functions of the (national) state performed by subnational and local governments (see Chapter 1). In the environmental and climate contexts, this shift has been understood in terms of a rescaling process, which also recognises that subnational entities are actors in global governance in their own right (Andonova and Mitchell, 2010; Schroeder and Lovell, 2012). Especially in the area of climate governance, subnational governments often compensate for insufficient regulation at the national and international levels (Michaelowa and Michaelowa, 2017). Hundreds of cities, states and provinces in Brazil, Canada and the United States, to name just a few examples, engage in transnational climate governance and legislate more ambitiously than their national governments (Setzer, 2017). As part of the Paris process and accompanying initiatives,

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subnational governments have several different options to continue establishing climate-related commitments and engaging internationally (see Biniaz, 2017). Such localisation of climate governance is cited as a positive feature of a polycentric governance approach (McGinnis, 2016: 25; see also Chapter 1). National governments should, therefore, mobilise and support subnational climate action.

However, some climate laws and policies might not be feasible at a subnational level. While climate policies should preferably be site-specific (Dorsch and Flachsland, 2017), it is not always possible for subnational governments to regulate certain emission sources (Setzer, 2015). Furthermore, national governments may view such attempts as undesired interventions. For example, in the United States, the Supreme Court has already invalidated climate state laws that it considered a risk to foreign affairs (LaMotte, Williamson and Hopkins, 2009: 409). The same can occur in relation to subnational attempts to forge interstate and international cooperation (Kysar and Meyler, 2008). In some cases, it has been possible to recast climate change as a domestic problem, allowing subnational governments to enact climate laws and establish carbon markets with other actors across borders (Peel, Godden and Keenan, 2012). In other cases, subnational governments are prevented from legislating, even if the national government has not articulated any policies (Rose, 2008: 673). As climate change is a global problem, certain jurisdictions consider it part of the realm of foreign affairs, which is the prerogative of the national government (Farber, 2008). When mutual adjustment between governing units cannot be achieved,[5] subnational governments may have limited competence or capacity to legislate or enact climate policies.

Despite these legal limitations on subnational action, national governments have a direct interest in what their subunits are doing with respect to climate change. At the same time, national governments have the challenge of grasping the impacts of such subnational action; simply evaluating the extent to which their actions contribute towards achieving national climate targets can be very difficult. This indicates once again how national governments are part of a wider polycentric system, as well as a polycentric domain in themselves, and they are imbricated in such a way that one cannot be understood without the other.

3.3.2 Mobilising Non-governmental Actors

In addition to mobilising subnational governments, national governments also mobilise non-governmental actors, most prominently businesses and civil society. In many countries, non-governmental actors engage in policymaking by providing ideas about policies and programmes, and contributing means to the achievement of policy ends (Peters and Pierre, 2016: 34). In advancing climate action, non-

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governmental actors often play a critical role, as they compensate for failing policies and institutions at the national or international levels (Hoffmann, 2011). Nevertheless, non-governmental actors also depend upon and benefit from frameworks and incentives provided by national governments.

First, national governments drive forward private initiatives. Businesses and non-governmental organisations (NGOs) often rely on governments to initiate actions, formulate priorities, coordinate efforts or legitimate their decisions (Van den Brande, Bruyninckx and Happaerts, 2012: 5). Even in a polycentric system, national governments set a trajectory for non-governmental actors, defining goals towards which actions should be oriented, either in terms of emission reductions or in terms of increased resilience to the impacts of climate change. For example, the United Kingdom (UK) Climate Change Act specifies long-term emission reduction targets, supported by short- and medium-term targets called 'carbon budgets' that are reviewed periodically. Norway's main climate policy, the Climate Settlement, specifies that the country will become carbon neutral by 2050.

Thus, national governments have an important role in signalling to the private sector that it can support innovation, providing incentives to various actors to invest in research and development and overcoming barriers such as facing high costs of transformation. Backing the targets with laws and incentive structures and setting an example (e.g. by regulations for the public sector) provides much-needed certainty for investors. Laws like South Korea's Framework Act on Low Carbon Green Growth, which encourages the development of green industries and the transformation of traditional industries to low-carbon ones, reduce uncertainty and provide a space for businesses to develop and transform. On the other hand, regulatory instability and policy reversals may disrupt businesses and investors, potentially leading to devastating implications for green industries, as illustrated by the renewable energy feed-in tariff cuts in Spain following the 2008 financial crisis.

Second, national governments create accountability mechanisms by mandating consultation, reporting and oversight arrangements. For example, the UK government is legally obliged to consult the Climate Change Committee on setting and meeting carbon budgets, as well as adapting to climate change. In addition, the institutions created by the state serve as vessels to facilitate policy continuity, legitimacy and effective enforcement (Willems and Baumert, 2003; Nachmany, Abeysinghe and Barakat, 2017a).

Lastly, a government's ability to act is relative to that of non-governmental actors. Governments have the capacity to upscale non-governmental action, thus contributing to reducing costs and improving technologies such as renewable energy or energy-saving solutions, where vertical policy interventions by higher levels induce horizontal dynamics (Jänicke, Schreurs and Töpfer, 2015). Having

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governmental power and capacities as a backbone to the weaker and/or diffused capacities gives leeway to those with weaker ones to make mistakes, or to not deliver on their agendas – trusting that there will be coordinated action to compensate for their shortcomings.

3.4 Regulation and Mobilisation: Judicial Law Enforcement and Challenging the State

The three branches of the state – legislative, executive and judicial – interact amongst themselves in multiple ways. A functioning judicial system dedicated to the rule of law contributes to ensuring that the state guarantees civil and political rights (Slaughter, 1995: 511). In the context of climate change, the courts play a double role, both enforcing existing climate laws and policies and directing action by state and non-state actors. As Peel and Osofsky (2015) argue, litigation is a forum for enforcement and interpretation of the law, as well as a site of potential regulatory development. Used strategically, litigation offers another possible response to inadequate lawmaking activity by governments and also prompts wider policy change. This dual role of the courts in climate litigation – enforcing the law and challenging the state and large emitters – illustrates polycentricity in action within the state.[6]

Climate litigation is a growing phenomenon. In the past years, in many countries, local and regional authorities, businesses, NGOs and individuals have been involved in climate litigation. There have been nearly 700 cases of climate litigation in the United States, and more than 250 court cases across 25 other jurisdictions.[7] Governments have been the defendants in most of these cases. For instance, in the 25 jurisdictions for which data are available, excluding the United States, 79 per cent of the cases are against governments. Corporations are the second most common defendants (13 per cent of cases). Previous research similarly suggests that in the United States, the government has also been the defendant in the majority of cases relating to climate change (Markell and Ruhl, 2012). Out of the 201 cases filed prior to 2010, governments (federal, state and/or municipal) were named as defendants or co-defendants 204 times.[8] Corporations were defendants in 45 cases.

In some cases, climate litigation aims to drive climate action in countries that lack comprehensive policies or legislation to address climate change. Plaintiffs hope that their claims will fill a governance gap in the short term and spur legislation and regulation in the longer term (Setzer and Bangalore, 2017). A favourable court decision could allow national or subnational governments to regulate greenhouse gas emissions and implement climate policies, even when there is no specific legislation. In the United States, litigation has been driven by the

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absence of a comprehensive federal legislation that addresses climate change. In this context, court decisions might even replace the need for legislation. For example, the ruling in *Massachusetts* v. *United States (US) Environmental Protection Agency* by the Supreme Court in 2007 not only created a legal basis for regulating carbon dioxide emissions but also formed the basis for a bilateral deal with China, and the Obama government's participation in the Paris Agreement (Carnwath, 2016).

In other cases, lawsuits are brought to enhance climate action in countries that already have climate regulation in place, and is geared to interpret or enforce existing legislation. An example is the case of *Ashgar Leghari* v. *Federation of Pakistan* in 2015, in which the national government was found to have failed to implement its climate policy. Another example is *Urgenda Foundation* v. *Kingdom of the Netherlands*; in a 2015 decision, the District Court of The Hague ruled that the Dutch government is required to reduce its emissions by at least 25 per cent by the end of 2020 compared to 1990 levels.

However, the capacity of courts to contribute to effective climate governance should not be overstated. In addition to these cases where climate litigation is brought as a means to strengthen climate action, litigation can equally be used to oppose climate laws and policies, most commonly because such instruments affect private commercial interests (Hilson, 2010). For example, coal companies opposing regulatory emissions reductions have used the courts to challenge clean energy measures. Even if an examination of the outcomes of climate litigation suggests that so far courts are mostly strengthening, rather than hindering, climate regulation (Setzer and Bangalore, 2017), in the lawsuits so far identified in jurisdictions outside of the United States, 40 per cent of the cases were brought by corporations against governments and government agencies, but also against NGOs and individuals.

Viewing litigation as an appropriate site for regulatory development to address climate change is also controversial. Sine argue that strategic climate litigation has been largely political, having no plausible legal basis or chance of success (Zahar, 2015: 24). Courts and tribunals still have to consider whether the law can and should recognise climate change as a problem and respond to it (Fisher, Scotford and Barritt, 2017: 184). Procedural questions over separation of powers, legal standing, jurisdiction or the scope of permissible review also constitute significant obstacles to cases in many jurisdictions.

Another concern is that the majority of cases taken thus far to courts have not addressed climate policies and legislation or wider emission reductions. Instead, lawsuits have aimed at specific projects (e.g. coal-fired power plants, wind farms or coastal homes), commonly brought under land use and planning laws, or at details regarding the implementation of existing climate policies.

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As with other climate governance initiatives in polycentric systems, lawsuits dealing with specific projects at the local level have seen more success, while ambitious attempts to promote significant mitigation still constitute the minority of cases. The few examples of successful strategic climate litigation cases are *Massachusetts* v. *US Environmental Protection Agency* and the *Urgenda* case, which push for more aggressive national climate change mitigation policies, and *Coalition for Responsible Regulation* v. *US Environmental Protection Agency* and *West Virginia* v. *US Environmental Protection Agency*, which challenge the legal bases for US mitigation policy.

But while climate change litigation may not provide the whole answer to the problem of climate change, it is increasingly clear that it will be an important part of the answer (Peel and Osofsky, 2015). Despite some limitations, rather than simply a forum for enforcement, courts are a site of potential regulatory development of the law (Peel, Godden and Keenan, 2012). New strategic cases brought by NGOs, local authorities and public prosecutors involve a great deal of experimentation. Although so far there are few cases in which the judiciary has improved existing regulatory outcomes, in a polycentric climate governance scenario, courts are likely to continue being used to pressure for future regulatory decision-making to be more responsive to climate change (Peel and Osofsky, 2015: 308). As Ostrom (2005) acknowledged, the rule of law depends on actions taken by the state, as well as by individuals, and all of these actors are potentially involved in lawsuits dealing with climate change. Climate litigation is a potentially powerful mechanism offered by the state, which allows non-state actors to hold governments to account for insufficient lawmaking, and corporations for current and historical emissions. In addition, instances of strategic litigation that seek to push for more aggressive mitigation policy have been initiated particularly since 2015; this is likely to be a growing trend.[9]

3.5 Conclusions

Through legislative, executive and judiciary branches, national governments remain key actors in the changing climate governance landscape, particularly in the post-Paris period, in which there is an increased reliance on states' ambitions and on their capacity to establish and implement ambitious policies, mobilising subnational and non-governmental actors.

This chapter has explored the roles of the state in the context of polycentric climate governance, asking if functions performed by the state (a polycentric actor in itself) can coexist with the logic of polycentric governance. At first, it is difficult to envision how the built-in hierarchy fits in the deeply complex and dynamic polycentric setting. Yet, the unique role of states requires some theoretical reconciliation with the logic of non-hierarchical polycentric governance. Without

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challenging the concept of polycentric approach to climate governance, we claim that states and their governments play a central role, which cannot be filled by any combination of non-state climate activities. National regulation is unique in that it sets rules and a trajectory for other actors. Also, overarching rules can potentially promote effective coordination at the societal level. But this does not imply a hierarchy of importance, as the concerted action of other actors is required more than ever. This is why, in practice, the extent and quality of coordination should remain an empirical question (McGinnis, 2016), and not part of the basic definition of polycentric governance.

In this context, a polycentric approach to climate governance should be able to accommodate governmental action intertwined with non-governmental, as well as governmental units at different levels, competing and cooperating, interacting and learning from one another (Cole, 2015). Nevertheless, effectively implementing rules and mobilising others to action are difficult tasks to perform, and even harder to measure. The challenges to shape social behaviour and markets towards a low-carbon economy are many and varied. With that, state regulation and the mobilisation of subnational and non-governmental actors in future years is likely to encounter only varying degrees of success.

Notes

1. Black (2002) notes that the element of intentionality excludes market forces, social forces and technologies, although these may control the actions of others.
2. The 'Climate Change Laws of the World' database covers climate change laws, policies, executive orders and key executive strategies of comparable nature in 175 countries, together accounting for more than 95 per cent of global greenhouse gas emissions. It is accessible at www.lse.ac.uk/GranthamInstitute/legislation.
3. Out of 48 least developed countries, only 3 do not have any recorded climate laws or executive policies.
4. For example, in the group of least developed countries, under a quarter of policy interventions are set by legislation, compared with 60 per cent in G20 countries (Nachmany *et al.*, 2017a).
5. Vincent Ostrom (1999: 57) defined a polycentric system as 'one where many elements are capable of making mutual adjustments for ordering their relationships with one another within a general system of rules where each element acts with independence of other elements'.
6. The role of the judiciary is seldom fully acknowledged by scholars investigating climate governance. However, Osofsky (2011) argues that climate litigation has an important 'diagonal quality' that can create new intersections between different levels of government and different actors – public and private – concerned with climate change.
7. Data for all countries save the United States are found in the 'Climate Change Laws of the World' database. The database for climate litigation in the United States is maintained by the Sabin Center and by Arnold and Porter Kaye Scholer LLP.
8. In some cases, more than one level of government is named as a co-defendant.
9. The most recent cases are already dealing with NDCs. For example, in *Thomson* v. *Minister for Climate Change Issues*, the adequacy of New Zealand's intended NDC was challenged for allegedly falling short of the emissions reductions required by the country's Climate Change Response Act of 2002.

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4

Transnational Governance
Charting New Directions Post-Paris

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4.1 Introduction

Over the past decade, a key dynamic in climate politics has been the emergence and growth of transnational climate change governance (TCCG) (Abbott, 2012; Bulkeley *et al.*, 2014), which has played an important part in the shift from the monocentric regime established by the United Nations Framework Convention on Climate Change (UNFCCC) to an increasingly polycentric system of climate change governance (Ostrom, 2010; see also Chapter 2). Transnational governance is typically understood as efforts to authoritatively steer society by a range of actors – including civil society organisations, subnational governments and companies – operating across international borders (Rosenau and Czempiel, 1992). TCCG takes on many different forms, including carbon-trading mechanisms, labelling and certification schemes, emissions registries, voluntary corporate reporting and urban planning (Andonova, Betsill and Bulkeley, 2009; Hoffmann, 2011; Bulkeley *et al.*, 2014; Hale and Roger, 2014). TCCG often includes novel arrangements, techniques, measures and interventions designed to respond to climate change. TCCG initiatives are by definition the product of 'local' self-organisation (where 'local' is understood to mean action within the context of a particular setting), and they tend to interact both with each other and with other forms of governance such as the UNFCCC and national-level arrangements (Roger, Hale and Andonova, 2017) in a process akin to mutual adjustment in polycentricity theory. TCCG has been described as a form of experimental governance (Hoffmann, 2011; see also Chapter 6), though the extent to which this is producing learning across the diverse universe of TCCG remains moot.

The emergence of TCCG and its gathering momentum through the 2000s reflected the growing engagement of a diverse array of actors with climate change, the ease of establishing transnational connections and the stalemate within the multilateral climate change regime. In some accounts, its emergence is firmly

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linked to the deficit of climate governance and leadership at the level of the international regime and the nation state (Roger *et al.*, 2017). For others, TCCG as a form of governance innovation has more diffuse causes. These include: broader trends in the fragmentation of authority; diverse motivations amongst those actors who initiated climate governance, including cities, non-governmental organisations (NGOs) and corporate actors; as well as the evolution of the climate issue itself from a singular environmental issue into many diverse realms, including carbon trading, the development of new forms of energy supply, forestry and so forth (Bulkeley *et al.*, 2014). As TCCG has grown, our aggregate knowledge of the scale and scope of TCCG has increased. Significantly, several interrelated databases have been developed to map TCCG initiatives and the subnational and non-state actors that engage in them (Hoffmann, 2011; Bulkeley *et al.*, 2014; Widerberg and Pattberg, 2015; Hsu *et al.*, 2016; Roger *et al.*, 2017). Drawing on this evidence base, in this chapter we review TCCG and identify its most salient features. With the development of the 2015 Paris Agreement, we see a significant shift in the extent and positioning of TCCG. Rather than remaining a relatively marginal form of climate governance, TCCG has come to be recognised and integrated within the multilateral climate change regime complex (Hale, 2016). At the same time, TCCG provides new arenas for contesting what climate governance entails. We detail how TCCG and UNFCCC politics have become increasingly intertwined through the Paris Agreement and suggest that this evolution can be captured through an appreciation of the development of polycentric climate governance as a whole.

Regarding TCCG as part of polycentric climate governance has significant consequences for how we explore the phenomenon and evaluate its impacts and implications. Rather than analysing singular initiatives, it suggests the onus is on understanding the interactions between individual initiatives and the wider governance complex of which they are a part. In the final part of this chapter, we consider three such arenas – clean energy, carbon markets and fossil fuel divestment – and examine the forms of governance innovation that are emerging in the transnational domain. While early forms of TCCG tended to share the same ideological positioning (thus enabling the building of trust across initiatives, a key dynamic in polycentric governance), we find that the transnational arena today is characterised by both centripetal and centrifugal forces. Many TCCG initiatives now explicitly align themselves with goals and frameworks embedded in the UNFCCC regime. At the same time, TCCG is becoming a more contested political domain in which actors challenge those goals and frameworks in search of alternative forms of climate action. In conclusion, we reflect on the implications of our discussion for the development of this area of research and our understanding of polycentric climate governance.

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4.2 Constructing TCCG: Experimenting with an Alternative Approach to Governing?

Transnational efforts around climate change in the 1990s predominantly began not as governance efforts but as attempts to influence the state-centric global response to climate change (Newell, 2000; Betsill and Corell, 2008). These actors (NGOs, corporations, regions, provinces, etc.) were actively engaged in the multilateral negotiations and considered themselves either governance takers (having to implement the directives that came from the multilateral process) or governance influencers (seeking to shift the trajectory and substance of multilateral treaty-making). One exception to this picture was found in the work of cities (see Chapter 5), which actively formed networks intended to directly govern climate change.

After the adoption of the Kyoto Protocol, many of these actors shifted towards attempts to engage in transnational climate change *governance.* In part this was because of what they saw as inadequate progress within the Kyoto Protocol itself (Depledge, 2006), but in part it was because the overarching rules created by the Kyoto Protocol (e.g. emissions trading to support the Kyoto targets) offered an enabling environment for their growth. This was noted first by those examining municipal climate governance efforts through transnational networks (Bulkeley and Betsill, 2003), but came to be seen as much more widespread (Andonova *et al.*, 2009; Hoffmann, 2011). During this period, actors began to experiment with alternative responses to the issue of climate change in ways that cut across traditional divides between actors and scales. Through these efforts, TCCG was becoming an *alternative form* of global climate governance, independent in many crucial ways from state and multilateral climate governance. By the mid-2000s, there were two coexisting and interrelated realms of the global response to climate change – the multilateral arena and an emergent TCCG arena. Initial efforts at understanding TCCG revealed that it is widespread, but also patterned in particular ways. Indeed, rather than consisting of a random assortment of initiatives only tied together by an externally imposed analytic definition, TCCG – like the broader polycentric climate governance system of which it is a part – displays self-organisation and significant order even though it is not centrally organised.

Three elements of this ordering are particularly prominent – functional, geographical and ideological. Functionally, early studies revealed that TCCG initiatives produced innovative governance arrangements, but the novelty had limits. Hoffmann (2011) uncovered four types of governance prominent in the TCCG world – networking, capacity building, voluntary action and accountable action. Bulkeley *et al.* (2014) explored these varied functions in terms of the patterns through which diverse public and private actors institutionalise TCCG initiatives and create authoritative governance arrangements. Furthermore, while TCCG

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initiatives take on a wide range of climate-related issues, there is clustering around four topics: energy, carbon markets/finance, biodiversity and sequestration and infrastructure (Bulkeley *et al.*, 2014).

The geographical dispersion of TCCG initiatives is also uneven. While actors in the global North have been the dominant initiators of TCCG, this broad generalisation obscures significant regional variation in TCCG activity (Bulkeley *et al.*, 2014). Despite a large proportion (75–90 per cent) of TCCG initiatives aiming to operate in developing countries (UNFCCC, 2016; Chan *et al.*, 2018), developing country–based actors lead only a tiny fraction of these initiatives. Northern-based actors lead 70–90 per cent of initiatives (Widerberg and Pattberg, 2015; Hsu *et al.*, 2016) and 64–84 per cent of participating actors come from developed countries (Galvanizing the Groundswell of Climate Actions, 2015). Actors from Africa and Asia are particularly underrepresented (Bulkeley *et al.*, 2014; Hsu *et al.*, 2016). The role of the global South in TCCG remains a key area of ongoing research (Newell and Bulkeley, 2017; Chan *et al*., 2018). So far it is unclear whether, as a component of the wider system of polycentric governance, TCCG delivers 'the achievement of more effective, equitable, and sustainable outcomes' (Ostrom, 2010: 552).

Finally, ideological patterns are prominent in terms of the underlying worldview across TCCG initiatives and legitimating discourses. What Bernstein (2002) dubs 'liberal environmentalism', a notion that sustainability efforts are dependent on or have to be compatible with economic growth, permeates the TCCG world (Bernstein *et al.*, 2010). In addition, TCCG initiatives follow relatively similar strategies of formal or informal institutionalisation to generate the authority to govern in the absence of the more traditional legal authority that state-based governance efforts possess.

As TCCG activities have expanded and academic interest in them has grown, analysis has shifted from examining their emergence, substance and functioning to considering the extent and kinds of impacts that TCCG initiatives have individually and collectively generated. Put simply, do they achieve their objectives? Do they have second-order effects on other actors or on national policies? A number of approaches to assessing the impact of TCCG are now available. Some focus on direct impacts (what individual initiatives accomplish themselves) measured in terms of quantitative emissions reductions goals (Widerberg and Pattberg, 2015). Others argue for a process-based evaluation (Chan and Pauw, 2014: 33) like a 'function-output fit' approach to assess outputs against stated goals of TCCG initiatives (Chan *et al.*, 2015: 45; see also Chan *et al.*, 2018). Much of this existing literature, however, focuses on its potential contributions rather than its actual performance and effects. For example, Michaelowa and Michaelowa (2017) analyse climate partnerships to understand whether they have design features that

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would allow them to effectively mitigate emissions independently of national policies. One step closer to impact, Chan *et al.* (2018) look at what activities climate partnerships undertake to see if they are producing the kinds of outputs that are likely to lead to impact. Literature on the related area of partnerships for sustainable development suggests that effectiveness may vary considerably across TCCG initiatives (Szulecki, Pattberg and Biermann, 2011; Pattberg *et al.*, 2012).

Complementing these attempts to directly measure impacts are proposals to evaluate TCCG initiatives on the basis of indirect impacts – how much they contribute to broader transformations (van der Ven, Bernstein and Hoffmann, 2017). This approach considers that the key effects of TCCG initiatives are likely to be catalytic and political – contributing to normative change, building the capacities of political actors and altering coalition-building and conflict dynamics (see Chapter 14) – in addition to, or even instead of, quantifiable emissions reductions. Measuring indirect effects is thus a matter of monitoring the political dynamics that initiatives entail over time (Chan *et al.*, 2015). Evidence suggests that TCCG initiatives are now woven into the fabric of global climate change governance, and interact with United Nations–based multilateral treaties and national government policy systems in important ways (Betsill *et al.*, 2015) such that they provided an important foundation for the Paris Agreement (Hale, 2016). Cao and Ward (2017) even speculate that growing transnational networks created by TCCG will fundamentally alter the policy preferences of the nation states enmeshed in them. TCCG then – through experimentation, network-building and establishing trust between actors across the climate governance complex – can prepare the ground for the formal recognition and incorporation of the efforts of non-state actors under the umbrella of the multilateral regime. Rather than operating in isolation or in parallel, therefore, we suggest that we should consider the multilateral process and TCCG as part of an evolving polycentric climate governance system. We turn now to considering how this phenomenon has evolved in relation to the shifting multilateral regime and the 2015 Paris Agreement through the formation of a global climate governance complex, before examining specific developments within TCCG since Paris.

4.3 Reforming the Global Climate Governance Complex: Before and after the Paris Agreement

There was a sharp expansion of attention to the role of TCCG activity in the broader regime around the UNFCCC Conference of the Parties (COP) in Paris (Hale, 2016). This increase resulted from a variety of factors, including greater mobilisation of civil society, heavier media attention and, critically, the efforts of

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the United Nations and national governments to 'orchestrate' such actions (Hale, 2016; see also Chapter 11). This orchestration, and thus the shifting terms of engagement between the multilateral regime and the realm of TCCG, reflects an ongoing process of evolution within the multilateral regime itself. Since the 2009 Copenhagen COP, the climate regime has evolved in interesting and unexpected ways, which has been characterised as a shift from a gridlocked 'regulatory' regime to a 'catalytic' regime (Falkner, 2016; Hale, 2016; Keohane and Oppenheimer, 2016). The UNFCCC process has brought climate action from cities, companies, civil society groups and other subnational/non-state actors into its understanding of the ways in which climate change can and should be governed (Figure 4.1).

In September 2014, UN Secretary-General Ban Ki-moon's Climate Summit brought heads of state together with business leaders, mayors and others to announce bold actions on climate. The Secretary-General's office had spent months in advance of the summit working to orchestrate multi-stakeholder initiatives on climate change as a way to motivate countries to increase their own ambition (Hale and Roger, 2014). This dynamic was repeated two months later at the High-level Action Day at COP20, held in Lima, Peru, which provided significant impetus to existing TCCG initiatives. It was at this time that the UNFCCC, under the auspices of the Peruvian hosts, created its online Non-state Actor Zone for Climate Action (NAZCA) portal to track climate action by cities, businesses and other subnational/non-state actors. While this portal identifies the action being taken by individual actors, much of what is reported actually takes place in forms of TCCG. In parallel, the United Nations Environment Programme's (UNEP) Climate Initiatives Platform specifically monitors transnational initiatives. This effort to track and profile subnational/non-state climate activities and TCCG initiatives on an ongoing basis has therefore been central to the attempt to organise and coordinate TCCG in relation to the multilateral regime.

Throughout 2015, the governments of Peru and France, in partnership with the UNFCCC secretariat and the UN Secretary-General, worked to mobilise additional action and initiatives from all sectors of society. This 'Lima-Paris Action Agenda', as the programme was called, eventually came to include more than 10,000 individual commitments, many of which were aligned to TCCG initiatives. It was declared a 'fourth pillar' of the Paris climate conference (alongside the national pledges, the climate finance package and the negotiated agreement itself), and cited as a critical driver of the successful outcome. Instead of being relegated to the sidelines, local and regional governments, the private sector and other actors were showcased at a series of thematic days throughout the COP, and celebrated in a star-studded Action Day. This conscious effort by international organisations and governments to bring subnational and non-state actors more

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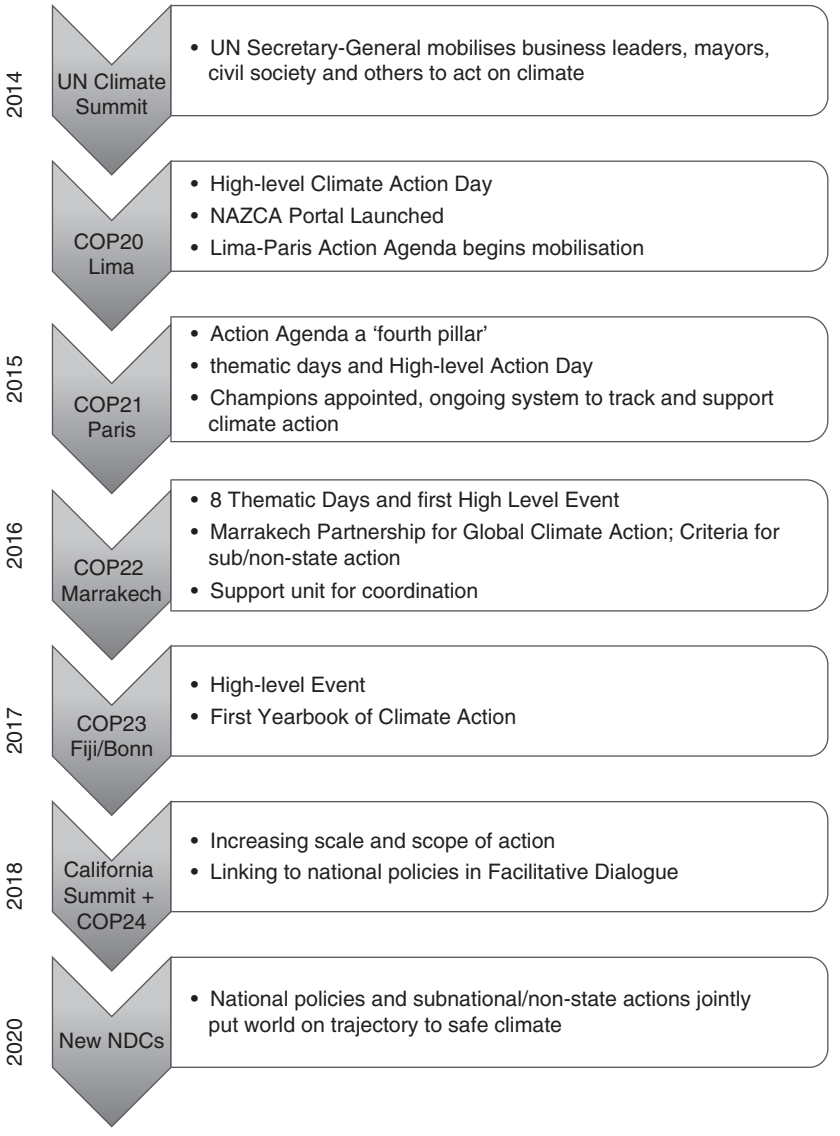

Figure 4.1 The growing role of sub/non-state climate action in the climate regime.

closely into the process was reflected and augmented by the countries meeting in Paris. In a major departure, governments in Paris instituted the NAZCA portal as an ongoing system to track, support and accelerate subnational/non-state climate action going forward. They appointed two 'high-level champions' to catalyse bottom-up climate action. They mandated that a high-level event be held at every future COP for subnational/non-state actors to announce new commitments and report on progress. And they decided to link the 'Action Agenda' to the technical

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process in the negotiations through which countries consider new policy options they might adopt, so that subnational/non-state action can inform national policy and vice versa. These initiatives were further institutionalised at COP22 in Marrakech, through the Marrakech Partnership (UNFCCC, 2016), especially via the formation of a support unit in the UNFCCC secretariat to coordinate the process, bolstered by a hybrid support network envisioned to include a mix of governments, representatives of city and business networks, international organisations and other actors. This new link between the intergovernmental sphere and the subnational and transnational spheres sets, in many ways, a unique precedent in global governance.

4.4 The Dynamics of TCCG Post-Paris

There is, then, an impressive level of activity within the transnational realm now being recorded that could have very significant impacts. Yet the place of TCCG within a broader polycentric climate governance system means that understanding this phenomenon requires moving beyond the analysis of individual initiatives towards an analysis of the ways in which initiatives are interacting both with one another and with other aspects of the climate regime. In short, innovation within the transnational realm can only be evaluated in terms of its position and dynamic within the broader governance landscape. Betsill *et al.* (2015) usefully distinguish between 'divisions of labour' and 'catalytic' linkages. The former refers to types of interaction where two or more organisations might be attempting to govern a specific aspect of climate change, and the question is whether and how to coordinate their activities to remove unnecessary duplication, avoid contradictions between them, and so on. The latter refers to ways in which two or more governance initiatives may create effects that interact, for example, between the information disclosure from investor initiatives like CDP (formerly, the Carbon Disclosure Project) and carbon price initiatives by governments via carbon markets. Such interactions may then create synergies, realising improvements in climate change responses beyond which each could individually achieve, or of course conflicts, with one undermining the other, with for example some economists arguing that renewable energy targets undermine carbon-pricing initiatives.

Of course, a significant problem of studying TCCG in general, but especially these interactions, is the dynamism of transnational governance. In this section, we discuss three areas where transnational governance has been changing especially rapidly and in which divisions of labour and catalytic links are visible – clean energy, carbon markets and fossil fuel divestment. Each area demonstrates how polycentric climate governance now entails the intertwining of TCCG and the

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multilateral regime, but that the relationship is not singular. On the contrary, we observe both complementarities and contestation.

4.4.1 Clean Energy: Realising the TCCG Potential of the Paris Agreement?

One area in which the nature of TCCG is shaped by its position within polycentric climate governance is around the mobilisation and governance of investments in 'clean' (low-carbon) energy. Already existing initiatives in this regard, such as the E8, the Renewable Energy and Energy Efficiency Partnership, the Johannesburg Renewable Energy Coalition, the Global Methane Initiative, the Green Power Market Group and the Roundtable on Sustainable Biofuels (Bulkeley *et al.*, 2014), have recently been joined by many more, partly reflecting the heightened level of ambition contained in the Paris Agreement. This ambition is reflected in the shift to talk of a 'clean energy revolution' – a phrase adopted by groups as diverse as the Climate Group and Greenpeace, the World Bank and many parties to the UNFCCC.

The Paris summit witnessed numerous side events proclaiming a 'clean energy revolution' and announcing trillions of dollars of new investment (UNFCCC, n.d.). Africa was singled out in particular, suggesting the need to increase investments to a region deprived of finance for climate mitigation to date (Lenferna, 2016). The Africa Renewable Energy Initiative, for example, aims to build at least 100 gigawatt of new and additional renewable energy generation capacity by 2020, and 300 gigawatt by 2030. The Initiative is led by the African Union's commission, the New Partnership for Africa's Development Agency, the African Group of Negotiators, the African Development Bank, UNEP and the International Renewable Energy Agency (IRENA). Also at the Paris summit, a new 'billion dollar clean energy access investment opportunity' was announced through the release of the United Nations Foundation's Energy Access Practitioner Network's Energy Access Investment Directory, which seeks to showcase best in the off-grid clean-energy sector globally, from successful start-ups to prominent renewable energy pioneers. The directory identifies more than a billion dollars of investment and financing opportunities presented by some 200 leading companies and organisations in the sector (Energy Access Practitioner Network, n.d.). Across this realm, several focal institutions like IRENA, the United Nations' Sustainable Energy for All initiative and the Clean Energy Ministerial seek to integrate TCCG initiatives with national and intergovernmental policy processes.

Reshaping patterns of energy investment in this way will be essential if the world is to achieve the ambition of the Paris Agreement to keep warming below 1.5 or 2° C. TCCG has a role to play here. Within the NAZCA portal, there are close to 5,000 companies from more than 88 countries representing more than $38 trillion in

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revenue, including nearly 500 investors with assets under management of more than $25 trillion, one-third of total global assets (Hsu *et al.*, 2015). Ultimately, private and hybrid public–private flows of investment will decisively shape the prospects of low-carbon energy transitions around the world in which what emerges from UNFCCC processes is but one driver (Newell and Bulkeley, 2017), and therefore the role of TCCG in mobilising and shaping the priorities and nature of investment assumes central importance in how climate change is governed.

4.4.2 Carbon Markets: Reviving the Potential of TCCG?

Carbon markets are a major area of interaction between TCCG and the Paris Agreement (see Chapter 13). About 100 parties – accounting for 58 per cent of global greenhouse gas emissions – plan or consider carbon-pricing initiatives in their nationally determined contributions (NDCs) submitted under the Paris Agreement. The Agreement sought to breathe new life into carbon markets, with transnational actors such as the International Emissions Trading Association and the International Carbon Reduction and Offset Alliance and the World Bank–led Carbon Pricing Leadership Coalition (World Bank, 2014) lobbying for the inclusion of such provisions. The 'State and Trends of Carbon Pricing' 2016 report (World Bank, Ecofys and Vivid Economics, 2016) highlighted the (contested) rationale for this: that cooperation through an international carbon market could reduce climate mitigation costs by one-third by 2030 and that trading carbon assets can create financial flows of 2–5 per cent of gross domestic product for low-emissions countries by 2050.

The Paris Agreement serves as an anchoring device for global carbon markets by revalidating and legitimising their role through a multilateral seal of approval, aiming to send a positive signal to investors and carbon traders about the role of carbon pricing. Article 6 of the Paris Agreement allows countries to use standardised international units to achieve their NDCs and establishes a new crediting mechanism, the Sustainable Development Mechanism, under the UNFCCC's authority. It thus provides a means to link voluntary, state and subnational carbon markets, as well as sectoral initiatives such as that of the International Civil Aviation Organization. The latter body, for example, passed a resolution to cap emissions growth in the aviation industry starting in 2021 and to offset its emissions via a global market–based mechanism (ICAO, 2016).

Article 6 does not specify particular policies that might generate these international credits, or 'internationally transferred mitigation outcomes', affording flexibility to countries in their choice of policy tools. At the time of writing, these provisions are under negotiation in the UNFCCC. Significantly, in terms of

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'catalytic' linkages, the Paris Agreement contains provisions for 'interconnection' (Article 6). Networks and coalitions such as the G7 Carbon Market Platform or the World Bank's Networked Carbon Markets might be the vehicles through which this work of coordination or mutual adjustment will be performed. Likewise, how these markets evolve and are governed will be shaped by transnational climate actors critical of carbon markets such as Carbon Market Watch lobbying to ensure previous lessons about the failings of the Kyoto Protocol's Clean Development Mechanism (CDM) are taken into account as new market mechanisms proliferate and interconnect. In particular, there is a key role for transnational climate alliances in providing monitoring, oversight and grievance mechanisms, such as citizen redress when human rights violations occur and consultation does not take place – all issues raised (but not resolved) by the CDM Policy Dialogue four years ago (Newell, 2014).

4.4.3 Divestment: A Transnational Governance Innovation?

Fossil fuel divestment differs from both clean energy and carbon markets in that it is both a relatively novel part of TCCG and serves to contest rather than endorse the rationale of most forms of climate governance (on divestment generally, see Ayling and Gunningham, 2015; Rowe, Dempsey and Gibbs, 2016). Efforts to shape investment in fossil fuel companies have long formed part of TCCG. Initiatives like CDP and the Investor Network on Climate Risk, for instance, arose out of interactions between environmental NGOs and institutional investors, and in CDP's case, UNEP. But from 2010 onwards, after a particular campaign at Swarthmore College in the United States, and stimulated by an article by Bill McKibben in *Rolling Stone* (McKibben, 2012) and then coordinated by the NGO 350.org, initiatives to divest from fossil fuel corporations have spread, especially across North America, but also in many other places. They have centred on universities, colleges and churches, but have included decisions by the Norwegian government pension fund and the Church of England. These take one element in the logic of investor action but orient it towards divesting from companies directly involved in fossil fuel production.

This logic is partly based on a shift in climate change political discourse that occurred from around 2012 onwards, towards an 'end of the fossil fuel era' frame, which was advocated by McKibben and became widespread in academic circles, notably with an influential article by McGlade and Ekins (2015). The 2014 Fifth Assessment Report by the Intergovernmental Panel on Climate Change (IPCC) report and the Paris Agreement itself were both widely interpreted as signalling this in more institutionalised settings. The IPCC (2014) stated that for a scenario that would have a reasonable chance of limiting warming to 2°C, 'net emissions' would

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have to be zero or even negative during the second half of the 21st century. The report does not explicitly state that this entails eliminating fossil fuels entirely, but it does show that the zero- or low-carbon (with the latter excluding *all* fossil fuels without carbon capture and storage) energy sources need to be very close to 100 per cent of the energy mix by 2100 (IPCC, 2014). The Paris Agreement took up the IPCC's 'net zero emissions' frame and embedded it as a goal, whilst also assuming a role for so-called negative emissions technologies, which led many to frame Paris as the beginning of the end for fossil fuels, including Greenpeace, Al Gore, Desmog and Avaaz (Avaaz, 2015; Grandia, 2015; Naidoo, 2015; Vidal and Vaughan, 2015).

Furthermore, several reports emerged arguing that fossil fuel companies were liabilities as investments, since as governments act to limit emissions to meet the 2°C goal, this would mean in practice that fossil fuel reserves would have to be left in the ground. They represented 'unburnable carbon' and therefore 'stranded assets' (e.g. Berners-Lee and Clark, 2013; Carbon Tracker Initiative, 2014). The point for divestment activists like McKibben was that constructive engagement with fossil fuel companies was no longer possible. Existing investor initiatives had been initially framed where one of the possible outcomes was that investors would shift away from fossil fuel interests (Paterson, 2001). In practice, however, initiatives like CDP or the Investor Network on Climate Risk, or the Financial Stability Board's high-level Taskforce on Climate-Related Financial Disclosures, have ended up primarily having effects on corporate managers via the information they have generated and enabling investors to become somewhat more active in their dealing with companies they invest in – deploying 'voice' rather than 'exit' (Hirschman, 1970). But if the aim is no longer a 'low-carbon' transition but a 'zero-carbon' one, such transparency-based measures may become vehicles not merely for risk-management but for the fundamental transformation of fossil fuel companies. Correspondingly, divestment becomes a type of strategic governance activity to effect a broad delegitimation of fossil fuel companies per se, seeking to eliminate rather than reform them, and using investor power as a means to that end. As such, it is a form of TCCG that involves the investment community in direct forms of climate governance but also includes efforts to influence the fossil fuel sector.

4.4.4 TCCG and the Landscape of Polycentric Climate Governance

Together, these three cases point to some interesting new directions in the polycentric governance of climate change. In the case of both clean energy investment and carbon markets, disparate TCCG initiatives function to extend and give substance to the aims, objectives and modalities prescribed in the Paris Agreement as

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well as fill gaps concerning actors, sectors and regions poorly represented in the UNFCCC process. They do this by demonstrating, financing and implementing projects and investments that contribute to the broad aims of the Agreement. Clean energy and carbon markets are areas where there has been significant change in TCCG, and we can see very clearly how the Paris Agreement has begun to affect these areas of governance. In the former case, this is due to the enhanced ambition of the Agreement. But the latter case shows how it revived the possibility of carbon markets at the international level, but in a way which will be very different in institutional terms to the markets (and the initiatives to govern them) that emerged both within the Kyoto Protocol and in its shadow.

By contrast, fossil fuel divestment has provided a novel twist on the shape of TCCG, which could have significant interaction effects across the governance complex if its momentum continues. Bulkeley *et al.* (2014) showed that only a small percentage of initiatives within TCCG were involved in contesting dominant norms and practices, measured in terms of either the overall ideology they espoused or the types of governance activities they engaged in. Divestment, however, perhaps signals a shift in the balance within TCCG towards more radical forms of practice. If so, it fits well with Hadden's (2015) argument that was a marked shift to more contentious practices among transnational NGOs at climate summits after 2008. Such actions at summits have been mirrored not only in the divestment movement but also in direct action aimed at keeping fossil fuels in the ground, notably against new oil pipelines across North America, and fracking in parts of Europe and elsewhere; an extension of the delegitimation strategy that challenges the social license to operate of fossil fuel companies.

4.5 Conclusions

After two decades, TCCG has come to be recognised as a substantive arena of climate governance in both academic and policy circles. If the establishment of TCCG was forged through, and in some senses required its distinction from, the multilateral climate process, the recent history of climate governance dominated by the creation and aftermath of the Paris Agreement has witnessed stronger interactions between these arenas as TCCG becomes both formally recognised and orchestrated by actors within the UNFCCC. However, the 'inherent messiness' of these interactions when seen alongside the known deficiencies of polycentricity (Biermann *et al*., 2009; Jordan *et al.*, 2015) requires further research.

Despite its increased prevalence and profile, it is important to remember that TCCG remains a far from universal phenomenon. The North–South gap in both participation and action implies, for instance, that developing country–based actors do not have a similar impact on the definition of objectives. This might in turn

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undermine political support for effective engagement of non-state and subnational actors in the UNFCCC, even when they play a crucial role in the provision of additional means necessary to meet targets in NDCs by developing countries. Especially when such imbalances in participation serve to lend weight to Northern framings and initiatives on climate governance, they may encounter opposition from Southern governments to their recognition and inclusion under the umbrella of multilateral climate governance. At the same time, it is important to recognise that the partiality of our picture of TCCG may be a result of how it is defined and observed, and that although our understanding of TCCG has advanced considerably in recent years, mapping and understanding the phenomenon continues to present significant challenges, which in turn creates a need for future work.

This chapter has also identified the issue of evaluating the impact of TCCG as a significant challenge. While existing studies provide helpful information regarding the process through which partnerships might have impact, we need more systematic studies of the actual outcomes and effects of partnerships to fully assess their critical role in global climate governance (van der Ven *et al.*, 2017). The most important aspect of this in relation to polycentric climate governance is to think about effectiveness in relation to the interactions across different initiatives. In a polycentric system, there are traditional forms of 'orchestration' of interactions between different specific sites or practices of governance (Hale and Roger, 2014), but also forms of mutual adjustment (Ostrom, 1999). These interactions and linkages are only beginning to be studied (Hale and Roger, 2014; Betsill *et al.*, 2015; Hickmann, 2015; see also Chapter 10).

While we are starting to build a picture of the kinds of TCCG innovation that have emerged in the post-Paris era, our understanding of the ways in which specific forms of TCCG are taking shape remains relatively limited. Cases of clean energy, carbon markets and divestment reveal rather different patterns and forms of interaction between the multilateral regime and TCCG initiatives, revealing both centrifugal and centripetal dynamics. For example, many of the transnational city and business initiatives now frame themselves explicitly as contributing to the Paris Agreement, rather than as alternatives to the UNFCCC process (which was not always the case). They are adopting some of the intergovernmental goals (like the 1.5°C target) and are finding frameworks for coordination through the Marrakech Partnership and elsewhere. At the same time (and to the extent that divestment becomes more widely adopted and starts to have effects on the legitimacy of fossil fuel companies), this suggests that TCCG, and by extension polycentric climate governance as a whole, may be becoming more of a contested field, where the interactions are not only functional but properly *political*. Divestment arguably constitutes a true 'innovation'

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(Jordan and Huitema, 2014) in climate governance through the delegitimation of fossil fuels, such that in some contexts, the burden of proof is on those seeking to argue why we should invest in new fossil fuel infrastructure rather than on those promoting clean energy. The conflicts over pipelines in North America or new-build coal mines in Europe and Australia seem to provide some evidence in favour of this – those promoting pipelines are subject to increasing amounts of scrutiny where the presumption is no longer automatically in favour of the construction of new high-carbon infrastructure. This revival of conflict in climate governance is a reminder that underlying the technical, almost managerial language of polycentric climate governance, as with any similar concept, are deep conflicts of interest and vision at the heart of climate change politics.

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5

City and Subnational Governance

High Ambitions, Innovative Instruments and Polycentric Collaborations?

JEROEN VAN DER HEIJDEN

'Our struggle for global sustainability will be lost or won in cities.'
Ban Ki-moon, United Nations Secretary-General (2012)

5.1 Introduction

Cities and local communities will play a key role in climate change adaptation and mitigation (Bulkeley and Betsill, 2003; Parnell, 2016; Jayne and Ward, 2017). Already in Local Agenda 21 (UNCED, 1992), adopted at the Earth Summit in Rio de Janeiro in 1992, they were recognised and explicitly mentioned as an important site for climate action. Fast forward to the mid-2010s: the Climate Summit for Local Leaders was hosted, in parallel to the Paris Conference of the Parties (COP) in 2015. This event was attended by many urban leaders and gained much recognition in the climate negotiations that resulted in the Paris Agreement. At COP22 in Marrakech in 2016, the parallel Climate Summit for Local and Regional Leaders was held. Again, this event provided cities and other local actors with an opportunity to influence international climate change negotiations. Similarly, cities were a central focus of the United Nations' Sustainable Development Goals of 2015. Meanwhile, the New Urban Agenda resulting from the bi-decennial HABITAT Conference in 2016 has a strong focus on the role of cities in climate change mitigation and adaptation (United Nations, 2016).

When surveying these developments, one might easily assume that cities are already an integral part of international climate governance (see Chapter 4). Unfortunately, the reality is less positive. In international policymaking, cities are not recognised as formal actors – after all, cities are sites as well as actors when it comes to climate action. They still have to break through institutional boundaries to make themselves heard at international climate negotiations and be recognised in international agreements. The side events at the COPs are exactly that – side events, not formal parts of the negotiations – and the

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Sustainable Development Goals, for example, are not even referenced in the Paris Agreement. Moreover, the Paris Agreement does not explicitly refer to cities, urban geographies or local settlements as actors or sites of governing, but mentions 'country-driven' processes as the key principle for organising climate action (United Nations, 2015: Articles 7, 9 and 11). In short, there is much talk at the international level about the importance of urban climate governance, but little is done to empower cities – as actors – taking meaningful action, nor is there much coordination or cohesion between the different international forums engaged with climate change governance in how they envisage the role of cities in climate action.

In response, cities themselves have become involved, as actors, in local and international climate governance interventions, experiments and networks (Hoffmann, 2011; van der Heijden, 2014; Bulkeley, Castán Broto and Edwards, 2015). This is illustrative of polycentric governance – albeit that cities and the networks they form can best be understood as units within a polycentric system rather than a specific domain (cf. Ostrom, 2010). That is, acting as (partly) independent actors, city governments and other urban leaders have begun to organise themselves around specific urban climate challenges to better understand how these can best be addressed. They do so on regional, national and international scales, following more or less formalised rules. Thus, we see multiple governing authorities acting, as explained in this chapter, at different scales, and exercising considerable independence in making and implementing norms and rules – i.e. matching the essential definition of polycentric governance identified in Chapter 1 (see also Ostrom, Tiebout and Warren, 1961; Ostrom, 1990).

In what follows, three related topics are addressed to better explain the role of cities as units of polycentric climate governance. First, cities often set higher climate governance ambitions than the nation states they are in (Reckien *et al.*, 2014). What explains this tendency of cities seeking to outperform and thus act independently of national governments? Second, cities are increasingly becoming sites and actors of experimentation with innovative governance instruments, including eco-financing and 'urban laboratories' (van der Heijden, 2016b). What drives cities to experiment with innovative governance instruments in the first place? Third, cities have begun to break out of traditional top-down, national-regional-local hierarchies and act in trans-local networks (Acuto and Rayner, 2016). How do these networks seek to overcome regional and national barriers to climate governance, and what barriers do these networks raise themselves for cities in responding to climate change? Finally, whilst the literature on these three topics – and polycentric urban climate governance more broadly – has expanded rapidly since the early 2000s, it has a strong focus on a relatively small number of cities from the global North (Evans, Karvonen and Raven, 2016). This chapter therefore

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concludes with a reflection on how applicable it is for all cities in the world – including, crucially, those in the global South. It also identifies what further research is required to understand and support the full potential that cities hold as actors in – and sites of – polycentric climate governance.

5.2 High Ambitions at the Local Level

From the early 2000s onwards, cities have been in a healthy competition to be at the forefront of emission reduction efforts. For example, Sydney aims to cut its emissions by 70 per cent from 2006 levels by 2030, and New York has set itself the goal of reducing its greenhouse gas emissions by 80 per cent below 2005 levels by 2050. What makes the ambitions of these cities – and others like them (C40 Research Team and Arup, 2014) – of particular interest is that they go above and beyond the ambitions set by their respective nation states. Indeed, Sydney and New York's ambitions are more than double those of their respective countries. Comparing city-level emissions and reduction ambitions with those of nation states is somewhat like comparing apples and oranges (emissions from carbon-intensive sectors such as manufacturing and mining are normally not included in city emissions). Nevertheless, the size of this difference begs a question: why do cities set such ambitious mitigation targets in the first place?

In answer to this question, various reasons are highlighted in the literature. These can be clustered into four main themes: cities as a source and victim of climate change; cities as the low-hanging fruit in climate action; the rise of green growth and ecological modernisation thinking in cities; and national political support for urban climate action.

Starting with the first of these, cities are often considered both a key contributor to and a main victim of climate change. Most resources, including energy, are consumed in cities, and most wastes, including carbon emissions, are produced in cities. This makes cities – and particularly the high consumerist lifestyle that characterises modern urban life – a key contributor to climate change (Dodman, 2009). Because cities are often characterised by high population densities, and because cities represent the geographical epicentre of many economic activities, it will be in cities where climate change–related and other disasters will strike the hardest (IPCC, 2014). Seeking to prevent the devastating effects of such disasters, or simply seeking to save on the costs of operating cities by reducing waste or resource consumption, city governments around the world have implemented myriad regulatory interventions, subsidies and taxes to steer citizens towards more environmentally sustainable forms of living. A typical example is the emergency energy requirements introduced by the government of Tokyo in 2011. These were adopted in response to power shortages experienced from closing down all

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nuclear power plants after the Fukushima nuclear power plant incident. Whilst these emergency requirements aimed at relieving the electricity net, they had the positive side effect of considerable energy savings (and thus city-related carbon emission reductions), particularly from large offices. Many large office users continued their reduced energy consumption after the emergency requirements were lifted (Nishida, Hua and Okamoto, 2016).

Second, cities have access to much low-hanging fruit. Of all anthropogenic activities, it is only in constructing, maintaining and using cities (and particularly the built-up part of cities, or simply, buildings) that we see a unique combination of well-trialled, readily available technology and knowledge to achieve emission reductions at net-cost benefit and at a large scale (IPCC, 2014). In many areas – including manufacturing, agriculture and non-city transport – some of these conditions are also present, but not in the same, unique combination. In the United States, for example, possible building-related energy savings of up to 23 per cent are worth double the costs of upfront investments, with a return rate of ten years – $1.2 trillion can be saved if $520 billion is invested (McKinsey, 2009). Some studies even go so far as to forecast that fully carbon-neutral built environments can be achieved in the United States and China by applying all currently available technologies at a net economic gain (Lovins, 2013). Again, seeking to capitalise on such expected savings, city governments around the globe have been steering their citizens to forms of living that are less carbon-intensive than what is formally required by their national governments.

A third and related argument revolves around the paradigm of green growth or economic modernisation (Dryzek, 2005). It is often argued, and sometimes empirically observed, that cities compete with each other to become the most climate-friendly city, seeking to attract investors and citizens that have a 'green' orientation (McCann, 2013). The underlying assumption here is that city policymakers are mainly interested in economic prosperity, creating jobs and gaining votes by keeping citizens happy (Schragger, 2016). By creating an image of environmental sustainability and climate action and/or rewarding specific forms of investments, for instance reducing property taxes to encourage more energy-efficient buildings (van der Heijden, 2015), authorities seek to attract firms. This in itself can result in job creation. At the same time, creating an image of environmental sustainability and climate action may attract 'creative' people that may provide an additional boost to the economic competitiveness of a city (Florida, 2005). Such images run the risk, however, of having a merely symbolic function, with cities being unable to live up to some of the high promises they make (Johnson, Toly and Schroeder, 2015).

A final argument, but one that is sometimes hidden between the lines, is that many cities have set climate change ambitions that are higher than those of the

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nation states they are in simply because they were actually mandated or supported by national governments to do so (Homsey and Warner, 2015; van der Heijden, 2017; see also Chapter 3). Despite its many flaws, Local Agenda 21 can be credited for recognising cities and their governments as an important level for climate action and addressing other societal problems. Following on from Agenda 21, national governments began requiring, supporting and promoting local action (Bulkeley and Betsill, 2003; Jayne and Ward, 2017). Returning to the example of Sydney, in 2011 the Australian government launched the National Urban Policy (Australian Government, 2011). This policy required that all jurisdictions have in place the planning systems to deliver nine specific goals. These include better urban design, more environmentally sensitive new homes and offices and preparations for climate change and natural disasters (Albanese, 2013). Seeking compliance with this policy, Australian states and territories developed long-term regional and metropolitan plans and required cities to draw up strategic development plans and indicate how they were going to meet national requirements. Being exposed to pressure from higher levels of government as well as urban climate mitigation ambitions expressed by other cities resulted in a race to the top between Australian cities to set far-reaching carbon emission reduction ambitions (COAG, 2012). Therefore, even though cities may behave as partly independent actors in polycentric climate governance, the interactions between them and other actors should be borne in mind.

5.3 Experimental Urban Climate Governance and Innovative Governance Instruments

Around the globe, cities have also become highly active in experimenting with novel governance processes and innovative governance instruments to address local and trans-local climate challenges. This 'experimental governance' is characterised by iterative rounds of trialling governance instruments within a bounded jurisdiction or population, with the ambition to adapt the instruments based on lessons learnt and to ultimately scale it up to a larger jurisdiction or population (Hoffmann, 2011; Ansell and Bartenberger, 2016). Scholars have identified hundreds of urban climate governance experiments ranging from very local ones to some at an international scale (Bai, Roberts and Chen, 2010; Bulkeley and Castán Broto, 2013; van der Heijden, 2016b). Examples include the Chicago Sustainable Backyards programme that incentivises households to create water-efficient gardens, through to the international Transition Towns Network that provides tools and processes for citizens to take local climate action (van der Heijden, 2014). These experiments seek to act on barriers that stand in the way of effective urban climate action. Such barriers may be political or legal (such as the difficulty of

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mandating retrofits and upgrades for existing parts of cities), financial (such as split incentives between those who pay and those who gain from urban climate action), technological/behavioural (such as a mismatch between sustainable design and sustainable use of cities) and social (such as the risk of negatively affecting disadvantaged groups by requiring costly climate action) (van der Heijden, 2017).

The turn to experimental urban climate governance observed since the early 2000s is more than a pragmatic, local government–led approach to solving problems experienced in implementing national requirements (see Chapter 6). Urban climate governance experiments bring together local governments, private actors and civil society actors in formal and structured processes of developing, demonstrating and trialling new forms of authority and governance instruments to address climate challenges at the city level (Bulkeley *et al.*, 2015). Scholars are confident about their ability to draw lessons from experiments about what governance interventions work, where and how, and to scale them up or extend them out across the city in question, and even to other cities and countries (Sassen, 2015).

But what drives cities to experiment with innovative governance instruments in the first place? Again, the literature identifies various motivations. A first and somewhat structuralist understanding relates to the privatisation of (local) public service delivery that started in the 1970s (Hodge, 2000; van der Heijden, 2010), the 'reinventing of government' and implementation of new public management practices since the 1980s (Osborne and Gaebler, 1992; Hood, 1995) and the larger shift from government to governance that has been documented since the late 1990s (Rhodes, 1996, 2007). City governments are no longer considered the executive branch of national governments, merely implementing national legislation and regulation (Pierre, 2011). They are increasingly expected to deliver local services themselves (or have local services delivered by others) in an effective and efficient manner, and have to be transparent about their actions and be fully accountable for these – for instance through 'smart city' rankings and urban climate indexes (López-Ruiz, Alfaro-Navarro and Nevado-Peña, 2014). Facing these increasing expectations – and often assuming that satisfying them aids local economic development (an expectation that is not always based on sound evidence; see Schragger, 2016) – local governments then have little choice but to reach out to local private and civil society actors and search for innovative governance instruments. This is even more the case in a policy area like climate change, where city governments lack experience or prior knowledge about which interventions yield the most desirable outcomes.

Another literature assigns more agency to local governments, private and civil society actors. Rather than considering changing institutional and other structural conditions as forces that tie them together, it considers that all governments wish to be actively involved in addressing urban climate challenges in collaborative

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processes and experiments (Bingham, 2006; Hohn and Neuer, 2006). This branch of the urban climate governance literature has very high hopes and expectations for the outcomes of these experiments (see Chapter 6). By involving a wide range of stakeholders in the development of governance instruments, their tacit knowledge can be used. This is expected to result in instruments that are 'smarter' than those developed by somewhat distant bureaucrats (Lobel, 2012). Also, by involving a range of stakeholders, instruments can be developed through a consensus-building process that allows for deeper reflection on the advantages and disadvantages of the instrument for the various parties involved. This is expected to bridge their diverse and sometimes competing views (Bulkeley and Mol, 2003). It is further expected to increase the acceptance of the instruments that are developed and implemented and, correspondingly, to improve compliance with them (Walters, 2004). In terms of the design of the new governance instruments, scholars have focused on the move away from traditional deterrence-based, hard-law instruments that penalise non-compliance, such as building codes, to soft-law instruments that reward compliance and provide positive incentives. Such positive incentives come, for example, in the form of information, the ability to advertise compliant behaviour or some form of financial compensation (van der Heijden, 2016a). Scholars further point to a move away from mandatory governance instruments towards those that ask for voluntary commitments, again assuming that compliance is more likely when individuals and firms commit voluntarily to them (van der Heijden, 2014).

That being said, an emerging body of more empirically informed literature is rather more critical of the ability of cities to actually deliver on these normative expectations. It highlights that there is often a normative assumption in the urban governance literature that all experimentation is beneficial, and that whilst there is much talk about experiments and innovative instruments, their development and day-to-day performance are poorly understood (Johnson *et al.*, 2015). The small empirical knowledge base highlights that challenges abound, and are particularly found when it comes to scaling-up and scaling-out experiments. For example, rules and regulations may lag behind to formalise experiments into urban policy, economic conditions and finance may work against scaling or the experimental setting may not fully reflect the real-world setting an instrument has to operate in (Bulkeley, 2013; Schroeder, Burch and Rayner, 2013). A specific risk associated with urban climate governance experiments is that they target frontrunners and not the majority of firms and citizens. Hence, there tends to be a mismatch between what climate action frontrunners can achieve and what 'ordinary' firms and citizens are willing to accept and are capable of delivering (van der Heijden, 2017).

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In short, experiments are a popular focus for researchers and practitioners, but whether they will be successful in delivering governance instruments capable of quickly reducing carbon emissions and resource consumption at the city level remains an open question. In fact, many experiments have been found to result only in rather piecemeal solutions at best. Moreover, cities that are considered leading and lauded for their example-setting roles often are among the ones with the biggest environmental footprints (Johnson *et al.*, 2015). More problematically, urban climate experimentation is sometimes used to justify a neo-liberal development agenda and not an especially environmentally or socially sustainable one at that (Evans *et al.*, 2016). For example, it is highly laudable that certain multinationals are collaborating with cities to experiment with new information technology solutions to reduce vehicle emissions or city-related energy consumption – so called smart cities. But questions need to be asked about whether they do so out of altruistic motivations or whether they see this as pilot projects for creating new markets for their products (van der Heijden, 2014). Of course, both could in principle be true – hence the desirability of assessing the performance of climate governance experiments against multiple criteria (see Chapter 14).

5.4 Trans-local Collaborations

Yet another manifestation of polycentric urban climate governance can be found in the ongoing growth of trans-local or city-to-city networks, as well as a growth of city-to-citizen and city-to-business networks (van der Heijden, 2016b). Whilst city networks, city collaborations, sister-city agreements and so on are not a fully novel development, the active networking of cities in the area of climate action stands out from earlier, somewhat more passive initiatives (Jayne and Ward, 2017). These active networks are important but informal bodies at trans-local and international levels, comprising formal bodies at the local level (Jordan and Turnpenny, 2015). They allow cities to learn from each other, jointly experiment and seek governance solutions to urban climate problems and, perhaps most important, to bypass their national governments in the international arena. Three well-known city networks are ICLEI – Local Governments for Sustainability (originally the International Council for Local Environmental Initiatives), the C40 Cities Climate Leadership Group and the Covenant of Mayors for Climate and Energy. The first is an international network of more than 1,500 cities, towns and regions founded in 1990; the second is a network of more than 80 of the world's largest cities founded in 2005; and the third is a network of more than 7,000 local and regional authorities (mostly from European countries) founded in 2008.

To what extent do these trans-local networks help overcome regional and national barriers to climate governance, and what barriers do these networks

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themselves raise for cities in responding to climate change? Sometimes a distinction is made between 'first-wave' and 'second-wave' networks. The first attempt made to push cities to act on climate change was made by ICLEI. It strongly focused on trialling and disseminating knowledge about technological solutions for climate mitigation. Following on from this, academics began writing 'best practice' books that were often linked to the then-popular notion of green growth and ecological modernisation. The first-wave city networks strongly revolved around creating knowledge for cities by cities (Jayne and Ward, 2017). C40 and the Covenant of Mayors can be considered 'second-wave' city networks. For these second-wave city networks, knowledge creation and dissemination is still important, but they also seek to have the voice of cities included in international climate negotiations (Johnson *et al.*, 2015; it has been argued that first-wave cities are now engaged in this too). Representatives of ICLEI, C40 and the Covenant of Mayors were, for example, highly active at COP21 and COP22 (see earlier). Such international events allow cities to showcase their best practices, and challenge their nation states and others to go one step further in their commitments to climate action.

There is some evidence that city networks help overcome regional and national barriers to climate governance, including the difficulty of developing and implementing mandatory regulation and the lack of institutional capital in, particularly, smaller municipalities (van der Heijden, 2014). Progressive cities in less progressive nations may find like-minded cities in more progressive nations – there is an abundance of information available for members and non-members on the websites of these networks. By combining resources (funds, staff and so on), these networks are, in theory, capable of carrying out more rigorous experiments than cities can achieve on their own (Bansard, Pattberg and Widerberg, 2016). That said, even though such networks are reporting successes, it remains doubtful how valid these statements really are. The quality of data underlying the statements is sometimes questionable, simply because it is exceptionally difficult to measure reductions in carbon emissions or even energy consumption at the city level (Bulkeley, 2013). The networks might attract already well-performing cities rather than poor-performing ones and provide an unrepresentatively high willingness of cities to take climate action (van der Heijden, 2017). The reported successes might work in one city but not another. Thus, a big challenge for the climate networks is to find a balance between providing very general and very tailored information on governance interventions (Johnson *et al.*, 2015). Finally, cities may seek to join these networks seeking co-benefits that may not always stem from a genuine concern about climate change. For example, by participating in the networks, cities hope to attract investors, new workers and residents (Brenner, 2004; Jonas, Gibbs and While, 2011).

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In short, while the urban climate governance literature was initially positive about the opportunities provided by city networks and their potential to spur urban climate action, recently it has taken a more critical turn. Moving beyond questioning the successes reported by these networks, scholars have pointed out that they easily become 'networks of pioneers for pioneers' (Kern and Bulkeley, 2009). Rather than being all-inclusive, the networks run the risk of becoming exclusive clubs that only provide benefits (such as knowledge on urban climate action, or being represented in international climate change negotiations) to their members, somewhat at odds with some of the normative assumptions of polycentric theory (see Chapter 1). Others have highlighted that even members of a network do not always have equal access to all the benefits of membership (Lee, 2015). For example, cities in the global North may find it easier to bear the costs of sending representatives to networking events than cities in the global South. An issue that has received less attention in the literature thus far is that these networks may produce an illusion of active and successful cities in the area of climate action (van der Heijden, 2017). While both ICLEI and C40, for example, proudly advertise the proportion of the global urban population that they affect – 25 and 15 per cent, respectively (C40, n.d.; ICLEI, n.d.) – it could just as well be argued that after three decades, many cities are still not members.

Furthermore, by looking at the urban governance experiments and innovative urban governance instruments that these networks consider illustrative of outstanding performance, it becomes clear that many only deliver quite moderate rather than transformative climate action. For example, the C40 network has an annual awards ceremony, the Climate Change Leadership Awards, to '[reward] important, innovative policies and programmes that reduce emissions and improve sustainability' and to 'recognize those successes, catalyze ambition, and share lessons with cities around the world' (C40, n.d.). In 2013, one of these awards was given to 1200 Buildings in Melbourne, a programme that supports property owners in finding finance for building retrofits. At the time that it was awarded for being a 'world-leading governance innovation for improved urban sustainability' (C40, n.d.), only a mere five buildings had actually been retrofitted. In 2014, an award was made to the Amsterdam Climate and Investment Fund, a revolving loan fund. This was made to the city of Amsterdam for its 'leading position in the transition to low-carbon cities' (C40, n.d.), but at the time it had only issued some five loans, mainly to support highly conventional technological upgrades of buildings (see, for further examples, van der Heijden, 2017). If such action is among the best within the member cities, one may wonder what the rest are up to, and whether cities are really being truly challenged by their city networks to take ambitious climate actions.

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There are, of course, good reasons for these city-to-city networks to provide their members with exclusive rewards, to put them in the spotlight in the international arena and to create a narrative of climate activity initiated and supported by them. The supply of networks is sufficient – to the extent that some have to compete for members. On a more positive note, showcasing good practice, however marginal, may spur other cities to take action too. But too much promise and too few results could just as easily backfire. For example, whilst ICLEI initially attracted many cities in the United States, substantial numbers have terminated their memberships as a result of changing political ideologies, interest group pressures and declining membership benefits (Krause, Yi and Feicock, 2015). It has been observed that some of these networks have over time become increasingly neo-liberal, seeking to expand and hold their membership base. Rather than a race to the top, there is a risk of a race to the bottom, in which the survival of the network becomes an end in itself (cf. Johnson *et al.*, 2015). Put differently, the (dominant) city networks may even become a victim of their own success. With a growing membership base came a need to professionalise and formalise, but with the move from being voluntary networks of cities to being large and powerful city interest groups came all the problems that are typically found in bureaucratic organisations – turf wars, a focus on quantity over quality and managerialism (see further Wilson, 1989). That said, absent a benchmark of what constitutes 'good performance', it may be difficult for cities and their networks to spur city-level action that is genuinely transformative. Without that, it is also very difficult to assess the efficacy of cities as units in systems of polycentric governance.

5.5 Conclusions

This chapter has addressed polycentric urban climate governance in action. When stepping back and reflecting on the various examples and forms of polycentric urban climate governance discussed, a number of observations stand out. First, city governments often set higher climate action ambitions than the nation states they are in. Second, cities are very active in experimenting with novel climate governance instruments. In doing so, cities self-organise active collaborations with private and civil society actors. Third, cities participate in trans-local and often international networks to develop and share information about urban climate mitigation and adaptation, and seek to influence international climate negotiations. Policymakers, practitioners and academics often express high hopes for city governments and other urban leaders in addressing climate change. The forms and examples of (polycentric) urban climate governance discussed in this chapter are repeatedly used to argue that it will be cities rather than nation

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states that will take the most meaningful climate actions in the future (Barber, 2013; Sassen, 2015; Knieling, 2016). One could frame it even more dramatically than this, as did the former UN Secretary-General, quoted in the epigram of this chapter.

But how well-founded is Ban Ki-moon's trust in the capacity of cities (including local governments and private and civil society actors) to take meaningful climate action? In line with other critical scholars (Johnson *et al.*, 2015), this chapter urges some caution when considering cities 'the *key* to addressing the global climate change problem' (C40, n.d.; emphasis added). First, some care. The forms and examples of polycentric urban climate governance discussed in this chapter point to a growing reliance on private and other non-governmental actors in collaborative governance processes. Urban governance theory easily assumes that efficiency through such collaborations and democracy go hand in hand (Davies and Imbroscio, 2009). Yet the involvement of private and other non-governmental actors, particularly multinational companies, pushes urban climate governance further towards neo-liberalism and market-based interventions, and further strengthens the focus on technological fixes rather than behavioural change (Johnson *et al.*, 2015). Also, with cities acting independently of their national governments, national climate policies no longer ensure that all citizens contribute equally to and benefit from climate action. This begs a need for stronger accountability systems (see Chapter 19), involving (perhaps elected) city officials who can represent and look after the interests of all citizens, especially those more vulnerable to its impacts (Pierre, 2011).

Second, some realism. Whilst the polycentric urban climate governance literature is burgeoning, scholars – myself included – only tend to focus on a handful of (leading) cities. More often than not, these are part of the three main, dominant city networks. The more active cities in these networks – the ones, incidentally, that receive the most scholarly attention – tend to be larger cities in the global North. Yet, whilst climate change is on the agenda of some of the larger cities, particularly in the global North, it should be remembered that in many others it is not: '[c]limate change simply remains "un-governed" in cities' (Bulkeley, 2013: 104; see also Reckien *et al.*, 2014). In short, we have substantial knowledge about polycentric urban climate governance in a small number of predominantly large cities in the global North, but we know very little about polycentric urban climate governance in general. Hence, we are not well equipped to determine how far cities are genuinely capable of self-organising (Johnson *et al.*, 2015) as polycentric theory suggests. This is troubling for two reasons. First, urbanisation is taking place predominantly in the global South, particularly in Asia and Africa. Solutions that are found to 'work' in the global North are often found to generate less positive outcomes when

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transferred to the global South – or even have negative outcomes there (Gupta *et al.*, 2015; van der Heijden, 2017). Second, it remains unclear whether the trends visible in large cities are also found in smaller ones (Sassen, 2001). Smaller cities likely face different barriers than larger cities and have fewer capacities than their larger neighbours. Hence, solutions that are found to 'work' in larger cities may not easily transpose to smaller ones (Homsey and Warner, 2015).

Third, some downscaling of expectations. Following on from these points, the evidence base to support claims about the opportunities and constraints of (polycentric) urban climate governance is thin at best – and at worse may be imbued with a great deal of wishful thinking. There is no doubt that city governments and other local leaders (including private and civil society actors) are organising themselves around specific urban climate challenges to better understand how these can be addressed, following more or less formalised rules, and do so independently from national governments. It is particularly hopeful to see highly progressive cities in countries that are very conservative when it comes to taking climate action – for instance those that have (or had initially) not ratified the Kyoto Protocol or the Paris Agreement (Lee, 2015). Yet the room cities have for climate action is shaped by the prevailing national, political and legal context (Johnson *et al.*, 2015). In particular, the national, legal and policy setting hampers what cities can do locally in terms of self- and facilitative governance, limiting the possibilities for self-organisation by cities (Schroeder and Bulkeley, 2009; Schragger, 2016). Thus, some of the high hopes that have been expressed about the benefits of polycentric climate governance are not being borne out in practice. This begs the need for a more critical approach to studying polycentric urban climate governance than has hitherto been the case.

To conclude, it is difficult to determine whether polycentric urban climate governance will be 'the key to addressing the global climate change problem' (C40, n.d.). It is encouraging that city governments and other urban leaders have begun to reach out to each other, have begun to take climate action that reaches beyond action taken by nation states, and have not been unduly held back by the lack of formal (inter)national recognition. It is troublesome, however, that polycentric urban climate governance has been studied only in a relatively small number of cities, that we have a limited knowledge base about whether it really delivers on its promises, and that we have a very poor understanding of what this approach to governing means in areas with the very highest levels of urbanisation, namely those in the global South, and particularly Asia and Africa.

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Part III

Polycentric Governance Processes

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6

Experimentation

The Politics of Innovation and Learning in Polycentric Governance

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6.1 Introduction

Polycentric thinking seeks to develop a more holistic picture of governance (see Chapter 1). Polycentric governance theory acknowledges that, in addition to nation states, other initiatives contribute to the shaping of collective orders. They involve local governments, businesses, civil society organisations and social movements. A core proposition identified in Chapter 1 is that an experimental search for governance arrangements within diverse local settings will lead to effective solutions, performing better than states or some kind of monocentric, globally oriented system of governance. This reflects awareness of complexity and limits of central control, which require 'reflexive governance' (Voß and Kemp, 2006).

An interesting paradox, however, is that while polycentric thinking acknowledges the complexity of ecological and social systems, it says little about the complexity of social processes that are involved in devising, carrying out and evaluating experiments. This leads to a highly reductionist conception of governing. Of course, experiments help involved actors to learn about what is actually being tested and they contribute to problem resolution in that way. But how are decisions taken on *what to test* and *how*? What role do politics and power play here and how do they affect the experiments? Do actors experience different effects from the outcomes of experiments with new forms of collective order, or already from the process of undertaking them? To what extent are their various concerns and aspirations addressed by experimental processes, and how are they negotiated with each other? If we consider that all experimentation is deeply embedded in institutional, cultural and material settings and asymmetric power relations, we quickly realise that just by leaving institutional development up to decentralised trials, we may not promote universally best solutions, but in fact

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help already powerful actors to assert their visions of collective order against others (cf. Voß and Bornemann, 2011).

Our first aim in this chapter is to increase awareness of the fragility of expectations that are linked with this conceptual weakness in polycentric governance thought. We point to the idealistic assumptions about experimentation that the current discourse of polycentric governance hinges on. Following from this, our second goal is to offer a systematic account of where and how politics play out in the course of doing experiments, and to draw attention to the fact that in real-world contexts, experiments are likely to be shaped by asymmetric power relations. Our third goal is to caution against the uptake of polycentric and experimental governance concepts for orientating or legitimating governance interventions, unless a more realistic understanding of the practices of experimentation is taken as a starting point.

Before we start, let us introduce two key terms that we refine as we move along. Experimentation refers to the *deliberate production of experiences for finding out what works*.[1] Politics is understood as the *making of collectively binding decisions* selecting from a diversity of deliberately judgments some to be realised.[2] Broadly defined, the politics of experimentation thus occur whenever, throughout a process of creating novelty and making experiences, diversity is transformed into unity. Most obviously, this happens when controversies over findings are fought out in public, but it also occurs more inconspicuously when decisions are made about what needs to be known, which hypotheses are to be tested and which observations are to be made. Often, no one cares to contest such decisions as they are thought to be just epistemically, but not politically relevant.

6.2 Experimentation in Polycentric Governance

A closer look at the polycentric governance literature reveals that, even if it has developed into a much broader evolutionary philosophy of governance, it still carries forward some of the ontological assumptions from institutional economics (Ostrom, Gardner and Walker, 1994; Ostrom, 2011; Cole and McGinnis, 2014; Thiel, 2016). Polycentric governance theory emphasises decentralisation, local embedding and responsiveness to specific contextual conditions, along with the potential to mobilise entrepreneurial initiatives, also against incumbent powers and rigid institutions. The underlying imaginary is a constantly evolving institutional landscape (see Chapter 1). As such, the concept immediately attracts attention as a preferable alternative to the cumbersome business of coordinating state action on global problems like climate change through international diplomacy (Ostrom, 2010; Cole, 2015; Dorsch and Flachsland, 2017). The concept offers hope in times when ‘big politics’ appears to fail. Yet the expectation is not only that self-

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organisation will step in to fill gaps that are left open by state government and international institutions. The current discourse also raises the expectation that it would be actually preferable to actively withdraw state oversight to leave more space for self-organised institution building, because this would produce forms of governance that are better adapted to a diversity of socio-ecological contexts, and would thus be more effective and legitimate.

All this hinges on particular assumptions about experimentation that are imported from the functionalist evolutionary theory of institutional economics that originally inspired the articulation of the concept. First, there is the assumption that new institutions are freely created (in effect, randomly generated variations). And second, that selection works on the basis of feedback and adjustment within particular contexts (leading to a survival only of the fittest, best-adapted institutions that generate maximum utility for those who adopt them). Only if these assumptions about the inner workings of experiments are correct can we assume that experiments deliver trial-and-error learning that eventually results in governance that works well for all. When these assumptions are incorrect, however, the result would be quite a different scenario. Curtailing the regulatory monopoly of the state and liberalising the market for experimental institution building may, in this scenario, fail to bring about a world of governance bubbling with creativity and responsively adapting to the needs of the people, and instead lead to the emergence of a private oligarchy that can work more or less undisturbed by constitutional rules, public accountability and democratic control – which would have applied under a more monocentric or state-led system of governing.

Let us take a closer look at experimentation in polycentric governance. It generally appears as a central proposition in the discourse (Ostrom, 2010; Cole, 2015: 115; Dorsch and Flachsland, 2017; see also Chapter 1). There is overlap with partly connected discourses of experimentalist governance (Sabel and Zeitlin, 2012; De Búrca, Keohane and Sabel, 2014) and experimentation for sustainability and decarbonisation (Kemp, Rip and Schot, 2001; Hoffmann, 2011; Sengers, Wieczorek and Raven, 2016), or more specific discourses on urban experiments (Bulkeley and Castán Broto, 2013; Bulkeley, Edwards and Fuller, 2014; see more generally Ansell and Bartenberger, 2016). Despite its centrality, however, the concept of experimentation is weakly developed in polycentric governance theory. Experiments are primarily understood as idealised methods, or are understood through the lens of *expected effects* (producing a variety of new and robust innovations), but not so much through the lens of the *social processes* in which they are done and from which actual effects could emerge.

We can discern two strands of philosophical thought in the literature on experiments in governance: a *positivist-utilitarian* strand and a *pragmatist-*

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interpretivist strand. In both strands, experiments are understood to generate solutions to perceived problems by trying out what happens when visions are put into practice. A fundamental difference is, however, that the former sees experiments as a process of *adapting to reality*, and the latter sees them as a process of *making reality*. Let us elaborate. The positivist-utilitarian framework assumes that the subjective and the objective world are ontologically separate. The generation of theoretical hypotheses is a matter of human ingenuity while the senses, if methodically controlled, can provide neutral data of an independently existing, objective world. The key task of experiments, then, is to provide empirical observations for selecting theoretical hypotheses about institutional designs and their effects (Campbell, 1969; Stoker and John, 2009; Abbott and Snidal, 2016). Within the pragmatist-interpretivist framework, however, the world is understood to be essentially in flux. Subject and object are both part of this process. Within it, human imagination and the material world constitute each other, mediated by motoric and perceptual capabilities, in active human interventions and the experiencing of consequences. Experimenting thus is a way of deliberately changing the world. It enables learning, not about a pre-existing reality, but about the possibilities of knowing and doing reality differently. It is never neutral, but always geared towards specific concerns, and irreversibly transforming the world (Dewey, 1986; Evans, 2000; Ansell, 2016).

While epistemologically these two strands of experimental philosophy are fundamentally different, neither of them provides fine-grained discussions, or illuminating empirical analyses, of experimental processes in governance. In both strands, there is little concern for social interactions and the nitty-gritty of actually doing experiments. As a result, they both neglect the *politics of experimentation*. Positivists see experimentation as a way to bypass the political resolution of conflicts because 'nature' becomes instituted as a neutral arbiter. Decisions are handed over to the 'jury of experience', which becomes objectified through methods of science (Norton, 2005: 79). Pragmatists, in contrast, do not assume neutrality, but unanimity or at least equality in the process of collectively conducting experiments (Wilkinson, 2012). They assume that social interactions unfold under conditions of freedom and symmetrical relations – as explicated, for example, through Habermas' (1981) model of communicative action or Lindblom's (1965) model of mutual adjustment. If politics is mentioned, it is restricted to something that exists outside of experiments: to how experimenters struggle with incumbent interests and ideologies or how different experiments compete for space (Misiko, 2009; Hoffmann, 2011; Bulkeley *et al.*, 2014; Evans, Karvonen and Raven, 2016).

The possibility that experimentation may be *captured by dominant interests* and used for them to realise their own particular visions of collective order is ignored in

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current discourses of polycentric and experimental governance, either because it is assumed that objective conditions will determine the course of experiments or that power is absent or symmetrically distributed among those involved in and affected by experiments. That is the case despite empirical case studies suggesting that experimentation in governance is imbued with conflicting interests and asymmetric power relations.

A prominent example is the case of 'transition management', which is heralded as an approach for experimentally searching for pathways of sustainable system transformations in energy, agriculture, mobility and so on (Kemp and Rotmans, 2009; Voß, 2014). Experience with transition management in the Netherlands has shown that the process of defining experimental agendas and evaluating results can be easily captured by incumbent networks of administration officials and big companies for pursuing innovation strategies especially geared towards the growth and competitiveness of particular branches and firms (Kern and Smith, 2008; Heiskanen *et al.*, 2009; Kern and Howlett, 2009; Meadowcroft, 2009). This demonstrates the relevance of considering politics and asymmetric power relations, if experiments are not to undermine democracy and allow powerful actors to assert their interests (Hendriks, 2008, 2009; Voß, Smith and Grin, 2009; Voß and Bornemann, 2011; Pel, 2016). Because we seek to address this deficit in the conception of polycentric governance, we now move to discuss where the politics of experimentation can be found more specifically.

6.3 The Politics of Experimentation: Configuring Experimental Infrastructure

The practice of experimental inquiry has been a focus in science and technology studies. This led to the insight that experimentation is a social process, with decision-making deeply embedded in historically grown cultural and institutional patterns with asymmetric relations and established power positions. A key finding of so-called laboratory studies is that experimentation not only takes place within a societal context that affects what comes to be known, but also within specifically configured material settings that are deliberately shaped according to particular research interests and theoretical constructions of the phenomena that are tested (Knorr-Cetina, 1995). Massive laboratory complexes are a case in point, but this also applies in less visible configurations as when sight is focused through a telescope or field studies are conducted by systematic surveying and the drawing of probes (Latour, 1999). The general point is that, in practice, experimentation occurs in socio-material settings that are preconfigured according to some theoretical model of what it is that is to be tested, and that they, to a greater or lesser degree, provide for seclusion from the wider world (Callon, Lascoumes and Barthe,

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2009). This is one of the key conditions of success for modern science: by reducing, simplifying and purifying a complex macrocosm of 'reality out there', already before any experiences are made, it makes specific phenomena experimentally demonstrable and knowable that would otherwise always be overwhelmed by the complexity of actual interactions and continuous change. In effect, experimentation fabricates the realities that it comes to know, rather than discovering them in nature (Knorr-Cetina, 1981; Hacking, 1992; Rheinberger, 2005). This includes the careful composition of a collective of trained and professionally disciplined experimenters to cultivate convergent ways of thinking, intervening and sensing (Fleck, 1994).

Experimentation thus appears as a particular mode of collective ordering, working through three steps (see Figure 6.1): (1) the selective *reduction* of reality 'in the wild' by building simplified local realities; (2) the experimental *construction* of local realities for the creation and controlled reproduction of theorisable phenomena in a confined setting; and (3) the *expansion* of experimentally created orders, by claiming that theories and data describing these phenomena represent universal properties of nature and by developing technology to replicate them elsewhere.

In these three steps, the world becomes creatively transformed. At least with the final step of expanding experimentally configured orders, they also come to be binding on others who were not involved in making them. Against this background, scientific experimentation is claimed to work as 'politics by other means' (Latour, 1983) or as a form of 'ontological politics' (Mol, 1998).

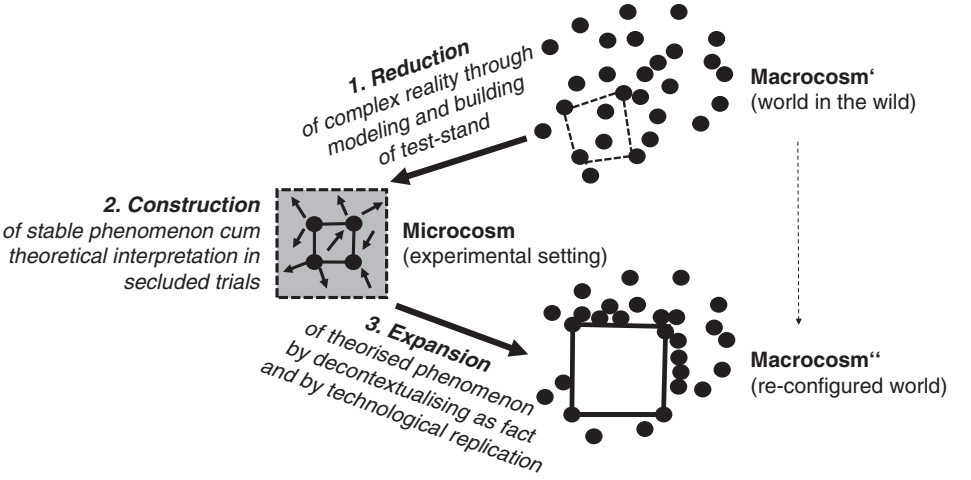

Figure 6.1 Experimentation as 'secluded research'. Source: Callon *et al*. (2009)

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An illustrative example from the world of climate governance is the way in which the Kyoto Protocol's Clean Development Mechanism (CDM) was given shape through experiments that were set up for testing how emission reduction commitments under the United Nations Framework Convention on Climate Change (UNFCCC) could be fulfilled through international cooperation. A reconstruction of the process shows how experimentation in pilot projects not only produced special expertise, exemplary working arrangements, and more generally applicable methods but also contributed to realise a particular version of international cooperation. This version was very much geared towards the interests of private investors, as it allowed the trading of carbon emission offsets (Schroth, 2016). When the concept of 'joint implementation' of national reduction commitments was introduced in the late 1980s by the Netherlands and further developed by Norway and the United States, it was highly controversial (Paterson, 1996; Trexler and Kosloff, 1998). Concerns over international justice, asymmetrical power relations between the North and South (see Chapter 18), capacity-building and technology transfer, efficiency and reduced costs for fossil-fuel intensive industries, as well as the mobilisation of private capital and the making of new markets, suggested different directions for developing the proposal and different criteria for evaluating what works. From early on, however, advocates like Norway, the Netherlands and the World Bank started with experiments to test and demonstrate how international cooperation could work. In the late 1980s, they started with small-scale experiments to generate emission offsets by electric companies investing in reforestation projects in Guatemala. In the early 1990s, projects with energy efficiency investments in Mexico were undertaken. From 1993, experimentation with joint implementation proliferated through a dedicated programme set up by the US government (Jepma, 1995). In 1995, the UNFCCC officially endorsed a pilot phase, then called 'Activities Implemented Jointly'. The insights and technical designs that were brought forward in these experiments turned out to reflect concerns about the mobilisation of private capital and establishing a new market more than any other of the concerns originally raised and politically debated under the UNFCCC. With the social momentum, evidence and the technical solutions that were generated, a decade of experimenting had created a new reality. With the 2001 Marrakech Accords, experimentally constructed arrangements for a CDM were finally adopted as a flexible mechanism for implementing international commitments under the Kyoto Protocol.

Next, we take a closer look at what is at stake in each of the three dimensions of reduction, construction and expansion and where asymmetric power relations can shape the experimental process.

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6.3.1 Reduction: Modelling the World and Building a Test-Stand

A first point at which decisions are taken is that a research problem is identified and a basic analytical framework is deployed, which is then translated into the design and installation of a 'test-stand'. This is a specifically prepared observational setting, 'a simpler, more manipulable reality' that replaces the unselected and overwhelmingly complex world as it actually unfolds 'in the wild' (Callon *et al*., 2009: 50). Many foundational decisions are thus taken before the actual experimenting starts. During the subsequent process, however, these arrangements move into the background, working as a hidden experimental infrastructure that is taken for granted as 'trials on nature' proceed. The presumptions and considerations that led into decisions on this initial set-up, or reflections on what was excluded from the outset and could therefore not be observed, tend to be forgotten when results are publicly presented (Latour, 1987).

An example from the CDM case is that particular forms of economics and engineering expertise had been assembled with a focus on testing methods to verify emission reductions per invested dollar, by measuring emissions of several greenhouse gases, calculating baseline scenarios and allocating portions of declared reductions between host and investor. Specific projects and sites were selected against the background of this framing and agreements with involved actors were negotiated in this orientation (Schroth, 2016: 82–107). While these methodological decisions were presented as technical issues, they presupposed a decision for cost-efficiency and the mobilisation of private capital as primary purposes of joint implementation – an issue that in the wider public and in the UNFCCC was still controversially discussed.

6.3.2 Construction: Creating Ordered Phenomena in Seclusion

The actual carrying out of trials starts within a reality that has already been selectively reduced. It then takes place through an iterative process of refining theoretical propositions, designing interventions, making observations and fine-tuning the material setup for the next round of experiments. This involves decisions to specify the experimental agenda in dealing with situational contingencies and to arbitrate between various possible ways to make sense of what happened. Even if attempts are made to objectify criteria, it involves 'interpretive flexibility', which is to be overcome by social means like status, threat, rhetoric or negotiation (Gilbert and Mulkay, 1982; Collins, 1983). Making decisions within the research collective thus is a form of micropolitics that helps to arrive at shared results and create a new way of collectively knowing and doing reality among selected actors and within a confined local setting (Callon *et al.*, 2009: 52).

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In the case of the CDM, crucial design issues and conclusions on the outcomes of experiments were resolved among experts involved in the pilot projects, coming from non-governmental organisations, the Organisation for Economic Co-operation and Development, the World Bank, research institutes, companies and agencies (Schroth, 2016: 108–129). They translated the issue of shared global responsibility for climate change into an issue of measuring emission effects of investments, thus bypassing political processing of diverse concerns and instead pursuing a particular concern as an epistemic and technical matter of testing facts. Working out ways to make joint implementation work was thus removed from the political forum of the UNFCCC and shielded from broader public scrutiny. The selected group of experts eventually came to the conclusion that 'in the absence of credits, investments in [joint implementation] projects will not reach the level necessary to fully realise the potential of this concept' (Dixon, 1998: 3) – a technical answer to many politically fraught questions related to crediting, the involvement of private investors and even the overall purpose of international cooperation projects in the first place.

6.3.3 Expansion: Generalising Local Achievements

Finally, politics occurs in the generalisation of experimental findings. Initially, findings are only locally true. The challenge is to turn what a few people have learned within a particularly configured experimental space into a collectively shared fact. This requires a disconnection from specific interpreters and circumstances. Descriptions must be formulated in abstract, decontextualised ways. In order to reproduce findings and use interventions that have been tested in the confines of the experimental setting, the experimental infrastructure needs to be turned into a 'technology', a transportable package with a reliable function. In effect, it also requires that other sites within the macrocosm are reconfigured after the model of the experimentally arranged microcosm: 'For the world to behave as in the research laboratory, . . . we simply have to transform the world so that at every strategic point a "replica" of the laboratory, the site where we can control the phenomena studied, is placed' (Callon *et al.*, 2009: 65). To achieve this, the experimental collective needs to recruit broader support, mobilise collective action and build legitimacy in interaction with powerful stakeholders and broader publics.

In the example of the CDM, this challenge is clearly visible in bringing results from experiments back into the UNFCCC (Schroth, 2016: 130–148). Crucial for this was the generation of support by raising economic interests in replicating experimentally configured solutions. The World Bank played a key role here. It adopted procedures and methods, as had been developed in pilot

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projects under the US joint implementation programme, and adopted them in the guidelines for a new fund for private investors, the Prototype Carbon Fund. A larger constituency of firms and governments was thus enrolled for installing a new wave of projects after the concept of joint implementation as developed in the pilot projects, and thus for replicating that experimentally configured reality elsewhere. This generated momentum, which eventually led to a shift in international negotiations under the UNFCCC as resistance against a private offset market from the alliance of G77 and China crumbled (van der Gaast, 2015). Finally, after the pilot phase of Activities Implemented Jointly, it was stated as a matter of fact that it 'has demonstrated that, for the Kyoto project-based flexibility mechanisms to work effectively, the private sector will need to be engaged through appropriate incentives' (UNFCCC, 1999: 6).

Since decisions taken within the experimental collective only really start to affect others when experimental creations are expanded, the process of mobilising acceptance and support for replication is a key moment in the politics of experimentation. This is where the micropolitics of experimentation turn into macropolitics. In polycentric theory, this is usually rather unproblematically referred to as diffusion and 'upscaling'. In the following section, we take a closer look at two specific mechanisms and at how they work together.

6.4 The 'Scaling Up' of Experimental Results

6.4.1 Generating Epistemic Authority: Performing the 'Representation of Nature'

A first way in which locally generated truths can expand is by gaining acceptance for the claim that they are indeed of wider validity and importance. To this end, results are formulated in abstract and general terms, as decontextualised accounts that can circulate, while linkages with the actual experiment are maintained as chains of reference. By erasing particular concerns, interactional dynamics and situational contingencies that shaped this particular process, the experimental findings are turned into neutral representations of universally given conditions of nature. As such, they appear relevant even for those who were not themselves involved in the creative production of these findings, neither taking constitutive decisions nor actually making experiences (Gilbert and Mulkay, 1982; Shapin, 1984; Latour, 1987). If the claim to represent nature becomes accepted by a wider audience, local experimental findings are vested with epistemic authority. 'Applying' them for a reconfiguration of collective orders elsewhere thus shifts from being a matter of trusting that decisions among experimenters also reflect

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one's own values and measures of relevance into a matter of rationally coping with factual requirements.

In the process of innovating governance instruments like emissions trading (Voß, 2007a; Simons, Lis and Lippert, 2014), transition management (Voß, 2014) or methods of public participation (Voß and Amelung, 2016), it has been shown how the translation of findings from experiments into authoritative epistemic claims led to the establishment of facts about their functioning among a growing constituency. This is an achievement that is not necessary nor irreversible. The expert literature plays a key role here, as it establishes facts about the functionality of a general model of governance across a series of experiments (Simons, 2015, 2016).

6.4.2 Generating Political Authority: Mobilising 'Instrument Constituencies'

A second way of expanding experimentally shaped orders is by generating collective will and agency for developing experimental findings into a general instrument for solving problems of governance. In addition to generating epistemic authority, as described earlier, collective action can also be mobilised by attracting wants and desires of actors from beyond the original experimental collective. Additional actors may become enrolled for the aesthetic attraction of a world modelled after the experiment or for the expectation that it solve their own problems or otherwise benefit them, if practical efforts were undertaken to reproduce the experimental order beyond the confined setting of first trials (Akrich, Callon and Latour, 2002). Supporters may, for example, be recruited by raising expectations of increased demand for products and services, or of institutional authority and expert positions in fields like public administration, business, civic activism, science etc. (Voß and Simons, 2014: 739). Apart from mobilising a wider array of actors, there is the challenge of orchestrating an enlarged constituency with more diverse attachments and expectations. This involves the articulation of 'representative claims' (Saward, 2006) on a collective will and interest in developing the experimental configuration into an instrument. When they are adopted by constituency members, this 'produces temporarily associated wills' (Latour, 2013: 133) and generates political authority to be used for legitimately articulating collective action strategies and norms.

A dedicated effort to enrol a wider set of actors for the expansion of early experiments with emissions trading can be seen in 'Project 88' (Voß, 2007b; Simons, 2015). It was initiated by committed members of an experimental collective that emerged around the first trials with emissions trading at the US Environmental Protection Agency (EPA) in the 1970s. The project brought together spokespersons from industry and the environmental movement, from different states and from the US Republican and Democratic parties. Through

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a series of workshops and negotiations, it eventually produced a policy proposal supported by a widespread and influential constituency (Project 88, 1988). This in turn was taken up by the incoming president, and the constituency was mandated with the task to install the US Acid Rain Program as the then-largest emissions trading programme. Though the Acid Rain Program was not concerned with greenhouse gas emissions, it became a crucial stepping stone for inserting emissions trading into climate policy and expanding the constituency transnationally, such as founding the International Emissions Trading Association in 1999.

6.4.3 Co-producing Epistemic and Political Authority: 'Realising Governance'

So far, we have highlighted various points at which politics occurs in the experimental process. Studies which follow particular models of governance along their historical pathways of development also show, however, that they become articulated over a series of different experiments (Muniesa and Callon, 2007; Callon, 2009). Along the innovation journey of such models, one can find experiments that are geared specifically towards epistemic or political authority generation, as described earlier, and discern a ping-pong pattern in which they play together (Voß, 2014, 2016). Epistemically oriented experiments gradually produce harder facts on the basis of more sophisticated models that process more data and generate increasing evidence for arguing necessities and possibilities of collective action. They are carried out by experts in the laboratory or otherwise highly controlled circumstances, and are concentrated on fact-making in support of the functionality of governance models. Politically oriented experiments are associated to them. They gradually assemble broader and more powerful coalitions for installing larger real-world cases and for funding further research efforts to draw empirical data and provide evaluations. In these experiments, the focus is on testing claims about collective interests for policy-making and reconfiguring practices out in the field. Like pistons in a reciprocating engine, both types of experiments can so work together for the 'realisation' of new forms of governance, both in knowing and in doing (Voß, 2014).

Here again, emissions trading provides an instructive case. From the early 1970s until 2000, economic models and experiments 'in silico' have been developed in close interplay with policy coalitions and experiments 'in vivo' (Voß, 2007a; Simons, 2015). While designs and evidence of their effects were simulated in computer models, these results were taken up, for implementation, first in a tentative trial at EPA and later for the Acid Rain Program as a large-scale policy experiment. Both policy processes fed model-based experiments with data and

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mobilised public support for this kind of research. Epistemic and political authority in support of emissions trading were thus co-produced over a series of interconnected lab and field experiments (Voß, 2016).

6.5 Conclusions

We have shown that the experimental process involves several decision moments. Every decision has the effect of including and excluding, and of granting more central positions to some actors rather than others. It would be an illusion, or a tactical masking, to presume that experimenting could somehow delegate all those decisions to nature or objectify them through method.

Since there is an inescapable social component in all experimenting, we may expect established power relations to shape experimental agendas and outcomes. Studies of the actual conduct of experiments in governance testify to this point. Without any further provisions, a greater role for experimentation in the shaping of collective orders, as polycentric governance theory proposes, would allow a few already powerful actors to realise their particular visions of governance at the expense of others who do not get to test theirs. At the same time as it would provide spaces for unregulated power play, it would make politics less visible, because decisions about collective order would be displaced from political arenas to more or less closed projects in which selected experts and stakeholders negotiate the future in apparently technical terms. The neglect of politics in polycentric and experimental governance theory contributes to this.

What are we to make of this? A first point would be to be attentive to problem frames and deeper ontological presuppositions that are inscribed in experimental infrastructures. We need to have a closer look at the processes in which decisions are taken in this respect. To develop our understanding of experimentation, more detailed empirical studies are needed of how governance experiments are actually done and how politics and power play out at the micro level of social interactions within certain experimental projects. Which alternative problems, research questions, experimental designs, measurement options and interpretations of results are articulated, which ones are suppressed and how are some asserted against others? Following up on these questions would require an interpretive and practice-oriented research approach that allows for empirically tracing the negotiation of problem frames and ontological assumptions while experimental infrastructures are socially and materially configured.

A second point would be to build on such studies for explicating the politics of doing governance experiments and to start thinking about a constitution. So far, experimental politics, because of their existence in the shadow of critical analysis and public attention, allow the fittest to survive. For civilising the ‘Wild West’ of

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experimental politics, they would need to be turned into a public issue so that a wider discussion is opened about how they should be done and how overarching rules could be established (Thiel, 2016; see also Chapter 1).

Finally, what is at stake here are future world orders that are collectively to be cherished or endured by 'the people'. This brings democracy back in. The most crucial problems of polycentric governance as currently debated and advocated are that it ignores issues of legitimacy and justice by implicitly assuming some kind of pluralistic equilibrium (see Chapters 18 and 19). Yet, as polycentric governance 'escapes the control of nation states' (see Chapter 1), it simultaneously escapes the constitutionalisation of politics that has been fought over for centuries. Once upon a time, only princes and bishops experimented with governance. Polycentric governance, as it stands, would just evade democratic principles and open the field for new princes and bishops to emerge, perhaps in the shape of self-appointed sustainability stewards, experts, corporations and charities. Thus a major challenge is to make sure that experimental politics receive public scrutiny and to give it a solid democratic constitution.

Notes

1. We here refer to John Dewey's pragmatist conception of experimentation as inquiry (1986). As such, it is not limited to science or the production of theoretical knowledge, nor to specific settings and methods like laboratories or randomised controlled trials.
2. The usual reference for this formulation is Easton (1957), but we do not adopt a system-functional framework and rather take the effect 'collectively binding' as an occasion to empirically look out for the processes that constitute it. Here we deliberately look beyond legislation and include the cultural establishment of rationalities, values, facts and material arrangements, if respecting and adopting them is required for participating in a collective practice.

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7

Entrepreneurship
A Key Driver of Polycentric Governance?

ELIN LERUM BOASSON

7.1 Introduction

What do investment banker Tessa Tennant, former California governor Arnold Schwarzenegger, European Commission official Jos Delbeke and former London mayor Ken Livingstone have in common? They are all climate governance entrepreneurs. Drawing on academic studies of these and other entrepreneurs, this chapter argues that an entrepreneurship approach can help analysts to understand why some actors, in some situations, seem able to significantly accelerate, stall or shift climate policy and governance. Moreover, the shift towards more polycentric climate governance potentially affords governance entrepreneurs an even more important role as drivers or inhibitors of new governance developments.

Governance entrepreneurship is by no means a phenomenon that pertains *only* to polycentric governance. Over the years, political scientists and sociologists have explored how entrepreneurship plays out in a wide variety of contexts (e.g. Huitema and Meijerink, 2009; Green, 2014; Jordan and Huitema, 2014; Boasson, 2015). The rapidly expanding literature on environmental and climate governance focuses on entrepreneurship at many different levels and in many different sites of governing: local and regional (Brouwer, 2013; Anderton and Setzer, 2017; Maor, 2017), national (Huitema and Meijerink, 2009; Boasson, 2015; Hermansen, 2015), supranational (Buhr, 2012; Boasson and Wettestad, 2014) and transnational (Green, 2014; Pattberg, 2017). This chapter seeks to add to the more nuanced picture of entrepreneurship that these authors have painted, avoiding the trap of heralding entrepreneurs as heroic figures. This chapter neither defends nor questions the development of more polycentric forms of governance. Rather, it uses polycentric governance as an explanatory concept to help explain the role of entrepreneurship in climate governance.

This chapter explores three main questions. First, how should climate governance entrepreneurship be understood, defined and operationalised? Second, to what

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extent and how may we expect entrepreneurship to play out in polycentric governance as compared to monocentric governance? Third, what are the potential limitations of applying an entrepreneurship lens to the analysis of climate governance?

7.2 Defining Climate Governance Entrepreneurship

Political scientists have a long tradition of studying actors that aim to achieve extraordinary things. Yet there is still confusion about what entrepreneurship actually means, how to apply it as an analytical tool in empirical research and how to perform entrepreneurship studies in a way that fosters cumulative research. Let us therefore first explore how climate governance entrepreneurship can be understood, defined and operationalised.[1]

Back in 1961, Dahl argued that policy entrepreneurs are especially '*skilful* or *efficient* in employing the political resources at their disposal' (Dahl, 1961: 272, emphasis in original). Polsby (1984: 171) emphasised a different aspect, regarding entrepreneurs as actors 'who specialize in identifying problems and finding solutions'. However, it was Kingdon who offered a more detailed theorisation and conceptualisation. He held that entrepreneurs are characterised by their 'willingness to invest their resources – time, energy and sometimes money – in the hope for a future return' (Kingdon, 2011: 122).

His definition is very broad: it could conceivably apply to all actors aiming to influence policy development. Roberts (1992: 56) argued that it was difficult to evaluate the state of entrepreneurship research because there was no consensus on what entrepreneurship was. This challenge persists, despite the substantial empirical and theoretical contributions published since the early 1990s. For entrepreneurship studies to prosper, it is important to develop a clearer understanding, starting with clear definitions. Various scholars define entrepreneurs by their *skills*. For instance, Fligstein (2001: 107) has argued that entrepreneurs are skilled societal actors who will be 'more skilful in getting others to cooperate, manoeuvring around more powerful actors, and generally knowing how to build coalitions in political life'. In a similar way, Dahl argues that '[s]kill in politics is the ability to gain more influence than others, using the same resources' (Dahl, 1961: 307). Fligstein, Dahl and Polsby also indicate that *creativity* is a key skill, because it enables entrepreneurs to find new paths to influence. The assumption that skills are the most important defining feature is intuitively appealing. Indeed, some actors *are* better at assessing the political context than others. Sometimes their influence may extend far beyond what could be expected on the basis of their formal position or role. One problem here, however, is that the identification of superior abilities and personal character is difficult to operationalise. How can

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a person's intrinsic skills and qualities be measured? Moreover, skills are not likely to translate into actions in all situations and at all points in time. In identifying entrepreneurship, it is thus more fruitful to focus on entrepreneurial *strategies* and *actual actions*. Ackrill and Kay (2011: 78) suggest that entrepreneurship should be regarded 'as a general label for a set of behaviours in the policy process, rather than a permanent characteristic of a particular individual or role'. Sheingate (2003: 198) actually argues that in the study of entrepreneurship, it is a mistake to focus on the personal qualities of individuals, 'for this . . . limit[s] the utility of the concept to the study of "great men"'. Instead, Fligstein and McAdam (2012) argue that the position of entrepreneur is a *role* that becomes available under certain social conditions. It is up to the actors involved in the process to seize the moment and exert entrepreneurship.

In this chapter, I understand entrepreneurship as acts performed by actors who seek to 'punch above [their] weight' (Green, 2017). By contrast, actors who merely 'do their job' and do what is 'appropriate' cannot be considered entrepreneurs. Two different categories of entrepreneurship can be identified (see Boasson, 2015; Boasson and Huitema, 2017). *Institutional-cultural* acts are aimed at enhancing influence by altering the distribution of authority and information. They require scholars to pay close attention to the use of decision-making procedures and venues (Roberts and King, 1991; Schneider and Teske, 1992; Moravcsik, 1999; Leca, Battilana and Boxenbaum, 2006; Hardy and Maguire, 2008; Mintrom and Norman, 2009; Mackenzie, 2010; Kingdon, 2011; Fligstein and McAdam, 2012). By contrast, *structural* acts aim at altering or diffusing norms and cognitive frameworks, worldviews and institutional logics. It requires scholars to explore activities such as framing, image-making and persuasion (Goffmann, 1974; Snow and Benford, 1988; Campbell, 2004; Goodin, Rein and Moran, 2006; Baumgartner and Jones, 2009).

Many entrepreneurship scholars have been interested in entrepreneurship as a vehicle for *change* (i.e. the entrepreneur as a disruptive agent). Even if many entrepreneurial acts aim at producing change, and even if the most common criterion for successful entrepreneurship is achieving change, it is important to be open to the possibility that an entrepreneur can also block change (Boasson and Huitema, 2017). Moreover, given the complexity of the contemporary climate governance landscape (see Chapter 1), it is not always clear which governance measures will work and which will be counterproductive. Hence, we should include all kinds of entrepreneurial motivations when we study polycentric climate governance.

Moreover, we should take into account that governance entrepreneurship is a broader term than policy entrepreneurship. Governance covers traditional forms of public policy as well as private, and public-private initiatives aimed at

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influencing, steering and coordinating behaviour (see Chapter 1). Hence, entrepreneurship aimed at influencing private and public, as well as public-private, decision-making should be taken into account.

7.3 The Role of Governance Entrepreneurship in Polycentric Governance

Back in 1997, many regarded the signing of the Kyoto Protocol as the first step on the path towards a monocentric global regime. Instead, climate governance subsequently adopted many more characteristics that can be described as polycentric. Changes in the basic landscape of climate governance have important implications when it comes to understanding the actual and potential roles of entrepreneurship. To shed light on this, I explore entrepreneurship under two simplified but contrasting conditions: *polycentric* and *monocentric climate governance*. Monocentric and polycentric governance differ in at least two respects (see Chapter 1):

(1) Whether steering and coordination is induced top down from global, intergovernmental agreements or bottom up from a variety of countries, sectors and domains.
(2) Whether climate mitigation relies on a few intergovernmental measures or a whole variety of measures adopted in international, transnational, national, subnational and private domains.

Figure 7.1 combines the two dimensions and shows that – depending on the degree of top-down steering and the number of measures in use – we are likely to find different modes of climate governance. Strong top-down steering combined with few measures and instruments would produce monocentric climate governance, while bottom-up developments combined with a great number of diverse measures and instruments would result in polycentric governance. For the sake of simplicity, I rely on the definition of polycentric governance outlined in Chapter 1.

Figure 7.1 aims to illustrate that the two dimensions (top down versus bottom up, and few versus many policies and measures) can exist in various degrees, and that polycentric governance and monocentric governing are ideal types that can guide the analysis but that will not be found as such in reality. Nevertheless, climate governance following the adoption of the Kyoto Protocol (from 1997 until around 2009) can be considered closer to the monocentric ideal than climate governance after the Paris Agreement. The Kyoto Protocol had important monocentric traits: it was based on binding commitments, targets and timetables for emissions reductions and detailed rules pertaining to collaborative efforts to reduce emissions, such as the Clean Development Mechanism and Joint Implementation (Andresen and Boasson, 2012). The Paris Agreement does away with most of these monocentric features, has weak central steering and follows a more bottom-up form of

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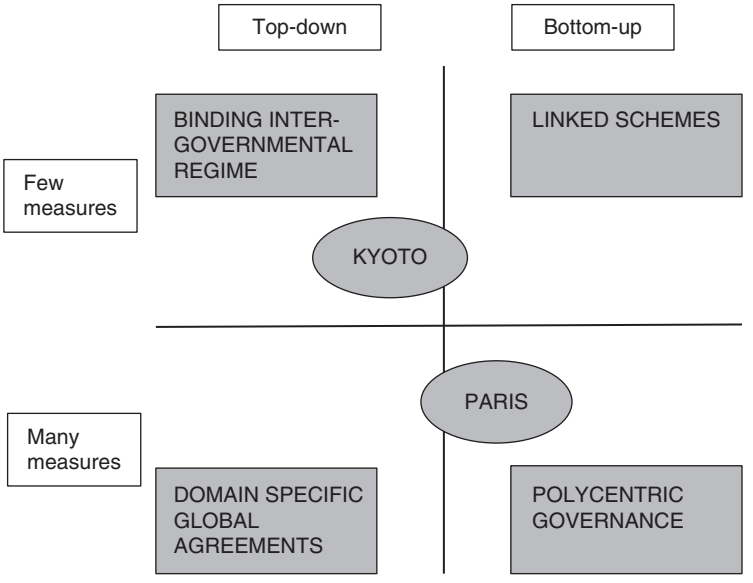

Figure 7.1 Possible climate governance patterns.

governance, in which countries make pledges to address climate change, which are subsequently subject to review (see Chapter 2).

Analytically, distinguishing between the two ideal types – polycentric and monocentric climate governance – can help us to develop more tangible expectations and predictions as to what role entrepreneurship can and will play in climate governance in the years ahead. Next, I discuss what implications these two forms of governance may have for climate governance entrepreneurship, paying particular attention to differences relating to (1) the number of measures and instruments; (2) policy windows; and (3) coordination across levels and domains.

Starting with the first of these, ever since the Kyoto Protocol was negotiated, actors that have promoted monocentric climate governance have sought to put a price on greenhouse gas emissions. I thus assume that this measure will play a superior role in this type of governance (see Andresen and Boasson, 2012; Boasson and Lahn, 2016). Under more polycentric conditions, the greater willingness and ability to experiment will probably lead to multiple parallel and partly overlapping measures (see Chapters 1, 6 and 14). This will again tend to create multiple parallel and partly overlapping policy and governance patterns at different domains and at various levels (local, national, international and transnational).

The entrepreneurship literature indicates that many overlapping decision-making venues at various levels can be a valuable asset for entrepreneurs (Boasson and Huitema, 2017), as it creates more entrepreneurial opportunities.

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One may argue that climate governance will in any event be complex – given the many sectors and actors involved in mitigating emissions – but a polycentric governance model will arguably increase this degree of complexity. I assume that polycentric climate governance will entail more, and more varied, entrepreneurship across levels of decision-making and societal domains, while a reversal towards more monocentric climate governance will reduce the volume and diversity of entrepreneurship. This assumption is rooted in existing research on how entrepreneurs respond to complexity. Newman (2008: 121) shows that duplication of authority structures in the European Union (EU) offers increased possibilities for societal groups to exert entrepreneurship (see also Börzel and Risse, 2003: 67). Mackenzie (2010: 383), studying Australian policy development, observes that a multiplicity of policy forums in the federal political system in Australia provides 'policy entrepreneurs with more avenues through which to pursue their innovations'. According to Sheingate (2003: 187, 191), heterogeneity creates uncertainty that can be exploited by entrepreneurs.

Indeed, scholars have increasingly identified how climate governance entrepreneurs have targeted many different venues of decision-making. Cities and states play an increasingly important role in climate governance, and several authors have argued that this is partly a result of entrepreneurship. For instance, Anderton and Setzer (2017) show that entrepreneurship played a key role when São Paulo and California developed stronger climate polices. Biedenkopf (2017) shows that entrepreneurial governors have been instrumental in the adoption of emissions trading in several US states. Maor (2017) and Mintrom and Luetjens (2017) show how entrepreneurial activities and strategies have resulted in transnational city climate networks.

Entrepreneurship may also play an important role in national climate policy development. For instance, Boasson (2015) and Hermansen (2015) explore how entrepreneurship has been key at certain moments in the development of Norwegian climate policy. Significant entrepreneurial activities have also influenced EU climate policy. Boasson and Wettestad (2013, 2014) find that entrepreneurship has been important for the EU's policies on emissions trading, renewable energy and carbon capture and storage. Buhr (2012) shows that entrepreneurship was central for the inclusion of aviation in the EU's emissions trading system. This literature indicates that institutional as well as structural entrepreneurship plays out at all levels. However, it is biased towards acts of entrepreneurship that seek to strengthen mitigation; it is less clear regarding how much counter-entrepreneurship (i.e. acts aimed at defending carbon-intensive practices and/or hindering the adoption and implementation of climate measures) we may see as the world moves towards more polycentric forms of climate governance.

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While entrepreneurship can be a cause of polycentric development, it can also be understood as a consequence of weak monocentric steering (see also Chapter 9). Green (2014: 16) argues that weaknesses in the United Nations Framework Convention on Climate Change (UNFCCC) created a vacuum that allowed non-state, entrepreneurial actors to launch their own governance measures. If these experiments prove successful, they may be adopted by states. It is easier to initiate new policy ideas when no policy already exists than in a landscape crowded with other activities. In particular, scholars have highlighted entrepreneurship as an explanation for the upsurge in transnational governance (Green, 2014; see also Chapter 4). Andonova (2017) explores entrepreneurship in international public-private partnerships. Pattberg (2017) shows that the entrepreneurial activities will change during the lifetime of transnational governance initiatives, and specifies what activities we may expect in different phases. There is an emerging literature on the role entrepreneurship plays in international private governance; much less is known about its role in national, regional and local private and/or private-public initiatives.

We may expect that as a more polycentric governance pattern is established, entrepreneurship may contribute to strengthen it further. After all, policies tend to determine politics (Lowi, 1964, 1972). A range of historical institutional studies have taught us that once a path of development has been created, subsequent policy tends to continue along that path (Pierson, 2004; Streeck and Thelen, 2005). Accordingly, we may expect each of the many policies and measures adopted across scales and domains to develop along idiosyncratic paths, fostering multiple policy constituencies and decision-making venues. This will again create many opportunities for entrepreneurship, but it will become increasingly hard to know in advance which decision-making opportunities will be important. These multiple path dependencies may also contribute to hinder coherent and well-coordinated climate action (see in more detail later in this chapter).

In a monocentric regime, public decision-makers will seek to select one or a few of the best available instruments; the potentially important decision-making situations will be relatively few, and it will be relatively easy to differentiate important from unimportant decision-making opportunities. The competition for influence at these moments may, however, be very intense, so it may be harder for entrepreneurs (of all kinds) to succeed.

Second, the volume as well as the success of climate entrepreneurship is related to the existence of policy windows (e.g. Burh, 2012; Boasson and Wettestad, 2013, 2014; Hermansen 2015). This is probably *the* single most dominant contextual condition cited in the entrepreneurship literature. Kingdon (2011: 165) regarded a policy window as 'an opportunity for advocates of proposals to push their pet solutions, or to push attention to their special problems'. He further stated that 'a

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window opens because of change in the political stream (e.g. change in the administration, a shift in the partisan or ideological distribution of seats in Congress, or a shift in national mood); or it opens because a new problem captures the attention.' A substantial number of subsequent studies have shown that open policy windows permit enhanced entrepreneurial activities and sometimes also entrepreneurial success (e.g. Corbett, 2005; Ugur and Yanjaya, 2008; Bakir, 2009; Zito, 2011).

In the following, I argue that polycentric climate governance will tend to entail the emergence of many climate policy windows, but not all windows will be utilised and thus contribute to the success of entrepreneurs. In more monocentric forms of governance, there will be fewer but more important policy windows that lend themselves to entrepreneurial exploitation. Climate policy research shows that open policy windows have made climate policy and governance entrepreneurs more successful than they would have been without such a window. For instance, Boasson and Wettestad (2013, 2014) identify an open climate policy window in the EU from about 2006 to 2009, created by the preparations for the 2009 UNFCCC Conference of the Parties (COP) in Copenhagen. Many actors in several different climate policy areas seized this opportunity. This had implications not only for EU policy but also for national policy in the EU; however, we lack systematic research on how this window influenced national policy development (for an exception, see Hermansen 2015). Moreover, Boasson and Wettestad (2014), as well as Hermansen (2015) and Buhr (2012), argue that policy windows are not merely a result of exogenous forces; entrepreneurs themselves seek to open windows and subsequently to keep them opened for as long as possible. Hermansen (2015: 933) argues that '[a] political wave comes from somewhere and involves some form of agency; it does not just appear out of the blue.' Several authors have shown that institutional-cultural entrepreneurship and framing is key when it comes to the very creation of windows (Buhr, 2012; Boasson and Wettestad, 2013, 2014; Hermansen, 2015). Structural entrepreneurship can be important to prolong the period the window is open (Boasson and Wettestad, 2014).

Preparations for important UNFCCC COPs (such as COP15 in 2009 and COP21 in 2015) create more important domestic policy windows in some countries than in others, but we have little systematic and comparative research on this (but see Chapter 3). We also lack systematic knowledge about the relative importance of policy windows in private or private-public governance processes. Existing research indicates that such windows primarily strengthen the positions of actors that champion more and stronger climate polices. This may, however, result from a research bias, as there are far fewer studies that analyse actors who seek to obstruct climate policy initiatives (for an exception see Kibaroglu, Baskan and Alp, 2009).

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There are good reasons to expect that the character and volume of potential policy windows will differ between polycentric and monocentric climate governance, and work on Chinese policy change processes (te Boekhorst *et al.*, 2010) lends support to this notion. A centralised system will probably produce rather few, but potentially more important, policy windows. The fact that national climate policy adoptions tend to peak in the year or two before and after major global climate summits, such as those held in Rio de Janeiro (1992), Kyoto (1997) and Copenhagen (2009), indicates that intergovernmental summits help to create windows of opportunity that entrepreneurs can exploit (Townshend *et al.*, 2013). However, it is important to acknowledge that a range of other factors may also have contributed to producing this pattern. The future regular 'global stocktakes' of the nationally determined contributions under the Paris Agreement may ensure that the global regime continues to open up policy windows. If the ratcheting-up logic works, then the five-year cycle of 'pledge and review' could create regular, global policy windows. Moreover, increasingly polycentric governance patterns will probably ensure that many more policy windows are opened across decision-making levels and domains, created by local and regional conditions, sector-specific conditions, summits held by non-state actors and so forth. Yet, it may be that these policy windows will be less dramatic and be open for shorter periods than the windows relating to major intergovernmental summits. Moreover, this development may also reduce the importance of UNFCCC COPs as events that create windows of opportunity.

In any event, it is important to acknowledge that not all actors will be able, or have the resources required, to understand that a window has opened, and thus not all windows will be exploited to the same extent. Mintrom and Norman (2009: 852) argue that entrepreneurs need to 'display high levels of social acuity, or perceptiveness' to exploit such windows. Such actors are not always around, and thus only some of the ensuing political potential will be tapped (Boasson, 2015). Moreover, polycentric governance creates a more murky political landscape that may make it harder for entrepreneurs to detect, trigger and influence policy windows. Hence, the growth in the number of potential policy windows under polycentric conditions may not necessarily translate into more successful climate policy entrepreneurship and hence more ambitious climate policies.

Third and last, coping with climate change is a true global challenge, and thus we need a certain degree of *coordination* in order to solve the issue effectively and efficiently. The polycentric and monocentric models of governance rely on different modes of cooperation. The polycentric approach highlights self-organisation or mutual adjustment, often resulting from mere interaction and learning (see Chapter 1). By contrast, coordination in the more monocentric approach relies on what Scott (2014: 59–64) terms regulative steering: hierarchically designed, formal

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requirements that prescribe how information is to be disseminated and compliance monitored. There are also likely to be coercive sanctions to address any shortfalls in compliance. I argue that while coordination in the monocentric approach relies on intergovernmental political agreement and the agreed system of enforcement, coordination in a polycentric governance system is more reliant on entrepreneurship.

Coordination will not be a task that gains much entrepreneurial attention in monocentric governance. Rather, this will primarily be ensured by top-down steering. The situation is likely to be radically different in polycentric governance. For coordination mechanisms to emerge in the first place, these will need to be initiated and developed by actors other than the intergovernmental regime. Some of the polycentric governance authors suggest that mutual adjustment is a key feature of polycentricity, but I do not a priori assume that this will occur (see Chapter 1). Rather, I expect climate governance entrepreneurs to primarily mobilise to influence development of rules and practices, and to a lesser extent engage to ensure adjustments of measures across levels and domains.

The pledge-and-review system introduced by the Paris Agreement combines polycentric and monocentric governance elements (see Chapter 2). It requires countries to regularly submit a nationally determined contribution, but it is largely up to the countries to set their own ambitions and choose their own reporting format. Thus, it is a relatively weak top-down steering mechanism, 'creating a framework for making voluntary pledges that can be compared and reviewed internationally, in the hope that global ambition can be increased through a process of 'naming and shaming' (Falkner, 2016: 1107). Whether this will develop into a system that truly facilitates behavioural change depends on whether and how country representatives, business actors, international environmental organisations and so forth respond to it. Put differently: whether actors will engage in entrepreneurial ways to ensure a 'race to the top'.

The radical increase in private carbon disclosure can be understood as an entrepreneurially induced attempt to increase climate information sharing, particularly amongst private actors (Maor, 2017; Pattberg, 2017). Carbon disclosure implies carbon reporting which denotes reporting of carbon emissions by companies, but also a broader societal purpose, increasingly understood as an instance of informational governance (Pattberg, 2017). Hence, mechanisms of transparency and accountability may eventually influence the behaviour of actors, leading to processes of mutual adjustment. Pattberg (2017) shows that while several carbon disclosure systems initially resulted from entrepreneurship, the activity has since become institutionalised. This indicates that coordination under polycentric governance can eventually be sustained by institutional-cultural social features, and is not completely reliant on entrepreneurship. It is, however, important to note that

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while disclosure may ensure that information is disseminated, actual behavioural change may not happen unless some actors use the information that is disclosed in an entrepreneurial way, for instance to nudge or pressure other actors to adjust their behaviour. Moreover, we have not (yet) witnessed such elaborate systems of carbon reporting from governmental units, such as municipalities, regions and countries (with the notable exception of the C40 reporting from cities). The pledge-and-review system under Paris may, however, trigger the emergence of more streamlined pledge-and-review procedures from a larger number of actors.

Finally, there is reason to expect that it will be challenging to ensure coordination in a polycentric system given the 'let a thousand flowers bloom' nature of bottom-up governance. Many initiatives can sometimes be good, but it may also hamper effectiveness and efficiency. There is indeed a danger that having too many cooks involved in polycentric climate governance can spoil the broth. That is to say, the more actors that have authority over an issue area, the harder it may be to ensure coordination (Gulick, 1937; Egeberg, 2003).

Against this backdrop, I assume that polycentric climate governance may entail emergence of entrepreneurially induced coordination, but that this will probably primarily ensure the dissemination of information and to a lesser extent ensure mutual adjustment of action. A reversal to more monocentric governance will reduce the entrepreneurial activities aimed at ensuring coordination.

Table 7.1 summarises the differences between the nature and volume of entrepreneurial activities under the two governance modes. We should expect entrepreneurship to be a more important driver of climate action in a polycentric than in a monocentric climate governance situation, but also that entrepreneurship will take on different roles depending on which form of governance dominates. However, entrepreneurship is a rather quixotic factor – one that is highly dependent on a range of other variables. As not all entrepreneurs will be interested in more ambitious climate rules and practices, more room for entrepreneurship also means more room for actors aiming to resist climate governance.

7.4 The Role of Entrepreneurship in Climate Governance Studies

Thus far, I have argued that we should expect to see systematic differences in the role and magnitude of entrepreneurship depending on the type of climate governance mode. However, it is important to keep in mind that entrepreneurship is only one piece of the climate governance puzzle. There are clear limitations of applying an entrepreneurship lens to the assessment of climate governance.

Few studies have examined how entrepreneurship will fare when challenging powerful segments or sectors in society. It is, however, not very daring to suggest that entrepreneurship will have a smaller chance of succeeding when challenging

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Table 7.1 *Entrepreneurship in monocentric and polycentric governance*

Governance approach Elements of variation	*Monocentric governance*	*Polycentric governance*	*Expect polycentric governance to lead to . . .*
Number of instruments	Few measures adopted intergovernmentally and then implemented; pricing of greenhouse gas emissions key.	Many. Technology-specific and sector-specific, voluntary as well as binding, economic as well as administrative.	More, and more varied, entrepreneurship across levels of decision-making and societal domains, while a reversal towards more monocentric climate governance will reduce the volume and diversity of entrepreneurship.
Policy windows	Will emerge in relation to important climate summits: few, but very significant windows.	May emerge in relation to the planned revisions of national pledges, but also relating to national, local and sector-specific conditions. Some major and many smaller windows.	Emergence of many climate policy windows, but not all windows will be utilised and thus contribute to enhance the success of entrepreneurs. A reversal to more monocentric governance will create fewer, but more important policy windows that lend themselves more to entrepreneurial exploitation.
Mode of coordination	Top-down, hierarchical steering by coercion.	Loose networks, information campaigns, naming and shaming.	Emergence of some entrepreneurially induced coordination, but this will probably primarily ensure dissemination of information and to a lesser extent ensure mutual adjustment of action. A reversal to more monocentric governance will reduce the entrepreneurial activities aimed at ensuring coordination.

economically and/or politically powerful actors. Social scientists that only focus on entrepreneurship may easily overlook entrenched power relationships relating to economic as well as social and cultural sources of influence. Wilson (1989: 77) suggested that entrepreneurial action is key to ensuring environmental regulation, arguing that the cost of mitigating most environmental issues will be 'heavily concentrated on some industry, profession, or locality and the benefits are spread over many if not all people'. He argued that the actors that experience costs relating to environmental action will mobilise all the political powers at their disposition to oppose these measures, while those in favour of a cleaner environment will tend to only overcome collective action dilemmas when they perform skilled entrepreneurship. Moreover, while such entrepreneurship can be very important in certain decision-making situations, it will often be challenging to create a long-lasting entrepreneurial counterweight to stronger social forces (Wilson, 1989: 80).

In addition to the economic interests highlighted by Wilson, several other factors may also counter the effect of entrepreneurship. Entrenched institutional-cultural features, for instance relating to energy use, modes of transportation ('car culture') or dietary habits (i.e. meat consumption), may thwart the adoption of stronger climate practices and governance. Moreover, public administrative units and businesses that have little to gain from climate mitigation often have superior formal authority and the ability to control information. For instance, a study of carbon capture and storage in the Norwegian petroleum industry shows that scientists, environmentalists and politicians succeeded only to a very limited degree, despite having applied a whole range of entrepreneurial strategies. The resistance from the structurally powerful petroleum segment was too strong (Boasson, 2015). This created a paradox: since it took more to succeed when the resistance was strong, entrepreneurs ended up being very active when they encountered strong opposition, while paying little attention to areas where the potential counterforces were much weaker. Thus, many opportunities remained unexploited.

Despite this bleak example, other parts of the climate entrepreneurship literature show that entrepreneurship can have long-lasting effects, and this gives us reason to be a bit more optimistic than Wilson (e.g. Boasson and Wettestad, 2013; Biedenkopf, 2017; Green, 2017; Pattberg, 2017). To understand the potential expansive effects of entrepreneurship, we need to combine the entrepreneurship approach with other social science frameworks and theories. Green (2017) argues: 'Considering the expansive effects of entrepreneurship means looking beyond the specific goal or target of an individual entrepreneur. Rather, it examines the extent to which entrepreneurship influenced a larger set of actors than originally intended, or helped catalyze broader effects.'

Drawing on various social science literatures, Green highlights three types of expansive effects. First, demonstration effects, where entrepreneurs, perhaps

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through forms of experimentation, ensure that some climate action is tested. When an action has been proven to work, this will help make the measure more legitimate. Second, policy entrepreneurship might give rise to normative changes. For instance, we have seen that entrepreneurship related to carbon disclosure has contributed to a broader corporate norm of more transparent measurement and reporting. Third, entrepreneurship might have the expansive effect of changing governance practices, leading governments to align with or adopt practices initiated by entrepreneurs. It can be challenging to determine analytically when the effects of entrepreneurship end and other causal forces take over, but skilful combinations of different theories and frameworks can help us capture important expansive and long-term effects of entrepreneurship.

To gain a better understanding of the role of entrepreneurship under polycentric climate governance, we need more cumulative and comparative research. Hopefully, the increased interest we have seen in entrepreneurship in the area of climate governance will lead more scholars to base their research on similar understandings of this concept, enabling us to contrast how entrepreneurship may play out under different conditions and the short- as well as long-term effects of entrepreneurial activities.

7.5 Conclusions

Drawing on policy, governance and institutional entrepreneurship literatures, this chapter concludes that entrepreneurship should be understood as acts performed by actors who seek to 'punch above their weight'. By contrast, actors who merely 'do what is appropriate' should not be considered entrepreneurial. Two different, more operational categories of entrepreneurship were identified: institutional-cultural entrepreneurship, understood as acts aimed at enhancing governance influence by altering distribution of authority and information; and structural entrepreneurship, understood as acts aimed at altering or diffusing norms and cognitive frameworks, worldviews or institutional logics.

This chapter has explored when – and to what extent – entrepreneurship plays out in conditions of polycentric and monocentric climate governance respectively. The upshot is that the role and importance of entrepreneurship will probably differ between polycentric governance and monocentric governance; entrepreneurship will probably be a more important driver of climate action in polycentric than in monocentric climate governance situations. We will also rely on entrepreneurship to ensure a broader range of tasks in the former than the latter governance mode. Moreover, entrepreneurship is a rather quixotic and unpredictable causal factor – whether entrepreneurship will be performed is not only a result of the prevailing mode of governance. It depends on the skills and experience of the persons

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involved, but other factors may be just as important, such as the distribution of economic and structural resources and prevalent institutional-cultural understandings. Ideally, research on climate governance entrepreneurship should combine this analytical lens with analytical frameworks that highlight other causal factors, such as path dependency, exogenous shocks, socialisation and diffusion.

There is no reason to expect that climate policy entrepreneurship will mushroom in all domains and offer a quick fix to the daunting climate governance challenge outlined in Chapter 1. Actors that aim to hamper climate governance may be just as empowered by more polycentric governance as actors that aim to induce ambitious measures. If we had been in a monocentric governance situation, we could have expected non-entrepreneurial factors, such as coercion, to produce climate governance irrespective of entrepreneurial activity. However, we are not in such a situation and it seems safe to conclude that strong monocentric climate governance will not emerge anytime soon. Hence, both researchers and practitioners should try to enhance their understanding of the promise and the limits of governance entrepreneurship.

Note

1. Section 7.2 draws on Boasson (2015) and Boasson and Huitema (2017).

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8

Leadership and Pioneership
Exploring Their Role in Polycentric Governance

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8.1 Introduction

Leaders and pioneers are widely seen as agents of change. Such actors are of central importance for climate change mitigation and adaptation. We define *pioneers* as being 'ahead of the troops or the pack' while carrying out 'activities which, depending on the circumstances and events "in the field", may or may not help others to follow' (Liefferink and Wurzel, 2017: 952–953). *Leaders*, on the other hand, have 'the explicit aim of leading others, and, if necessary, to push others in a follower position' (Liefferink and Wurzel, 2017: 953). In other words, leaders usually actively seek to attract followers (Burns, 1978, 2003; Helms, 2012; Torney 2015), while pioneers normally focus on domestic or internal activities without paying much attention to attracting followers, although they may unintentionally set an example for others.

The literature on leaders and pioneers in environmental and climate policy initially focused primarily on states (e.g. Young, 1991; Underdal, 1994; Andersen and Liefferink, 1997; Jänicke and Weidner, 1997). However, non-state actors have increasingly also been identified as capable of exhibiting climate leadership and pioneership (e.g. Wurzel and Liefferink, 2017). International climate change governance has traditionally been analysed as taking place within multilevel governance (MLG) structures, within which leaders and pioneers play a central role (e.g. Grubb and Gupta, 2000; Jordan *et al.*, 2010; Wurzel and Connelly, 2011). However, especially since the adoption of the 2015 Paris Agreement, which largely abandoned the 1997 Kyoto Protocol's top-down 'targets-and-timetables' approach in favour of a bottom-up approach with national pledges (i.e. nationally determined contributions; see Chapter 2), international climate governance appears to have become more polycentric (Jordan *et al.*, 2015; Oberthür, 2016; see also Chapter 1). This chapter therefore assesses to what degree, if any, climate leaders and pioneers can play a central role not only

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within MLG structures but also under conditions of polycentric climate governance.

As we explain in more detail in what follows, under conditions of polycentricity, a potentially very large 'universe' of actors can in principle act as leaders or pioneers. According to Elinor Ostrom (2010: 552), '(p)olycentric systems are characterized by multiple governing authorities at different scales rather than a monocentric unit . . . Each unit within a polycentric system exercises considerable independence to make norms and rules within a specific domain.' However, while polycentricity and monocentricity, which constitute opposite poles on the governance dimension, are useful heuristic analytical terms, they are rarely found (at least in their pure form) in the highly interdependent pluralistic liberal democratic states which are the main focus of this chapter. Whereas in MLG structures leaders or pioneers may be limited by hierarchical relations and restrictive rules, each 'unit within a polycentric system' (Ostrom, 2010: 552) can have its own leaders and pioneers. Pushed to its extreme, polycentricity potentially enables virtually any conceivable actor within a particular unit of governance to become a leader or pioneer. At the same time, polycentricity may limit the effect of leaders and pioneers to the relatively independent unit in which they function.

In this chapter, we first discuss the specific features of leadership and pioneership under conditions of polycentricity at a conceptual level. Drawing on the existing literature and a wide range of examples, we then offer a systematic assessment of various types of actors employing different types of leadership and pioneership in polycentric climate governance.

8.2 Polycentricity, Leadership and Pioneership

Polycentricity potentially offers seemingly endless opportunities for leadership and pioneership. At the same time, the relative autonomy of polycentric decision-making centres (e.g. Aligica and Tarko, 2012) may severely limit the range of possible followers. If we view 'a family, a firm [or] a local government' as a fairly independent unit within a polycentric system (Ostrom, 2010: 552), it cannot be automatically assumed that its activities attract followers from outside this unit. Hence, at first sight, *pioneership* seems more likely than *leadership* to occur under conditions of polycentricity. A closer look at two basic conceptual features of polycentricity and their links to MLG, which constitutes another widely used concept of multicentred decision-making, may provide a more nuanced picture (see also Chapter 1).

First, the concept of polycentricity is built on a functionalist logic. Vincent and Elinor Ostrom and their collaborators developed the idea of polycentricity around various specialised agencies providing specific public services (e.g. water supply

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or policing) in local governments in the United States (Ostrom, Tiebout and Warren, 1961). In Ostrom's definition, polycentric units 'exercise considerable independence . . . *within a specific domain*' (Ostrom, 2010: 552; emphasis added) in which they perform specific functions or deliver specific services (Aligica and Tarko, 2012: 241).

Second, polycentricity is a multilevel phenomenon. According to Aligica and Tarko (2012: 241), the Ostroms 'hammered the crucial fact that the optimal scale of production is not the same for all urban public goods and services'. Hence, 'the existence of multiple agencies interacting and overlapping . . . is the result of the fact that different services require a different scale' (Aligica and Tarko, 2012: 241). This insight can be linked to the normative principle of subsidiarity which states that decisions should be taken at the lowest possible level of governance. Subsidiarity also plays a role in the governance of federal and quasi-federal systems such as the European Union (EU) (see also Chapter 1).

The functional and scale-focused character of polycentricity resembles key features of MLG. This is especially the case for Hooghe and Marks' (2003) analytical distinction between Type I and Type II MLG. Type I refers to nested, non-intersecting, general-purpose jurisdictions, i.e. the 'systemic' hierarchy of territorial units – municipalities, regions, states, international organisations – which is reflected in the formal governance structure of states as well as the EU. Type II refers to flexible, task-specific, overlapping jurisdictions and shows strong resemblance with polycentricity. Rayner and Jordan (2013: 75) even equate polycentricity with MLG when stating 'polycentric or, in EU parlance, multilevel governance'.

Comparing polycentricity to MLG Type II helps to demonstrate that polycentricity and monocentricity are actually related and may be seen as ideal-typical opposite poles of the same analytical dimension. This insight can be traced to the writings of both MLG and polycentricity scholars. Hooghe and Marks (2003) have argued that the 'systemic' institutions of MLG Type I often help to provide the legal framework or the financial basis for functional Type II activities. In their view, 'Type II governance is generally embedded in Type I governance' (Hooghe and Marks, 2003: 238). Rayner and Jordan (2013: 77) note that polycentricity and monocentricity can be interconnected in various ways, as occurs, for instance, in the EU. This is also recognised by Aligica and Tarko (2012: 248), who point to the 'unstable coexistence' of polycentricity and monocentricity. They acknowledge that different polycentric systems may be laterally related (e.g. the market and the legal system) and that polycentric and monocentric systems may be nested, not least when it comes to the provision of shared, overarching rules which are essential for the functioning of a polycentric system (Aligica and Tarko, 2012: 255–256). Ostrom *et al.* (1961) also refer to central mechanisms to resolve conflicts

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under conditions of polycentricity. In addition, several inherent weaknesses of polycentric systems that are flagged up by Ostrom (2010, 2012), including the risk of fragmentation, inconsistent policies, coordination problems and free-riding, could arguably be countered by establishing links to MLG Type I arrangements. Thus, Ostrom (2010: 550) stresses that developing long-term solutions to complex problems (such as climate change) in fact requires both hierarchical and decentralised efforts. Homsy and Warner's (2015) study of sustainability policies in approximately 1,500 municipalities across the United States goes further by arguing that municipalities working in an MLG framework supportive of local sustainability action perform better than others under polycentric governance conditions. This notably involves the provision of incentives, redistributive mechanisms, expertise and technical assistance, as well as a favourable general political atmosphere by the state (i.e. MLG Type I) government. Thus, while the 'pure' forms of polycentricity and monocentricity are useful heuristic devices, at least in pluralistic democratic states they tend to be found in mixed forms.

The discussion so far makes three things clear. First, polycentric leadership/pioneership is likely to take place primarily within relatively small, often functionally differentiated domains such as a water district, a school, a branch of industry or a product chain (Ostrom, 2010: 552). This implies that the ways in which leadership/pioneership can be exerted may differ depending on the relationships prevalent between actors within a particular functional context. In the next section, we explore in more detail the relevance of different *types* of leadership for different categories of actors in polycentric climate governance.

Second, the functional confines of polycentric leadership/pioneership may lead one to assume that the ambition and possible impact of polycentric leadership/pioneership are likely to remain limited to a small, functionally determined environment. This would strongly curtail the opportunities for attracting followers and thus put the focus on pioneership rather than leadership under conditions of polycentricity. However, the foregoing discussion suggested that polycentric systems actually maintain various relations with other (polycentric) systems outside their own relatively self-contained functional environment.

Third, the observation of polycentric (or MLG Type II arrangements) being embedded, at least in certain respects, in MLG Type I governance leaves open the possibility of some degree of leadership 'from above' (compare with Chapter 4, which argues that monocentric institutions remain important for safeguarding democratic control in systems with increasingly polycentric characteristics). For example, Homsy and Warner (2015) found that active US states exerted leadership vis-à-vis municipalities within their territories by providing incentives, expertise, etc. Within the context of the German energy transition, there is strong empirical evidence of the federal government's key role in creating favourable conditions for

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local initiatives (Ehnert *et al.*, 2016; Jänicke, 2017). The Chinese National Development and Reform Commission in 2010 initiated a project that encouraged five provinces and eight cities to undertake pilot projects in order to demonstrate the feasibility of low-carbon development plans and renewable energy in urban areas (Li, 2017: 264).

8.3 Types of Leadership and Pioneership in Polycentric Climate Governance

As stated earlier, the analytical concepts of leaders and pioneers which are rooted in the international relations and comparative politics literature were originally developed for states (Liefferink and Wurzel, 2017). The distinction between leaders and pioneers builds on the observation that states may have different *internal* and *external* 'faces', i.e. leaders and pioneers may foster internal and external ambitions to different degrees. We argue that this logic also applies to non-state actors in polycentric (and MLG) governance structures.

Table 8.1 shows the four ideal-typical positions that result from combining low versus high *internal* ambitions and low versus high *external* ambitions.

An actor pursuing high internal and low external ambitions (cell b) adopts demanding policies for internal (or domestic) reasons without explicitly trying to attract followers. Such an actor can be defined as a *pioneer. Symbolic leaders* (cell c) and *pushers* (cell d) both have high external ambitions and thus offer *leadership*. However, while symbolic leaders combine high external ambitions with low internal ambitions, pushers pursue both high external and internal ambitions. Finally, *laggards* exhibit low internal and external ambitions (cell a).

The distinction between the internal and the external 'face' of a state can easily be applied to other governmental actors such as regions, provinces, cities and agencies, which all have internal policies while also maintaining 'external' relations. Importantly, the distinction between internal and external ambitions also

Table 8.1 *Ambitions and positions of leaders and pioneers*

	Internal 'face'	
External 'face'	*Low internal environmental ambitions*	*High internal environmental ambitions*
Low external environmental ambitions	(a) Laggard	(b) Pioneer
High external environmental ambitions	(c) Symbolic leader	(d) Pusher

Source: Adapted from Liefferink and Wurzel (2017).

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applies to non-state actors. Internal ambitions may refer to, for example, production methods of firms or farmers, to purchasing policies of non-governmental organisations (NGOs) or to consumption choices of individual citizens. External ambitions refer to their willingness to push or to set an example for other firms, consumers, etc. Consequently, the different positions set out in Table 8.1 can also be applied to non-state actors. An individual using public transport for environmental reasons without trying to convince others to abandon their cars may be characterised as a pioneer. The same applies to a citizen's initiative producing wind energy primarily for their own use. Classic NGOs such as Friends of the Earth or Greenpeace, on the other hand, derive their very existence from high external ambitions. Their internal 'face' is less important, although in view of their credibility they are usually expected to act as pushers rather than symbolic leaders.

For market actors, Dupuis and Schweizer (2016) have pointed out that a firm with high *internal* ambitions logically also has a strong interest in realising these ambitions *externally* by keeping competitors at bay while profiling itself as the only actor of its kind in a particular market. In other words, such a firm wants to gain or maintain a competitive advantage or possibly even a monopoly position. In the early 2010s, the Dutch start-up Niaga developed a new method for producing a fully recyclable carpet using 90 per cent less energy than a product made following conventional production methods. As soon as the method was operational, some large carpet producers unsurprisingly attempted to acquire the exclusive right for applying the method (van der Steen, 2017). It would be difficult to imagine a firm spending money on 'measures to protect the climate without attempting to reap the potential benefits in terms of image and influence over consumers' (Dupuis and Schweizer, 2016: 5). From a company's point of view, being a pioneer (as defined earlier, i.e. having only high *internal* ambitions) would constitute an unlikely form of altruistic behaviour, which is likely to be found only among not-for-profit organisations. What, as far as market actors are concerned, 'truly distinguishes pushers from pioneers is their involvement in politics … Pushers' external polic[ies] do not only target consumers, but they also lobby the state in order to enshrine their own norms and techniques of [greenhouse gas] reductions into formal legislation' (Dupuis and Schweizer, 2016: 5).

Leaders and pioneers can have an impact on other actors in polycentric (and MLG) governance structures in many different ways. They can, for instance, exert pressure on potential followers, spread new ideas or scientific insights or just offer a good example for others to follow. They can thus help to spread or upscale innovations. To assess these roles in a more systematic manner, we put forward an analytical distinction of different types of leadership that builds in particular on Oran Young's seminal work on leadership in international regime formation (Young, 1991; see also Wurzel and Connelly, 2011; Wurzel, Connelly and

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Liefferink, 2017a). We distinguish between the following four types of leadership: (1) structural leadership, related primarily to military and economic power; (2) entrepreneurial leadership, involving diplomatic, negotiating and bargaining skills; (3) cognitive leadership, relying on knowledge and expertise; and (4) exemplary leadership, i.e. intentionally or unintentionally acting as an example for others (cf. Liefferink and Wurzel, 2017).

8.3.1 Structural Leadership

In traditional international relations theory, structural leadership is foremost associated with military power which, however, is of little relevance to climate governance. Moreover, leadership and power are related but not identical. Actors in possession of (structural) power may not actually use it to exert (structural) leadership (Liefferink and Wurzel, 2017).

Economic power asymmetries are important in climate governance, including under polycentric conditions. For states, the size of the domestic market is an important source of structural power and can be used to exert structural leadership. Similarly, market share can facilitate leadership by firms. In Austria and Denmark, the conversion of the dominant supermarket chains to organic products was decisive for increasing the market share of organic food labels and their reputation in both countries (Hofer, 2000). Consumers have economic power too. Their individual purchasing power may be very limited, although changing consumption patterns are often important drivers for change in products. Whereas one local windmill project may constitute an example of pioneering, thousands are likely to lead to fundamental shifts in the functioning of the energy grid (van Vliet, Chappells and Shove, 2005). Popular trends that can nowadays be rapidly shared via social media offer large potential for grassroots leadership. Some well-orchestrated consumer boycotts have mobilised considerable economic (consumer) power. For instance, a boycott against Shell was one of the decisive factors which made the company abandon its plan to dump the disused Brent Spar oil platform at the bottom of the North Sea in the 1990s (Löfstedt and Renn, 1997).

Another form of structural power derives from an actor's contribution to the problem at stake or what may be called its systemic relevance. For instance, China has a pivotal role in global climate mitigation policies simply because it is the world's largest greenhouse gas emitter. The bilateral agreement between Presidents Xi Jinping and Barack Obama in November 2014 constituted a milestone in the run-up to the 2015 Paris Agreement, not least because China and the United States together account for approximately 40 per cent of global greenhouse gas emissions (Bang and Schreurs, 2017; Li, 2017). With the more climate-sceptic Trump

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administration installed in the United States, a global leadership opportunity falls to China almost by default (cf. Li, 2017; Mufson and Mooney, 2017). Systemic relevance may also provide structural power to business. Good examples are investor groups such as the Ceres Investor Network on Climate Risk (which represents more than 130 investors, mainly in North America, and $17 trillion in assets) (Ceres, 2017) or the Institutional Investors Group on Climate Change (which includes more than 130 institutional investors in Europe and nearly $15 trillion in assets) (IIGCC, 2017). In November 2016, ten large oil and gas companies associated with the Oil and Gas Climate Initiative pledged to invest $1 billion to help develop low-emission technologies (OGCI, 2017). Apart from the large sum of money involved and the economic power exerted by the participating multinational companies, this initiative represents 20 per cent of global oil and gas production and accounts for about 12 per cent of historical greenhouse gas emissions (Bach, 2016).

NGOs do not themselves wield much economic power. Instead, they derive structural power from their size and the support they receive from the general public. For NGOs representing hundreds of thousands or even millions of members, political legitimacy is a key factor for exerting leadership and/or pushing others (such as the EU, states and firms) to exert leadership. Forming alliances is a way for NGOs to increase further their legitimacy. A key example is Climate Action Network Europe, which claims to include more than 130 member organisations that represent approximately 44 million citizens in more than 30 countries (CAN Europe, 2017). Its structural power enables it to put substantial pressure on businesses or states by attracting considerable media attention (Wurzel, Connelly and Monaghan, 2017b).

It makes sense to also include under the heading of structural leadership the use of formal institutional power (Wurzel, Liefferink and Connelly, 2017c). This is relevant primarily for state actors (including agencies) with, for example, law-making and law-enforcing competences. Examples in an international context include voting rights in international institutions and the European Commission's right to initiate and enforce EU law. These rights provide the Commission with a degree of structural power within a supranational governance context. Reflecting the complex MLG relations in the EU, Jänicke (2017: 126) offers an interesting case of 'enforced leadership' when the Commission rejected Germany's second National Allocation Plan, which aimed to distribute emissions allowances among emitting installations in the country, as insufficiently demanding under the EU emissions trading scheme (ETS). By forcing the German government to stick to its 'self-proclaimed' pioneer role, the Commission exhibited structural leadership (Jänicke, 2017: 119).

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But formal institutional powers also offer opportunities for non-state actors to exert structural leadership. Structures for consultation and participation in liberal democracies warrant societal interests a seat at the table in most phases of the policy cycle, although the range of interests granted this right and the extent of their formal and informal influence may vary greatly. The right of standing in court also constitutes a potentially powerful weapon. A fairly spectacular example is the court case which the NGO Urgenda started against the Dutch state in 2012 (see also Chapter 3). It was aimed at increasing the government's efforts to reduce greenhouse gas emissions. In 2015, the District Court of The Hague decided largely in favour of Urgenda (Liefferink, Boezeman and de Coninck, 2017). The possibility to lodge formal complaints with the Commission against the incorrect implementation of EU law has empowered citizens and particularly environmental NGOs to 'fight' their own national governments (Jordan and Liefferink, 2004: 228). Interestingly, non-state actors may also themselves create formal institutions for exerting leadership. Examples include various international certification schemes (e.g. for sustainable forestry products or palm oil) set up by business partnerships and roundtables (Arts, 2006; Schouten and Glasbergen, 2011), as well as various national labelling schemes. By setting standards and procedures for participating in these schemes, businesses (in some cases in collaboration with the state) create their own framework for the inclusion of leaders and the exclusion of laggards.

8.3.2 Entrepreneurial Leadership

The main role of entrepreneurial leadership is to draw attention to the character and importance of the issues at stake, to propose innovative policy solutions and to broker compromises (Young 1991: 294). There is a certain degree of overlap between entrepreneurial and cognitive leadership (see later in this chapter). While the framing of issues and the development of innovative ideas is mainly a function of cognitive leadership, effectively setting or at least shaping the climate policy agenda and negotiating the adoption of particular solutions is a matter for entrepreneurial leadership. In practice, entrepreneurial and cognitive leadership are often utilised simultaneously as generating knowledge without efforts to disseminate it and to convince others of its relevance is not likely to be very effective (Young, 1991: 300–301; Liefferink and Wurzel, 2017). Nevertheless, there is a clear conceptual distinction between cognitive leadership, which is about the production of 'intellectual capital or generative systems of thought' (Young, 1991: 298), and entrepreneurial leadership, which is about diplomatic, negotiating and bargaining skills (Liefferink and Wurzel, 2017; Wurzel *et al.*, 2017; see also Chapter 7, where entrepreneurship is defined somewhat differently).[1]

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Entrepreneurial leadership capacities are in principle available to both state and non-state actors, although the ability to mobilise and employ them may vary between different types of actors. Especially large states usually have fairly significant diplomatic resources at their disposal for networking, alliance-building and negotiating compromises. Massive diplomatic efforts by France were instrumental for the successful outcome of the 2015 Paris climate change conference (Bocquillon and Evrard, 2017). Large firms have considerable resources for various forms of consultation and lobbying activities with states and international organisations such as the United Nations and supranational actors such as the EU.

Small and medium-sized enterprises, NGOs and subnational governments have limited staff and financial capacities and therefore have to restrict themselves to clearly defined and well-targeted entrepreneurial efforts. A good example is the court case which was brought by Urgenda against the Dutch government. Urgenda is a network organisation with no more than 15 staff members (Urgenda, 2017). By making optimal use of the opportunity structures offered by the Dutch legal system, Urgenda managed to have a significant impact on the national climate debate. Cities sometimes conduct significant 'paradiplomatic' activities (Keating, 1999), which consist primarily of entrepreneurial leadership efforts. They increasingly do so in the framework of vertical networks (e.g. networks of 'green' cities or climate cities) initiated and facilitated by national governments or the EU such as the Covenant of Mayors (Kern, 2016; see also Chapter 5).

8.3.3 Cognitive Leadership

Cognitive – or in Young's terminology 'intellectual' – leadership 'relies on the power of ideas' (Young, 1991: 300). It usually 'operates on a different time scale than the other types of leadership … [because] the process of injecting new intellectual capital into policy streams is generally a time-consuming one' (Young, 1991: 298).

That cognitive leadership is indeed a long-term process is aptly illustrated by the case of climate change. Almost one century passed between the discovery of the greenhouse effect by Svante Arrhenius in 1896 and its emergence as one of the key issues on the global political agenda. It required the activities of generations of scientists and activists, culminating in the shared 2007 Nobel Peace Prize for the Intergovernmental Panel on Climate Change (IPCC) and former US vice president Al Gore.

The capacity to frame and/or reframe problems, interests and future perspectives is arguably the most important feature of cognitive leadership by NGOs (e.g. Wurzel *et al.*, 2017b). Environmental NGOs have coined the term 'hot air' (Long

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and Lörinczi, 2009) and led the way in questioning the alleged sustainability of biofuels.

Scientists and experts are crucial for developing knowledge about the causes and effects of environmental problems as well as for possible solutions. Their knowledge can be used by NGOs, individuals (e.g. Al Gore) or policy-makers at various levels of climate governance. Scientists and experts can themselves also play an important role in the climate policy-making process. The IPCC, whose activities oscillate between science and politics, provides the key example (e.g. Hulme and Mahony, 2010). Epistemic communities, which consist of scientists and experts (Haas, 1990, 1992), as well as knowledge brokers (Litfin, 1994), have played leading roles in the creation of various environmental regimes. However, climate scientists and experts have come under attack by populist movements and politicians, for example in the 2016 US elections and in the 2015 Brexit referendum in the United Kingdom.

Apart from scientific knowledge, the importance of 'experiential' knowledge about 'how policies actually work at the street level or company level, and how implementation problems can be solved effectively' (Haverland and Liefferink, 2012: 184) should not be underestimated. Experiential knowledge can be powerful ammunition for firms, branch organisations or other stakeholders to push for certain solutions (e.g. certain policy instruments) over others. Practical evidence that a given policy approach works and demonstrable support among policy addressees provide output legitimacy.

8.3.4 Exemplary Leadership

Exemplary leadership consists of providing good examples for other actors. States may act as exemplary leaders in climate governance both *intentionally* or *unintentionally.* Intentional exemplary leadership is provided by leaders which act as pushers while pioneers usually exhibit merely unintentional exemplary leadership (see Table 8.1). The United Kingdom's early adoption of a national ETS with the intention of influencing the EU ETS (Rayner and Jordan, 2017) offers a good example of intentional leadership, while Germany and Denmark's initial steps towards domestic energy transitions constitute examples of unintentional exemplary leadership (Andersen and Nielsen, 2017; Jänicke, 2017; Wurzel *et al.*, 2017c).

As discussed, intentional exemplary leadership may be problematic for firms as they may have sound commercial reasons for being the first (and possibly only) actor to introduce an innovative 'green' product in a particular market. As Dupuis and Schweizer (2016) have pointed out, only some corporate actors are 'confident enough in the superiority of their abatement techniques or in their internal climate

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policy' – and thus in their comparative advantage vis-à-vis competitors – to consider presenting themselves as examples for others. The activist company Fairphone explicitly adopted the ambition to demonstrate the feasibility of a more sustainable mobile phone. With its activist roots and the explicit goal to make its branch of industry more sustainable, Fairphone is arguably best described as a hybrid between a firm and an NGO, which shows that the once strict divide between business and environmental organisations has become permeable, at least to some degree (Biedenkopf, Bachus and Van Eynde, 2016).

Exemplary leadership plays a particularly important role in the world of 'green' cities. A wide variety of city networks facilitate the exchange of good examples and local 'best practices' (Kern, 2016). Cities which attempt to attract economic investment by branding themselves as 'green' (e.g. Andersson, 2016; Wurzel *et al.*, 2016) may be confronted with the same dilemma as corporate actors. Increasingly, however, city networks are embedded in multilevel arrangements which are explicitly aimed at 'spreading the word'. A key example is the Covenant of Mayors, which was set up by the European Commission in 2008. With its monitoring programmes, benchmarking exercises and collaborative initiatives, the Covenant of Mayors provides learning opportunities for more than 7,000 member cities (CoM, 2017). Competitions like the European Green Capital Award and the European Energy Award are geared towards showcasing exemplary leadership. With the possible exception of some very large or mega-cities, individual cities do not usually wield significant structural power and have little interest in actively pushing others with the help of cognitive or entrepreneurial efforts. By setting up the Covenant of Mayors and the European Green Capital Award, the EU provided entrepreneurial leadership in their place.

8.4 Conclusions

Leadership and pioneership can take many forms. This is the case in traditional top-down government systems, which are dominated by state actors, and even more so under conditions of polycentric governance, which encourage potentially any actor to become a leader or pioneer. This chapter has shown that a wide range of both state *and* non-state actors are capable of exerting leadership and pioneership. Importantly, the differentiation between different types of leadership and pioneership has allowed us to offer a more fine-grained analysis of the actions of leaders and pioneers in polycentric climate governance.

Large corporate actors usually have considerable economic power and experiential knowledge which can be mobilised to exert *structural, cognitive* and *exemplary* leadership. However, depending on their market position, corporate actors may be reluctant to use their leadership capabilities to push others to adopt and

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implement the same or similar policies and measures. Apart from the economic power of consumers, which is potentially very significant but difficult to organise due to collective action problems, the *structural* power of civil society actors is mostly limited to formal institutional power and, in the case of in particular large NGOs, legitimacy. Moreover, NGOs, scientists and experts are in a relatively strong position to exert *cognitive* leadership by framing and reframing problems and identifying cause–effect relationships and solutions. However, these actors can be challenged by, for example, populist movements and politicians, which reject their cognitive leadership. Cities (and by extension also other tiers of subnational government) finally have a large potential for exerting *exemplary* leadership.

All actors assessed in this chapter, moreover, are potentially capable of exerting *entrepreneurial* leadership. This may involve diplomatic and/or lobbying efforts, for which only some actors (e.g. especially large states, companies and business organisations) usually have sufficiently large capacities. Entrepreneurial leadership may, however, also entail relatively small-scale, well-targeted efforts, such as initiating a strategic lawsuit or sharing knowledge in a network of peers. Such entrepreneurial leadership opportunities allow actors of limited size and capacity to exert leadership far beyond the boundaries of their own polycentric unit.

Pioneers are especially able to exert exemplary and cognitive pioneership as well as structural and entrepreneurial pioneership. However, because pioneers do not intentionally seek to attract followers, they will exhibit these four different types of pioneership primarily internally (e.g. within their organisation) rather than externally (i.e. vis-à-vis other actors). However, powerful and/or highly innovative pioneers are likely to have a significant impact on other actors in polycentric climate governance, even if they do not intend to do so.

In this chapter, we assessed whether polycentricity might lead not only to a proliferation of leaders and pioneers, but also to narrowing down the range of their potential followers to only those actors which operate in the same relatively independent domain in which leadership or pioneership originates. We argued that in many cases, 'systemic' institutions are essential for widening the audience of polycentric leaders and pioneers to potential followers from outside their relatively small, functionally defined governance units. Relatively autonomous polycentric units maintain relations with other relatively autonomous polycentric governance units and are in turn embedded within larger international, supranational, national or subnational governance units. This makes it possible for both state and non-state actors – which function as leaders and pioneers – to attract followers from both within *and* outside relatively autonomous, functionally defined polycentric governance units. All types of leadership identified in this chapter are important in this regard. States and large firms can amplify the impact of structural leadership through

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international organisations and international markets. NGOs would be considerably less influential without overarching national and/or EU legal systems offering to them the opportunity to exert wide-ranging cognitive leadership. Without its formal role in the United Nations Framework Convention on Climate Change machinery, the IPCC would never have been as influential as a cognitive leader as it is nowadays. And without the Covenant of Mayors, the European Green Capital Award and the European Energy Award, individual 'green' cities would be less well able to act as exemplary leaders and have an impact on other cities across Europe. Importantly, it was the EU which created these institutions in the first place.

In sum, leadership and pioneership originating in polycentric (or MLG Type II) units cannot be understood without taking into account their embeddedness in more hierarchical, top-down (or MLG Type I) arrangements. What seems to be important is to achieve the 'right' balance between more polycentric (or bottom-up) governance arrangements and hierarchical (or top-down) elements in climate governance. Finding this balance has become even more important since the adoption of the 2015 Paris Agreement, which encourages bottom-up or polycentric climate governance approaches.

Note

1. Chapter 7 conceives of entrepreneurship in terms of 'acts performed to "punch above your weight"' in a much broader sense, including for instance the creation and maintenance of networks or processes of framing; our conception of entrepreneurship relates to all four types of leadership discussed in this chapter.

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9

Diffusion

An Outcome of and an Opportunity for Polycentric Activity?

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9.1 Introduction

Climate change governance is in flux, and policy analysts have identified different sources of dynamism (Jordan and Huitema, 2014a, 2014b). Most importantly, recent research suggests that the national and subnational levels are much more dynamic sites of governing activity than is often thought, at least in comparison with the international regime, which has been described as gridlocked (Hoffmann, 2011: 16). These research findings have resulted in a better appreciation that climate governance has become much more multilevel and 'polycentric' (Jordan *et al.*, 2015; see also Chapter 1).

Polycentricity is chiefly about the emergence of and interaction between multiple governing authorities at different scales, which are mostly or completely independent when making norms and rules within a specific domain (Ostrom, Tiebout and Warren, 1961; Ostrom and Ostrom, 1977; Ostrom, 2010). In line with this concept, we observe a growing number of climate governance initiatives operating at the local level through processes of self-organisation, with cities striving to shape climate governance not only at the local level but also at the transnational level (see Chapter 5). To attain this goal, cities have formed networks that are bound by a set of overarching rules and that are committed to experimentation and learning (e.g. Castán Broto and Bulkeley, 2013). City networks and other types of local action develop collaborations with other governing units at the subnational, national, transnational or international levels, involving both public and private actors. With the formation of such public-public and public-private partnerships (e.g. Bäckstrand, 2008), climate governance initiatives become more ambitious over time. These developments are described and discussed by various contributions to this volume and the broader literature on climate governance.

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Recognising that climate governance has become increasingly polycentric (Jordan *et al.*, 2015), two research questions are well worth posing. First, we can hardly expect that polycentricity emerged as a reaction to one specific event, but is it more likely to be the outcome of decisions taken by many different actors in response to a whole series of events over a longer period? An analytical concept that explicitly takes into account decision-making processes over time in different governing units is that of diffusion. Therefore, to what extent is the emergence of polycentric governance an *outcome* of a diffusion process?

Whilst one could reason that polycentric climate governance represents the outcome of a diffusion process, at the same time it can be asked to what extent greater polycentricity itself has facilitated diffusion (see also Chapter 7). One of the core propositions in polycentric governance theory (see Chapter 1) is that experimentation facilitates learning (see Chapter 6). Learning, however, also represents a core mechanism by which diffusion takes place. From this perspective, it is conceivable that polycentricity is related to diffusion processes in two ways: first, polycentricity could be the outcome of diffusion processes; and second, diffusion could be facilitated by the existence of polycentricity as an active opportunity structure. Consequently, the second research question that underlies this chapter is: to what extent does polycentric governance represents an *opportunity* for diffusion?

This chapter begins by giving an overview of the conceptual foundations of diffusion research, which involves both the diffusion of policies and institutions. Next, it discusses the extent to which polycentric climate governance is an outcome of diffusion processes, followed by an assessment of how polycentric governance can serve as an opportunity structure for further diffusion processes. With regard to the latter, the European Union (EU) is prominently discussed, as it has often been referred to as a leader in climate policy (see e.g. Oberthür and Roche Kelly, 2008). It closes with a summary of the main insights and suggestions for future research. While the focus of this chapter is on climate policy, the concluding section also discusses the applicability of diffusion research to other forms of governing.

9.2 Conceptual Foundations of Diffusion Research

A major research interest of policy studies has focused on the sources and patterns of policy change; that is, how policies, instruments or the calibration of instruments differ when examined at different points in time (Hall, 1993). At the policy level, for instance, policy change can entail the decision to adopt a legal act that establishes sustainable forest management. At the policy instrument level, policy change can refer to replacing regulatory instruments (e.g. maximum permissible levels of

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pollution) with market-based instruments (e.g. levies, taxes or subsidies). In terms of the third level (the calibration of specific instruments), replacing existing maximum permissible levels of pollution with stricter standards represents an instance of policy change (Tosun, 2013). To explain the occurrence and patterns of policy change, scholars have relied on a set of theories that stress the importance of the policy process; that is, who participates in policy-making, what interests the individual actors have and which coalitions they form (Weible and Sabatier, 2017). Among these theories is the analytical perspective offered by diffusion research (Meseguer and Gilardi, 2009; Gilardi, 2012; Berry and Berry, 2018).

The main interest of diffusion research lies in how policy innovations spread from one entity to another (Dobbin, Simmons and Garrett, 2007), leading to policy change in the adopting entity. While straightforward at first glance, the definition of a policy innovation raises questions about what exactly characterises a policy innovation. According to Walker (1969), policy innovation is about a national government adopting a new policy, while 'new' means that it is new to the jurisdiction in question. Consequently, an important difference exists between policy *invention* and policy *innovation* (Jordan and Huitema, 2014a, 2014b). The first refers to the process of *developing* an original policy idea, whereas the latter is about the *spread* of that policy idea.

Policy scholars have conducted extensive inquiries into policy innovation, which can inform and guide scholarship on polycentric climate governance. Despite the vast corpus of research, Berry and Berry (2018) argue that most studies are similar as they all elaborate on two sets of explanations for the adoption of a new policy by a government. The first set of explanations refers to political, economic or social characteristics *internal* to the jurisdiction that innovate. Political characteristics include the partisan composition of national governments; we know, for example, that green parties are more supportive of climate policy than other political parties (e.g. Biesenbender and Tosun, 2014). Institutional veto players must also be taken into account when explaining why policy innovations are taken up by some countries but not others (e.g. Fleig, Schmidt and Tosun, 2017). Economic characteristics refer to the economic strength of countries, as well as the industries that dominate their economies and the degree to which the countries are integrated with regional and international markets (e.g. Tosun, 2013). Regarding the social characteristics, the existence and strength of civil society groups, for instance, have been shown to matter for policies addressing climate, energy and environmental concerns (e.g. Tosun and Schulze, 2015).

The second set of explanations refers to factors that are *external* to the jurisdictions that innovate. The main explanation offered by this group of factors relates to diffusion, which is about national governments emulating the policy decisions previously taken by other governments. The drive behind emulation is the search

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for social acceptance by demonstrating conformity with the behaviour of other states (e.g. Meyer *et al.*, 1997). While emulation represents the classic diffusion mechanism, several alternative mechanisms have been identified (e.g. Dobbin *et al.*, 2007). These include learning, coercion and competitive pressure.

Learning – which is also an important feature of polycentric governance theory – is conceived as the process of changing preferences due to the availability of social knowledge. Put more directly, a government may adopt a policy in place elsewhere because it regards it as an appropriate solution to a given problem (Gilardi, 2012). Thus, instead of embarking on a costly search for appropriate solutions at the national level, governments can rely on the solutions adopted by other jurisdictions or international organisations. Such a scenario aligns with polycentric governance theory, in which local experiments lead to learning about what works and the upscaling of policy innovations.

The next mechanism is *coercion*, which can be defined as a situation in which policy choices of countries are constrained. Dobbin *et al.* (2007: 454–457) discuss coercion by referring to the concepts of conditionality, policy leadership and hegemonic ideas (see also Chapter 8). Powerful countries may require third states to adopt certain rules directly or indirectly by acting through international institutions (conditionality). In this context, Schneider and Urpelainen (2013: 14) argue that the United Nations, the Bretton Woods institutions, the General Agreement on Tariffs and Trade and the North Atlantic Treaty Organisation, among others, have been established and promoted by the United States in an effort to spread its liberal economic and political ideas. According to Gruber (2000), powerful states may influence decisions taken by weak ones even without an intention to do so (policy leadership). This is achieved by altering the nature of the status quo they face. The example given is the decision of the United States to pursue free trade with Canada, which stimulated the Mexican government to engage in free trade as well. Finally, hegemonic ideas are about the prevalence of certain policy notions. Powerful countries can influence the framing of policy discussions because they have a better research infrastructure (Dobbin *et al.*, 2007: 456).

The third mechanism highlights the importance of economic *competition* in the diffusion of policy innovations. The logic underlying this mechanism is that the competition for trade and investment affects the incentives of policy-makers regarding whether to adopt policy prescriptions. Several empirical studies point out the relevance of economic competition for policy diffusion. The findings generally suggest that countries are inclined to adapt their standards to those of their key export markets (e.g. Prakash and Potoski, 2006).

The second point that needs further clarification concerns the patterns we can observe when policy innovations spread. Studies of policy diffusion often focus on the horizontal spread of policy innovations from one state to another (*horizontal*

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diffusion). An alternative diffusion pattern involves studying whether the adoption of policy innovations by subnational units makes national-level action more likely (*vertical diffusion*) (Shipan and Volden, 2006). The fact that diffusion research recognises both horizontal and vertical diffusion makes the diffusion perspective, in principle, compatible with polycentric governance and promises some valuable insights. However, in reality, the literatures on polycentric climate governance and policy diffusion do not speak to one another, which hampers the seizing of this opportunity for conceptual advancement.

Studies of policy diffusion are not only remarkably similar in that they all test a relatively stable set of explanatory factors (Berry and Berry, 2018), but they predominantly focus on one or a few specific policy instruments per analysis and adopt a relatively simple measurement that only gauges whether that specific instrument (e.g. carbon taxes) exists in the individual jurisdictions (Howlett and Rayner, 2008). This choice of measurement is often motivated by limitations in data availability and other challenges to measurement. In this context, Meseguer and Gilardi (2009) further note that existing studies tend to concentrate on instances of 'explosive' diffusion (i.e. the adoption of a policy innovation by numerous or all observation units at fast rates), which correspond to a selection bias and may potentially lead to overestimating the likelihood that policy diffusion takes place. The selection bias results from the fact that 'explosive' events are easier and possibly also more exciting to observe, which stems from two sources. First, such diffusion events are usually triggered by actors such as international organisations that offer empirical data on the characteristics of the policy innovation concerned and the corresponding diffusion patterns. Second, 'explosive' diffusion is rare compared to 'regular' diffusion, which makes it easy for researchers to identify these events themselves and make them the subject of analysis.

9.3 The Diffusion of Climate-related Policies and Institutions

A vibrant research landscape exists that examines the diffusion of climate-related policies and institutions. For example, studies by Dubash *et al.* (2013), Lachapelle and Paterson (2013) and Fankhauser, Gennaioli and Collins (2015, 2016) demonstrate the spread of policy tools designed to tackle climate change, which especially took place from the 1990s onwards. The climate policies that have diffused transnationally include regulation, taxes and subsidies (Hughes and Urpelainen, 2015; see also Chapter 3).

Regulation can target the mitigation of climate change as well as the adaptation to it. Mitigation policies predominantly include measures aiming to lower emissions of greenhouse gases, for example, by means of protecting natural carbon

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dioxide sinks such as forests and oceans, or creating new sinks through afforestation or reforestation (Fleig *et al.*, 2017: 104). Adaptation policies are about developing responses to climate change impacts (see also Chapter 17) such as strategies for managing drought periods or flood management (Brouwer, Rayner and Huitema, 2013). Fleig *et al.* (2017) show that there is a basic interdependence between the adoption of mitigation and adaptation policies: governments that adopt mitigation policies are also more likely to adopt adaptation policies, and vice versa.

Carbon taxes are directly connected with the level of carbon dioxide emissions and put a price on the volume of these emissions with a view to creating an incentive for users to reduce their consumption of fossil-fuel energy sources. Carbon taxes typically apply to diffuse sources of carbon dioxide emissions such as the road transport, residential and commercial sectors. Finland was the first country to adopt an explicit carbon tax in 1990. The introduction of the carbon tax in Finland represented an ad hoc reaction to the international discourse on sustainable development and climate change (Vehmas, 2005). The other Nordic and European countries followed the Finnish example in the 1990s and also introduced some type of carbon tax (Daugbjerg and Pedersen, 2004).

Regarding subsidies, Schaffer and Bernauer (2014) concentrate on the diffusion of feed-in tariffs for renewable energy and the adoption of green certificate systems in advanced democracies over the past 20 years. Their empirical findings show that higher shares of fossil and nuclear energy increase the likelihood of a national government adopting these two policy instruments for promoting renewable energy. A climate policy innovation that has only recently started to diffuse is subsidies for electric cars, which was introduced in Norway in the 1990s (Holtsmark and Skonhoft, 2014). In 2009, China adopted a similar subsidy policy for electric cars, and Germany followed in 2016.

The literature has also addressed the diffusion of institutions. In this regard, one strand of the literature has examined the diffusion of ministries responsible for drafting climate policies. For example, Busch and Jörgens (2005) and Aklin and Urpelainen (2014) study the global spread of environmental ministries that tend to push for the adoption of national climate policies. Some countries such as Pakistan even created specific ministries for climate change, but such ministries have seen less diffusion. In most cases, climate change is a subdivision within either the environmental or energy ministry (see Tosun, 2018).

Research on climate policy and institutions has shown that climate policies in particular are prone to diffusion, since climate change requires coordinated action by many or ideally even all jurisdictions. The diffusion of climate policy innovation is driven by both external and internal factors. With regard to the external drivers, all four diffusion mechanisms (i.e. emulation, learning, coercion and competition)

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discussed earlier can be found in the relevant literature (e.g. Biesenbender and Tosun 2014). What is perhaps even more interesting is that internal considerations seem to matter as much as external drivers (e.g. Gilardi 2012). For example, Marcinkiewicz and Tosun (2015) show that lack of support for climate policies by political parties has hampered the adoption of innovations by the Polish government. Climate governance–related institutions are less well explored in the literature, especially those that specifically govern climate change. What we can observe is that many energy and/or environmental ministries have been reorganised to include a subdivision on climate change (e.g. Bauer *et al.*, 2012).

9.4 Polycentric Climate Governance as an Outcome of Diffusion

Through its annual Conference of the Parties (COP), parties to the 1992 United Nations Framework Convention on Climate Change (UNFCCC) meet regularly to negotiate collective climate actions and to monitor progress made by their implementation. A milestone in the development of the international climate regime was the adoption of the Kyoto Protocol in 1997 (see Chapter 2). As highlighted by Oberthür and Tänzler (2007), the adoption of the Protocol represented an important stimulus for the diffusion of climate policies. Initially, the UNFCCC aimed to reach agreement on climate policies at the international level, ideally involving all state parties. However, it quickly became apparent that the international community lacked the willingness to agree on a set of harmonised measures to protect the climate.

The failure to agree on binding commitments at the international level can be considered one of the reasons for the EU's climate leadership aspirations (Wettestad and Boasson, 2013). This first became visible in the negotiations of the Kyoto Protocol when the EU proposed the most ambitious emission cuts among the major industrialised countries (Oberthür and Roche Kelly, 2008: 36). Another important symptom of the EU's leadership in global climate governance was the adoption of its emissions trading system in 2003, which set limits on the carbon dioxide emissions that large polluting installations can emit, together accounting for about 40 per cent of the EU's total carbon dioxide emissions.

The EU's push to become an international climate leader has resulted in two important processes. First, *within* the EU a diffusion process has started, which in some cases (e.g. the promotion of renewable energy) has resulted in the adoption of harmonised policy measures, whereas in other cases the policy innovations have been adopted by only some EU member states (e.g. carbon taxes). The diffusion of climate policies within the EU has helped to establish the EU as a domain in which polycentric climate governance takes place.

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Second, the EU has tried – and to some extent succeeded – to diffuse its climate policies *beyond* its own jurisdiction, which has resulted in forming another level at which polycentric climate governance occurs. A case in point is the Energy Community, which is an international organisation that brings together the EU and its neighbours to create an integrated pan-European energy market by extending the EU's energy policies to countries in South-East Europe, the Black Sea region and beyond. The energy policies it has diffused include measures to increase the security of supply as well as measures that aim to decarbonise energy systems and reduce carbon dioxide emissions (e.g. Tosun and Schulze, 2015). As a result, the EU cooperates with the member states of the Energy Community on climate governance. The Energy Community members introduce new ideas to the EU and help to diffuse EU policies further to regions such as Central Asia.

The Energy Community is not the only means by which climate-related policies have diffused beyond the EU and have contributed to the emergence of a new governance domain. When the German government proposed the idea of forming a Renewables Club in 2013, the governments of China, India, Morocco, South Africa, Tonga and the United Arab Emirates as non-EU members declared their interest in joining (Hovi *et al*., 2016). In the case of China, India and South Africa, the decision to join the Renewables Club can be ascribed to their recognition of the EU's market power and the potential risk to their economic development stemming from carbon-dioxide-intense industrialisation. Before joining the Renewables Club, these three countries had already adopted climate policies that were similar to those in place within EU member states (Dubash *et al*., 2013).

Diffusion is also the main driving force behind the development of subnational networks that become important venues of climate governance. Examining the motivations of Spanish cities and municipalities to join the Covenant of Mayors, Pablo-Romero, Sánchez Braza and González Limón (2015) show that an important driving force is the membership of neighbouring municipalities, which supports the very basic logic of diffusion (through emulation and/or learning). Conversely, the more cities and municipalities join subnational networks such as the Covenant of Mayors, the more relevant they become as domains of polycentric governance.

Altogether, the literature supports the view that diffusion processes (rather than other processes such as a deliberate creation of this system in a top-down fashion through international organisations) have led to the emergence of polycentric climate governance as it can be observed today. The starting point for this was frustration with a gridlocked international regime. Influential actors such as the EU have helped fill this void and have sought to spread climate policies by employing different diffusion mechanisms. As discussed, the EU is not the only venue that has formed as an outcome of diffusion processes: we can observe very different venues,

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all of which emerged as a response to diffusion processes. The examples discussed concentrated on the transnational, national and subnational levels. However, it should be noted that the creation of the International Renewable Energy Agency was also preceded by diffusion processes related to the promotion of renewable energy (see Schaffer and Bernauer, 2014). From this, it follows that diffusion can help to establish institutional forums at all governance levels.

9.5 Polycentric Climate Governance as an Opportunity for Diffusion

Polycentric climate governance is about the emergence of an institutional system, which is theorised to lead to more efficient policy outcomes (Ostrom, 2010: 550). This section presumes that such efficient policy outcomes can come about by means of diffusion processes that are facilitated by the multitude of governing authorities at different scales. Policy diffusion entails an efficiency gain since national governments are spared the costs stemming from gathering information about what works to solve a policy problem.

As discussed in the previous section, the EU has sought to claim leadership in global climate governance. Did the EU's leadership aspirations result in the spreading of climate policies that otherwise would not have happened? Evidence exists within the literature demonstrating that the EU has succeeded in bringing about several developments with regard to climate policy. A well-documented example is Russia's ratification of the Kyoto Protocol. The primary reason for inducing the country to ratify the Protocol – and to trigger a process of formulating national policies to attain the carbon dioxide reduction goals – was pressure imposed on the Russian government by European leaders. The EU representatives maintained that they would only support Russia's membership in the World Trade Organization if the government ratified the Kyoto Protocol (Henry and Sundstrom, 2007). The polycentric climate governance regime and the role the EU claims for itself therein gave the EU the coercive power to change the Russian government's stand on climate policy and to exercise international leadership. Put more generally, polycentric governance can potentially allow for international leadership that can attract followers. In the aftermath of ratifying the Kyoto Protocol, the Russian government has also adopted policies to promote the production of renewable energy (see Zhang *et al.*, 2011). While Russia cannot be regarded as a frontrunner in promoting renewable energy, the country has joined the International Renewable Energy Agency (see Van de Graaf, 2013) and has supported corresponding policies at different instances at the international level, such as the Group of 8 (G8) Summit held in Saint Petersburg in 2006.

The literature suggests that the EU is most likely to facilitate the diffusion of climate policy innovations when it speaks with one voice or when it has adopted

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a harmonised policy that can help guide non-EU countries when deciding on whether to adopt a climate policy innovation. For example, carbon taxes have been subject to a slow diffusion process, despite the fact that they have been in place in some countries (e.g. Finland) since 1990 (see Busch and Jörgens, 2005; Baranzini and Carattini, 2014). One explanation for this observation is that the EU has not adopted a common stance on carbon taxes. Instead, the (limited) diffusion of carbon taxes can be attributed to the international image and economic importance of individual EU member states.

An important takeaway message from this example is that the mere existence of governing authorities at different levels is not a sufficient condition for diffusion processes to take place. Another point worth making is that diffusion processes – even if they take place in the EU context – do not have to result in the upscaling of policy innovations. In the case of carbon taxes, horizontal diffusion took place to a limited degree (see Andersen and Elkins, 2009), but this policy innovation failed to become the subject of vertical diffusion.

Policy measures adopted to promote the electric car in Germany offer an example of the successful vertical diffusion of a policy innovation in a polycentric system. German cities and municipalities have been experimenting with electric cars for a couple of years and communicated the lessons they drew with means of Germany-wide and transnational city networks. In 2016, the German Federal Council (*Bundesrat*), composed of the governments of the German states (*Länder*), adopted a resolution in which they demanded that from 2030 onwards cars that do not produce carbon dioxide emissions are to be authorised for road traffic, which can effectively be attained only by replacing fuel-powered cars by electric ones. This resolution appears even more extraordinary when considering that Germany has a very powerful car industry that has in the past been spared from policy measures that would have imposed regulatory burdens on it (e.g. Tosun, 2017). When comparing the transition for electric mobility in Germany and the United Kingdom, for instance, it becomes apparent that the German government pursues a 'careful transformation and conservation of its automotive industry' (Mazur *et al.*, 2015: 84), which mostly consists of support for research and development for major German-based car manufacturers and suppliers. In the same year, the German federal government decided to put in place a financial incentive for buying electric cars.

In their resolution, the members of the Federal Council called on the European Commission to adopt a new policy approach that would support cars that do not produce carbon dioxide emissions (Khan, 2016). Whether the European Commission will act upon this call remains an open question, but what is important is that a climate policy innovation has diffused vertically from the local level to the regional and then national level, and may eventually even reach the European level.

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Yet there is an indicator that the topic of electric cars has entered the agenda of the European Commission: the draft proposal for the Energy Performance in Buildings Directive calls for a fixed share of parking spaces in all new buildings in the EU to be equipped with electric car recharging facilities. The EU's policy agenda has also been influenced by discussions taking place in other venues of the polycentric climate governance system. In this case, the EU has formed a partnership with China (EU-China Urban Partnership) that brings together not only political and administrative elites, but also representatives of business and industry. One of the areas of collaboration of this transnational public-private partnership concerns electric mobility. Therefore, the EU's policy approach to electric mobility is also determined by its embeddedness in transnational networks, which may facilitate policy diffusion through learning.

A variable that appears particularly important here is how well the policy innovation in question works in the jurisdiction from which it originates and/or in the other jurisdictions that adopted it. With regard to that question, the case of Germany is problematic since motorists seem unwilling to buy electric cars, at least at this point in time. Among the factors preventing German motorists from buying an electric car are cost considerations (e.g. Barth, Jugert and Fritsche, 2016). Thus, though political actors support the promotion of electric cars, the demand for them has been limited until recently (e.g. Meckling and Nahm, 2017). However, with political actors at different governing levels in Germany all adopting the same stance on electric cars, it is conceivable that the public will eventually become supportive of them, replacing fuel-powered cars with electric ones.

What the example of electric mobility in Germany shows is that polycentric governance can facilitate upscaling in some circumstances, but that it is likely to develop over long periods of time. A necessary precondition for vertical diffusion is horizontal diffusion, which is accelerated by the existence of polycentric governance. Then, vertical diffusion relies on the convergence of policy preferences across the different governing units, which may or may not be attained. Finally, it should be noted that upscaling does not necessarily mean that the policy innovation adopted by the upper governing units is identical to the policy innovation as it has emerged and diffused (horizontally) among the lower governing units. As exemplified by the EU's draft directive, the reduction of carbon dioxide emissions by means of promoting electric cars can be pursued by targeting the installation of recharging facilities, but the initial idea for this measure could have come from a national policy that aims to foster the purchase of electric cars (e.g. financial incentives adopted by the German government).

Another facet of the relationship between diffusion and polycentric governance is that the latter can accelerate diffusion processes (Busch and Jörgens, 2005). Diffusion studies are interested in both the patterns and the time it takes for a given

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policy innovation to diffuse. From that perspective, the timing of a diffusion process could be explained by the development of a system of polycentric governance and the multiplication of domains in which communication, cooperation and learning takes place.

This argument is based on the reasoning that polycentric governance empowers different governing units and therefore motivates them to write their own success stories. From this, it follows that lower-level governing units in countries that are not known to be climate policy pioneers may take advantage of the new opportunity structure and adopt policy innovations that are not feasible at the higher governing levels. A prominent example is the case of California and the strict air pollution standards in place there (Tosun, 2013). The state is keen to maintain, tighten and export these standards. To this end, the government of California has drafted a global pact to reduce carbon dioxide emissions, which it seeks to get signed by a broad alliance of countries, including Canada, China and Mexico (Davenport and Nagourney, 2017). With California striving to act as a pace-setter in global climate politics (Bang, Victor and Andresen, 2017), the slow diffusion of climate policies at the international level may receive a stimulus and lead to better results.

9.6 Conclusions

This chapter has attempted to trigger a debate about the linkages between two different bodies of literature that have been discussed in isolation so far: one on diffusion and the other on polycentric governance. Diffusion research has been used to study how climate change policies come about (e.g. Fleig *et al.*, 2017), but in doing so, this literature has not paid attention to the existence of polycentric governance and has also not reasoned to what extent – if any – its existence may affect the patterns of diffusion processes. Likewise, the small but growing literature on polycentric climate governance tends to describe the empirical characteristics of the emerging system and, insofar as it explains the empirical phenomena observed, tends to emphasise the effectiveness of policy learning and the role of policy entrepreneurs (e.g. Jordan *et al.*, 2015). The current literature does not explain how domains of polycentric climate governance emerge and how innovations in one domain diffuse to others, which is, however, addressed by the research on policy diffusion. Despite the seemingly different interests of these two strands of research, it is analytically possible and – as argued here – rewarding to abstract from the research perspectives adopted in the respective literatures and attempt to synthesise them.

This chapter argues that polycentric governance is an outcome of diffusion processes and that it offers an opportunity structure for climate policy diffusion. The international climate governance system is polycentric as it involves multiple

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scales, mechanisms and actors. This structure is the outcome of multiple and simultaneous diffusion processes. While polycentric climate governance can be seen as an outcome of diffusion processes, it also offers an opportunity structure for the subsequent diffusion of particular initiatives by means of different diffusion mechanisms, which include but are not limited to learning. These diffusion processes are sometimes supported and sometimes hindered by domestic characteristics such as the nature of national political systems, the economy and society (e.g. Fankhauser *et al.*, 2015, 2016).

The Paris Agreement introduced a global climate governance system that rests on the individual states offering nationally determined contributions (NDCs) (see Tobin et al., 2018). As the NDCs are subject to a five-year evaluation cycle in which every country needs to submit its efforts regarding climate change (see Chapters 2 and 12), it is likely that diffusion processes will continue to take place at different governance levels. The regular evaluation of the NDCs can result in both horizontal and vertical diffusion, which can potentially lead to a coherent climate regime at the international level. It could also lead to the preservation of the current regime, which is characterised by polycentricity. The assessment of the consequences of diffusion processes for polycentric climate governance is something that future research should address.

With the polycentric regime as it has emerged, horizontal diffusion can take place between cities, regions and nation states. While vertical diffusion in both directions – that is, downscaling and upscaling – is feasible, existing research on climate experiments and the role of learning processes suggests that in the future upscaling is the more likely outcome (e.g. Hoffmann, 2011). However, it is up to future research to validate this expectation.

More importantly and in line with the concept of polycentric governance, policy learning appears to be the diffusion mechanism that is preferred by political actors and that is also most likely to produce an upscaling of policy innovations. At the climate conference in Marrakech in November 2016, countries discussed the setting up of new initiatives such as the NDC Partnership, with a view towards supporting the formulation and implementation of NDCs in developing countries by means of facilitating policy learning (Fleig *et al.*, 2017).

Considering that the Paris Agreement acknowledges both mitigation and adaptation policies, a consequence to be expected is that diffusion processes can be observed for both types of climate policy. The question that results from this perspective, then, is whether diffusion is more successful (i.e. more countries adopt policy innovations) in the case of mitigation or adaptation. At any rate, it appears analytically worthwhile to include both mitigation and adaptation policies in the study of diffusion in polycentric climate regimes – an aspect that was not addressed by Ostrom (2010). It is plausible to hypothesise that the upscaling of adaptation

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policies is most likely to occur in cities and subnational units as they have more experience with this type of policy, whereas we could expect mitigation policies to be subject to downscaling. Regarding the latter, it is possible that mitigation policies that have trickled down to lower governance levels become modified and then become the subject of a new horizontal and/or vertical diffusion process. However, again this expectation warrants a systematic analysis by future research.

In short, plenty of promising and relevant research questions related to the theme of this chapter remain unanswered, which should stimulate theoretically grounded empirical research on a wide range of governance units in developed and developing countries.

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10

Linkages

Understanding Their Role in Polycentric Governance

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10.1 Introduction

Global climate governance has developed from a classic international regime (based on the interests and decision-making of states) to a polycentric system (see Chapters 1 and 2), encompassing a wide range of non-state and subnational actors. Polycentric governance theory assumes that while governing initiatives are largely independent in establishing their own norms and rules via self-organisation, they are able to mutually adjust and collaborate with each other. Polycentric governance, in other words, highlights a non-hierarchic, layered landscape in which initiatives are linked rather than isolated. However, the exact nature of linkages has not been a major puzzle in polycentric governance theory to date. To close this gap, we explicitly discuss linkages between and among state, non-state and subnational actions in the polycentric climate governance system.

From a research perspective, 'linkages' is a broad and diverse concept. Linkages can be material, functional, biophysical or a 'fact of life' (van Asselt, Gupta and Biermann, 2005). For instance, climate change has an impact on biodiversity and poverty levels in countries lacking adaptive capacity. We focus, however, on *institutional linkages* that occur directly or indirectly, intentionally or unintentionally, among climate actions. Cities, for instance, collaborate and compete with other cities for resources; they are also dependent on the actions by the regions and countries in which they are located, the companies and industries driving their economies and their citizens (see Chapter 5).

From a policy perspective, coordinating and improving linkages between actors and institutions has started to gain traction. The 2015 Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) could be seen as marking a decisive shift towards more polycentric climate governance, increasingly trying to harness the potential benefits of linkages, while at the same

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time attempting to minimise the risk of conflict and overlap (see Chapter 2). The system of nationally determined contributions offers opportunities for new collaborations between public and private actors, and for strengthening existing linkages. The outcomes of the Paris climate summit gave unprecedented recognition to non-state actors (or, in UNFCCC jargon, 'non-party stakeholders') and cooperative initiatives in delivering climate action (see Chapter 4).

Against this background, we analyse linkages between state, non-state and subnational climate actions in the context of an emerging polycentric climate governance architecture. We begin by observing that the emerging polycentric climate system constitutes a networked structure, wherein individual actors interact with each other. To better assess the nature, quality and impacts of these interactions, we offer a discussion of previous conceptualisations of institutional linkages showing how climate actions by a myriad of cities, regions, companies and civil society organisations are connected. We then provide several illustrative examples for the main categories of linkages, focusing on interactions between transnational and international organisations. We then discuss the current and prospective approaches to ensure that climate actions interact synergistically with the intergovernmental UNFCCC regime and how synergistic interactions can be improved. Finally, we reflect on the core propositions of polycentric governance theory to assess its usefulness in analysing the current landscape of climate governance.

10.2 Polycentric Climate Governance as Networked Governance

Polycentric governance systems (including the global climate governance architecture) are characterised by multiple institutions organised in a non-hierarchical, top-down fashion. In the words of Ostrom (2010: 552), polycentric governance is characterised by

> multiple governing authorities at different scales rather than a mono-centric unit. Each unit . . . exercises considerable independence to make norms and rules within a specific domain (such as a family, a firm, a local government, a network of local governments, a state or province, a region, a national government, or an international regime).

In this section, we review the evidence for the presence of a polycentric climate governance system by applying a network analysis to the plethora of regional, subnational, private and transnational climate actions currently making up the global climate governance architecture (see Biermann *et al*., 2009). Our argument is that climate actions are well connected and that, therefore, scholarly attention should focus on the linkages and interactions between governance initiatives.

The growth in the variety and number of actors and institutions in global climate governance is well documented. For instance, the Climate Initiatives

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Portal, a platform providing information on transnational climate initiatives administered by the United Nations Environment Programme (UNEP), contains more than 220 initiatives engaging state and non-state actors across eight thematic issue areas (e.g. transport, energy efficiency and adaptation; see Widerberg and Stripple, 2016). Michonski and Levi (2010: 1) identify more than 16 international organisations in the United Nations (UN) system that are part of the 'broader complex of multilateral institutions whose rules, decisions, and activities can be expected to have important consequences for international efforts to confront climate change'. Similarly, Weischer, Morgan and Patel (2012: 177) study 17 'climate clubs' that 'includes any grouping that comprises more than two and less than the full multilateral set of countries party to the UNFCCC and that has not reached the degree of institutionalization of an international organization' (see also Chapter 19). From a polycentric perspective, it may be tempting to see this emerging system of governance units as consisting of relatively independent centres of authority. However, the degree of polycentricity of the system can be determined only by establishing how interdependent each governance unit is vis-à-vis other units.

Climate governance institutions are not necessarily independent governing centres. Keohane and Victor (2011) even argue that there may be tight coupling or regional hierarchies and clusters between some institutions. Green (2013) shows this empirically by mapping how 30 different private transnational carbon accounting standards recognise other standards, such as those used by the Kyoto Protocol's Clean Development Mechanism (CDM) or the European Union emissions trading system. Her analysis suggests that there is policy convergence in that public rules provide an 'anchor' for private rules to operate (Green, 2013). Hence, while the polycentric system of global climate governance appears to be increasingly populated by a myriad of new institutions and rule systems, Green shows how self-organisation around a limited set of common rules makes the system less fragmented than it seems at first glance. It is thus questionable whether in a counterfactual situation, without the Kyoto Protocol, there would have been a comparable surge in private carbon accounting schemes. This contradicts some of the core thinking in polycentric theory, namely that systems do not necessarily require a central coordinating force or agent to create order (Dorsch and Flachsland, 2017). It also begs another question: when can a system be considered polycentric, i.e. consisting of multiple centres of authority that are to some degree independent (taking into account that polycentricity is not, as noted in Chapter 1, a binary variable but should be understood as a continuum)? To answer this question, one has to understand the number and intensity of linkages between different governance units.

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Green's analysis includes three key conceptual and analytical aspects that enable her to study institutional linkages in a manner that resonates with polycentric theory. First, she conceptualises the system as a network consisting of nodes and links, following a growing trend among international relations scholars that characterise global governance in terms of networks (e.g. Hafner-Burton, Kahler and Montgomery, 2009; Kahler, 2015). This perspective understands the world as consisting 'not of states but of networks', and problems (and their solutions) arise because of too many or too few connections (Slaughter, 2017). Second, Green analyses linkages at the system level rather than at the dyadic level. Whereas traditional perspectives on institutional interplay and interactions (see later in this chapter) studied the linkages between a 'source' and a 'target' institution, Green's network perspective allows her to look at linkages between three or more institutions. Third, she uses network analysis to approach her subject. Network analysis has become increasingly popular over the past 15 years through scientific breakthroughs in disciplines such as mathematics, physics and biology (Barabási, 2015). Network science suggests that widely different networks tend to share common properties. For instance, cascading events – when an initial change in one node has knock-on effects on neighbourhood nodes leading to large-scale effects – have been observed on the Internet, the financial system and human bodies (Barabási, 2015). Moreover, network analysis also allows for identifying central nodes in the network, revealing where power and authority may be situated.

Moving towards an empirical mapping of linkages in global climate governance requires the analyst to choose what type of linkages to focus on. One attempt has been presented by Widerberg (2016), who focuses on the 'interaction structure' created by joint membership of actors in institutional arrangements. This approach suggests that if two institutions share a member (i.e. an organisation), then knowledge, ideas, information and norms can more easily travel between the institutions. Members become 'bridges' between different institutions, acting as mediators or gatekeepers for linkages. Members also function as forces of convergence as they try to streamline rule systems for reasons of efficiency. For example, if a city is part of two different urban climate governance networks, it has an incentive to ensure that mitigation goals and monitoring and reporting standards are the same or at least do not contradict each other. Hence, mapping how institutions are linked by membership provides valuable insights into the processes of convergence and divergence in the polycentric climate governance system.

Using data collected by Widerberg, Pattberg and Kristensen (2016), we create a network diagram of 77 international and transnational, public, private and hybrid institutions. Each node in the network represents a climate action, and each link represents a shared participant (i.e. organisational member). For instance, if Sweden participates in both the UNFCCC and the Renewable Energy and

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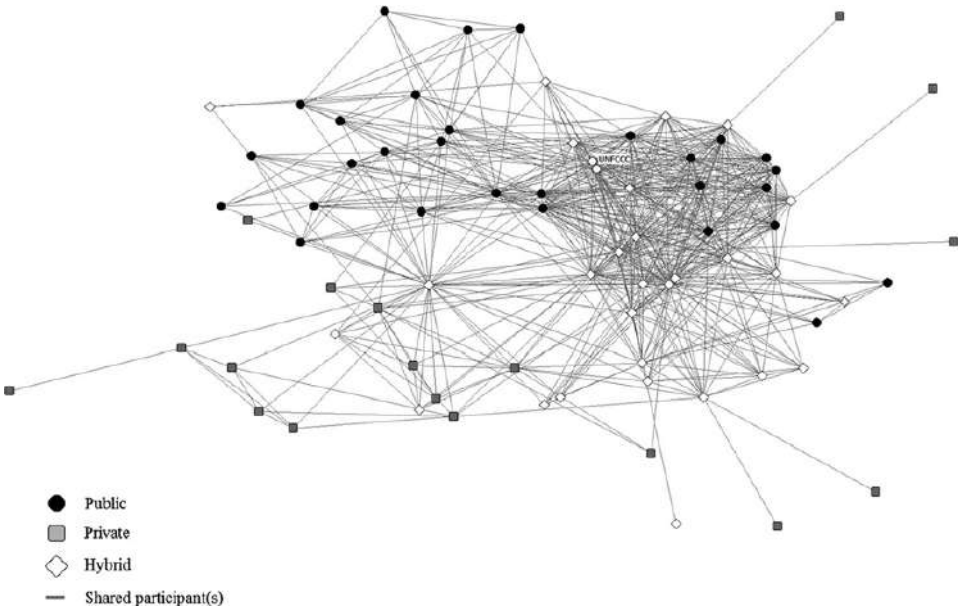

Figure 10.1 Network visualisation of 77 institutions in global climate governance. Source: Widerberg (2016).

Energy Efficiency Partnership, a link is created between the two institutions. Figure 10.1 shows the resulting figure, with the UNFCCC clearly marked.

Visualising the global climate governance landscape as a network shows how well connected the institutions are in terms of shared membership. It also shows how the UNFCCC is one of many institutions but that it remains centrally positioned vis-à-vis the others. If one assumes that shared membership increases the likelihood of interaction between institutions in terms of the exchange and flow of knowledge, ideas, information and norms, then it provides a starting point for delving deeper into what exactly travels through the network and in what direction. The next section discusses various approaches to conceptualise the linkages of institutions in the polycentric climate governance architecture.

10.3 Institutional Linkages in Polycentric Climate Governance

10.3.1 Conceptualising Institutional Linkages

Linkages between individual units of governance are key to polycentric governance, particularly as they may result in mutual adjustments improving the overall coherence of the governance landscape. Institutional linkages have been studied extensively in the environmental politics literature and, as a result, we can draw on

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a variety of typologies (e.g. Young, 1996; Stokke, 2001; Oberthür and Gehring, 2006) to help us better understand them.

Among the first to provide a typology of institutional linkages was Young (1996), who distinguished among embedded, nested, clustered and overlapping institutions. The first category refers to international institutions that are embedded in overarching institutional arrangements. As most are international treaties, they are embedded in the general principles of international law and society, such as the principle of sovereignty (Young, 1996). The second category involves institutions that are nested in, and restricted by, a broader institutional framework. This is clearly demonstrated by the high number of protocols folded into environmental framework conventions. The third refers to situations in which several international agreements are deliberately combined into a new agreement, even though there is no functional need. The fourth category includes institutions that serve different purposes but impact each other in the process, without reference to each other (Young, 1996: 6).

Young emphasised that this typology is not exhaustive, and that the categorisation was intended as 'an initial step towards understanding the nature and significance of institutional linkages in international society' (Young, 1996: 2). Subsequently, Stokke (2001) provided a refined classification, distinguishing between utilitarian, normative and ideational interactions. Utilitarian interactions refer to situations in which institutions affect the costs and benefits of the behavioural options addressed by the other institution. Normative interactions occur when one institution confirms or rejects the norms of the other institution, which affects the normative effectiveness of that institution. The third category draws attention to learning processes between the interacting institutions.

A third categorisation was introduced by Oberthür and Gehring (2006), who distinguished among cognitive interactions, interactions through commitment, behavioural interactions and impact-level interactions. They focused more strongly on the causal mechanism underlying these interactions, or, in other words, on the processes or pathways through which the interactions are shaped. Cognitive interactions imply that one institution influences the development of another institution through knowledge and information. An interaction through commitment refers to overlapping or conflicting normative commitments. Behavioural interactions occur when the behavioural change triggered by one institution affects the performance of the other institution. Finally, impact-level interactions refer to situations in which the side effects of the activities by one institution affect the implementation of the targets of the other institution.

Interestingly, the aforementioned efforts, and in particular Young's (1996), mostly focus on linkages between international treaties and regimes. However, it is widely acknowledged that the landscape of climate governance is no longer

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solely governed by state authority, top-down regulations and international treaties and organisations. Consequently, Young's typology cannot easily be applied to assess linkages in a more diverse and multilayered landscape, including bottom-up initiatives, voluntary private arrangements and public-private partnerships. The typologies by Stokke (2001) and Oberthür and Gehring (2006) are more flexible in this regard, since these focus on the causal mechanism shaping the linkages. In a different attempt to close this knowledge gap, Eberlein *et al.* (2013) introduce a framework to analyse 'transnational business governance interactions'. Their framework enables the analyst to study drivers, forms, causal mechanisms and pathways, and effects of linkages between heterogeneous actors that have varying capacities and are located within diverse institutional contexts (Eberlein *et al.*, 2013: 2). However, as the scholars emphasise themselves, this is merely a modest initial attempt to assess the effects of linkages on 'regulatory capacity and performance' (Eberlein *et al.*, 2013: 14), and it is not yet sufficient to study the effects on the performance of a polycentric governance landscape as a whole.

Comparing the typologies by Stokke (2001) and Oberthür and Gehring (2006) reveals that some types display similar characteristics in terms of the causal mechanisms underlying the linkages. Both the ideational interaction and the cognitive interactions are based on learning processes as causal mechanisms. In addition, the normative interaction as well as the interaction through commitment is based on the diffusion of norms and principles. Finally, the utilitarian and impact-level interactions overlap in the way that they are both focused on the interacting impacts of the institutions' activities. Therefore, these three types of linkages can be considered similar, and are here summarised under the most recent terminology: cognitive linkage, linkage through commitment and impact-level linkage (Oberthür and Gehring, 2006).

In addition, the categorisations introduced earlier are not exhaustive. One could think of additional mechanisms through which linkages can be shaped – for example, financial flows, shared resources, political ideas and discourses, and so on. Finally, the aforementioned studies focus on dyadic linkages between units of governance, while to analyse polycentricity, it is necessary to go beyond these dyadic linkages and to analyse polyadic linkages among different units of governance. Only this would serve the ultimate goal of assessing the impacts on the performance of a governance landscape in addressing the issue or attaining the societal goal.

Clearly, to assess linkages in a polycentric governance landscape, it is important to reconsider and refine existing typologies of linkages. Table 10.1 serves as a starting point by summarising, combining and slightly adjusting the applicable types of linkages to make them fit the polycentric governance debate. In combination with Eberlein *et al.* (2013), this is a first step towards finding

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Table 10.1 *Summary of applicable types of linkages*

Type of institutional linkage	Description	Causal mechanism	Reference
Cognitive linkage	Governance units are linked through the exchange of knowledge, information and ideas	Learning process	Stokke (2001); Oberthür and Gehring (2006)
Linkage through commitment	The (voluntary) commitments of a governance unit influence or enter into those of another governance unit	Norms, commitments, principles, objectives or goals	Stokke (2001); Oberthür and Gehring (2006)
Behavioural linkage	The behavioural change triggered by a governance unit influences the performance of another governance unit	Behavioural change	Oberthür and Gehring (2006)
Impact-level linkage	The ultimate targets of governance units intersect	Impacts of activities	Stokke (2001); Oberthür and Gehring (2006)

linkages in a governance landscape that is characterised by the diversity of actors and governance processes.

10.3.2 Examples of Linkages between State and Non-state Climate Action

Empirical work on institutional linkages has demonstrated the influence governance institutions can have on the development and performance of others. Most research has focused on multilateral institutions, for instance the linkages between the UN climate regime and the World Trade Organization (e.g. Brewer, 2003; Charnovitz, 2003; van Asselt, 2014). We provide illustrations of each type of linkage identified earlier and include linkages between public and private institutions. Our empirical focus is on climate actions in the renewable energy field.

First, *cognitive linkages* appear to occur frequently and can be identified relatively easily. The Renewable Energy Policy Network for the 21st Century (REN21), for example, connects a wide range of key actors in climate governance to facilitate knowledge exchange. Thereby, this network facilitates cognitive linkages between international organisations, such as the International Renewable Energy Agency (IRENA) and the International Energy Agency (IEA), non-

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governmental organisations such as the World Council on Renewable Energy, and multi-stakeholder partnerships such as the Renewable Energy and Energy Efficiency Partnership. The cognitive linkages between these different types of governance units are easily identified; however, the more challenging analytical step is to assess if the linkages actually affect the development, performance and preferences of these governance units. This would require a more extensive review of official documents and interviews. Additionally, a cognitive linkage can also be intentional when a request for assistance is involved. This is the case between the IEA and the UNFCCC. In 2012, the IEA and the UNFCCC signed a Memorandum of Understanding, which committed both institutions to a closer and active exchange of information (Heubaum and Biermann, 2015). Upon request, the IEA now provides its statistics and knowledge on energy systems to inform the UNFCCC secretariat to support the parties to the UNFCCC.

Second, *linkages through commitment* can be observed, for example, between the UNFCCC and the Sustainable Energy for All (SE4All) initiative. Before elaborating on this linkage, is it important to note that an 'interaction through commitment' is interpreted flexibly. Since hard law and rule-making is less prominent in polycentric governance, while voluntary commitments increasingly occur, here a 'commitment' does not solely refer to imposed rules, but also to (voluntarily set) principles, norms, objectives or goals, etc. SE4All was set up to address the dual challenge of reducing carbon intensity of energy use and expanding energy access globally. More specifically, SE4All pursues efforts to hold the increase of the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the increase to 1.5°C (SE4All, n.d.). Hereby, the objective of the Paris Agreement framed the goal of SE4All, influencing the development and performance of the initiative. Given the global recognition of the 2/1.5°C objectives, it is plausible that they will likewise frame the goals and commitments of other types of initiatives.

A potential *behavioural linkage* occurs between the Friends of Fossil Fuel Subsidy Reform and RE100. The Friends of Fossil Fuel Subsidy Reform is an informal group of countries, set up in 2010, which aims to build political consensus on the importance of phasing out harmful fossil fuel subsidies. According to the Friends of Fossil Fuel Subsidy Reform, these subsidies encourage wasteful consumption of energy, which in turn disadvantages the use of renewable energy. Consequently, to the extent the Friends of Fossil Fuel Subsidy Reform is successful in phasing out these subsidies, it could trigger a behavioural change towards the use of renewables. Therefore, it potentially increases the effectiveness of RE100, which is an initiative of businesses collaborating to massively increase the demand and supply of renewable energy (RE100, n.d.). Since the impact of the Friends of Fossil Fuel Subsidy Reform initiative is still unknown, this is a potential linkage of

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which both the occurrence and the effect remain uncertain. Still, it could be worthy of consideration for future research.

Finally, *impact-level linkages* imply that the side effects of the activities by the source institution affect the performance of the target institution unintentionally. An interesting example of this linkage can be found in the Kyoto Protocol, more specifically the set-up of CDM projects, and the Global Network on Energy for Sustainable Development. For developed countries, the CDM projects are a way to generate credits to achieve compliance to their emission limitation and reduction targets under the Protocol. The prerequisite was that the projects were to be set up in developing countries to support their sustainable development. Therefore, the side effects of these CDM projects, for example improving energy access, affect the effectiveness of the Global Network on Energy for Sustainable Development, whose main objective is to support energy access and sustainable development in developing countries. Beyond anecdotal evidence, however, identifying impact-level linkages has proven difficult. As Oberthür and Gehring (2006) argue, this type of linkage is complex to identify as it does not involve a social interaction, but rather a biophysical or scientific link between the targets of the governance units. However, we prefer not to assume it is impossible and recognise that it requires intensive collaboration between different disciplines to assess such a linkage.

To conclude, the typologies by Stokke (2001) and Oberthür and Gehring (2006) can be applied to study linkages in a polycentric governance landscape. However, doing so properly requires time-intensive empirical research, including extensive documentary reviews and interviews, to assess the causal pathways and their effects. In addition, covering all linkages in the polycentric landscape of climate governance does not seem feasible since the number of governance units being linked can be in their hundreds. A more realistic research strategy might instead focus on critical nodes or sub-areas of the broader polycentric climate governance system (e.g. renewable energy in this brief discussion).

10.4 Strengthening Linkages in Polycentric Climate Governance

Mapping and identifying linkages in the climate governance network shows the potential that exists for ideas and innovations to diffuse through the system (see Chapter 9). For polycentric climate governance to be conducive to a low-carbon future, however, synergies need to be strengthened while conflicts need to be avoided or minimised. This section consequently discusses coordination efforts to enhance synergistic linkages between different institutions and organisations by the UNFCCC, national and regional initiatives and transnational initiatives themselves.

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10.4.1 A Framework for Coordinating the UNFCCC and Non-state Climate Action

Within a polycentric climate governance environment, traditional political actors, such as governments and international organisations, are likely to remain important. Polycentricity implies that such actors are part of a complex system that includes non-state and subnational actors. Traditional actors can create synergies and strategic linkages between different types of actors, and between the international regime and the non-state realms, to achieve climate goals. International organisations often enjoy a high degree of legitimacy through their broad membership of national governments. However, in their traditional role as facilitator of international negotiations, they have also become associated with slow-moving and often deadlocked regimes. Closer engagement of non-state and subnational actors could provide an attractive complement to these traditional roles. Various international organisations have tried to encourage non-state actors to register their actions, for instance at the 2002 World Summit for Sustainable Development. These efforts have often been unsuccessful (Pattberg *et al*., 2012). Much emphasis was put on the launch of non-state actions; however, the lack of follow-up processes prevented systematic tracking of performance of individual initiatives and an assessment of aggregate contributions towards global targets and goals. Moreover, international organisations often lacked the mandate and the means to support new or struggling initiatives.

In the context of the UNFCCC, considerable progress has been made in recent years towards more orchestration by key governments (in particular presidencies of annual Conference of the Parties [COP]: Peru, France and Morocco), as well as the UNFCCC secretariat and the Executive Office of the UN Secretary-General (see also Chapter 11). These key political actors have strategically engaged with the broader environment of non-state and subnational climate actions. The engagement of non-state and subnational actors has been central to the so-called Workstream 2 of the UNFCCC's Ad Hoc Working Group on the Durban Platform for Enhanced Action, which was the body responsible for negotiating the Paris Agreement.

This Workstream was particularly concerned with strengthening climate action and ambition before 2020 because non-state and subnational actors could make mitigation efforts in addition to what states do. The UNFCCC secretariat also presented 'international cooperative initiatives', including non-state and subnational actions that 'could provide added value to Parties' actions and bring sizeable emission reductions' (UNFCCC, 2013). Moreover, as part of the Workstream, technical expert meetings were organised to feature international cooperative initiatives as solutions for governments seeking to enhance their mitigation

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ambition. The negotiations towards the Paris Agreement also provided new impetus for key governments and the wider UN system to engage non-state and subnational actors. A milestone in this regard was the convening of the 2014 UN Climate Summit by UN Secretary-General Ban Ki-moon, which was dedicated to commitments to actions by business, investor, local and regional leaders.

Subsequent presidencies of the COP to the UNFCCC, and the UNFCCC secretariat, have continued efforts to 'galvanize and catalyse climate action [to] reduce emissions, strengthen climate resilience, and mobilise political will for a meaningful legal agreement in 2015' (UN, 2014). For instance, the Peruvian government, together with the then-incoming French COP presidency, the Office of UN Secretary-General and the UNFCCC secretariat, launched the 'Lima-Paris Action Agenda' to incentivise more actions ahead of the COP in Paris. After Paris, these efforts were sustained – albeit under a new name, the Marrakech Partnership.

Arguably, consecutive efforts have amounted to a coordination framework for actions between the UNFCCC and non-state and subnational initiatives, a 'global climate action agenda' (Chan and Pauw, 2014; Chan *et al.*, 2015b; Widerberg and Pattberg, 2015). This framework has partly become formalised through the Paris outcome, as governments agreed to appoint 'high-level climate action champions' to mobilise and showcase climate actions by non-state and subnational actors at high-level climate action events. The decision coming out of Paris also helped to strengthen links between non-state actors and the UNFCCC. Specifically, governments decided to extend technical expert meetings to also cover adaptation; to gather insights from the technical expert meetings on an annual basis; to emphasise the Non-State Actor Zone for Climate Action (NAZCA) as the main platform for registering non-state climate actions; to encourage the registration of more actions; and to install two 'high-level champions'. The champions take some of the burden away from COP presidencies and the UNFCCC secretariat in the mobilisation of non-state and subnational climate actions and the organisation of an annual high-level event for climate action, while ensuring the continuity of mobilisation efforts, at least until 2020.

However, increased coordination in the context of the UNFCCC has not necessarily created synergistic linkages between intergovernmental regimes and non-state initiatives that ensure effective achievement of climate goals. In terms of linkages, the existing framework falls short of exploiting opportunities to ensure that non-state actors deliver effectively and in a balanced manner. For instance, the overemphasis on the showcasing of non-state and subnational climate commitments (e.g. through NAZCA) ignores the fact that many commitments may not be met, and that some commitments may be disingenuous (consider, e.g., a multinational corporation that seeks to present business as usual as clean and

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green). Moreover, current studies show that mobilised initiatives are not performing equally as well across sectors and countries (Chan *et al.*, 2015a); resilience and adaptation initiatives are underperforming compared to mitigation initiatives, and initiatives perform worst in least developed countries. A framework that primarily seeks to improve visibility and recognise voluntary commitments puts a spotlight on imbalances that arise in a self-organising polycentric governance environment, rather than remedying them. For instance, by strengthening the role of private actors – often based in developed countries – such a framework could exacerbate disparities between mitigation and development needs, and between developing and developed countries. Proponents of a 'comprehensive framework for climate actions' have therefore argued that coordination should also provide material and ideational support and encourage accountability to ensure that non-state initiatives are in line with objectives under international agreements, in particularly under the Paris Agreement and the 2030 Agenda for Sustainable Development (Chan and Pauw, 2014; Hale and Roger, 2014; Chan *et al.*, 2015b; Widerberg and Pattberg, 2015).

While the Paris outcome constitutes the most comprehensive framework to link the UNFCCC with other actors in the more polycentric landscape, it still could be improved. For instance, the emphasis of the ongoing climate action agenda is still on mobilising action, while much less attention is given to evaluating the performance of initiatives, let alone whether their aggregate impact is consistent with long-term objectives (see Chapter 12). Without such evaluation and assessment of non-state initiatives, key players in the UNFCCC process cannot design evidence-based interventions to maximise non-state mitigation contributions, or to provide targeted support in areas where non-state actors underperform. Part of the difficulty in creating beneficial linkages lies in the fact that coordinating actors, for instance the UNFCCC secretariat, often lack the political mandate and sufficient capacity themselves to ensure transparency and effectiveness of non-state initiatives. Although the UNFCCC secretariat has some capacity to mobilise initiatives and showcase them in international forums – especially in connection to the international conferences and intergovernmental negotiations they traditionally facilitate – its capacity to perform assessments of individual initiatives is very limited, let alone to evaluate whether a larger realm of climate actions and commitment is bringing long-term goals within reach.

In a polycentric governance system, however, there is no reason why the function of coordination should be concentrated in the hands of one or a few actors. Instead, the coordination of actions itself could be distributed in a network of, for instance, research groups and international organisations (Chan *et al.*, 2015a). For example, UN organisations could (continue to) mobilise actions and administer an online platform recording initiatives; their achievements could be hosted by

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another public institution; individual assessments could be performed by research organisations; and the UNFCCC secretariat could compile individual assessments into periodic progress reports. Such a distributed coordination framework could leverage distributed capacities and resources in a polycentric governance system, and – contrary to one-off mobilisation campaigns – provide material and ideational support to new or underperforming actions, and track progress and aggregate impacts towards low-carbon and climate-resilient development.

10.4.2 National and Regional Platforms

Beyond the international processes aiming to strengthen linkages in the polycentric climate governance system, local and national initiatives to coordinate various climate actions are starting to emerge (see also Hale and Roger, 2014). For example, in Sweden, the government has appointed a national coordinator to develop and maintain a platform for dialogue and cooperation between the government and non-state actors such as companies, cities, regions, civil society organisations and academia, as well as among the non-state actors themselves. It currently engages about 170 different organisations that have signed a declaration stating they will show leadership and promise to contribute to further reductions of greenhouse gas emissions.

The platform is a continuation of the already existing initiative *Fossilfritt Sverige* that was launched by the government in the run up to COP21 in Paris. Besides functioning as a liaison between the government and non-state and sub-national actors, the platform and the coordinator are also mandated to engage more organisations in the platform and increase the visibility of their actions. *Fossilfritt Sverige* is also directly linked to the UNFCCC process as it encourages its members to report to the NAZCA platform. The platform is also a way to link the low-carbon agenda to broader industrial policy processes such as the national export strategy, smart industry and reindustrialisation strategy, the agenda for a bio-based economy, the national innovation council and several others (Kommittédirektiv Initiativet Fossilfritt Sverige, 2016: 66). *Fossilfritt Sverige* emerged out of an understanding by the Swedish government and its partners that coordination was needed to enhance linkages between initiatives and the government. By coordinating actions, the hope of the government is to create synergies and learning effects between organisations across sectors through dialogue, cooperation and learning.

10.4.3 Transnational and Private Initiatives

Linkages in the polycentric governance system are increasingly and deliberately created by transnational and private initiatives. The global climate action agenda mentioned earlier also stimulates linking between transnational initiatives by

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categorising actions under different action areas and by appointing lead organisations to organise events aimed at actions within a certain sector. For instance, in the Paris Process on Mobility and Climate, 15 transnational initiatives collaborate to hold stakeholder meetings, to engage with high-level processes (including the global climate action agenda) and to produce joint progress reports (Paris Process on Mobility and Climate, n.d.).

Non-state and transnational networks can also contribute in a more direct manner to the international climate process. For instance, non-state actors could contribute information to the assessment and review of national climate pledges made under the UNFCCC (van Asselt, 2016). Moreover, non-state expert networks have directly supported the global climate action agenda. Galvanizing the Groundswell of Climate Actions, a network convened by experts from a variety of civil society and research organisations, and defining itself as 'a series of open dialogues that aims to bring the groundswell of climate actions from cities, regions, companies, and other groups to a higher level of scale and ambition' (Galvanizing the Groundswell of Climate Actions, n.d.) has suggested options for the global climate action agenda and closely advised high-level climate action champions, for example on priority areas to address at high-level action events. The network produced an assessment of 70 initiatives launched under the Lima-Paris Action Agenda and has continued to identify opportunities to strengthen linkages between the international climate regime and non-state climate actions, for instance by engaging funders through a memorandum on how they can accelerate global climate action until 2020 (Galvanizing the Groundswell of Climate Actions, n.d.).

These instances illustrate that the gradual development of a more comprehensive framework linking the transnational and international climate realms is not characterised by one-way traffic, with traditional actors in international politics – governments and international organisations – reaching out to non-state actors and their contributions. Rather, the global climate action agenda – and the building blocks of a more comprehensive framework – have been a co-production between state and non-state actors.

10.5 Conclusions

Global climate governance is no longer an exclusively intergovernmental process. It has become a more polycentric governance system that is open to a range of non-state, non-party, subnational and private actors. In this chapter, we have shown that the polycentric system of climate governance is not only constituted as relatively independent initiatives, but also that climate actions are interlinked and consequently form a networked structure. To better scrutinise the possible and actual linkages among institutions in the polycentric governance system, we have

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provided an overview of four types of linkages and corresponding illustrations from the climate field. We can make three concluding observations.

First, the dense interaction structure in the polycentric climate governance system enables an exchange of resources via shared membership. Organisations in the network can exchange knowledge, norms and information, thereby enabling mutual adjustment and experimentation – two central propositions within polycentric theory (see Chapter 1). Furthermore, the potential to exchange resources such as information through the network allows for linkages to form that can lead to behavioural interdependence, i.e. a situation of mutual adjustment. As a consequence of the dense structure and the linkages between governance units, the polycentric climate governance system might display characteristics of a complex system in which the whole is more than the sum of its parts.

Second, while the system is polycentric, it also demonstrates elements of integration. In particular, the strong and central position of the UNFCCC (which acts as a centre of gravity in the system) is well reflected in the network analysis as well as in the observed interaction through commitment where normative foundations of the UNFCCC are streamlined into non-state initiatives. In particular, the Paris Agreement and its 2/1.5°C goals serve as such an integrative device.

Third, based on our empirical illustrations from the renewable energy field, we see little evidence of conflictive linkages. While more systematic research on the overall quality of linkages in the polycentric climate governance system is needed, it is an encouraging sign that linkages are often synergistic. In part, this might be the result of attempts to strengthen linkages discussed in this chapter.

Finally, what is the value of polycentric governance? While it helpfully serves as a concept to describe the evolving landscape of climate governance, it also raises questions. In particular, no agreement can be found in the literature on what constitutes a minimum level of independence in terms of norm- and rule-setting abilities of individual initiatives in order to constitute a polycentric structure. In addition, no threshold values are defined for linkages. In this chapter, we have suggested that the degree of connectivity in the polycentric governance system is high, as is the number and types of linkages present in the climate governance system. Beyond serving as a broad and inclusive concept, the analytical value of polycentric governance seems to be limited in the case of networked climate governance. One way forward would be to more openly embrace the theoretical implication of understanding climate governance as a *system*. Beyond the metaphoric use, this would mean that researchers start to apply insights from complexity theory (which deals with the behaviour of

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complex systems). An intermediate step towards this goal could be to reflect more on the system-theoretical assumptions underlining polycentric governance theory.

Note

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11

Orchestration

Strategic Ordering in Polycentric Governance

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11.1 Introduction

Global climate governance has undergone a 'Cambrian explosion' of organisations, norms, 'contributions', commitments and other institutions (Keohane and Victor, 2011; Abbott, 2012). The result is an intricate, diverse institutional complex that exhibits the defining features of polycentric governance (see Chapter 1). Multiple centres of decision-making authority adopt rules, standards and policies and conduct other governance activities; these authorities act at multiple scales, from international to local (Ostrom, 2010a; Cole, 2011, 2015).

Recent trends have increased polycentricity: climate institutions have become more numerous and diverse. Nationally determined contributions (NDCs) under the Paris Agreement allow for diverse national commitments; subnational governments have expanded their commitments and actions, domestically and transnationally; and a new voluntary commitment system (VCS) has encouraged domestic and transnational initiatives by non-state actors (Abbott, 2017). As polycentric governance theory suggests, these developments should increase the resilience of climate governance; for example, as the Trump administration weakens US support for intergovernmental action, private and subnational actions may provide partial substitutes.

Polycentric governance has costs as well as benefits (Keohane and Victor, 2011; Abbott, 2012; van Asselt and Zelli, 2014; see also Chapter 1). Many scholars therefore conclude that polycentric structures operate more effectively with modest levels of coordination or ordering (Zürn, 2010; Betsill *et al.*, 2015; Mayntz, 2015; Dorsch and Flachsland, 2017). This chapter focuses on orchestration, an important approach to institutional ordering widely applied in climate governance.

Orchestration is an indirect mode of governance that relies on inducements and incentives rather than mandatory controls (Abbott *et al.*, 2015). It is common in many areas of global governance, where 'governors' – from intergovernmental

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organisations (IGOs) to transnational initiatives – possess limited authority and power for binding, direct action. But even powerful governors, including states, engage in orchestration. An orchestrator (O) works through like-minded intermediaries (I), catalysing their formation, encouraging and assisting them and steering their activities through support and other incentives, to govern targets (T) in line with the orchestrator's goals (O-I-T). An orchestrator can also structure and coordinate intermediaries' activities to enhance ordering (Abbott and Hale, 2014; Abbott, 2017).

The prevalence of orchestration has significant implications for several of the core propositions of polycentric governance theory outlined in Chapter 1. I consider three such propositions here:

(1) Local action: that organisations constituting polycentric systems emerge spontaneously at local levels amongst self-organising actors, perhaps facilitated by organisational entrepreneurs (Andonova, 2017; see also Chapter 7), but without higher-level intervention. In climate governance, by contrast, states, IGOs and other actors have actively catalysed and facilitated the formation of many new organisations.
(2) That organisations within polycentric systems spontaneously coordinate their actions through mutual adjustment, without centralised intervention. In climate governance, by contrast, while many organisations undoubtedly adjust to one another's actions, states and IGOs have orchestrated extensively to structure the complex, although they have not strongly coordinated organisational behaviour.
(3) That polycentric systems promote experimentation, policy innovation and learning (see Chapter 6). Polycentricity (and orchestration) have stimulated climate experimentation in a broad sense by encouraging diverse organisations and actions (Hoffmann, 2011). Yet the pursuit of other governance goals limits experimentation in some domains. In addition, without an organised system to manage experiments and evaluate their results, climate experimentation and learning fail to reach their full potential (Abbott, 2017).

This chapter first maps the climate governance complex, identifying orchestrators, intermediaries and targets. It then contrasts theoretical perspectives that emphasise spontaneous, decentralised coordination, including polycentric governance theory, with more strategic approaches, including orchestration. It reviews actions across many areas of climate governance, demonstrating the importance of orchestration. It then considers the findings of the analysis, returning to the three propositions identified earlier. This chapter closes by suggesting areas, including experimentation, where further orchestration may be desirable.

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11.2 Orchestrators, Intermediaries and Targets in Climate Governance

Global climate governance consists of multiple types and systems of organisations. Figure 11.1 depicts the principal organisations and groupings, highlighting different scales and levels of organisation.

11.2.1 Intergovernmental Bodies

Many intergovernmental bodies play important roles in climate governance (see Chapter 2). Many act as orchestrators, as discussed in what follows; some are potential intermediaries. The United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement are the core of the regime. They encompass multiple organs – including the Conference of the Parties (COP), COP presidencies and the UNFCCC secretariat – and diverse subsidiary bodies, such as the Technology Executive Committee (TEC) and the Climate Technology Centre and Network (CTCN). UNFCCC organs have also created specialised institutions to promote voluntary commitments. Closely linked to the UNFCCC are its financial mechanisms and the Intergovernmental Panel on Climate Change (IPCC).

Numerous IGOs address climate policy (van Asselt, 2014). These include the Office of the United Nations Secretary-General (UNSG), the United Nations Environment Programme (UNEP) and other United Nations (UN) agencies, and the High-Level Political Forum on sustainable development. International financial

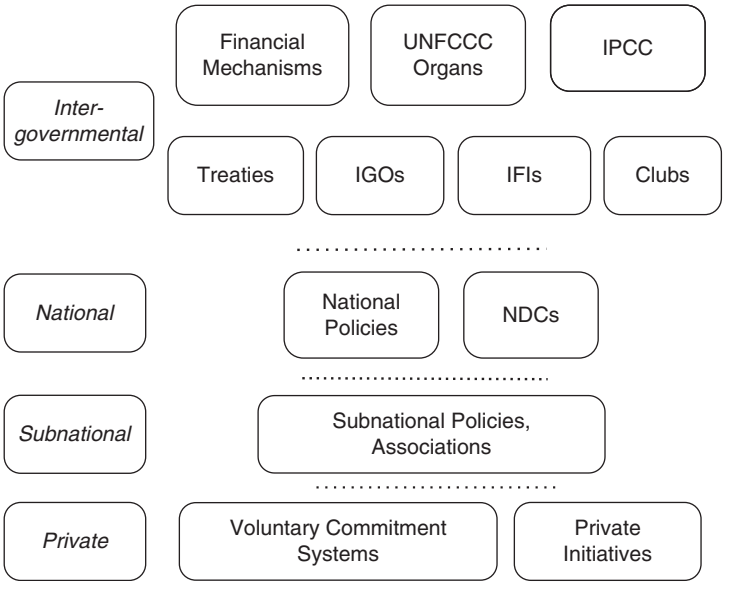

Figure 11.1 The polycentric governance complex for climate change.

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institutions (IFIs), such as the World Bank, provide finance and expertise. All of these act as orchestrators. Limited-membership climate 'clubs' include the G20 and the Major Economies Forum. Multilateral treaties with climate impacts include the Montreal Protocol and the Convention on Biological Diversity.

11.2.2 National Actions

National laws, policies and commitments are central modes of climate governance (see Chapter 3). NDCs under the Paris Agreement are 'nationally determined', but subject to review and expectations of increasing ambition. Some governments have separately adopted innovative climate policies (Jordan and Huitema, 2014a, 2014b); a few are active orchestrators (Abbott and Hale, 2014). Overall, however, because current national actions fall well short of what is needed to achieve the Paris Agreement goals, national actions remain important targets of climate orchestration.

11.2.3 Subnational Actions

The laws and policies of cities, provinces and other subnational governments are increasingly important in climate governance (see Chapter 5). Subnational governments have made extensive climate commitments – individually, through transnational associations and through the voluntary commitment system (Betsill and Bulkeley, 2006; Bulkeley, 2010; Widerberg, Pattberg and Kristensen, 2016; see also Chapter 4). Yet local actions too remain targets of orchestration. Highly institutionalised associations – such as C40 Cities, ICLEI – Local Governments for Sustainability, the Covenant of Mayors and the World Mayors Council on Climate Change – act as orchestrators and intermediaries.

11.2.4 Private Initiatives

Private activities are the source of most greenhouse gas emissions and so are the ultimate targets of climate governance. Until recently, the climate regime focused heavily on national commitments. Yet since the 1990s, business groups, environmental non-governmental organisations (NGOs) and other private actors have created numerous voluntary initiatives outside of UNFCCC processes (Abbott, 2012; Abbott, Green and Keohane, 2016; Widerberg *et al.*, 2016). Many reflect the self-organisation highlighted by polycentric governance theory.

Some initiatives include governments or IGOs; many are purely private. Examples include the Verified Carbon Standard (business), the Gold Standard (civil society), the Greenhouse Gas Protocol (business and civil society) and the

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Climate and Clean Air Coalition (CCAC) (business, civil society and government). These initiatives set standards for private behaviour, provide financing, carry out operational activities such as registering carbon offsets and promote information exchange. They can be significant intermediaries.

11.2.5 Voluntary Commitment System

Building on precedents in the sustainable development regime (Abbott, 2017), a VCS encouraging voluntary commitments by non-state actors has been developed since 2014, when the UNSG sponsored the UN Climate Summit to catalyse voluntary commitments. At COP20 in Lima in 2014, the current and incoming presidencies, the UNSG and the UNFCCC secretariat launched the Lima-Paris Action Agenda (LPAA) to showcase commitments and encourage new ones; in parallel, they established the Non-state Actor Zone for Climate Action (NAZCA) portal, an online registry which now lists more than 12,500 commitments. COP21 in Paris accepted additional commitments and agreed to name two 'high-level champions' to promote voluntary initiatives. At COP22, the first champions launched the Marrakech Partnership for Global Climate Action (MP) to 'catalyse and support climate action by Parties and non-Party stakeholders in the period from 2017–2020' (Global Climate Action Champions, 2016; see also Chapter 4).

This review demonstrates the polycentric character of climate governance – the institutional complex includes 'multiple governing authorities at different scales rather than a mono-centric unit. Each unit . . . exercises considerable independence to make norms and rules within a specific domain (such as . . . a local government, a network of local governments, . . . a national government, or an international regime)' (see Chapter 1, quoting Ostrom, 2010b). It also highlights the range of organisations that act as orchestrators and intermediaries, and the targets' orchestration addresses. We now consider how these organisations emerge and interact.

11.3 Ordering: Decentralised and Strategic

Polycentric governance theory emphasises decentralised, horizontal ordering, both in the formation of organisations and in their ongoing interactions. Orchestration – and related techniques including delegation (Green, 2014) and direct regulatory cooperation (Abbott *et al*., 2015) – challenge these understandings. They involve more strategic interventions – that is, actions that are part of a plan designed to achieve an overall goal – that are often taken at higher governance levels. This section compares these two perspectives and introduces orchestration in greater detail.

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11.3.1 Decentralised Ordering

Self-organisation is 'a key underlying concept in the polycentric literature' (Dorsch and Flachsland, 2017: 51). Considering organisational formation, Elinor Ostrom and colleagues analysed the ability of small local communities to self-organise common-pool resource management systems, without mandatory regulation or other hierarchical interventions (Ostrom, 1990, 2010a; Poteete, Janssen and Ostrom, 2010). In appropriate conditions, local communities can overcome free-rider incentives (in part due to local co-benefits), build trust and overcome collective action problems that challenge larger groupings. In later work on climate change, Ostrom (2010b) noted the burgeoning activities of subnational governments, equating these with community self-organisation, and called for many small-scale, multilevel climate actions, in addition to monocentric national and international actions (see Chapter 1).

The focus on mutual adjustment among organisations derives from studies by Vincent Ostrom and colleagues of local government authorities (Ostrom, Tiebout and Warren, 1961; Bish and Ostrom, 1973). Many metropolitan areas feature multiple authorities with similar functions, such as local police forces. The then-dominant approach to public administration favoured consolidating these into unitary agencies. Ostrom argued, however, that local units are often more effective – they better reflect local preferences, better provide services requiring personal contact and are more responsive and efficient than 'monopolistic' unitary authorities. In addition, while critics emphasised the supposed duplication and inefficiency of multiple authorities, Ostrom found that horizontal ordering often avoided those problems: authorities coordinated their activities, contracted for services, created dispute resolution procedures and competed (e.g. on taxes) in ways that promoted efficiency.

Other literatures on institutional complexity likewise emphasise decentralised ordering (see Chapter 10). The organisational fields literature (Dingwerth and Pattberg, 2009) emphasises isomorphism among organisations with similar functions; such organisations often take on similar features, procedures and rhetoric through social interactions such as mimicry and common professional norms (DiMaggio and Powell, 1991). Organisational ecology (Abbott *et al.*, 2016) emphasises competition for resources – from funding to legitimacy – among similar organisations. Competition influences the types and numbers of surviving organisations and leads organisations to seek specialised 'niches', structuring the complex. Gehring and Faude (2014) argue that the members of multiple organisations – states, in their examples – enjoy the flexibility polycentricity offers, but also want their organisations to operate effectively. They therefore promote 'decentralised coordination', reducing or managing inefficient overlaps.

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11.3.2 Strategic Ordering and Orchestration

Scholars have also identified more centralised, strategic approaches – still short of mandatory control – designed to enhance organisational formation and ordering (Isailovic, Widerberg and Pattberg, 2013; see also Chapter 10). Under the heading of 'meta-governance', or the governance of governance, scholars consider how authorities 'at a higher level of decision-making' (Beisheim and Simon, 2015: 8) – governmental or non-governmental – structure and manage interactions among lower-level organisations (Derkx and Glasbergen, 2014). In climate governance, Betsill *et al.* (2015) and van Asselt and Zelli (2014) argue that the UNFCCC has the capacity to coordinate and strengthen linkages among governmental and private governance organisations.

Orchestration is consistent with the meta-governance approach. Orchestration is *indirect* – an orchestrator works through intermediaries, rather than directly, to regulate or provide benefits to targets. It thus differs from direct modes of governance, including mandatory regulation and regulatory cooperation. A governor can use orchestration to enter new fields where intermediaries possess experience, contacts or authority it lacks, or where its own entry is contested.

Orchestration is also *soft* – while the orchestrator typically possesses some authority, in an orchestration relationship it cannot impose or enforce mandatory obligations on intermediaries; it must enlist organisations that share broadly similar goals and guide their behaviour through inducements and incentives. It thus differs from hard modes of governance, both direct (regulation) and indirect (delegation).

The techniques of orchestration address different points in the intermediary's life and policy cycles. Initially, the orchestrator enlists the cooperation of existing intermediaries or catalyses the formation of new ones. It then encourages and assists intermediaries and steers their behaviour in line with its goals. Where there are multiple intermediaries, it coordinates their actions. All of these techniques rely on soft inducements: persuasion, convening relevant actors, material and ideational support (financing, guidance, technical assistance) and reputational incentives (recognition or endorsement, shaming). Support and endorsement simultaneously enhance intermediary capabilities and enable steering – the orchestrator can direct support to desired activities or make support conditional on them. The orchestrator may also mobilise persuasion, support and reputational incentives from third parties, multiplying its influence.

Governors of all types typically orchestrate when they lack certain capabilities needed for stronger forms of governance (Abbott *et al*., 2015). IGOs, for example, often lack sufficient authority for hard, direct governance, especially vis-à-vis private actors. While many IGOs have substantial expertise, they frequently lack material resources and other capacities for demanding operational activities.

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However, even strong, well-resourced organisations, including states, may turn to orchestration where direct or mandatory action would entail high political or material costs. While orchestration may be less powerful than mandatory control, it has proven influential in many settings (Abbott *et al.*, 2015). When governors lack strong hierarchical authority, or share the relevant authority with others, it may be the only strategy available.

Diverse actors and organisations – governmental and non-governmental – act as orchestrators, but research suggests several qualities that influence their success (Abbott and Hale, 2014; Abbott *et al*., 2015). An orchestrator must have sufficient agency to apply the techniques of orchestration; a body like the High-Level Political Forum, which includes all UN member states, meets for short periods and lacks its own staff, will encounter problems of agency (Abbott and Bernstein, 2015). An entrepreneurial organisational culture facilitates orchestration and makes its use more likely. Inducements such as convening, persuasion and endorsement are more influential where the orchestrator possesses significant legitimacy and authority, derived from its focal institutional position, achievements, expertise or moral reputation. An orchestrator must possess or be able to mobilise sufficient resources. Connections to potential intermediaries are helpful but not essential.

The orchestrator is often at a higher governance level than its intermediaries; for example, the European Commission orchestrates networks of Member State regulators, and many IGOs orchestrate NGOs. Even here, however, orchestration remains non-hierarchical: intermediaries respond because of shared goals, persuasion, inducements and other incentives, not mandatory controls. Respected organisations may also orchestrate their peers (Abbott and Hale, 2014).

A governor can orchestrate only if suitable intermediaries are available. As Section 11.2 details, climate orchestrators benefit from many potential intermediaries, including IGOs, associations of subnational governments and private transnational initiatives. Where appropriate intermediaries are lacking, orchestrators often catalyse their creation, convening relevant actors and using persuasion, support and other incentives to encourage the formation of organisations with desired goals and structures. Some orchestrators – notably UNEP, whose role in creating private environmental initiatives provided the original model for orchestration (Abbott and Snidal 2009) – have catalysed numerous organisations, strongly suggesting that they find spontaneous self-organisation an unreliable source of suitable intermediaries.

Orchestration is valuable for structuring and coordinating intermediary relationships where mutual adjustment is insufficient (Abbott and Hale, 2014; Abbott *et al.*, 2015). An orchestrator can use persuasion, material and ideational support and reputational incentives to encourage organisations to reduce overlaps, manage conflicts, fill governance gaps, collaborate and otherwise govern more effectively.

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Intermediaries may welcome coordination, which can increase their legitimacy and effectiveness.

11.4 Orchestration in Climate Governance

This section examines how orchestration has been used to catalyse, encourage, support, steer and coordinate diverse actors and organisations in climate governance. While many climate initiatives have emerged through self-organisation and engage in mutual adjustment, orchestration of organisational formation and ordering is nonetheless widespread. As in other areas, climate orchestration serves two broad purposes: 'managing states', encouraging strong national commitments and promoting implementation and compliance; and 'bypassing states', encouraging non-state commitments and actions where orchestrators view state actions as insufficient (Abbott *et al.*, 2015: 11).

11.4.1 Voluntary Commitment System

In developing the climate VCS, orchestrators emulated techniques pioneered in sustainable development governance (Abbott, 2017). Sustainable development summits, supported by the UNSG, focused on catalysing partnerships that could act as intermediaries, promoting and coordinating individual actions by partners. They enlisted existing networks, including the UN Global Compact, originally an intermediary established by the UNSG and UN agencies to elicit business commitments to social responsibility, including through its Caring for Climate programme. They helped organise commitments into 'action networks' – such as Sustainable Energy for All (SE4All) – that act as intermediaries, eliciting and coordinating commitments and promoting accountability. They offered modest ideational support but relied primarily on reputational inducements, including public recognition and inclusion in an online registry.

The UNSG initiated the climate VCS at the 2014 UN Climate Summit, convening businesses, NGOs, subnational governments and even states and IGOs, and using persuasion and recognition to elicit commitments to climate action. The UNSG provided ideational guidance by encouraging commitments in areas of need – 'action areas' such as climate finance, energy and cities. It encouraged multi-stakeholder 'cooperative initiatives' that could function as intermediaries – like partnerships and action networks – eliciting, coordinating and managing individual commitments.

The Peruvian and French presidencies, the UNSG and the UNFCCC secretariat established the LPAA to encourage additional 'transformative' initiatives in the run-up to Paris. The NAZCA registry was designed to 'showcase' cooperative initiatives

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and other commitments, providing soft reputational incentives for organisational formation while facilitating collaboration and accountability. The orchestrators implicitly endorsed several organisations selected to provide the commitment information that NAZCA aggregates. Providers include the Carbon*n* Climate Registry and the Covenant of Mayors (subnational commitments), and the UN Global Compact and the Carbon Disclosure Project (CDP) (business commitments).

COP21 recognised new commitments at high-level public events. The COP decision adopting the Paris Agreement endorsed the VCS, welcoming voluntary commitments, encouraging NAZCA registration, urging governments to participate in cooperative initiatives and agreeing to recognise new commitments at future meetings. COP21 also created two new intermediaries: 'high-level champions' from the current and incoming presidencies, charged with promoting and supporting 'voluntary efforts, initiatives and coalitions' (see Chapter 4).

At COP22, the first 'champions', from France and Morocco, initiated the MP, a framework for orchestrating voluntary commitments, led by the champions, presidencies and UNFCCC secretariat, plus the UNSG as 'global convenor', reflecting its unique convening authority. These actors commit to:

(1) *Catalyse initiatives*, convening stakeholders and governments through regional and thematic meetings, technical examination processes, the Global Forum of Alliances and Coalitions, COP 'action days' and other events. They will provide ideational guidance by setting priorities, and reputational incentives by highlighting successful initiatives. They will use persuasion and recognition to promote increased ambition and Southern participation and will encourage third-party support.
(2) *Track progress*, requiring initiatives to register on NAZCA and provide regular updates on progress as conditions of participating in the MP. New criteria for commitments 'encourage' concrete goals, clear targets, scale, sufficient resources and transparency. Tracking is intended to promote accountability and to identify areas where additional actions are needed.
(3) *Showcase successes*, publicising ambitious initiatives in priority areas through NAZCA, COPs and other events. Showcasing creates incentives to emulate successes, provides learning opportunities and allows for modest steering.
(4) *Report* achievements to governments. The champions will identify options and priorities suggested by successful initiatives for technical examination processes, decisions on NDCs and COP deliberations.

As part of the VCS, governments and IGOs have initiated, supported and steered many cooperative initiatives. For example, UNEP and partners launched several energy efficiency initiatives in 2014, with financial support from the Global

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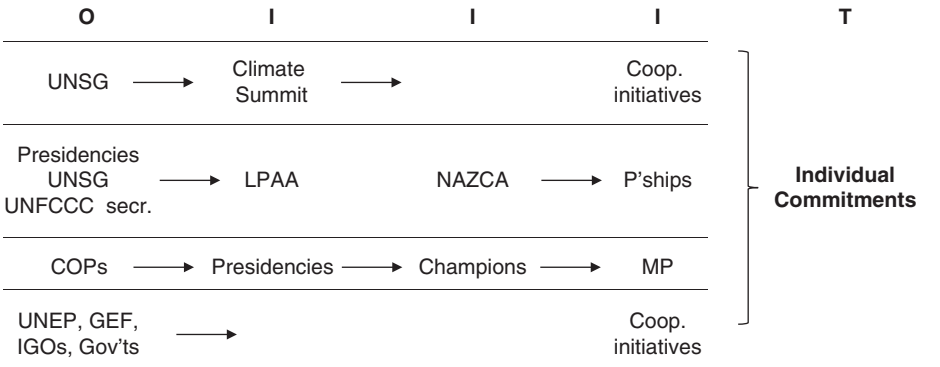

Figure 11.2 Orchestrating voluntary climate commitments.

Environment Facility (GEF). The Efficient Appliances and Equipment Partnership brings together UNEP and the United Nations Development Programme, the International Copper Association and the Natural Resources Defense Council to promote efficient appliances. Through United for Efficiency, UNEP and partners help developing countries transition to efficient products. UNEP and Norway launched the 1 Gigaton Coalition to help countries measure and report emissions reductions from energy efficiency projects. All these initiatives collaborate with the SE4All action network.

Orchestrators have used similar techniques to promote voluntary commitments by cities, provinces and other subnational governments (Figure 11.3). Among other intermediaries, orchestrators worked through transnational associations. For example, the World Bank provided significant financial support to C40 Cities, and collaborates with it in the Carbon Finance Capacity Building Program, encouraging carbon finance for 'emerging megacities of the South' (CFCB, n.d.). Entrepreneurial local leaders also used orchestration to catalyse, support and steer these associations. For example, illustrating orchestration among peers, Ken Livingstone, then the mayor of London, initiated C40 Cities in 2005, convening the mayors of 18 'megacities' to collaborate on emissions reductions. Livingstone later invited the Clinton Climate Initiative (CCI) to collaborate on concrete projects. A subsequent C40 chair, Mayor Michael Bloomberg of New York, integrated the work of C40 and Clinton Climate Initiative staff.

11.4.2 Private and Public-Private Climate Schemes

Businesses, NGOs and other actors have created numerous private and public-private climate initiatives outside the VCS and before its creation (Hoffmann, 2011; Abbott, 2012; Bulkeley *et al.*, 2012; Bulkeley *et al.*, 2014) (figure 11.4). Many initiatives set standards for the behaviour of signatories – often relating to carbon offsets and

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Figure 11.3 Orchestrating subnational commitments.

markets, including emissions measurement, accounting and disclosure (Green, 2014; Abbott *et al.*, 2016) – or elicit commitments from companies and other targets. Others conduct or finance pilot projects and other operational activities, facilitating learning and enabling disclosure systems, carbon markets and similar mechanisms. Many are now registered on NAZCA.

Participating actors created most of these schemes on a bottom-up basis, but orchestrators facilitated a number of them. UNEP has been particularly active, convening stakeholders, catalysing the formation of transnational environmental schemes and supporting new initiatives. As noted earlier, UNEP helped launch the multi-stakeholder Global Reporting Initiative (GRI) in 1997, endorsing it and providing significant ideational and material support. The UN Global Compact later endorsed GRI standards, which address carbon emissions and other environmental issues, for use by participating firms.

UNEP collaborated with Sweden and other governments to establish the CCAC to promote and facilitate action on short-lived climate pollutants. Through its Finance Initiative, and together with the UN Global Compact, UNEP coordinated the negotiation of the Principles for Responsible Investment and the Principles for Sustainable Insurance, which elicit commitments from investors and insurers to consider environmental, social and governance issues, including climate change. The UNEP Finance Initiative also sponsors the Portfolio Decarbonization Coalition, which encourages low-carbon investments, and the Sustainable Energy Finance Initiative, which supports investors in financing clean energy technologies.

The World Bank has been another active orchestrator (Hale and Roger, 2014), helping to establish schemes such as the Global Gas Flaring Reduction Partnership and Connect4Climate. National governments have collaborated with IGOs in catalysing initiatives such as Connect4Climate, and have independently supported initiatives such as CDP and the Collaborative Labeling and Appliance Standards Program (CLASP), a multi-stakeholder initiative to improve the environmental performance of appliances and equipment.

11.4.3 National Commitments and NDCs

Domestic political forces likely drive most national climate policies and NDCs (see Chapter 3); UNFCCC organs also directly encourage ambitious state actions. But

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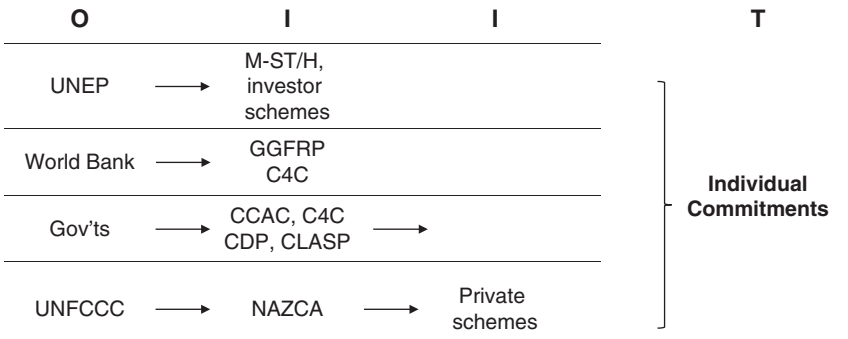

Figure 11.4 Orchestrating private climate schemes.

some national commitments and policies derive in part from orchestration (Figure 11.5). The 2014 UN Climate Summit elicited national commitments – including commitments related to future NDCs – directly from governments, and indirectly through cooperative initiatives that include governments. For example, 40 governments, with many non-state actors, endorsed the New York Declaration on Forests; some committed to new forestry policies while others pledged financial support. Forty governments also helped launch the Global Energy Efficiency Accelerator Platform to support subnational governments.

The UNFCCC engages intermediaries to facilitate strong national actions. For example, within its Technology Mechanism, the Technology Executive Committee (TEC), which consists of technology experts, provides policy recommendations to governments. The Climate Technology Centre and Network (CTCN), which UNEP and the UN Development Programme host, arranges technical assistance on technology transfer (see Chapter 15). The CTCN operates as an orchestrator, coordinating a network of technology organisations that provide assistance to governments. Such assistance can catalyse ambitious actions, provide crucial ideational resources and steer national decision-makers towards the most beneficial actions.

UNFCCC Technical Expert Meetings engage governmental and non-governmental experts, who act as intermediaries promoting national adoption of 'best practice' mitigation policies with sustainable development co-benefits, reducing the costs and increasing the benefits of national action. The current and incoming presidencies, with the UNFCCC secretariat and other IGOs, launched the NDC Partnership in 2016 to link countries with the financial and technical resources needed to implement NDCs.

The Paris Agreement initiated three review processes, which may include elements of orchestration as well as direct interactions among governments and with UNFCCC officials (van Asselt *et al.*, 2016):

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(1) Article 13 provides for review of national progress in implementing NDCs, based on national reports and other information. In addition to peer governments and the secretariat, this process will engage 'technical experts', who will act as intermediaries in assessing the information received. In addition, Article 13 review is intended to be 'facilitative' – it will identify barriers to national implementation, then encourage third parties, such as CTCN and the Green Climate Fund, to provide support that helps governments overcome those barriers.
(2) Article 14 provides for a 'global stocktake' every five years from 2023, designed to inform periodic updates of NDCs. Stocktake procedures will primarily entail direct interactions among governments, but they could engage diverse intermediaries – including the secretariat, technical experts and other non-state actors – as information providers and persuaders.
(3) Article 15 calls, in broad terms, for an implementation and compliance mechanism. It will involve an 'expert-based' committee; here, too, experts that are sufficiently independent could be considered intermediaries. This mechanism will again facilitate third-party support to address identified needs.

Even if non-state actors play only limited roles in formal review processes, their independent assessments have significant influence (van Asselt, 2016). Governments and IGOs can encourage, support, facilitate and publicise such assessments through orchestration.

The World Bank has created intermediaries to facilitate climate finance, supporting NDC implementation and policy and technical innovations. Its four Climate Investment Funds (CIFs) provide concessional financing for innovative policies in their domains, allowing countries to test new approaches, attract co-financing and qualify for new funding streams. While the World Bank and other IFIs support and

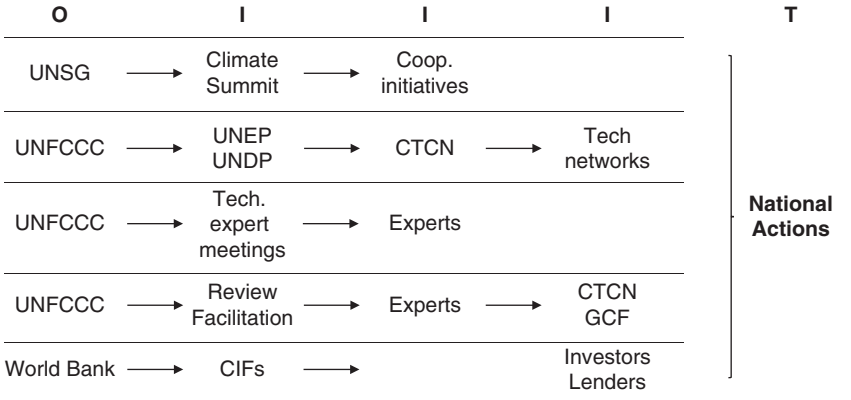

Figure 11.5 Orchestrating NDCs and national policies.

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guide the CIFs, they are independent organisations, governed by committees comprising donor and recipient governments, with diverse private and governmental observers. As such, they can tap varied public and private resources, material and ideational.

11.5 Climate Orchestration and Decentralised Ordering

The prevalence of climate orchestration, described in the previous section, has important implications for three of the central propositions of polycentric governance theory outlined in Chapter 1. I consider two of those propositions here, and a third in the concluding section.

11.5.1 Local Action

Polycentric governance theory asserts that new organisations emerge spontaneously as actors self-organise in local settings. Numerous organisations have entered climate governance in recent years – notably private and subnational initiatives – and many have self-organised at relatively small scales. In other cases, however, orchestrators have encouraged and facilitated organisational formation. This suggests that the spontaneous local action/self-organisation proposition is incomplete: observers of polycentric systems should also look for strategic actions that catalyse and incentivise organisational formation.

The entire climate VCS was a strategic construction. The UNSG, UNFCCC secretariat, presidencies and ultimately COP21 (O) worked through the champions, cooperative initiatives, subnational government associations and other intermediaries (I) to establish a system to elicit and register thousands of voluntary commitments from non-state actors (T). UNEP, the World Bank, other IGOs and governments also catalysed the formation of many cooperative initiatives and multi-stakeholder organisations, within the VCS and outside it. Under the MP, many of these actors are actively catalysing new initiatives. These actions have changed the shape of climate governance, created new opportunities for participation and new forms of commitment, and initiated new flows of information and ideas.

Orchestrators have utilised a range of techniques; while none involves mandatory control, all facilitate or influence desired behaviours through diverse pathways. Orchestrators enlisted existing intermediaries (COP presidencies, information providers) and catalysed formation of new ones (cooperative initiatives) through convening, persuasion and reputational incentives. They provided positive incentives for organisational formation through public recognition, endorsement and 'showcasing' – at public events, through NAZCA and in national and

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international policy processes. They provided ideational support to new organisations through information and guidance (action areas, MP priorities). Most provided little direct material support, but did facilitate third-party financing.

11.5.2 Mutual Adjustment

Polycentric governance theory asserts that organisations in polycentric systems spontaneously coordinate their behaviour through mutual adjustment, without centralised intervention. Many climate governance organisations do coordinate in this fashion, though sometimes only modestly. Secretariats and scientific bodies of the Rio Conventions, including the UNFCCC, coordinate through the Joint Liaison Group (CBD, 2013). Environmental IGO secretariats coordinate through the UN Environment Management Group. National governments can coordinate within COPs, the UN Environment Assembly and other institutions. Subnational governments collaborate through transnational associations, and private actors through multi-stakeholder initiatives and networks.

In other cases, however, orchestrators shape climate governance and encourage coordination among constituent initiatives. This suggests that the mutual adjustment proposition too is incomplete: observers of polycentric systems should also look for strategic actions that promote ordering and coordination.

States, IGOs and other orchestrators structure climate governance in several ways:

(1) They encourage initiatives of particular kinds. The UN Climate Summit encouraged 'cooperative initiatives', commitments in specified areas and government commitments relevant to NDCs. The LPAA and Marrakech Partnership adopted mandatory criteria for voluntary commitments, an approach known as 'directive orchestration' (Abbott and Snidal, 2009). Only initiatives meeting those criteria may register on NAZCA and receive other reputational benefits, although the criteria are not always vigorously enforced.
(2) They support intermediary initiatives that further favoured goals. The LPAA, MP and COP 'showcase' commitments they identify as 'successes', incentivising others to emulate them. Showcasing successful non-state initiatives also helps 'manage states' – it demonstrates to governments the actions their citizens are willing to take, undercuts excuses for inaction (such as infeasibility and cost) and provides new policy ideas and evidence. NAZCA endorses specific data-providing organisations; the World Bank supports C40 Cities through its urban programmes.
(3) They use intermediaries to facilitate desired actions. The CTCN facilitates ambitious national policies by orchestrating experts to provide technology

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assistance. United for Efficiency and other UNEP-supported cooperative initiatives likewise provide technical assistance on specific topics. The World Bank works through the CIFs to provide climate finance and to encourage third-party co-financing. The NDC Partnership links governments with third-party sources of support and expertise. The MP encourages donors to support voluntary initiatives.

(4) They promote coordination. Cooperative initiatives and other multi-stakeholder schemes facilitate coordination among participants. The Global Forum of Alliances and Coalitions promotes and facilitates coordination among initiatives. One rationale for the NAZCA portal is to disseminate information that reduces the costs for initiatives to coordinate. Overall, however, efforts at coordination have been more limited than those aimed at structuring the institutional complex.

Again, these actions utilise many orchestration techniques, including convening (Global Forum), persuasion (encouraging cooperative initiatives), reputational incentives (showcasing successes), ideational support (guidance, information) and steering (criteria, priorities, highlighting successes).

11.6 Conclusions: Enhancing Climate Orchestration

11.6.1 Orchestration Is Pervasive

Orchestration pervades climate governance. Many of the organisations in Figure 11.1 act as orchestrators: UNFCCC organs including the secretariat, presidencies and COP; UNEP, the World Bank and other IGOs and IFIs; the UNSG; and national governments. These international bodies lack authority for mandatory governance vis-à-vis states and private actors; even governments encounter limits to their authority when addressing transnational problems. International bodies also lack operational capacities and material resources – even the World Bank cannot provide all the needed climate finance. As orchestration research suggests (Abbott *et al.*, 2015), these actors engage (and help create) intermediaries able to provide the capabilities they lack.

Not every actor can orchestrate successfully, but these actors have demonstrated sufficient agency and organisational competence to do so. Some have shown unexpected entrepreneurial flair. All possess substantial legitimacy and authority with relevant audiences, based on their institutional positions, expertise and moral leadership. Only the IFIs – notably the World Bank and the GEF – have committed substantial material resources; other orchestrators rely almost exclusively on convening authority, ideational support and reputational incentives.

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11.6.2 Extending Climate Orchestration

For all its prevalence, however, climate orchestration falls short in certain areas: it has produced governance arrangements that are insufficient to meet agreed mitigation and adaptation goals, pose governance problems such as accountability (see Chapter 19) or simply fail to fulfil their potential. As mandatory governance remains unavailable, additional orchestration is the most feasible way to address these shortfalls. In this section I highlight four areas where extended orchestration would be valuable.

First, while a core proposition of polycentric governance theory asserts that polycentricity promotes experimentation and policy learning (see Chapters 1 and 6), the current system does not fully realise those benefits. The diverse actions taken under NDCs and the climate VCS offer unparalleled opportunities for experimentation and learning (Abbott, 2017). But the system produces only 'informal' experiments that do not follow the logic of experimentation in the natural and social sciences, and provides no systematic learning procedures. In addition, to pursue governance goals including speed and scale, the VCS adopts so-called SMART criteria, calling for specific, measurable, achievable and time-bound initiatives; these criteria encourage the application of established approaches, discouraging innovation and experimentation.

Climate orchestrators could encourage and support IGOs, governments and non-state initiatives to conduct designed, controlled experiments on technologies and policies (formal experiments), perhaps collaborating with natural and social scientists. At the least, they should encourage and support these actors to carry out their decentralised actions in ways that promote innovation and systematic learning (informal experiments). 'Experimentalist governance' offers one useful model (Sabel and Zeitlin, 2010), focusing on deliberation and peer review. An even stronger system would persuade, incentivise and support states and non-state actors to design and implement policies and interventions with an eye to experimentation and learning – adopting policies provisionally, coordinating their interventions to limit gaps and overlaps, defining important parameters to maintain comparability, keeping consistent records, disclosing results and engaging in systematic comparison and analysis of outcomes, with expert input where necessary (Abbott, 2017).

Orchestrators of the climate VCS could work through cooperative initiatives, local government associations and mechanisms such as the MP to encourage and facilitate these approaches among non-state actors; other orchestrators, such as UNEP, could work through independent initiatives. The UNFCCC could use the Article 13 transparency mechanism, the Technology Mechanism and other processes to promote them among governments.

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Second, the MP aims to accelerate and enhance voluntary initiatives. Its broad strategies – catalysing action, tracking progress, showcasing and reporting – are laudable. But its techniques remain unclear (Chan *et al.*, 2015; Chan, Brandi and Bauer, 2016). How can orchestrators effectively catalyse ambitious commitments, ratchet up their ambition, encourage financial support, promote Southern participation and ensure greater accountability? While a full discussion is beyond the scope of this chapter, the presidencies, champions, UNFCCC secretariat and UNSG should solicit advice from diverse stakeholders and experts, then design and implement a suite of concrete orchestration techniques to maximise the impact of the climate VCS.

Third, the Paris Agreement relies on NDCs, subject to periodic review and updating. The aim is to create a ratcheting dynamic, gradually increasing ambition. But review procedures are explicitly non-hierarchical and facilitative; effective orchestration is thus essential. Based on the foregoing discussion, an orchestration strategy might incorporate at least three elements. UNFCCC organs and leading governments should seek to embed influential intermediaries – e.g. IGOs, technical experts, finance providers, NGOs – into review processes, to facilitate action, introduce information and ideas and exert subtle pressures on governments (van Asselt *et al.*, 2016). These and other orchestrators, such as UNSG, should mobilise diverse intermediaries to develop and provide willing governments information on cost-effective mitigation and adaptation strategies, with the ideational and material resources to implement them (Victor, 2016). Finally, orchestrators should ensure that ideas, information and evidence from the 'groundswell' of voluntary non-state initiatives are clearly communicated to governments in the context of decisions on NDCs, both for learning and for the political impact of their demonstration effects.

Fourth, while climate orchestrators have helped structure the institutional complex, as by encouraging initiatives of particular kinds, they have done relatively little to coordinate the actions of those initiatives. To encourage and incentivise efficient coordination among national government policies and NDCs, UNFCCC organs and other orchestrators could work through the Technology Mechanism, Technical Expert Meetings, CIFs and public-private cooperative initiatives, as well as regional bodies and other IGOs. They could introduce experts and other influential intermediaries into these processes to persuade and provide information and assistance.

For voluntary non-state commitments, cooperative initiatives may coordinate participants internally, but orchestrators of the climate VCS could more actively encourage them to do so, through MP criteria, the Global Forum and other processes. UNEP, with a mandate for coordination and close relations with many initiatives, could assume a larger coordinating role. The most ambitious vehicles

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for non-state coordination in environmental governance are the sustainable development action networks. Networks such as SE4All and Every Woman Every Child have developed substantial agency, coordinate participating initiatives by tracking progress and establishing priorities, and operate accountability mechanisms. Similar networks would be valuable additions to climate governance.

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12

Policy Surveillance

Its Role in Monitoring, Reporting, Evaluating and Learning

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12.1 Introduction

Successfully mitigating the risks posed by climate change will necessitate substantial efforts by consumers, businesses and governments in nearly 200 countries to change their activities that are contributing to greenhouse gas (GHG) emissions. Doing so will require surmounting a collective action challenge; mitigating GHG emissions produces a global public good. Thus, the sources of these emissions have insufficient incentive to abate them (Barrett, 2003). In the multilateral sphere, there is uncertainty about the credibility of commitments, reflecting questions on whether a country can implement policies that alter the behaviour of private agents (e.g. emissions abatement) as well as questions on the ability to observe a country's performance with respect to its commitment (Hafner-Burton, Victor and Lupu, 2012). Mitigation efforts at lower scales of governance – by states and provinces, businesses and even universities – have resulted in commitments to reduce emissions and implement mitigation policies (see Chapter 1). Such self-organised efforts may reflect how local impacts can drive lower-scale mitigation initiatives (Ostrom, 2010), but uncertainty also characterises the extent and efficacy of these efforts.

An extensive academic literature illustrates how transparency can reduce uncertainty and mitigate incentives to deviate from a commitment, and thus enable a set of reciprocal actions to deliver on a public good. This is all the more important given the prominent role of voluntary commitments emerging through various forms of governance, including the evolution of pledge-and-review in the international climate policy architecture. This highlights the needs and opportunities for a robust system of monitoring, evaluating and learning of mitigation performance; in short, climate policy surveillance.

Climate policy surveillance refers to the generation and analysis of information on the existence and performance of GHG mitigation policies and measures, such

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as emission levels and estimated reductions, costs and cost-effectiveness, potential cross-border impacts and ancillary benefits. In effect, the scope of an effective surveillance system would reflect the interests of various stakeholders and governments that demand information. This would require reporting and monitoring of relevant climate policy performance data, as well as the analysis and evaluation of those data. Doing so can facilitate learning about the efficacy of mitigation efforts and subsequently build trust that countries, subnational governments, businesses and others that have made commitments to combat climate change are delivering on them. This surveillance can be institutionalised in international agreements, but it can draw from the provision and analysis of data by national governments, businesses, civil society, academics and others. Polycentric climate policy surveillance can take two general forms: (1) transparency of a polycentric system of emission mitigation efforts; and (2) multiple, independent transparency efforts that may feed into a more centralised mitigation regime (e.g. the United Nations Framework Convention on Climate Change [UNFCCC]). These are not mutually exclusive, and the emergence of the former could influence the implementation of the Paris Agreement's transparency regime.

Signalling the seriousness of commitment is often a condition for securing agreement among parties. Schelling (1956: 288) suggests that transparency and publicity of a party's ex-ante pledge and ex-post outcome can enhance the credibility of commitments. The 'publicity' Schelling called for can be established by the 'information structures' created by the rules of international institutions (Keohane, 1998). The provision of information could also come from non-profit organisations, academics, business stakeholders and other non-state actors (Aldy, 2016a). Transparency can facilitate 'naming and shaming' by other parties to an agreement, by interested stakeholders, by the media and by others. The prospect of adverse reputational consequences for deviating from an agreement or a public commitment may promote compliance (Chayes and Chayes, 1991; Simmons, 1998). Even without an enforcement mechanism, information-generating institutions may 'contain deviance within acceptable levels' (Klabbers, 2007: 1004).

Barrett (2003: 150) notes that the 'incentive for parties to deceive creates an incentive for others to monitor'. Indeed, any entity with an interest in ensuring that promised emission mitigation efforts are delivered has an interest in monitoring these efforts, as well as an incentive to experiment with alternative surveillance techniques (Ostrom, 2010). The probability of detecting deviations from an agreement increases with the transparency of the regime, which can thus reassure those predisposed to comply and deter those considering deviation (Levy, Keohane and Haas, 1993; Chayes, Chayes and Mitchell, 1998).

The iterative nature of multilateral climate negotiations provides an opportunity for transparency to inform subsequent rounds of negotiations. First, information

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can promote compliance in repeated games. In his discussion of monitoring in international environmental agreements, Barrett (2003: 284) notes that 'transparency is of fundamental importance in a repeated game'. Levy *et al.* (1993) also note that 'effective monitoring is a condition for sustained cooperation'. In economic policy contexts, Simmons (1998: 81) observes that '[g]reater transparency and opportunities for reciprocity also enhance compliance where there is repeated play within a small group, for example in the EU or among the large countries in the [World Trade Organization]'. In common pool resource management, Ostrom (1998: 10) emphasises that 'all reciprocity norms share the common ingredients that individuals tend to react to the positive actions of others with positive responses and the negative actions of others with negative responses'. Second, structuring iterative negotiations around periodic information collection and analysis could inform the setting of goals and their implementation in subsequent rounds of negotiations.

Given the repeated nature of mitigation pledges envisioned under the Paris Agreement, verifying countries' past performance can increase confidence and build trust that they will deliver on future rounds of pledges (Chayes and Chayes, 1991). Moreover, experimental evidence suggests that a transparency mechanism could increase both the ambition of pledges and the realised mitigation performance relative to a regime without review (Barrett and Dannenberg, 2016).

To deliver on the potential for global climate change efforts to attain the goals set in the Paris Agreement, however, climate policy surveillance will need to improve considerably. Section 12.2 discusses the experience with policy surveillance – and the substantial shortcomings – under the UNFCCC. The design of more effective climate transparency can benefit from the experiences implemented through various forms of governance in other, related contexts. Section 12.3 presents four mini-case studies of transparency practices: International Monetary Fund (IMF) Article IV consultations, the Group of 20 (G20) fossil fuel subsidies agreement, the US government's retrospective review of regulations and industries' voluntary reporting and disclosure through the CDP (formerly, the Carbon Disclosure Project). The selection of these case studies reflects an interest in: (1) illustrating transparency through a broad range of governance forms, from the multilateral to the business level; (2) drawing insights from reporting only as well as reporting subject to independent analysis schemes; (3) providing both positive and negative examples of review and surveillance; and (4) presenting examples of review schemes that each play at least a modest role in the existing structure of polycentric governance.

This chapter closes with a discussion of how monitoring, reporting and evaluation may in the future occur through more polycentric frameworks. In particular, it identifies opportunities for civil society, academics, business stakeholders and

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international organisations outside of the formal UNFCCC process to contribute to and enhance the rigour, accountability and legitimacy of policy surveillance. These conclusions emphasise complementarities in policy surveillance at different levels of governance – some of which have self-organised in the vacuum created by the weak UNFCCC transparency regime – as well as how other institutional approaches could address gaps in the multilateral climate transparency regime.

12.2 Shortcomings in Climate Policy Transparency

The opportunities for polycentric transparency and policy surveillance to make valuable contributions to climate policy reflect, in part, the shortcomings in multilateral climate policy transparency. The infrequent reporting of emissions, the incomplete information on mitigation policies and the absence of analysis and review of emission outcomes and policies have characterised the UNFCCC since the early 1990s (Aldy, 2014a, 2016b). The Convention established vastly different standards for reporting on emissions and national policies for industrialised (Annex I) countries and developing (non-Annex I) countries. In the first two decades of the UNFCCC, most developing countries had presented no more than two emission inventories (Breidenich and Bodansky, 2009). For example, China submitted information on its GHG emissions inventory for 1994 in its 2004 national report, and for 2004 in its 2012 national report. A once-per-decade snapshot of emissions, with nearly a decade-long reporting lag, is clearly inadequate to inform negotiations, policy design and investment decisions.

Developed countries submit annual emission reports, pursuant to established guidelines subject to expert review. By contrast, the infrequent developing country emission reports submitted before 2014 were neither subject to the same standards as developed countries nor underwent expert review (MacFaul, 2006; Breidenich and Bodansky, 2009). Even the regular reporting of developed country emissions was insufficient to characterise the effectiveness of emission mitigation policies in these countries (Thompson, 2006a; Ellis and Larsen, 2008; Breidenich and Bodansky, 2009). The reviews of industrialised countries typically draw, in an ad hoc nature, from government-sponsored experts (academia, business and government sectors) to conduct a review, with occasional in-country visits. The pre-2014 developed country national reports were so incomplete and inconsistent that it was not possible to credibly assess the impacts of mitigation policies across countries or even compare efforts *within* a country over time (Thompson, 2006a; Aldy, 2014b; Ellis and Moarif, 2015).

Given the poor track record on climate transparency, the multilateral community has aimed to enhance reporting and review. The Copenhagen Accord and Cancún Agreements included a variety of mitigation pledges, such as emissions targets

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relative to a base year, emission reductions relative to a business-as-usual forecast, improvement in the emission-to-gross domestic product ratio, as well as sector-specific policies and goals. While this heterogeneity of pledges may facilitate broader participation (also evident in the Paris Agreement), it may present challenges in assessing and comparing mitigation efforts absent in a robust transparency regime. These two agreements required biennial reports by developed countries and biennial update reports by developing countries (Ellis and Moarif, 2015). These reports feed into a consultative process for peers to discuss individual nations' domestic emission mitigation programmes. Again, the standards differ considerably between developed and developing countries. The Annex I nations have standardised reporting templates and all met their initial deadline of December 2013 for biennial update reports. By contrast, non-Annex I countries have substantial discretion in what and how information is presented in their reports, which undermines comparability. More importantly, the compliance with the due dates for the biennial reports has been low. By December 2016, the due date for the second biennial update reports, less than one-quarter of all developing countries had submitted their first biennial report (UNFCCC, 2017). China submitted its first report in 2017.

The Paris Agreement calls for further transparency efforts by building on these efforts. Significant improvements in policy evaluation will be necessary. This will be a challenge, given that some developing countries lack the institutional capacity to monitor emissions, evaluate programmes and policies, estimate emission reductions across various sources and sectors and report this information. For example, the 2013 United Nations Environment Programme Emissions Gap report notes that 'serious information gaps preclude comprehensive assessment of several countries' emission trajectories under current policies (UNEP, 2013: 12). Likewise, Ellis and Moarif (2015: 4) conclude that the 'lack of complete and/or timely information from a large number of countries prevents assessments of progress towards collective commitments or goals'. Moreover, UNFCCC reviews of developed country emission mitigation programmes have provided little useful information about policy efficacy as well as lessons and/or recommendations for policy export to other nations. The credibility and trust necessary for the Paris pledge-and-review framework to deliver more mitigation ambition over time will depend on countries understanding not only their peers' emission levels but also the impacts of the mitigation policies and programmes. This kind of policy evaluation could benefit substantially from inputs and contributions from non-UNFCCC processes. The next section presents several case studies and from them derives lessons for how a more polycentric approach to transparency could address these needs.

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12.3 Surveillance in Action: Insights from Four Case Studies

This section briefly describes each of the four transparency case studies. The following section synthesises the key lessons learned from them.

12.3.1 International Monetary Fund Article IV Consultations

The IMF undertakes country-, regional- and global-level economic surveillance (IMF, 2001; Schäfer, 2006). Individual country surveillance occurs annually under so-called Article IV consultations. The IMF conducts regular surveillance of the global economy – in effect, an assessment of the aggregate impact of various economic, monetary and fiscal policies of the member countries – and publishes the World Economic Outlook typically twice per year. While these reviews focus on economic policy, they have occasionally addressed climate-related policy reforms, such as fossil fuel subsidies (IMF, 2011).

The IMF consultations have enhanced monitoring and analysis capacity within countries, produced economic data for review and enabled policy review. As a result, scholars focused on climate policy have considered the IMF review as a gold standard worthy of emulation in the climate context. For example, Victor (2007) called for a climate change review mechanism based on the IMF model. Aldy (2013) also suggested that a formal institution with permanent staff could implement a transparency mechanism for the global climate policy regime. Such an institutional capacity could provide confidence in the review mechanism as a function of its credibility, competence and independence.

12.3.2 G20 Fossil Fuel Subsidies Agreement

At the 2009 Pittsburgh G20 summit, the leaders of the 20 largest economies agreed to 'phase out and rationalise over the medium term inefficient fossil fuel subsidies while providing targeted support to the poorest' (G20, 2009). The G20 leaders called on all nations to eliminate their fossil fuel subsidies, and Asia-Pacific Economic Cooperation leaders echoed the call to phase out such subsidies at their 2009 Singapore summit (Aldy, 2017).

Following up on the G20 agreement, leaders established processes of implementation and review to promote such transparency. Leaders tasked energy and finance ministers to identify their nations' fossil fuel subsidies, develop a plan for eliminating these subsidies and report to leaders on their progress. The G20 published a summary report of each member's identified subsidies and the plan for eliminating them at the 2010 G20 summit. Leaders have continued to task energy and finance ministers to continue their efforts and report back regularly

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(e.g. G20, 2013b). Several G20 governments have also voluntarily subjected their subsidy phase-out performance to a formal peer review process. In 2016, the G20 reported on the China and US peer review efforts (OECD, 2016a, 2016b).

12.3.3 US Government Retrospective Review of Regulations

In January 2011, President Obama issued Executive Order 13563, 'Improving Regulation and Regulatory Review'. This called for, among others, retrospective analyses of existing significant regulations. The president called on regulatory agencies to 'consider how best to promote retrospective analysis of rules that have become outmoded, ineffective, insufficient, or excessively burdensome, and to modify, streamline, expand, or repeal them in accordance with what has been learned' (Section 6). Under the Executive Order, each regulatory agency published a plan for periodic review of existing significant regulations and began evaluating their rules in the summer of 2011.

The Obama administration aimed to institutionalise retrospective review of regulations after ad hoc regulatory look-backs implemented at the behest of the White House in every previous administration since the 1970s (Aldy, 2014a). The United States is not alone; a number of other developed countries have also pursued retrospective review of their regulations (OECD, 2009; European Commission, 2014). These efforts represent a national-level form of self-surveillance. In the US government, federal regulators had the sole authority to initiate and undertake the review of their existing rules.

12.3.4 Voluntary Firm Reporting through the CDP

The CDP, initially launched in 2003, collects and publishes information on companies' climate change-related activities (Matisoff, Noonan and O'Brien, 2013). This includes data on company efforts to mitigate exposure to climate change risks, company GHG emissions and emission-abatement efforts and internal carbon pricing for project and investment evaluation. The CDP is a non-profit organisation, initially launched by major institutional investors, that operates around the world and aims to address the demand for information about companies' environmental-related outcomes from investors (Hahn, Reimsbach and Schiemann, 2015).

Each year, the CDP publishes a report that synthesises and analyses the climate-related data voluntarily reported by major companies (CDP, 2016). In addition, in recent years, the CDP has expanded to include reporting by cities on their climate-related activities. This reporting enables those who demand the information to assess and compare climate change actions by region, by industry and by other characteristics of business.

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12.4 Lessons from Polycentric Transparency

12.4.1 Producing Credible Information

Producing credible data and analysis can enhance the legitimacy and facilitate trust in the policy surveillance. As Thompson (2006b) notes, national governments have frequently delegated surveillance responsibilities to international organisations, and these entities can play important roles by generating 'neutral' information. The IMF and G20 models both rely on international organisations for implementing policy surveillance.

Under Article IV consultations, teams of permanent staff experts make in-country visits as part of policy and data reviews (IMF, 2001; Schäfer, 2006). These expert teams use country-provided data, among other sources, in their review of a country's economy and relevant economic policies. After a country visit, the IMF expert team compiles a report that feeds into a peer review process (see Section 12.4.2).

To facilitate transparency of the fossil fuel subsidies agreement, the G20 leaders tasked four international organisations – the International Energy Agency (IEA), the Organisation for Economic Co-operation and Development (OECD), the Organization of the Petroleum Exporting Countries (OPEC) and the World Bank – to evaluate fossil fuel subsidies. This includes an examination of countries' subsidies, their proposed subsidy reforms and the economic, energy and environmental impacts of these subsidies. These international organisations published their first joint report to G20 leaders at the 2010 Toronto meeting and have continued to provide analysis and reviews of countries' implementation strategies (IEA, OECD and World Bank, 2010). In addition to these joint reports, the IEA (2013), the OECD (2013) and the IMF (2013) have produced their own estimates of country-specific fossil fuel subsidies.

Drawing from experts among various international organisations to evaluate fossil fuel subsidy reforms mirrors the approaches taken by the IMF, the OECD and the World Trade Organization (Aldy, 2013, 2014b). Relying on external experts at established international organisations also mitigates concerns about the politicisation of the transparency mechanism and allows for a rapid ramping up of the review process. A potential limitation of relying on existing international organisations, however, may be the legitimacy of those with incomplete memberships. For example, some developing countries may question reviews by the IEA, whose membership is comprised of predominantly developed nations. Others may challenge the legitimacy of the IMF because of the greater weight that larger, more developed economies have in its decision-making, hiring and operations (IMF, 2017).

By contrast, the retrospective review of regulations in the US government requires regulators to review their own rules. Given the scarce resources, agencies

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have the discretion to identify rules for review, determine the nature and detail of analysis and make the final decision about changes to existing rules. Likewise, the firms disclosing through the CDP are subject to selection. Moreover, their reporting is not reviewed independently. As a result, such processes, absent supplemental review, may raise questions of credibility and legitimacy. In a polycentric world, however, they could enhance information in broader climate transparency schemes. For example, ex-post review of the performance of a carbon dioxide mitigation regulation could serve as an input in a country's reporting and review under the Paris Agreement's transparency regime (Aldy, 2016a).

12.4.2 Engaging Peers

Providing a forum for countries to engage one another through peer review can facilitate learning about effective policy practice and promote mutual understanding about individual policy designs and experiences of implementation. The IMF expert staff report serves as the basis for a peer review by the Executive Board, which includes 24 country directors representing member countries or groups of countries. A summary of the Board discussion and the report are typically published. Making these reports public enables stakeholders to push for better economic policies in their respective countries and improves the quality of the IMF review product by effectively subjecting the reviewers to external assessment (Fischer, 1999).

Coupling peer review with expert review enhances transparency on implementation and can empower domestic stakeholders as well as peer nations to apply pressure to push a country to deliver on its commitment. At the 2013 G20 summit, leaders supported broad participation in a voluntary 'country-owned' peer review of fossil fuel subsidy phase-out efforts (G20, 2013a). Through this process, small groups of G20 nations work together in reviewing one or more nations within each group that voluntarily submit their policies for review (G20, 2013b). Third-party experts (e.g. from the OECD) and non-G20 countries may participate in the reviews at the reviewed country's discretion. The peer review addresses the fossil fuel subsidies identified for phase out by the country under review. A reviewed country may agree to a broader assessment, including analysis of other potential subsidies, barriers to subsidy reform, etc. Initiated in 2014, the first round of peer reviews addressed China and the United States (OECD, 2016a, 2016b), and the second addressed Germany and Mexico.

The G20 agreement explicitly invites non-G20 countries to follow suit in eliminating their fossil fuel subsidies and provides an opportunity for non-G20 members to participate in peer review. For example, the Friends of Fossil Fuel Subsidy Reform – including Costa Rica, Denmark, Ethiopia, Finland, New

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Zealand, Norway, Sweden, Switzerland and Uruguay – participate in the G20 peer review process. Learning about effective reform efforts can then spill over to countries outside of the G20. Policy surveillance in an open club framework promotes the dissemination of information and knowledge – a public good that could benefit club members by leveraging subsidy reform outside of the club, i.e. de facto opt-in to the fossil fuel subsidies agreement (Victor, 2007).

12.4.3 Enhancing Capacity

The IMF supports standards for data dissemination and codes for good policy practice that can facilitate surveillance and also benefit member countries in their design and implementation of economic policy. Such standards provide transparent, timely and measurable metrics for evaluating policy performance and identifying potential economic vulnerabilities. The IMF emphasises the value in implementing such standards and codes to communicate clearly to the markets and other countries on a country's economic situation.

In the context of the retrospective review of government regulations, building capacity and increasing experience in conducting analyses of regulatory performance can create a 'culture' for review (Sunstein, 2012). Creating such a culture can change the pattern of periodic, ad hoc retrospective reviews (Coglianese, 2013). The institutionalisation of retrospective review, especially with regular reporting, helps promote that culture.

A critical element of building a culture for review lies in planning for review when developing new regulations. Some regulations are difficult to evaluate through rigorous statistical methods, as evident in the academic literature on the costs, benefits and impacts of federal regulations (Aldy, 2014a). This may reflect the absence of necessary data, time, resources and bureaucratic capacity to undertake a feasible analysis or an implementation that does not naturally lend itself to causal identification. Planning for ex-post analysis of a rule could ensure both the availability of such data and an implementation scheme that may permit causal inference on the impact of the rule. The Department of Homeland Security indicated that it would 'build in retrospective review at the earliest stages of regulatory development' (Aldy, 2014a: 61). The Departments of Labor, the Interior and Treasury indicated an interest in experimental designs to facilitate rigorous statistical evaluation of their regulatory actions (Sunstein, 2011). Such an analysis could help address key questions the public may have, such as whether the rule was successful (Coglianese, 2013). Nonetheless, none of the significant regulations promulgated by regulatory agencies in the first three years of the Obama retrospective review effort included plans for their future performance evaluations (Aldy, 2014a).

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12.4.4 Facilitating Policy Learning

An effective transparency mechanism not only collects information but also provides analysis and evaluation of policy actions and outcomes. Analysing and disseminating data on countries' actions under an agreement are necessary for transparency to contribute to regime compliance (Chayes *et al.*, 1998).

In addition to providing templates for analogous work in the climate context, Article IV consultations can improve the information set about the climate impacts of economic policy reforms. For example, the IMF reported on the impacts of Iran's major 2010 fuel pricing reform in its 2011 Article IV consultation. In this analysis, the IMF stated that the dramatic reduction in fuel subsidies (Iran quadrupled the price of petrol on one day) had reduced emissions of carbon dioxide as well as nitrogen oxides, sulphur oxides and particulate matter (IMF, 2011).

One of the key motivations for targeted, small-group efforts is to identify actions and processes that can successfully lower GHG emissions. A well-designed transparency regime can provide the information necessary to demonstrate whether the small-group process delivered on its objectives. It can illustrate the most effective reforms and highlight potential opportunities for scaling up the effort to a larger set of countries or even to the full UNFCCC negotiations. Working in a smaller group of similar countries may permit a more extensive system of policy surveillance. For example, the G20 members have substantially more resources and bureaucratic competency than the average of the UNFCCC membership. Thus, G20 members can draw on the technical expertise of their bureaucracies – and in some cases their civil society and academia – to experiment with ideas for effective policy surveillance. Demonstrating a well-functioning system of policy surveillance for the largest developed and developing countries can then serve as a model for large-group contexts such as the UNFCCC.

Retrospective review can increase the efficiency of regulations by reducing regulatory duplication, which has been an objective of retrospective reviews dating back to the 1978 Carter Executive Order and the 1980 Regulatory Flexibility Act. This is all the more important today, as agencies – such as the Environmental Protection Agency, the Department of Energy and the Department of Transportation – deal with various overlapping jurisdictions.

Improving multi-agency coordination would help address these issues of duplication and also better identify the cumulative extent of regulatory burdens borne by regulated entities. This can also be important as the United States works to better coordinate regulatory policy with other major trading partners. Each country is different in how it allocates regulatory responsibility to various agencies within its government, and thus regulatory coordination and coherence

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on any specific set of regulatory issues will likely involve multiple regulatory agencies in each country. With an increasing number of countries undertaking some form of retrospective review of regulations (OECD, 2009), there may also be opportunities for US government agencies to coordinate with overseas counterparts on retrospective review and hence potentially learn from other countries' regulatory agencies. For example, the European Commission is implementing the Regulatory Fitness and Performance Programme, which 'aims to cut red tape, remove regulatory burdens, simplify and improve the design and quality of legislation so that the policy objectives are achieved and the benefits of EU legislation are enjoyed at lowest cost and with a minimum of administrative burden' (European Commission, 2014: 2).

While governments craft climate policy, businesses and consumers will undertake the changes in behaviour and investment necessary to abate GHG emissions. The CDP reports provide ground-level evidence of corporate mitigation projects and outcomes and illustrate opportunities for learning from business peers. Moreover, they can enable policymakers to calibrate their assessments of climate change policy and determine if they are delivering on their desired results. Finally, business-level climate transparency can corroborate and complement transparency by governments in those regions where a given business operates (CDP, 2016).

The business reporting through the CDP can also signal private-sector expectations about the future of climate change policy. The nature of emission mitigation investments as well as the internal carbon price for planning reveals the expected effective carbon price influencing the returns to the business's operations. In its 2016 report, the CDP noted that more than 1,000 companies use or plan to soon use a carbon price for internal project evaluation and investment analysis. For example, large American corporations, including Duke Energy, General Motors, Google and ExxonMobil; large Asian corporations, including NEC, Samsung, TEPCO and Toto; and large European corporations, including BMW, BP, Deutsche Bank and Unilever, employ carbon prices in internal planning ranging from 5 to 100 per tonne of carbon dioxide. Formally integrating a carbon price in the assessment of business options reflects an expectation that policies of one form or another will impose an explicit carbon price (e.g. a carbon tax) or an implicit carbon price (e.g. through command-and-control regulation) on these companies' business operations. The dramatic heterogeneity in expected carbon prices among these companies, however, also reflects the continued uncertainty about the form, timing and ambition of international climate change policy after Paris (Aldy, 2016b).

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12.5 Conclusions

Let me close with a discussion of the demand and supply for transparency, and the opportunities – indeed the need – for a polycentric approach to transparency.

Transparency reflects the demand for information, which will be a function of the interests of all those engaged, one way or another, in climate policy. Governments may request the collection, analysis and dissemination of information through the transparency mechanisms that address the interests of their domestic publics and stakeholders (Aldy and Pizer, 2016; Aldy *et al.*, 2016). Some business stakeholders may view transparency as a way to assess the policy and economic landscape in a given country for purposes of determining future investments. Other business stakeholders, concerned about potential adverse competitiveness impacts of the domestic programmes they operate under, may be interested in assessing the comparability of mitigation effort among countries, with a particular focus on the energy-cost impacts of domestic mitigation programmes borne by their competitors (Aldy and Pizer, 2015). Environmental stakeholders may use assessments of a country's mitigation programme and comparisons with other countries to identify and pressure laggard countries. Addressing these interests will require information on the economic, energy and environmental impacts of domestic mitigation policies.

The Paris Agreement acknowledges the substantial interests in transparency by tasking the development of a policy surveillance mechanism to future negotiations (see Chapter 2). The track record of climate transparency in the UNFCCC processes to date suggests that the supply of transparency will be inadequate. Will the information be credible? Will there be sufficient analysis to address the most important questions? Will there be enough investment in the institutions to enable learning among peers? Will countries have the capacity to produce and consume information on climate policy performance? Failing to identify key policy insights will retard the development of more effective mitigation policies around the world. Drawing lessons from existing schemes of transparency can inform the supply of these necessary elements and processes of policy surveillance.

There may be, however, novel sources for information that can be tapped. The Paris Agreement emphasises the potential role of so-called non-party stakeholders – including civil society, the private sector, financial institutions and subnational authorities – in a markedly more open and positive manner than previous multilateral climate agreements (see Chapter 4). The decision adopting the Paris Agreement specifically calls for leveraging the expertise and knowledge of non-party stakeholders to complement the contributions of parties, convention bodies and international organisations in the existing technical review processes of pledges through 2020. Soliciting 'experiences and suggestions' creates an

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opportunity for stakeholders to inform, shape and demonstrate approaches to transparency that can facilitate greater mitigation over time (UNFCCC, 2015: para. 109). Moreover, the decision reiterates this enthusiasm for non-party stakeholders by noting that it 'encourages non-party stakeholders to increase their engagement' (UNFCCC, 2015: para. 119). Finally, the decision focuses on the role of domestic mitigation policies and carbon pricing, suggesting that stakeholders could play a role in integrating the design of domestic policy, the review of these policies and the implications for the transparency and assessment of mitigation pledges under the Paris framework. Non-party stakeholder experimentation with alternative transparency approaches may also identify more effective surveillance design (Ostrom, 2010).

Indeed, interest in domestic mitigation policies and actions is likely to continue to grow as parties and stakeholders seek a better understanding of how parties' nationally determined contributions are implemented and how far implementation delivers on a given country's initial pledge. Stakeholders often have more extensive input on the design and evaluation of domestic policy, including mitigation policy, than on a headline goal made in multilateral negotiations. Understanding what policies will work in practice can draw from stakeholder expertise. In addition, stakeholders can work with policymakers on the design of domestic policy to facilitate the supply of information for the benefit of both domestic policy review and international climate policy transparency (Aldy, 2016a). This can improve the efficacy of domestic policies, promote cost-effectiveness, enable greater policy learning and enhance the credibility of a country in international negotiations by rigorously demonstrating a good faith effort in mitigating GHG emissions (van Asselt and Hale, 2016).

A challenge in a polycentric approach to climate change policy lies in the prospect that the emerging climate change regime may include some redundancies in promoting emission mitigation as well as some omissions. These may simply reflect the lack of complete coordination among the various efforts to address climate change, but it could also be an outcome of strategic incentives and interactions (Gunningham and Sinclair, 1999; Ostrom, 2010). Just as there are free-riding incentives in the mitigation of GHG emissions by any individual source or country, the same can hold for polycentric mitigation efforts. If a small group of countries or an industry or major donor institution advances mitigation efforts, that risks weakening the incentive – and potentially the political resolve – to take action in other domains. In effect, there could be substitution among polycentric mitigation activities. This is not necessarily the case, but absent thoughtful coordination, this substitution could easily occur.

By contrast, the public good nature of providing information means that a polycentric approach to transparency could create strategic complementarities.

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If one regime enhances its transparency – such as businesses revealing information about their climate-related activities, including their emissions, internal carbon price for project planning, and changes in carbon-related investment – then that may lower the cost of undertaking transparency in a related regime – such as a retrospective review of domestic emission mitigation regulations, which could calibrate models of policy efficacy based on the business disclosures. Likewise, lowering the costs of national policy surveillance would increase the supply of information into plurilateral and multilateral transparency regimes. Thus, making commitments to transparency in the evolution of a polycentric climate policy complex could make it that much easier to improve the quality and usefulness of information going forward. Furthermore, given the critical role of learning about emission mitigation performance to build trust in global climate policy efforts as well as to identify and export efficacious policies in promoting more ambitious climate change policy, leveraging the strategic complementarities in polycentric transparency can contribute to a more successful global climate policy effort.

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Part IV

Substantive Governance Challenges

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13

Harnessing the Market
Trading in Carbon Allowances

KATJA BIEDENKOPF AND JØRGEN WETTESTAD*

13.1 Introduction

This chapter describes and evaluates the dynamically evolving web of carbon markets at various government levels around the globe – a web which can be conceived of as polycentric in nature. Individual but interdependent carbon markets have developed in many jurisdictions since the late 1990s. The Kyoto Protocol and the Paris Agreement provide an overarching umbrella for a wide range of designs, but international agreements are not the only factor contributing to the inception, design and diffusion of carbon markets. Individual countries, subnational entities and the European Union (EU) have taken initiatives in response to various domestic and international dynamics. No existing carbon market is an exact replica of another: each has been tailored to domestic preferences, contexts and politics.

A truly effective and ambitious global carbon market would arguably require strong harmonised rules and a central and independent authority to manage it (Green, 2017: 484). As this appears politically very difficult to achieve and is thus a rather unlikely scenario in the short term, a more feasible way for the various carbon markets to contribute to global mitigation efforts may be presented by the current polycentric approach. The interplay between local and international developments has led to the emergence of such a carbon market structure and continues to shape its further evolution. In this chapter, we discuss which opportunities and challenges will arise by approaching further development this way – with the challenges relating to fragmentation and political and economic uncertainties.

Carbon markets are systems within which carbon allowances and credits are traded. *Carbon allowances* are permits for emitting a certain amount of greenhouse gases (GHGs). *Carbon credits* are generally the output of an offset programme that reduces the emissions of actors outside the scope of an emissions trading system (ETS); participants can buy such credits and count them towards their overall

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obligation within an ETS. *Emissions trading* is a policy instrument that creates a carbon market in a specific jurisdiction. It sets a maximum emissions limit for a specified group of emitters; this may involve an absolute limit on GHG emissions (as in the EU), a carbon-intensity target (as in China) or a reduction target compared to a business-as-usual scenario (as in South Korea). This jurisdiction-wide limit, also called the *cap*, contrasts with a *command-and-control* approach of prescribing limits for each individual emitter (Dales, 1968).

Companies covered by an ETS can obtain emissions allowances for free, or purchase them in auctions or from other emitters. For predefined time periods, emitters must surrender to the authorities the number of allowances corresponding to their actual emissions during that time. Surplus allowances can usually be sold or 'banked' for future use. The price of a tonne of carbon is determined by the supply and demand of allowances. An 'ambitious' cap (one with a limit set significantly below expected demand) will create scarcity of carbon allowances, and is likely to result in a relatively high carbon price (Dales, 1968; Tietenberg, 2006; van Asselt, 2010).

Carbon markets have been hailed as a flexible and efficient means to curb GHG emissions and to incentivise the decarbonisation of the economy by putting a price on carbon, thereby making investment in low-carbon solutions more attractive. A fundamental reason for the growing interest in emissions trading by various governments, as well as industries and other stakeholders, is that it allows governments to control total emissions levels in the ETS sectors and the basic rules governing market transactions. Meanwhile, stakeholders remain free to determine how many emission permits they buy or sell. In theory, this instrument combines, in a unique way, relative predictability of emission reductions with flexibility to achieve compliance. However, creating a market for an artificial commodity like carbon is an extremely complex endeavour. Several problems have arisen, as described in this chapter.

The adoption and proliferation of ETSs is one of the illustrations of the emergence of polycentric structures used in Elinor Ostrom's (2010) pioneering article on coping with collective action and global environmental change. Our chapter adds a more systematic discussion of the polycentric structure of carbon markets. Since the late 1990s, carbon markets have developed at many levels of governance, ranging from the municipal and subnational to the supranational and international. The geographical spread and variety of designs are vast. In 2017, the International Carbon Action Partnership counted 21 individual ETSs, implemented in a total of 35 countries (ICAP, 2017). A few carbon markets have been linked and mutually adjusted to each other – notably the ETSs adopted by the EU, Norway, Iceland and Liechtenstein, as well as the California and Québec systems.

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The momentum and upward trend in the proliferation of ETSs makes harnessing the market in the name of climate mitigation an increasingly important element of global climate governance. Against this backdrop, our chapter begins by describing the origins of the current global landscape of carbon markets. Both local and international dynamics have contributed to the polycentric structure in evidence today. Second, we conceptualise the interaction and linkage among ETSs today. Various ties can be identified, from formal market linkages to informal exchanges of lessons learned. Third, we highlight key carbon market design challenges and opportunities, including those related to a polycentric architecture. Here we discuss the interaction with other climate policies and carbon price management. We conclude with some suggestions for future research on harnessing the market for climate policy purposes, including the role of polycentric governance.

13.2 Origins of the Polycentric Carbon Market Structure

A growing number of jurisdictions have adopted GHG ETSs since the turn of the millennium. None of these systems is an exact copy of another: each system has been tailored to its domestic socio-economic context and political preferences (Knox-Hayes, 2016; Wettestad and Gulbrandsen, 2017). Not only nation states but also subnational and supranational entities have adopted ETSs, as shown in Table 13.1. This section traces the evolution of GHG emissions trading, with an emphasis on the early phases. This brings out the conditions under which polycentric governance emerges.

The idea of harnessing markets for environmental policy was first developed by North American economists in the late 1960s (Coase, 1960; Crocker, 1966; Dales, 1968). It entered the climate policymaking realm in the 1980s, with 'Project 88' producing an important milestone report in the US context (for an overview of this early history, see Voss, 2007; Mehling, 2012; Calel, 2013; Paterson *et al.*, 2014; see also Chapter 6). In Europe, the economist Michael Grubb presented a similar idea in the late 1980s (Grubb, 1989). The first major ETS was implemented by the US government in 1995; however, it addressed the air pollutants sulphur dioxide (SO_2) and nitrogen oxide (NO_X) that cause acid rain, rather than the GHGs that cause climate change (Baldwin, 2008: 262; O'Neill, 2017: 212). The idea of using a market logic found resonance in the US government's ideology at the time.

Encouraged by its domestic implementation of SO_2 and NO_X emissions trading, the United States pushed the idea of carbon markets and flexible mechanisms in the negotiations on the 1992 United Nations Framework Convention on Climate Change (UNFCCC). Although the resulting convention text did not feature explicit carbon market provisions, the United States succeeded in getting three flexible mechanisms included in the 1997 Kyoto Protocol: the Clean Development

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Table 13.1 *Key emissions trading systems at various levels of governance*

Level of governance	Carbon markets*
International	Clean Development Mechanism, Joint Implementation, REDD+, Carbon Offsetting and Reduction Scheme for International Aviation
Multinational/bilateral	European Union ETS, Japanese Joint Crediting Mechanism
National	South Korea ETS, Chinese ETS, Kazakhstan ETS, New Zealand ETS, Switzerland ETS
Subnational	California ETS, Québec ETS, Ontario ETS, Regional Greenhouse Gas Initiative, Tokyo ETS, Saitama ETS, Tianjin ETS, Shenzhen ETS, Shanghai ETS, Hubei ETS, Guangdong ETS, Fujian ETS, Chongqing ETS, Beijing ETS
Voluntary/private	Chicago Climate Exchange, BP internal trading programme

* This table does not offer an exhaustive list. More examples can be found, especially in the category of voluntary carbon markets.

Mechanism, directed at developing countries; Joint Implementation, targeting Eastern Europe and the countries comprising the former Soviet Union; and international emissions trading among the 'Annex I' (i.e. industrialised) countries. It was the initial experimentation and experiences of one influential country – the United States – with emissions trading that drove the uploading of the idea to the international level, much as polycentric theory predicts.

Spurred by the Kyoto Protocol and failure to adopt an internal carbon tax for dealing with climate change, the EU set about designing an ETS to govern large industrial installations. The EU ETS Directive, adopted in 2003, established the main rules for a pilot phase (2005–2007) and a second phase that coincided with the Kyoto commitment period (2008–2012). Many companies supported market-based strategies, on the assumption that climate policy was imminent and market-based approaches were less expensive than traditional regulation. In 2000, BP launched an internal experimental ETS, outpacing policy developments in the EU (Victor and House, 2006; Meckling, 2011).

Since the EU in the early 2000s was an international frontrunner (see also Chapter 8), and uncertainty was high among stakeholders, the initial design of its carbon market was generally decentralised, with considerable power over implementation of the system held by the EU member states. Allowances were handed out for free. Core target groups were the power sector and several energy-intensive industries. To provide additional flexibility, the 2004 Linking Directive allowed for the use of Clean Development Mechanism credits from the pilot phase, as well as Joint Implementation credits from 2008. In 2005, Norway launched a national ETS,

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aiming to link up to the EU ETS. Switzerland launched a voluntary ETS in 2008, which subsequently became mandatory for large, energy-intensive entities. Switzerland agreed in 2017 to link with the EU ETS. Based on its experiences and lessons learned during the first implementation phases, the EU significantly altered its ETS rules for the 2013–2020 phase, with more centralisation and greater auctioning of carbon allowances (Skjærseth and Wettestad, 2008, 2010).

In the United States, the voluntary Chicago Climate Exchange was established in 2003; and in 2005, seven governors (Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York and Vermont)[1] signed a memorandum of understanding establishing the Regional Greenhouse Gas Initiative, covering only the power sector. Unlike the EU, this system includes a carbon price management mechanism in the form of a price floor and ceiling, and allowances were auctioned from its launch in 2008. On the US West Coast, the 2006 Global Warming Act required the California Air Resources Board to develop a scoping plan and to explore the possibility of an ETS. This was followed in 2007 by the launch of the Western Climate Initiative (including British Columbia, Manitoba, Ontario, Québec and California) (Biedenkopf, 2012).[2] The California ETS was launched in 2012. Among its unique design features is a complex price floor system (Bang, Victor and Andresen, 2017). Former California governor Arnold Schwarzenegger was also central in launching the International Carbon Action Partnership in 2007 (Biedenkopf, 2017).

In the Asia-Pacific region, Tokyo launched a climate strategy in 2007 that included an ETS. In 2006, Australia started a climate-policy assessment process which included an ETS discussion; subsequently, a carbon pricing mechanism was introduced. However, Tony Abbott's election to the prime ministership in 2013 abruptly halted this development in Australia (Müller and Slominski, 2017). In 2008, New Zealand launched an ETS, featuring a rather unique 'trading without cap' design and broad sectoral coverage (Inderberg, Harmer and Bailey, 2017).

As a potentially very important development in 2010, China's National Development and Reform Commission designated 13 low-carbon zones and began contemplating GHG emissions trading. A milestone was reached in 2011 when the National Development and Reform Commission and the State Council announced ETS pilot projects in five Chinese cities and two provinces, eventually followed by a national carbon market, which was launched in 2017 but remains further to be elaborated and expanded (Stensdal, Heggelund and Maosheng, 2018). In 2013, Kazakhstan launched an ETS – which was put on hold in 2016 (Gulbrandsen, Sammut and Wettestad, 2018). In 2015, South Korea became the first East Asian country to start operating a national GHG ETS (Biedenkopf and Wettestad, 2018).

While additional ETSs were being developed or contemplated in several countries, the EU continued to adjust its carbon market rules drawing on its experiences.

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After mid-2011, the EU ETS carbon price dropped, provoking a crisis of confidence. In 2014, the EU adopted a temporary postponement of the auctioning of some 900 million allowances ('backloading'). The European Commission also launched a proposal for a price-stabilising mechanism, the Market Stability Reserve, aimed at providing longer-term price stability. Adopted in 2015, it is due to start operating in 2019 (Wettestad and Jevnaker, 2016).

In addition, several jurisdictions, including Brazil, Mexico and Thailand, are considering (or in the process of) establishing national carbon markets (ICAP, 2017). About half of the intended nationally determined contributions submitted prior to the Paris climate summit in 2015 mentioned the use of carbon market mechanisms (EDF and IETA, 2016). This includes international mechanisms such as the REDD+[3] mechanism (addressing emissions from deforestation) and other systems that might emerge from the UNFCCC process and the Paris Agreement. Symptomatic of the increasingly polycentric spread of carbon markets, the design of carbon markets and carbon price levels were discussed at the 2017 Davos economic summit (Carbon Pulse, 2017). Summit participants called for a carbon price of around $40–50 USD in 2020, a level that the Organisation for Economic Co-operation and Development (OECD) originally advocated in 2016 (OECD, 2016).

The Paris Agreement promises to complement the proliferation of subnational, national and regional ETSs with a global umbrella establishing rules for market mechanisms. Article 6 establishes that parties may cooperate to implement their nationally determined contributions under the Agreement through a global market mechanism. The Paris Agreement contains several elements encouraging the further development of markets locally. An important further process within the UNFCCC context is the improvement of carbon accounting rules (Jevnaker and Wettestad, 2016). Achieving a level playing field in terms of how emissions data are accounted for in different jurisdictions is of key importance for building trust and for the legitimacy of carbon markets.

The evolution of carbon markets has been a rollercoaster ride, with the rise of ambitious carbon markets but also the decline of some initiatives like the Australian ETS. GHG ETSs have evolved as independent experiments with unique innovative designs that reflect distinct domestic contexts and politics – in line with two of the core propositions of polycentric governance: local action and experimentation.

However, the development of the individual systems is linked to varying degrees, and through various types of interaction. The origins of ETS as an idea and its very first applications were local, but the early uploading to the international level has spurred the further development of the polycentric carbon market structure. Its emergence and evolution does not have one single cause: the origins can

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rather be found in the interplay among various political processes, individual entrepreneurs (see Chapter 7) and levels of governance. In the following section, we focus on the interactions that binds carbon markets together.

13.3 Lessons about Design, Interaction and Linkage

The various ETS policies constituting the polycentric carbon market system did not emerge completely independently of each other. ETSs are linked through several types of interaction, ranging from the direct linking of systems to the exchange of experiences and lessons. Policy diffusion mechanisms (see Chapter 9) can help account for interactions beyond the formal and direct linkage of individual ETSs (Wettestad and Gulbrandsen, 2018). Key features of polycentric systems are the enhancement of innovation, learning, adaptation and trust.

Three types of interaction stand out. First, the different variants of GHG ETSs have produced a set of *lessons* which reveal elements that may underpin success and some that lead to failure. There has been a certain degree of convergence amongst trading systems around the globe, for example on the inclusion of price management provisions. While not every lesson has found its way into the actual design of ETS policies, policymakers are usually aware of and seek to draw lessons from other systems (Wettestad and Gulbrandsen, 2018).

It is challenging to achieve a well-functioning ETS. Crafting a market for an artificial commodity such as carbon entails several uncertainties. Setting the fundamental level of the overall emissions limit is a matter under political control. In addition come two unpredictable factors that may have a sizable impact on the carbon price: economic development and technological innovation. As experienced in the EU, an economic slowdown and the availability of too many allowances can lead to a decrease in the demand for and the price of carbon allowances (Jevnaker and Wettestad, 2017). The availability and costs of low-carbon technologies can influence the threshold at which investing in innovation becomes economically more feasible than purchasing carbon allowances. Not least for these reasons, policymakers tend to examine existing systems before devising their own.

However, drawing lessons and understanding the pitfalls of an ETS does not necessarily mean that policymakers will act upon all advice received. The domestic context may necessitate certain adjustments or design deviations, or political considerations may lead to decisions aimed at appeasing certain stakeholders and at attracting a broad support base (Knox-Hayes, 2016). For example, the fact that electricity prices in South Korea and China are controlled by the government has required a creative approach to ETS design, since the mechanisms on which a market logic is based – influencing (consumer) decisions through price signals –

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cannot be applied. This explains why the South Korean and Chinese systems also cover 'indirect emissions' that occur through the consumption of electricity (Biedenkopf and Wettestad, 2018; Stensdal *et al.*, 2018).

Key lessons include the risks of free allocation, the crucial importance of sound measurement, reporting and verification (MRV) systems and the need for price management provisions. Policymakers can allocate allowances to emitters free of charge to ease the compliance burden for covered companies, and to help garner political support for the gradual introduction of an ETS (Schmalensee and Stavins, 2015). On the other side of the coin, free allocation of allowances has led to 'windfall profits', which occur when power producers that are covered by a GHG ETS receive allowances for free and then make a profit by passing on the allowance price to their customers, charging higher electricity prices. Such windfall profits can be avoided by auctioning allowances (Brown, Hanafi and Petsonk, 2012: 19–23). During the first phase of the EU ETS, electricity utilities reaped large windfall profits, a matter addressed in subsequent phases (Convery, Ellerman and de Perthuis, 2008: 226). The EU experience contributed to state-level authorities on the US East and West Coasts designing their ETSs with greater auctioning of allowances (Biedenkopf, 2012; Bang *et al.*, 2017; Lygre and Wettestad, 2017).

The availability of accurate and reliable data is a precondition for sound allowance allocation and setting the overall emissions limit. Both aspects are crucial for avoiding allowance over-allocation (Schmalensee and Stavins, 2015). A solid system for the MRV of GHG emissions from all sources covered by the system is central to a well-functioning GHG ETS – as the EU learned during its first ETS phase in 2005–2008, and likewise Kazakhstan, which established its ETS in a hurry, without a proper MRV system in place (Gulbrandsen *et al.*, 2017). For this reason, building MRV capacity has constituted a major part of most externally funded ETS capacity-building projects (Wang, 2013: 8–12; Jotzo and Löschel, 2014: 7; Biedenkopf, van Eynde and Walker, 2017).

Carbon prices vary with demand and supply. Given the relative unpredictability of these two variables (demand in particular), several trading systems have experienced significant price fluctuations. The EU ETS has faced plummeting carbon prices since 2008 (Wettestad, 2014; World Bank, 2016: 36–38). The designers of the Regional Greenhouse Gas Initiative and the California ETS learned the lesson of the importance of carbon price management early in their initial policy design phase, thereby avoiding the need for later recalibration of the rules.

In 2016–2017, South Korean allowance prices rose to the highest of any existing ETS at the time (i.e. around €21). The resulting government decision to increase allowances on the market appears to have weakened the South Korean ETS, calling

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into question its ability to achieve national climate mitigation targets (Biedenkopf and Wettestad, 2018). These examples illustrate some of the lessons that have surfaced through experimentation in various contexts. They teach ETS designers that price management mechanisms may seem important, but that price response decisions must be weighed carefully.

Capacity building has become a tool for fostering the diffusion of GHG ETSs. Because establishing a carbon market requires significant financial, technical and knowledge resources, most countries realise they must expand capacity massively in order to construct an effective system, not least as regards emissions MRV. Capacity building can help a country to design and implement a well-functioning GHG ETS, and the close interaction among actors from different jurisdictions can generate trust. Capacity building is hence a crucial element and tool for carbon market diffusion and for linking individual policies in the polycentric system (Biedenkopf *et al.*, 2017).

Formal linking of individual carbon markets is the type of interaction that truly binds a polycentric system together. Efficiency gains can be generated by making it possible for System A to use allowances from System B for complying with obligations in System A (and vice versa). Options for low-cost emissions reductions can be increased if cost levels and emission abatement options vary between the systems. Adding more actors can mean greater liquidity, curbing the influence of individual market players and price volatility. Joining carbon markets also helps to reduce the risk of emitters relocating to jurisdictions with lower carbon prices, as the price in linked markets tends to level out at comparable amounts.

However, this is also a highly challenging endeavour, as the linked markets must be compatible, and it makes the involved jurisdictions interdependent. Market rules and decisions like free allocation of allowances can have impacts not only on the carbon market to which they apply but also to any market linked to it (Görlach, Mehling and Roberts, 2015; Ranson and Stavins, 2016). As noted, few GHG ETSs have been linked thus far.

Despite the challenges and risks, actors like the EU have expressed their interest and ambition to develop further linkages, which would increase the degree of polycentricity of the overall global structure. For example, in 2009, the EU launched the (unattained) goal of an OECD-wide carbon market by 2015 and 'even broader' in 2020. And the EU also had envisioned a trans-Atlantic carbon market, when a legislative proposal for establishing a national US carbon market seemed likely to be adopted in 2009.

However, this US proposal (known as the Waxman-Markey Bill) was not put to a vote in the US Senate, meaning that the EU had to look elsewhere for linking partners. Contacts between Australia and the EU were stepped up from 2011, but the linking process was abandoned when Australia halted its ETS policies.

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The closest type of interaction that can bind individual carbon markets together seems also to be the most challenging one. More widespread forms of interaction involve capacity-building initiatives and learning processes amongst the various carbon markets, joining them into a polycentric system.

13.4 A More Polycentric Carbon Market Architecture: Challenges and Opportunities

In this section we 'zoom out', focusing on some challenges and opportunities of a more polycentric form of governance. The main challenges – which may also provide opportunities – concern the operation of interlinkages among ETSs, the interaction between ETSs and other climate policies, and diverging levels of carbon prices.

An increasing number of public and private actors – including consultants, ministries, development cooperation agencies, international organisations and universities – are engaging in GHG ETS interaction. They have the potential to act as managers of the polycentric system, and can contribute to aligning and linking individual ETSs more efficiently. However, this role can both further integrate the polycentric system and contribute to its fragmentation. Conflict and competition may cancel out the contributions of these actors, whereas coordination and cooperation can mutually enhance their impact (Biedenkopf *et al.*, 2017).

The UNFCCC discharges several important functions fostering ETS interaction. For example, the growing emphasis on transparency and solid MRV systems as embedded in the Paris Agreement can enable the proliferation of ETSs and the creation of offset programmes, as solid data provide a foundation for reliable systems. Implementation of the Paris Agreement might lead to new carbon market structures that could create offset markets and joint implementation of climate mitigation commitments. The further elaboration of Article 6 of the Paris Agreement will lay the foundations for these processes and polycentric structures.

Another important driving force is the World Bank. Its Partnership for Market Readiness and Carbon Pricing Leadership Coalition (World Bank, 2017) aim at sharing and orchestrating carbon pricing experiences and building capacity (see Chapter 11). Other central actors include the International Carbon Action Partnership and the International Emissions Trading Association, both engaged in the dissemination of expertise and the fostering of ETS adoption in numerous places.

A first glance at the actors involved in facilitating carbon market interaction suggests a certain division of labour, with different actors engaging with different ETSs or ETS elements. However, deeper analysis of external capacity building supporting China's ETS pilot projects and national policy process has shown that

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coordination can still be improved (Biedenkopf *et al.*, 2017). There are many organisations, among them the World Bank, the International Carbon Action Partnership and the International Emissions Trading Association, and national governments engage in ETS awareness-raising – with the risk of overlap and possibly diverging advice.

Interlinkages within the polycentric carbon market system appear to work fairly well, with little outright conflict or destructive competition. However, their functioning could be improved by avoiding overlaps and by improving interaction management. The management of interactions in polycentric carbon market structures has not yet received much detailed academic attention. Table 13.2 lists some of the key actors and initiatives that foster interaction among, and promote the adoption of carbon markets.

Emissions trading is not the only climate-policy instrument in use. Often it is a core element of a broader policy mix, where overall climate policy goals are broken down into sub-goals, such as improving energy efficiency, increasing the share of renewable energy and diffusing low-carbon technology. While an ETS can help in achieving these aims, it cannot determine how emitters choose to comply. Moreover, an ETS usually covers only some of the emitters within a given jurisdiction – private households, transportation and the land-use sector are excluded from most ETSs. Additional climate policies are usually adopted, to interact with ETS policies. This interaction can be mutually supportive, not least for the overall goal of reducing GHG emissions. However, successful non-ETS policies can contribute to lowering the allowance price, which weakens the incentive structure

Table 13.2 *Selected major international initiatives to foster interaction and promote carbon markets*

Actor type	Carbon market initiatives*
International organisations	UNFCCC/Paris Agreement; World Bank Partnership for Market Readiness; World Bank Carbon Pricing Leadership Coalition; Asian Development Bank
Governmental organisations	German Development Cooperation Agency; Norwegian Climate and Pollution Agency; UK Foreign and Commonwealth Office; California Environmental Protection Agency; International Carbon Action Partnership
Private organisations	International Emissions Trading Association; the Wake-Up Coalition (EU ETS); University of New South Wales (Australia); Environmental Defense Fund (US-based); the Energy Foundation

* *Selected initiatives promoting carbon markets and their interaction; this is not an exhaustive list.*

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that an ETS strives to establish. From a polycentric perspective on carbon markets, this complicates linkages among the individual ETSs.

The differing designs and prices globally also pose challenges to the functioning of the system as a whole, as such differences lead to an uneven playing field and can create incentives for carbon leakage. Also, some ETSs (like that of the EU) have experienced significant price fluctuations over the course of time. The contribution of carbon prices to decarbonising the economy (see Chapter 14) depends on such prices reaching levels high enough for cleaner energy choices and technology development to become economically more attractive than purchasing carbon allowances (Bowen, 2011: 7).

However, price incentive effects and dynamics differ among industries and factories, making it extremely difficult to reach precise conclusions as to the carbon price necessary for achieving decarbonisation. Experimentation within a polycentric system can provide flexibility to find appropriate price levels. Low carbon prices may require complementary policy measures, in turn making the design of the policy mix a crucial factor.

While the carbon price has fluctuated drastically in the EU, with no price management mechanisms in operation so far, it has proven more stable in other systems. When the EU system was launched in 2005, the price climbed to around €30, fell to close to zero in 2007, climbed to above €30 again in 2008, before falling steadily to around €5 in 2017. California, with a complex price floor system, had a more stable allowance price ranging between about $10 USD to slightly above $13.5 between 2012 and 2017 (i.e. close to the price floor). In China's pilot projects, allowance prices were generally low, between about $8 and $1 between mid-2014 and mid-2016. In the early phase of these projects, prices were somewhat higher, peaking at more than $18 in Shenzhen in 2013.

Although prices in the individual ETSs differ, all appear low compared to the carbon price that experts deem necessary to trigger decarbonisation. This raises doubts as to whether the polycentric carbon market system as it is today can deliver deep and fast decarbonisation. The emissions reduction goals set by the various governments are generally met – but broader effects on decarbonisation seem to be lacking (see Chapter 14). The low allowance prices can be attributed mainly to moderate caps in existing systems (Schjølset, 2017), but also other design features and flaws may make systems incapable of reacting to demand fluctuations resulting from other mitigation policies or external factors (weather, oil prices, etc.). Hence, price management mechanisms are important for moving prices closer to the estimated threshold at which low-carbon investments become economically viable. That also draws attention to the link between the polycentric market structure and national climate policies (see Chapter 3).

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Within a polycentric system, widely diverging carbon price levels create competitive inequalities among the entities covered by the various trading systems. Binding the polycentric system closer together through interaction mechanisms that lead to an approximation of carbon prices could level the playing field within the system. However, it would not change the competition with entities operating in jurisdictions outside the polycentric system. Companies covered by one of the ETSs within the polycentric system must compete on an uneven playing field with companies not covered by an ETS. This could have repercussions for the overall effectiveness of the polycentric carbon market system, with companies relocating to jurisdictions without carbon markets (Ostrom, 2010).

13.5 Conclusions

Over the past 20 years, the field of international carbon trading has grown, from a system initially dominated by the Kyoto Protocol's country-to-country flexible mechanisms to something far more diffuse. As of 2017, there were 21 individual emissions trading systems in existence at global, regional, national and subnational levels. International and local factors have jointly influenced the diffusion of various ETSs across highly diverse jurisdictions. These ETSs interact in a range of ways – in particular, mutual learning, capacity building and formal market linking. They thereby form a system of polycentric governance, which faces some challenges while also creating some opportunities.

Because a harmonised global carbon market linking all existing systems is highly unlikely to develop, today's flexibly developing system seems a workable alternative for contributing to global climate mitigation efforts. However, the polycentric nature of this system may lead to overlaps and conflicts, as well as synergistic interactions among the actors involved. Moreover, interaction with other policies may undermine the functioning of carbon markets by inducing drops in the price of allowances – but such policies can also be a necessary complement to emissions trading by more directly supporting low-carbon investments.

Finally, the overall price level across today's carbon market system appears too low to provide forceful incentives for decarbonising the economy. Yet, the various ETSs that make up the system have succeeded in achieving their individual GHG emissions reduction goals. The mixed picture of achievements and remaining challenges provide ample scope for further research on the polycentric carbon market system – its separate parts, and its overall structure.

Few studies have focused on the role of orchestrators or network managers. A growing number of international organisations, national and subnational

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governments, ministries, and non-state actors like development cooperation agencies, foundations and companies, are getting involved in connecting ETS developments and encouraging their further diffusion. While the institutional carbon market landscape is becoming increasingly dense and polycentric, there has been scant academic attention to the interaction among the actors and their contribution to shaping the carbon market system.

Recent years have seen several informative studies of the adoption of ETSs and the main factors shaping them (e.g. Knox-Hayes, 2016; Wettestad and Gulbrandsen, 2018). There is a need for more in-depth research on the interaction between international processes and domestic politics in shaping ETS designs. A polycentric governance lens offers a useful tool for further conceptualising these processes.

Most trading systems are still rather young. As they mature, carbon price formation and overall functioning are bound to become key research issues, as effective functioning is crucial for systems to fulfil their potential as central drivers of the low-carbon transition. Research has identified the establishment of price-management mechanisms, price floors in particular, as central to effective functioning. However, price floors and management systems vary considerably, and much remains to be learned about their design and operation.

Finally, not least due to the current overall low ambitions and allowance prices in the carbon markets, low-carbon technology development seems so far to have been driven primarily by other economic logics and subsidy systems, rather than carbon markets. A key question then becomes if the polycentric carbon market system will pick up speed fast enough to become a forceful policy driver – or if this instrument will come 'too late to the low-carbon party'.[4]

Notes

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1. Later, Massachusetts, Rhode Island and Maryland joined the initiative. In 2011, New Jersey withdrew from the programme.
2. Initially, only California and Québec remained in the Western Climate Initiative and linked their carbon markets. Ontario joined in September 2017.
3. 'REDD+' stands for reducing emissions from deforestation and forest degradation, and for the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries.
4. We thank Stig Schjølset for pointing this out.

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14

Decarbonisation
The Politics of Transformation

STEVEN BERNSTEIN AND MATTHEW HOFFMANN

14.1 Introduction

Decarbonisation is a different framing of and approach to the climate change problem than concentrating on emissions reductions. They are related, to be sure, but decarbonisation is the process of disrupting carbon lock-in (Unruh, 2000; Seto *et al.*, 2016) and removing fossil fuels from our energy and economic systems. Decarbonisation thus implies attacking climate change at its fundamental core – global reliance on fossil energy – and it is a daunting task, as carbon lock-in arises from overlapping technical, political, social and economic dynamics that generate continuing and taken-for-granted use of fossil energy. While disrupting carbon lock-in and pursuing broad decarbonisation are immensely challenging, they are also necessary to avoid the worst consequences of climate change in the time frame suggested by climate change scientists (essentially by 2050; see Rockström *et al.*, 2017).

A polycentric governance system would appear to be an ideal approach for decarbonisation (Ostrom, 2009; Cole, 2011). Carbon lock-in is not only a multidimensional but also a multilevel phenomenon, existing simultaneously locally and globally. Indeed, whereas the world runs on fossil fuels, the worldwide nature of carbon lock-in arises because multiple, interdependent systems are also locked into the use of carbon-based energy and resources. The response to climate change also appears ripe for a polycentric governance approach to decarbonisation. It is now fairly well established that the world has thus far *not* responded effectively to the climate change challenge in a coordinated global fashion, but instead through an emerging response that has the appearance of polycentricity – in the sense of possessing many diverse locations of authority arranged largely non-hierarchically. The global response to climate change encompasses both multilateral governance (see Chapter 2), itself decentralised since the 2015 Paris Agreement (Falkner, 2016), and a broad array of activity outside the international negotiations

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(Hoffmann, 2011; see also Chapter 4). The global response to climate change thus already includes diverse activities at multiple levels of politics, engaging a wide array of actors that are (ostensibly) seeking to disrupt[1] carbon lock-in by: taking action in and among cities, subnational governments and individual countries; seeking to alter market systems and corporate behaviour; and changing the range of technologies available to individuals and societies. There are now truly multiple centres of authoritative climate action.

However, what we have now is, at best, a weak or nascent polycentric governance system for decarbonisation. A 'truly polycentric *system* is one in which governmental units both compete and cooperate, interact and learn from one another, and responsibilities at different governmental levels are tailored to match the scale of the public services they provide' (Cole, 2011: 405). Such coordination, interaction and interdependence of decarbonisation initiatives are not yet in evidence. In part, the lack of a polycentric governance system arises from a mismatch between the problem structure of decarbonisation and polycentric governance approaches. Polycentric governance theory was developed to help explain novel responses to collective action dilemmas, mainly relatively small-scale common pool resources problems (Ostrom, Tiebout and Warren, 1961; Cole, 2011). As it has evolved, proponents have prescribed polycentric approaches for solving diverse collective action dilemmas – even global collective action problems like climate change (Ostrom, 2009; Cole, 2011). However, current decarbonisation efforts are not solutions to collective action problems in the same way. Many decarbonisation initiatives have more circumscribed goals; they do not seek to provide global public goods. Instead, they seek to act in a specific place: to decarbonise a specific jurisdiction, set of practices or market activity.[2]

Collectively, it is possible that decarbonisation initiatives will eventually provide a global public good (stable climate), but they emerged in specific places with specific goals and do not necessarily have common purpose (like managing a common-pool resource). For Ostrom (2009) and Cole (2011), the goal is to *build* a polycentric governance system from the diverse, multilevel initiatives that have emerged in the past two decades. We contend that this project, and analysis of decarbonisation, must begin not with the collective goal, but with an understanding of the politics of individual decarbonisation initiatives *and* the way that they are linking and self-organising (nascently) to better understand the possibilities for and potential of polycentric governance of decarbonisation. Extant decarbonisation initiatives may be the constitutive elements of an emerging polycentric governance system. There is evidence that nascent polycentric dynamics are at play. As more and more initiatives emerge, their interdependence is recognised, and linkage/orchestration (see Chapters 10 and 11) become more prominent dynamics, the hallmarks of polycentric governance like development of

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trust, monitoring, learning and adaptation (see Chapter 1) may become more evident.

This chapter begins by introducing this different way of thinking about the challenge of decarbonisation and climate change – less as a collective action problem that requires solutions, whether in a monocentric or polycentric system, and more as a problem of catalysing action in a system likely to be polycentric in character, but which may or may not take on features of a polycentric governance *system*. We then discuss a framework for analysing the politics and trajectories of individual decarbonisation initiatives. This framework allows us to understand the potential for initiatives to disrupt carbon lock-in in particular places as they scale up and become entrenched. After briefly examining an example of this kind of analysis, we discuss the ways in which decarbonisation initiatives are self-organising and linked together, perhaps providing the foundations for the emergence of a polycentric governance system. We close with some thoughts on the normative implications and potential effectiveness of moving towards a more polycentric governance system.

14.2 The Challenge of Decarbonisation

Assessing the dynamics of decarbonisation must begin with an adequate understanding of the distinctive challenge that it poses. As asserted earlier, carbon lock-in is a multilevel phenomenon that operates simultaneously in multiple societal systems. Global energy, transportation and economic systems are locked into carbon because transportation, energy and economic systems at the municipal, subnational, state and regional levels are locked into carbon.

The challenge of decarbonisation lies in disrupting the interdependent, overlapping and reinforcing dynamics that lead to the continuing use of fossil fuels occurring across scales. Cities are locked into the use of fossil fuels because of (among other things) how they are physically planned, the expectations and practices of citizens around transportation and energy use, the political coalitions and institutional capacities that make cities run politically and the range of technological options that are available to city dwellers. The same could be said of nation states – they are locked into the use of fossil fuels because of similar (not the same) cultural, economic, political and technological dynamics on a larger scale (i.e. national energy and transportation policy, coalitions of interest groups, national culture, etc.). But it is more complicated than that, because the cities and nation states in this example are not independent. Carbon lock-in in cities reinforces the lock-in we find in nation states, just as nation state lock-in reinforces it at the municipal level.

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This makes decarbonisation a very different kind of challenge than the standard global commons or common-pool resources problem usually addressed in the polycentricity literature (Ostrom, 2009, 2010a). The hallmark of a global commons problem is a group of actors sharing a resource. The traditional approach to climate change, which focuses on greenhouse gas (GHG) emissions, treats the problem in just this way. Nation states conceived of the problem as one of a shared atmospheric resource and negotiated over how far to reduce GHG emissions, how to distribute reduction commitments, how to achieve reductions and how to pay the costs of reductions (or adaptation when reductions fail to occur). Global commons is the wrong perspective for decarbonisation, however, as there is no global system to act upon or shared decarbonisation resource. The standard means of addressing global commons problems (such as large, centralised, multilateral treaty-making processes or global carbon pricing schemes) are unlikely to be achieved because of problems of political feasibility and, furthermore, they are of questionable utility in disrupting carbon lock-in and promoting decarbonisation because of the mismatch they represent with the underlying structure of the problem (Prins and Rayner, 2007). Instead, we need to think about how decentralised decarbonisation works and when it can produce transformative trajectories that could eventually cohere into a larger polycentric governance system. This entails, in part, examining the interaction between the local and international levels, but we must also recognise that decarbonisation initiatives consist of different locations of governance that are not necessarily nested or hierarchical, nor are they in a common system responding to a common-pool resource issue. Instead, they are weakly polycentric in the sense that there are multiple centres of governance working with a good deal of independence.

Ostrom herself recognised the limits of approaching the problem of climate change from a global collective action perspective in one of her last published articles (Ostrom, 2010a). However, even as she proposed a polycentric approach as an alternative for addressing climate change, she, along with many of the students and colleagues she influenced, continued to view polycentricity through the lens of a collective action approach (e.g. Cole, 2015a). As she put it, what was needed given the by then discredited view that 'collective-action problems that have global effects must primarily be "solved" by legal actions of a global authority' was to 'update' the theory of collective action. She and her colleagues 'developed the concept of polycentric systems for the analysis of collective-action problems involved in the provision of diverse public goods and services', which fit well with how she observed climate change governance evolving (Ostrom, 2010a: 551).

Their commitment to viewing the problem of governance through the lens of collective action problems, however, puts the cart before the horse. It assumes that

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even as a large-scale problem like climate change might be best governed through diverse authorities arranged non-hierarchically at multiple levels, the fundamental nature of the political problem remains one of collective action, and thus there is a need to foster a truly polycentric governance *system* (Ostrom, 2009; Cole, 2011). In so doing, however, they leave out an important first step – examining the functioning, trajectories and impacts of the multiple, diverse initiatives that might constitute a polycentric governance system. Polycentricity may be a possible governance response over the longer term. However, the problem that decarbonisation initiatives are tackling is one of multiple interlocking systems, not, at least initially, of collective action over a shared resource. The key analytic move, then, is to first analyse multiple and diverse actions individually to assess their trajectories and functioning. This is necessary before assessments can be made as to whether they will evolve into a polycentric governance system.

The raw materials for the emergence of a polycentric governance system for decarbonisation are available. The past two decades have seen the emergence of multiple governance interventions – intentional efforts to steer actors and/or change the trajectories of different actors and systems in an authoritative way (Hoffmann, 2011; Bulkeley *et al.*, 2014). While the language of polycentric governance accurately *describes* the emergence of these multiple locations of authority designed to disrupt carbon lock-in, theories of polycentric governance cannot *explain* their emergence or trajectories, at least not initially, because their politics is not guided by the polycentric logic of collective action. Rather, they are widespread but discrete and multifaceted efforts to disrupt multiple systems' trajectories and induce transformation towards decarbonisation. These interventions include: cities enacting carbon action plans and participating in transnational networks; states and provinces in North America developing linked emissions trading systems, carbon tax policies and renewable energy targets; corporations and non-governmental organisations joining forces to promote smart grids, carbon accounting and clean technology deployment across national borders; and nation states developing targets for carbon neutrality and renewable energy industries in decentralised pursuit of the overarching collective goals set out in the Paris Agreement.

Elinor Ostrom (2009: 38) envisioned a polycentric approach that brought these kinds of initiatives together in common purpose, but realised that 'one cannot expect that an effective polycentric system will be constructed in the near future.' Yet they may be the precursors or constitutive elements of such a polycentric system. Decarbonisation efforts are certainly interdependent, not least because carbon lock-in arises from dynamics in interdependent domains. In addition, individual interventions are often linked to other interventions in other systems either consciously or unconsciously (see Chapter 10). These characteristics imply

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the need to consider links between the specific/local and the general/global – how actions and outcomes in specific places can catalyse broader transformation (or stymie it) – to account for change and to show how changes at different scales do or do not catalyse broader changes (Geels, 2010).

Our analytic framework, to which we now turn, is designed to uncover and make sense of the political trajectories of individual and linked interventions as they seek to disrupt carbon lock-in and usher in decarbonisation in specific places. In so doing, we provide a window on the potential precursors to a truly polycentric governance system, whereby decarbonisation interventions come to be a collective, though still multifaceted, decarbonisation governance effort, whether consciously through orchestration (Chan *et al.*, 2015; see Chapter 11) or through what Ostrom expected to be processes of self-organisation.

14.3 The Politics of Decarbonisation[3]

We focus on the *political* aspects of carbon lock-in and the decentralised efforts to disrupt it because no matter where one looks – markets, cities, subnational jurisdictions or nation states – there are institutional and normative processes and structures (political factors) contributing to carbon lock-in. The substance and functioning of the political factors differs across levels – municipal politics and national politics are not the same – but they similarly serve to reinforce carbon lock-in in all parts of the system.[4]

Our approach explores what political forces are unleashed once decarbonisation interventions are initiated in specific places and whether/how they disrupt carbon lock-in and generate pathways to decarbonisation. Once an intervention is initiated, the target of the intervention – be it a city, corporation, province, nation state or market practice – will move along one of three (ideal-type) trajectories: (1) continued reinforcement of carbon lock-in if the intervention has no effect or is counterproductive; (2) improvement in carbon lock-in if the intervention improves the efficiency of using carbon-based energy and reduces emissions but does not fundamentally challenge the central place of carbon-based energy; or (3) decarbonisation if the intervention spurs the target away from the use of carbon-based energy.

The impact of the intervention on the trajectory of the target is a matter of political dynamics that the intervention entails. We track three mechanisms to understand the politics of decarbonisation interventions: *normalisation, capacity building* and *coalition building* (discussed in more detail in what follows). These mechanisms help to determine if the changes the intervention promotes will *scale up* and become *entrenched* in the target, thus having an expanding and lasting impact on the target as well as more generally in the wider system through linkage

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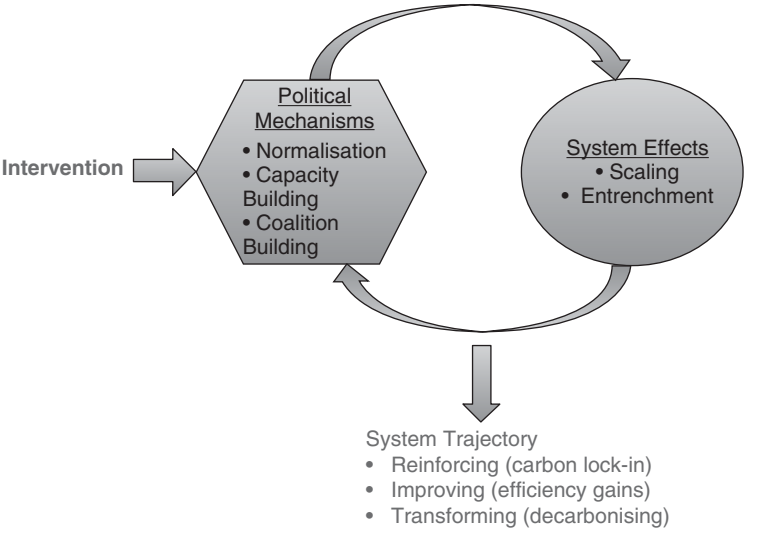

Figure 14.1 Decarbonisation pathway in a targeted part of the system.

and interdependence. Figure 14.1 provides a visual representation of this dynamic for a single target. Crucially, the potential for altering the system trajectory is found in the feedback between the intervention and the political mechanisms that it catalyses.

14.3.1 Political Mechanisms

Normalisation as a mechanism is about shifting social expectations about appropriate behaviour (e.g. Finnemore and Sikkink, 1998); thus, '[i]f policy advocates succeed in generating a political and public expectation that [GHG] emissions should decline over time then policies and behaviours that further reduce GHGs may be judged "better" and more appropriate than those that engender increases' (Selin and VanDeveer, 2005: 371–372). For example, the CDP (formerly, the Carbon Disclosure Project) advocates for companies to account for and disclose their carbon emissions and exposure to climate risk. In response, many large corporations – including General Electric, Google, Microsoft and even ExxonMobil – have changed their practices and now engage in shadow pricing: they assume there will be a carbon price in the future and include the cost of carbon in their business planning (CDP, 2013). The practice of treating carbon pricing as inevitable contributes to normalising potential moves towards decarbonisation in the corporate community and generates political support for public moves towards carbon pricing (Clark, 2015).

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Capacity building alters the material, institutional and cognitive capacities to act on decarbonisation (e.g. Pierre and Peters, 2000; Selin and VanDeveer, 2005; Bernstein and Cashore, 2012; Weible and Sabatier, 2014). Direct means through which interventions can increase capacity include 'direct funding, education, training, [technical] assistance, and . . . co-governance via partnerships between public and private actors and authorities' (Bernstein and Cashore, 2012: 593). Similarly, capacity can be built via demonstration effects that act as policy learning vehicles (Selin and VanDeveer, 2005; Rabe, 2008). Interventions generate institutional capacity when they alter how governments make decisions and implement programmes.

Finally, *coalition building* is about how interventions can spur the emergence and strengthening of economic and political coalitions that back decarbonisation. They can catalyse these coalitions by identifying and linking 'winners' in the move towards decarbonisation and neutralising losers. This entails empowering actors who have an interest in climate change, building constituencies either through creating or altering incentives or by active social movement building and utilising larger market forces.

For example, efforts to promote renewable energy portfolio standards and feed-in tariffs are designed to create winners (renewable energy companies, consumers) that can become a political force for sustained and/or broadened action (though these coalitions often face counter coalitions) (Rabe, 2007; Aklin and Urpelainen, 2013; Stokes, 2013). Even more overtly, carbon pricing initiatives commonly build in revenue distribution or compensation to build support or fend off counter coalitions, as Australia did by including subsidies to impacted sectors and flexibility mechanisms in its 2008 carbon pricing scheme (Gordon, 2015).

14.3.2 System Effects

When interventions successfully contribute to normalisation, capacity building and/or coalition building, the policies and practices they support have the potential to scale up. *Scaling* can take multiple forms. Most basically, climate governance interventions may start small and then grow. Growth can be in terms of size and/or range of activities; interventions attract more members and resources, expand their geographic scope or begin to undertake different types of activities. For example, the C40 Cities Climate Leadership Group began as the C20, an ironic reference to the Group of 20 (G20). The C40 Cities Climate Leadership Group has grown not only larger but also stronger – learning and demonstration effects within the network have enabled C40 cities to take the lead on climate change in a number of ways (Gordon, 2013; see also Chapter 5). Interventions might also be copied consciously in other places. This modular scaling looks like some classic versions

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of diffusion (e.g. Busch and Jörgens, 2005; Graham, Shipan and Volden, 2012; see also Chapter 9), or what DiMaggio and Powell (1983) call 'mimetic scaling'. A key example of this is the proliferation of similar forms of transnational city networks over the past two decades that bring municipalities together to work on climate change at the local level (Betsill and Bulkeley, 2004).

Processes of *entrenchment*, like scaling, can take multiple forms. While others have noted the disruptive potential of policy innovation and experimentation to policies that lock in carbon (Jordan, Wurzel and Zito, 2003), entrenchment is the mirror image of that dynamic – processes that make new initiatives and/or the policies or practices they promote 'sticky' or difficult to reverse (Levin *et al.*, 2012; see also Mahoney, 2000; Hacker, 2002; Pierson, 2004; Thelen, 2004; Page, 2006). Lock-in can occur in various ways, but the key for entrenchment is that an intervention becomes increasingly difficult to undo because the costs and benefits associated with it engender a shift towards valuing the intervention over the status quo.

The political mechanisms and scaling/entrenchment combine to shape the trajectories of actors or processes that interventions target. The feedback between them over time, along with the substance of the intervention itself, helps to determine whether an intervention will disrupt carbon lock-in and generate pathways that are truly transformational.

14.3.3 Decarbonisation through Carbon Labelling?[5]

To demonstrate how this framework can be used to examine the trajectories of diverse decarbonisation initiatives and therefore provide insight into functioning of the elements of a potential polycentric governance system, this section briefly outlines the case of the Carbon Trust's carbon labelling initiative. The United Kingdom's Tony Blair government created the Carbon Trust in 2001 as an arms-length, not-for-profit organisation designed to support decarbonisation initiatives for businesses. Perhaps its most ambitious initiative was to create a standard for reporting the carbon footprint of products to facilitate carbon labelling and stimulate consumer demand for low-carbon products. The initiative aimed to alter market dynamics in the United Kingdom, its target jurisdiction (The Economist, 2011). In its theory of change, consumer demand for low-carbon products would lead companies to mitigate GHG emissions throughout their supply chains. This logic augurs towards a system-improving pathway because incentives for decarbonisation are indirect through the assumed economic advantages that would accrue to products with lower carbon footprints rather than directly addressing lock-in.

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Our analysis begins with capacity building because this intervention's theory of change first required companies to build the capacity to measure individual products' footprints. In 2006, the Carbon Trust pioneered such a methodology and by 2008, in partnership with UK government agencies, developed Publicly Available Specification (PAS) 2050, a measurement method of product life cycle GHG emissions (Carbon Trust, 2008: 2). Accompanying PAS 2050, the Carbon Trust also developed a series of rules for communicating product carbon footprints and reductions and established a subsidiary (the Carbon Label Company) to help companies display their products' carbon footprint consistently and credibly (Carbon Trust, 2008: 7).

The business community initially reacted favourably. The Carbon Trust recruited a number of high-profile corporate partners, including Cadbury, Coca-Cola and Coors, to pilot carbon labels. Supermarket chain Tesco was an early adopter and vowed to put carbon labels on every one of its 70,000 products (The Economist, 2011). However, enthusiasm for carbon labelling in the United Kingdom quickly waned. Participating companies complained about the cost of calculating a carbon footprint. In 2012, Tesco abandoned its pledge to label all products, citing insufficient take-up from other retailers and costs of life cycle analysis for each product (Vaughn, 2012). By 2012, scaling and entrenchment seemed unlikely because even if capacity was in place to produce carbon labels, the idea of product-level labelling failed to normalise among consumers and corporations.

Despite the failure to generate norms around labelling in the UK market, corporations were normalising carbon management of their supply chains because of the capacity enhancements Carbon Trust provided. It turned out that the Carbon Trust methodology helped companies identify the true drivers of GHG emissions (Carbon Trust, 2008: 20). Normalisation of managing carbon in supply chains and production also spread beyond the corporations that initially agreed to participate in labelling pilot projects. Tesco's carbon labelling intervention led its suppliers to implement their own carbon reduction and energy efficiency programmes, as did other UK-based companies (Carbon Trust, 2008: 4). The Carbon Trust intervention thus did contribute to normalisation, but not as intended. Instead of normalising carbon-conscious consuming, its methodology helped normalise carbon-conscious production and supply chain management.

In our framework, political mechanisms can spur the system effects that drive trajectories. In this case, because of the failure to normalise the idea of carbon labelling in the United Kingdom, little simple scaling occurred. Indeed, initial uptake by retailers reversed when consumer behaviour failed to provide the expected economic incentive. However, capacity building for and normalisation of carbon management amongst corporations led to significant modular scaling of the intervention. Following the launch of the Carbon Trust's standard in 2008,

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a range of carbon footprinting methodologies emerged in countries around the world (France, Japan, Korea, Québec, Thailand) that drew on PAS 2050 methodologies (Sharp and Terada, 2008; Vergez, 2011: 1; KEITI, n.d.). PAS 2050 also became the basis for a number of transnational carbon labelling standards like the World Business Council for Sustainable Development and the World Resources Institute's Product Life Cycle standard. Further, ISO 14067, a newly developed international standard for the quantification and communication of the carbon footprint of products, draws heavily on PAS 2050, and the Carbon Trust participated actively in its development (Carbon Trust, 2008: 5). Although unintentionally, the labelling intervention, through capacity building, catalysed the emergence of multiple labelling interventions in other places that draw on the Carbon Trust methodology.

Similarly, while carbon labelling failed to entrench in the UK retail market, footprinting in supply chains shows evidence of durability, exhibiting self-reinforcing and increasing returns logics. Once companies saw benefits from supply chain management of carbon footprints, those changes, and the search for ongoing improvement, became self-reinforcing. For example, one UK-based manufacturer who participated in the Carbon Trust's footprinting pilot began to hold 'supplier summits' to foster cooperation and drive innovation amongst suppliers (Carbon Trust, 2008: 4).

The substance of the Carbon Trust intervention suggested that it would catalyse a system-improving trajectory. The initial failure of the intervention to scale or become entrenched through its intended theory of change would lead to a revision of that initial hypothesis and consider a system reinforcing trajectory to be the likely outcome. However, running this case through our framework highlights the importance of recursive evaluation to see what pathway it is on (i.e. improving as opposed to reinforcing or transformative), consideration of multiple forms of scaling and entrenchment and the importance of unintended consequences. Specifically, the combination of capacity building and normalisation catalysed scaling and entrenchment, but in unintended ways. Evidence suggests that carbon labelling has changed how companies mitigate their carbon emissions and interact with suppliers, helping to build coalitions of support and collaboration with suppliers, but entrenchment appears to be of management practices that saved costs, not the goal of reducing carbon footprints. In this case moving towards system improvement rather than transformation.

14.4 Nascent Polycentricity

Examining an individual intervention through this framework provides a window on how diverse decarbonisation initiatives might function and catalyse change in

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specific places. This analysis is a necessary step in assessing prospects for a polycentric governance system to emerge. While decarbonisation interventions are mostly independent at this point, they are not operating in isolation – they cannot. Because of the interdependent nature of carbon lock-in, decarbonisation in specific places has the potential to catalyse broader moves to decarbonisation. If a city decarbonises, this must have an impact on the province that city is located within and other cities with which that city has economic relations. Beyond this natural interdependence, we also observe the emergence of linkages among interventions – conscious and direct as well as self-organised. The potential for a polycentric governance system is becoming evident.

14.4.1 Direct Linkages

Most directly, a decarbonisation intervention in one place can alter the politics in other places or domains – see Figure 14.2. This crossover impact emerges in two ways. First, an intervention in one place can catalyse the emergence of new interventions targeting other places – what Ostrom would regard as mutual adjustment. The C40 network emerged, in part, in response to what was seen as lacuna in the main existing transnational city network at the time (ICLEI's Cities for Climate Protection). Second, an intervention in one place can contribute to the political mechanisms at play in other systems or domains that already have a decarbonisation initiative. For example, subnational emissions trading systems like California and Québec reinforced one another (by contributing to capacity building and normalisation across these interventions) and eventually became linked, and a new system in Ontario has joined them. It is just this kind of crossover impact that has the potential to generate the reciprocity, trust and self-organisation that are hallmarks of truly polycentric governance systems.

14.4.2 Self-organisation[6]

Even without direct links, ecosystems of interventions can also emerge and expand because decarbonisation initiatives open up political and economic space for further activity. Intervention begets intervention in important ways. This kind of clustering effect facilitates self-organised scaling and has the potential to engender increasing returns to interventions – a dynamic whereby adding interventions reduces the barriers to further innovations and encourages the expansion of complementary activity. Clustering produces new niches that additional interventions can fill and opens up opportunities for cooperation and competition that produces more interventions (Hoffmann, 2011). The voluntary carbon market is a quintessential example. Once carbon offsets producers emerged, this opened up

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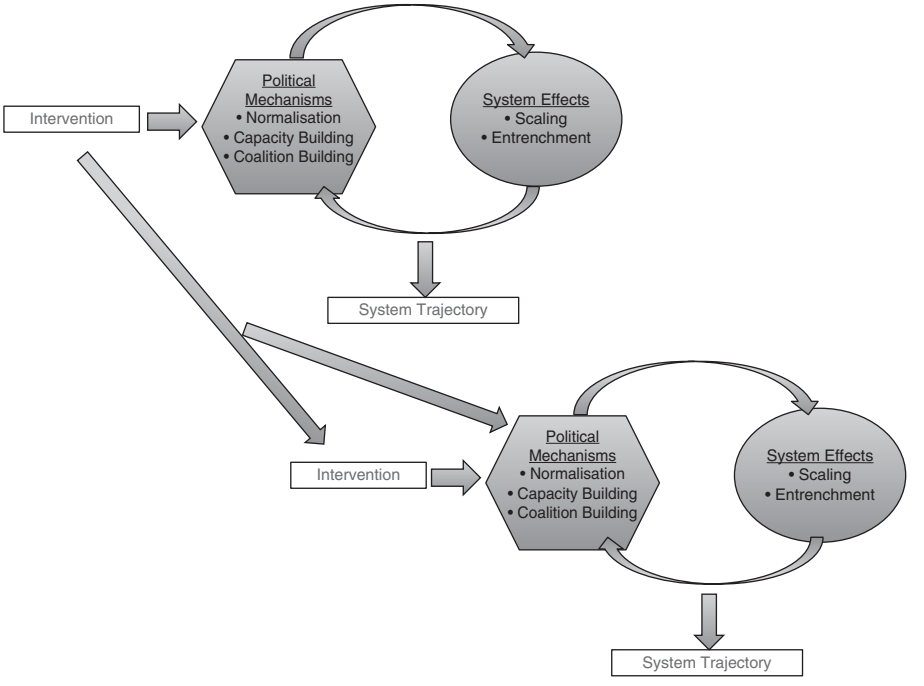

Figure 14.2 Decarbonisation pathways across subsystems.

room for additional interventions to make the market work – offset and carbon credit registries, carbon standard-setters and carbon accounting (compare Chapter 6). The entire voluntary carbon market is an ecosystem of interventions; each of its functions is made relevant by the functioning of others.

14.4.3 Meta Initiatives and Orchestration

Finally, more self-conscious efforts to build what Ostrom would recognise as a polycentric governance system are beginning to occur, with the trust-building, experimentation and monitoring that goes with it. One example of this is something we call 'meta-initiatives' – decarbonisation initiatives that are designed from the outset to consist of multiple projects in different places. For instance, the Renewable Energy and Energy Efficiency Partnership, founded in 2002 at the World Summit on Sustainable Development, promotes clean energy by providing funding, mentorship and investor matchmaking services for projects in the global South (REEEP, 2016a). The Renewable Energy and Energy Efficiency Partnership is really a facilitator of multiple decarbonisation initiatives in multiple places, providing resources and parameters for projects to follow. It seeks to catalyse innovation and experimentation in the projects that it funds, as well as to monitor

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and evaluate the projects with an eye towards knowledge creation, sharing and collaboration across projects (REEEP, 2016b).

As discussed in Chapters 2 and 11, we are also seeing active orchestration of diverse climate and decarbonisation initiatives. At the multilateral level, there is the Non-state Actor Zone for Climate Action (NAZCA) platform being run by the UNFCCC secretariat that 'aims to track the mobilization and action that are helping countries achieve and exceed their national commitments to address climate change' (UNFCCC, n.d.). Transnationally, we have the Galvanizing the Groundswell of Climate Action project that consists of 'open dialogues that aims to bring the groundswell of climate actions from cities, regions, companies, and other groups to a higher level of scale and ambition' (Galvanizing the Groundswell, n.d.). These orchestration platforms (van der Ven, Bernstein and Hoffmann, 2017) are working out ways to assess and account for the climate activities going on outside the multilateral negotiations (Chan *et al.*, 2015). They may produce a medium for the kind of trust building and mutual adjustment amongst decarbonisation initiatives that are necessary components of a fully polycentric governance system.

14.5 Conclusions

Decarbonisation governance can be *described* as polycentric; there are now multiple domains of authority *governing* decarbonisation attempts in specific places. One of the main messages of this chapter has been the importance of analysing this decentralised politics in a way that simultaneously takes seriously the fact of polycentric authority but remains open-minded as to whether that politics can yet be *explained or analysed* as a polycentric governance system. Observing the polycentric responses to climate change has generated many important insights touched upon in this chapter and covered extensively in the rest of this volume, including the benefits of experimentation, the importance of learning and diffusion and, specifically here, the focus on scaling and entrenchment. At the same time, the decarbonisation initiatives that are currently at work in the world do not follow a polycentric logic of collective action yet. The problem of carbon lock-in (and the goal of decarbonisation in response) rests at least initially on a very different *problématique* – one of interlocking social, economic, technological and political systems. Acting on the system of carbon lock-in requires multiple interventions, and the problem of collective action may or may not arise secondarily to this *problématique*. Our framework can be used to analyse the politics of these myriad interventions both individually and in their developing linkages as a precursor to the emergence of a polycentric governance system.

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A challenge in studying decarbonisation is that it is necessarily analytically speculative. We do not have completed 'cases' of decarbonisation to study, because moves towards decarbonisation are nascent at best, even amongst the most aggressive actors on climate change. Therefore, we focus on the study of trajectories and the political mechanisms that may produce decarbonisation pathways. This also explains our caution in jumping from the politics of decarbonisation among and between the polycentric array of governance interventions and the particular prescriptions derived from a *theory* of polycentricity that seeks to foster polycentric collective action (e.g. Ostrom, 2010b; Cole, 2015b). The prior step is to understand the politics of scaling and entrenchment, which may tell us something about the possibilities of these initiatives emerging into a truly polycentric system that can begin to transform the existing system of carbon lock-in.

A next step could be to combine the insights generated from this kind of analysis with those generated by other chapters in this book. Such a combination at least has the potential to analyse ways in which emergent properties of polycentricity can be leveraged to support both the scaling and entrenchment of governance arrangements with transformative potential and linkages, learning, further diffusion and coordination within a system where these myriad initiatives collectively can better achieve their ultimate goals. Indeed, if Jordan *et al.* (2015) are correct, such a polycentric climate governance system is already emerging.

In tandem, these approaches may be useful not only for studying decarbonisation trajectories but also for developing and nurturing them – a more normative endeavour which Ostrom herself was keen to encourage (Ostrom, 2009). Although we have not addressed normative implications of this approach in this chapter (see Chapter 1), studying the politics of trajectories also opens up space to address crucial questions of contestation over the meaning and purpose of decarbonisation. In addition, it raises questions about the values that would permeate a polycentric governance system. Which kind of initiatives would be valued? How would linkages, mutual adjustment and monitoring be agreed to? Because both decarbonisation and polycentric governance are nascent, we have the opportunity to reflect now on the ways in which pursuing decarbonisation may empower certain groups over others, or even the possibility that decarbonisation might be forced in undemocratic ways, exacerbate inequalities or pre-existing power dynamics, or be applied inappropriately in particular development contexts (Scoones, Leach and Newell, 2015). Further decarbonisation research should thus concentrate on understanding and imagining pathways that avoid the worst impacts of climate change and that are compatible with other social, political and economic values.

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Notes

1. Whether these activities are actually disruptive is an empirical question. We know from existing research that many of them are not, even though their stated purpose is to address climate change (Hoffmann, 2011).
2. Of course, there may be collective action problems in launching individual initiatives.
3. This section draws extensively from Bernstein and Hoffmann 2018.
4. This perspective can complement approaches to decarbonisation that focus more on the economic and technical aspects of disrupting carbon lock-in and pursuing a low-carbon future like the Deep Decarbonisation project (SDSN, 2014) and the sociotechnical transitions literature (e.g. Jordan, 2009; Geels, 2010, 2014; Meadowcroft, 2009, 2011).
5. This section draws from van der Ven, Bernstein and Hoffmann (2017).
6. This section draws from Bernstein and Hoffmann 2018.

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15

Transferring Technologies

The Polycentric Governance of Clean Energy Technology

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15.1 Introduction

Clean energy technology transfer is an important precondition for climate change mitigation and the transition to a low-carbon global economy, because clean energy technologies are costly and face a number of barriers to adoption, particularly in developing countries. Technology transfer is defined by the Intergovernmental Panel on Climate Change (IPCC) as 'a broad set of processes covering the flows of know-how, experience and equipment for mitigating and adapting to climate change amongst different stakeholders such as governments, private sector entities, financial institutions, non-governmental organizations and research/education institutions' (IPCC, 2000: 3). International technology transfer can involve the transfer of technical knowledge, hardware, assets and manufacturing capability from firms in one country to firms in another country (Gallagher *et al.*, 2012). Under the United Nations Framework Convention on Climate Change (UNFCCC), this transfer occurs from developed to developing countries, and involves technology information, learning, enabling environments, capacity building and mechanisms for transfer to occur (UNFCCC, 2017a).

This chapter focuses on the governance of transferring clean energy technologies to developing countries, covering the technologies, services and processes that reduce energy consumption and enable a transition to a low-carbon economy. The polycentric approach (Ostrom, Tiebout and Warren, 1961; Ostrom, 2010) informs our analysis. Since energy and technology transfer involve multiple governing authorities and scales, polycentricity is worth exploring. While the regime complex is a concept frequently used to characterise climate and energy governance (Colgan, Keohane and Van de Graaf, 2011; Keohane and Victor, 2011), it tends to provide a snapshot of different governance arrangements and their relations. The notion of regime complexity does not fully allow for the examination of what Andonova and Mitchell (2010) describe as the 'rescaling' of politics, which is generating multiple nodes of governance authority both horizontally

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(through the proliferation of international and transnational institutions) and vertically (across local, national and regional jurisdictions). Rescaling is producing a more polycentric system of climate governance (see Chapter 1). This chapter thus questions to what extent, why and with what outcomes this governance system has become increasingly polycentric over time.

Multiple barriers stand in the way of the cleaner energy transition in developing countries – from knowledge access limitations, to market and institutional failures, weak financing institutions and limited technological adaptability to the developing country's absorptive capacity (Acemoglu *et al.*, 2012; Dechezleprêtre, Glachant and Ménière, 2012). Additionally, developing countries face trade barriers, intellectual property rights issues and credit access constraints (Worrell *et al.*, 2001; Keller, 2004). Specific mechanisms of technology transfer aimed to address these different barriers, such as financing through development aid or capacity building, are thus needed to achieve clean energy development (Popp, 2011).

The intergovernmental regime under the UNFCCC has included relatively limited provisions for clean technology transfer. As a result, the Kyoto Protocol's market-based mechanisms, in particular the Clean Development Mechanism (CDM), became the de facto instruments for diffusing clean energy technologies to developing countries. Consequently, governance instruments and financing for clean energy have also emerged across other scales of governance, including traditional players such as international development banks, but also new ones such as development banks from the global South, new intergovernmental organisations like the International Renewable Energy Agency (IRENA) and transnational governance initiatives. This all suggests a shift in the balance of clean energy governance towards a more decentralised and complex polycentric system (Jordan *et al.*, 2015).

This chapter examines what political processes shape the polycentric structure of clean technology transfer. It analyses the early role of the UNFCCC's technology-related and market-based mechanisms in promoting technology transfer to developing countries. It then investigates the horizontal rescaling of international institutions through the rise of initiatives in the multilateral, transnational and bilateral spheres, and the implications for polycentric governance. Finally, this chapter investigates to what extent we can observe some of the anticipated effects of polycentricity in shaping clean energy technology pathways.

15.2 Clean Technology Transfer under the UNFCCC

The first international effort to set up a governance structure to address the international transfer of clean energy technologies was made through the UNFCCC. The 1992 Convention commits all parties to 'promote and cooperate in the

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development, application and diffusion, including transfer' of technologies related to climate change mitigation, and requires developed countries to 'take all practicable steps to promote, facilitate and finance' technology transfer to developing countries (UN, 1992: Articles 4.1[c] and 4.5). Technology transfer was one of the three main means – along with financial support and capacity building – in which the regime intended to support developing countries in addressing climate change. A technology transfer framework and an expert group on technology transfer were created under the Convention in 2001. The main achievement of this framework was the technology needs assessment process, under which more than 85 developing countries received support in identifying the key technologies needed in combating climate change (UNFCCC, 2016).

While the technology needs assessment process was instrumental in helping developing-country governments devise a climate 'technology action plan', providing capacity building and information, funding for the implementation of such plans is lacking (Pueyo *et al.*, 2011). Nonetheless, the UNFCCC reports that since 1991, its financial mechanism – particularly through the Global Environment Facility (GEF) – has provided developing countries with more than $5 billion of funding for 800 projects with mitigation technology transfer objectives. Since 2009, an additional budget of $50 million for climate technology activities was launched under the Poznan strategic programme on technology transfer (UNFCCC, 2016).

In addition, a range of bilateral and multilateral initiatives were set up early in response to the UNFCCC's technology transfer provisions. Among them were the Technology Cooperation Agreement Pilot Project set up by the United States in 1997, as well as the Climate Technology Initiative (CTI) established in 1995 by some European and Organisation for Economic Co-operation and Development (OECD) countries. Both the Technology Cooperation Agreement Pilot Project and the CTI worked to demonstrate how developed countries could fulfil their technology transfer obligations under the Convention, while the CTI, together with the United Nations (UN) Development Programme, also directly engaged in providing assistance to developing countries in producing their technology needs assessments (Kline, Vimmerstedt and Benioff, 2004). Thus, from an initially monocentric governance structure centred on the UNFCCC, bilateral and multilateral initiatives quickly started to emerge, though mainly as a way to implement the obligations that had been centrally established.

The UNFCCC's engagement in technology transfer to developing countries goes well beyond those made through its technology framework and financial mechanism. Several studies have highlighted the important role that the 1997 Kyoto Protocol's market-based mechanisms – particularly the CDM – have played in promoting the adoption of clean energy technologies in developing countries (e.g.

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Dechezleprêtre *et al.*, 2008; Schneider, Holzer and Hoffmann, 2008; Seres, Haites and Murphy, 2010). The CDM financially supports greenhouse gas emission reduction (or sequestration) projects in developing countries by allowing such projects to generate emission reduction credits that can be used by developed countries to meet their emission reduction obligations under the Kyoto Protocol. In terms of size, the CDM was very successful, with more than 7,750 projects and 300 multi-project programmes registered in 99 countries. These are expected to deliver more than one trillion tonnes of carbon dioxide–equivalent emission reductions per year. About 83 per cent of these projects (entailing 73 per cent of total emission reductions) involve investments related to energy generation or consumption, and can thus be regarded as potentially involving energy technology transfer.[1] Larger projects and projects developed with a foreign, industrialised country partner – or by a subsidiary of a foreign firm – are usually more strongly associated with technology transfer (Haites *et al.*, 2006; Dechezleprêtre *et al.*, 2008; Seres *et al.*, 2010). In financial terms, at its peak, the CDM provided significantly more resources to developing countries than the GEF (about $23 billion during 2002–2008, representing about $106 billion in primarily clean energy investment if all proposed projects are implemented), but its investments are still smaller than private foreign direct investment flows (Kossoy and Ambrosi, 2010: 42; Popp, 2011).

In part because funding was insufficient to implement the technology needs assessments, and partly due to the CDM's success, this mechanism eventually became the de facto UNFCCC channel to transfer new technologies to developing countries, even though this was beyond its actual remit. A 2010 UNFCCC Secretariat report on the CDM's contribution to technology transfer concluded that at least 30 per cent of projects and 48 per cent of estimated emission reductions involve some technology transfer to developing countries (Seres *et al.*, 2010).

Over time, technology transfer through CDM projects has become less frequent. This trend signals a weakening in the extent of clean technology promotion by the Kyoto mechanisms. However, it also reflects that technological learning takes place in the host developing countries so that 'local sources of knowledge and equipment become more established' (Seres *et al.*, 2010: 11; see also Dechezleprêtre *et al*., 2008). This learning process has taken place particularly in the three largest CDM project hosts – China, India and Brazil – while technology transfer still seems to be substantial in all other host countries.

Crucially, the host country context affects the extent to which the CDM promotes technology transfer. International technology transfer has been substantially more prevalent in CDM projects in China and Brazil than in India, at least partly because India does not set a requirement for such transfers. Also, the broader policy contexts of a country – including tariffs and barriers to technological imports,

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protection of intellectual property rights and openness towards foreign investment – have affected whether the CDM contributes to technology transfer. More generally, the likelihood that CDM projects take place at all – particularly for those more innovative and costly technologies for which technology transfer is most needed – is related to the existence of domestic policies that either mandate or financially support those technologies (Castro, 2014). Policies such as feed-in tariffs or other subsidies for renewable electricity complement the CDM in making these technologies more affordable and thus creating a demand that can be supplied by technology transfer. Nevertheless, research does not support the idea that the CDM has meaningfully contributed to accelerating the diffusion of such supportive policies to developing countries (Stadelmann and Castro, 2014). Finally, the domestic private sector, including its business infrastructure and technical capacity, provides the market and technical opportunities to absorb new technologies (Dechezleprêtre *et al.*, 2008; Seres *et al.*, 2010, Schmid, 2012).

Because of both domestic contexts and investor interests, CDM projects have not been equitably distributed across developing countries, with only three of them (China, India and Brazil) hosting 74 per cent of registered projects. Such a skewed distribution clearly has an impact on the CDM's ability to transfer clean technology to poorer developing countries. Scholars have further critiqued the CDM for the limited extent to which it contributes additional incentives for clean technology transfer (Haščič and Johnstone, 2011; Lema and Lema, 2013, 2016). They find that in China and India, for instance, the build-up of domestic technological capacity related to wind energy preceded the CDM, and that the technology transfer channels used by the CDM already existed. They concluded that at least in these core beneficiaries, the CDM was not a major factor in creating new technology transfer mechanisms. Domestic technological capacity, policies and innovation from local firms significantly shape the broadening international technology supply channels.

To enhance the relevance of technology transfer in the climate regime, UNFCCC parties agreed in 2010 to establish a new Technology Mechanism. This mechanism comprises the Technology Executive Committee (TEC) in charge of identifying policies to accelerate technology transfer, and the Climate Technology Centre and Network (CTCN) responsible for implementation, including the provision of information, knowledge and technical assistance, and the promotion of collaboration between countries seeking assistance and technology experts (UNFCCC, 2017b). As is elaborated in Section 15.3, this new governance structure relies much more strongly on partnerships with other technology-related organisations to deliver its services.

Overall, the UNFCCC initially provided a rather monocentric impulse for technology transfer, first through the technology transfer framework and later

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through the CDM (even though the CDM already had substantial tasks given to private hands; see Chapter 13). Nonetheless, these instruments already had to interact with bilateral and multilateral implementation-related initiatives, and more crucially with national-level policy systems and business environments, which shaped the way in which they were able to contribute to technology transfer. By contrast, the Technology Mechanism clearly reflected the evolving polycentric nature of technology governance by directly engaging with the relevant international and national-level partners.

15.3 Horizontal Rescaling of International Institutions

In parallel with the UNFCCC, the governance of technology transfer has undergone a horizontal rescaling, with a growing number of agencies taking on mandates or programmes for clean energy (Andonova and Mitchell, 2010; Andonova and Chelminski, 2016). This institutional development has created new nodes of governance at the international level, shaping a more polycentric system. Multiple factors have contributed to such developments, including the dissatisfaction of state actors with the existing UNFCCC mechanisms and the subsequent incentivisation for the proliferation of new institutions to address the limits on the renewable energy portfolio of the International Energy Agency (IEA), as well as innovative initiatives within developing agencies (Colgan *et al.*, 2011; Van de Graaf, 2013; Andonova, 2017). In addition, bilateral aid and regional institutions have played an increasing role; countries interested in promoting clean energy technology use them as another means to exert political influence.

The major intergovernmental actors that have played historical roles in governing clean energy technology transfer include the IEA's Renewable Energy Unit and the United Nations Environment Programme (UNEP), with the Group of 8 (G8) and the newly created IRENA emerging subsequently. Multilateral development banks such as the World Bank and the Asian Development Bank have similarly become key players in clean energy technology transfer, and bilateral development banks, such as KfW, the European Investment Bank and the China Development Bank, are playing an increasingly central role in financing technology transfer. Altogether, these are representative of major emerging and historical players in governing clean technology transfer, whose contributions include financial and technical assistance, policy advice, capacity building and knowledge sharing.

The first avenue through which an alternative platform for clean energy was created within the IEA was through the 2008 G8 Energy Ministerial in Aomori. The G8 and China, India, South Korea and the European Union decided to establish the International Partnership for Energy Efficiency Cooperation (IPEEC) to further promote energy efficiency policies and practices. IPEEC was created as

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a cooperation platform hosted by the IEA, to facilitate collaboration with emerging market economies that are not IEA members, which is envisioned as a way to integrate non-OECD members into the IEA for future energy cooperation (Lesage, Van de Graaf and Westphal, 2010). The IEA hosts IPEEC, but the partnership remains legally distinct from the IEA, with a separate legal agreement.

Donor countries such as Germany – and to a lesser extent Denmark and Spain – actively promoted the creation of an international organisation dedicated to renewable energy technology and technology transfer through international conferences and by political support. In response, many international organisations and transnational initiatives have mutually adjusted to the growing proliferation of institutions. In some cases, the horizontal rescaling has led to greater synergies as a type of mutual adjustment, where overlapping institutions form partnerships such as the creation of the CTCN, detailed further in what follows. In other cases, institutional overlap has created competition and turf wars, such as between the IEA and IRENA. While there was an admitted programming overlap, the initial contention between these two organisations eventually has led to synergies and partnerships on clean energy. Thus, the specific impetus towards greater polycentricity at the international level was political on the part of certain states and international organisations, as well as institutional. The processes of mutual adjustment among development banks and international organisations to respond to the changing incentives and political interests of donor countries thus developed a more polycentric organisational landscape (Andonova and Chelminski, 2016).

Since its creation in 2009, IRENA now has 154 member states and 26 states in accession (180 total), and a budget that rivals the IEA (IRENA, 2017). Unlike the IEA, which has OECD countries as its core members, IRENA is located in the United Arab Emirates, a developing country under the UNFCCC categorisation. Its location signals how governance authority needs to encompass a geographical shift to engage particularly emerging and developing markets. IRENA's contribution to technology transfer lies in its capacity-building programmes, policy and technical expertise, training, knowledge sharing and financing for renewable energy pilot projects. The IRENA/Abu Dhabi Fund for Development Project Facility is a $350 million concessional loan to finance 'innovative, replicable renewable energy projects in developing countries', which embodies the aims of technology transfer. Since 2012, $144 million in loans (and $189 million leveraged through co-financing) have already been allocated to 19 renewable energy projects recommended by IRENA, including wind, solar, geothermal, hydro, biomass and bioenergy and hybrid technology. Questions remain as to whether IRENA will accomplish its goals to reduce information asymmetries, facilitate technology transfer in developing countries and build political consensus for renewable energy (Van de Graaf, 2013).

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More than 10 years prior to IRENA's creation, UNEP acted with considerable governance entrepreneurship in promoting renewable energy technology transfer through knowledge management, policy advising and partnerships. In 1997, UNEP's technical Division of Technology, Industry and Economics created a new Energy Branch, which has since developed a substantial portfolio on renewable energy and energy efficiency, in anticipation of a growing interest among industry and policy circles in diverse mechanisms to support clean energy transfer after the adoption of the Kyoto Protocol (Andonova, 2017). UNEP was subsequently selected as the host of the CTCN, which was created under the UNFCCC. The networked structure of the CTCN – with authority under the UNFCCC, managed by UNEP, and including both intergovernmental and transnational organisations – represents a political recognition of the polycentric nature of clean energy governance and the need for greater coordination across its various horizontal nodes internationally, and vertically to domestic policies. The United Nations Industrial Development Organisation and 11 Centres of Excellence across developed and developing countries collaborate with UNEP to stimulate technology cooperation and enhance technology transfer through technical assistance, information and knowledge sharing and networks of collaboration (CTCN, 2017).

Development banks have similarly become important actors in clean energy transfer, creating another set of nodes in the horizontal rescaling of clean energy governance. UNEP and Bloomberg New Energy Finance found that financing from development banks was approximately $84 billion in 2014. The largest funders of clean energy were KfW ($28.3 billion), the European Investment Bank ($11.7 billion), the World Bank Group ($9.4 billion), Brazil's Brazilian Development Bank ($6.3 billion) and the China Development Bank ($6 billion), in addition to funding from the Asian Development Bank, the European Bank for Reconstruction and Development, the African Development Bank, the Japan Bank for International Cooperation and the Export-Import Bank of China ranging from $1.6 billion to 3 billion (UNEP and BNEF, 2016; BNEF 2016).

The World Bank entered the business of climate financing shortly after the adoption of the Kyoto Protocol, largely on its own initiative and with the financial support of donors with proactive climate policies and of private actors (Andonova, 2010). By 2008, the expansion of climate finance and the greater consensus among all major donors of the Bank resulted in the creation of the Climate Investment Funds (CIFs), whose programmes were subsequently extended to the regional development banks (Andonova, 2017; Newell 2011). The CIFs play a significant role in technology transfer by financing mitigation and adaptation activities, including renewable energy development and forest management in developing countries. The major funds related to technology transfer include the Clean

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Technology Fund ($5.6 billion) and the Scaling Up Renewable Energy in Low Income Countries Programme ($780 million) fund (World Bank, 2017). The $8.3 billion in CIF pledges are expected to attract an additional $58 billion in co-financing for the more than 300 projects. Equally importantly, the CIFs are to work with developing country governments in developing strategies for low-carbon development and technology investment.

Studies of polycentric systems rarely ask how the layers of such systems became established, and instead focus on the functions and effects of polycentricity. Our discussion reveals how both political incentives and governance entrepreneurship can provide a strong impetus for the horizontal rescaling of authority 2010. The emergence of multiple institutional nodes working on clean technology transfer in the multilateral system was created by institutions reacting to donor countries incentivising new institutions and institutional expansion into the clean energy domain, coupled with organisational entrepreneurship of the creation of new programming or partnerships related to clean energy. Donor countries incentivised institutional change to promote their respective agendas related to energy governance, which in the case of Germany was to support multilateral solutions to technology transfer, and in the case of the United States was to pursue a unilateral agenda or club governance. Governance entrepreneurs within organisations such as UNEP or the World Bank similarly saw windows of opportunities to propose new financing mechanisms for climate and clean energy that supported their mandates and expanded their resources (Andonova, 2017). We observe mutual adjustment amongst governing units, but also competition and contention. The significant role of the World Bank and other development banks has raised concern about the role of the more broadly representative UNFCCC framework, creating in turn a stimulus to new institutional developments such as the CTCN and the Green Climate Fund (Nakhooda, 2011; Newell, 2011; Andonova, 2017). The polycentric landscape of clean technology governance is therefore best understood as an evolving one.

15.4 Transnational Governance and Clean Technology Transfer

Transnational initiatives for clean energy, which link subnational and non-state actors across borders for the purpose of advancing a set of common governance objectives, represent a third layer in the rescaling of clean technology governance towards greater polycentricity (Bulkeley *et al.*, 2014; Andonova, Hale and Roger, 2017; see also Chapter 4). Several drivers have, in turn, contributed to the rise of such initiatives. First, several transnational climate governance initiatives that involve local actors such as cities or regions depend on the realisation of local and global co-benefits. An example is the optimisation of energy resource use or

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efficiency enhancement in buildings and transportation, which achieves global sustainability objectives of emissions reduction while serving the needs of local communities. A number of cities initiatives for climate change, such as ICLEI – Local Governments for Sustainability (originally called the International Council for Local Environmental Initiatives), Energy Cities and the Covenant of Mayors, have major energy optimisation components (Betsill and Bulkeley, 2004; Bulkeley *et al.*, 2014; Dolšak and Prakash, 2017). Second, the emphasis on clean energy of many transnational initiatives has reflected the initially weak intergovernmental mechanisms for technology transfer beyond the project-based CDM. For example, the private Gold Standard for voluntary certification of project-based carbon offsets was created with the explicit purpose of rewarding projects that emphasise sustainable development co-benefits, such as investment in renewable energy technologies. For countries interested in advancing clean energy cooperation, transnational clean energy partnerships have provided informal but useful vehicles of influence. After the exit of the United States from the Kyoto Protocol in 2001 and the unsuccessful effort of European countries to promote an intergovernmental agreement in 2002 on clean energy sources due to limited interest by both developing and major industrialised countries, transnational initiatives such as REN21 and the Renewable Energy and Energy Efficiency Partnership created an alternative vehicle to promote collaborative effort by interested parties (Andonova, 2010; Pattberg *et al.*, 2012). The peaks of transnational clean energy initiatives, first in 2001–2005 and subsequently in the 2006–2010 period, reflect these political drivers (Figure 15.1).

Unsurprisingly, many of the early transnational clean energy initiatives reflect specific interests pursued by their members. The United Kingdom initiated the Renewable Energy and Energy Efficiency Partnership in 2002 to advance investment in renewable energy by tackling (through capacity building and project-based investment) specific barriers to technology diffusion (Pattberg, 2010). The United States launched the (now-defunct) Asia-Pacific Partnership on Clean Development and Climate. It promoted a technology-oriented approach, albeit with a different conception of clean technology, which included clean coal. In the run-up to the 2015 Paris Agreement, India – together with France – initiated the International Solar Alliance (Government of India, 2017), a new transnational partnership reflecting the growing role of emerging markets and greater recognitions of the synergies between the UNFCCC and transnational governance (Hale, 2016; Andonova *et al.*, 2017).

Public-private partnerships have thus tended to dominate transnational governance for clean energy since 2000 (Andonova and Chelminski, 2016). Very few transnational initiatives involve solely private or non-state actors. The influence of private actors on clean energy diffusion and transfer has materialised primarily

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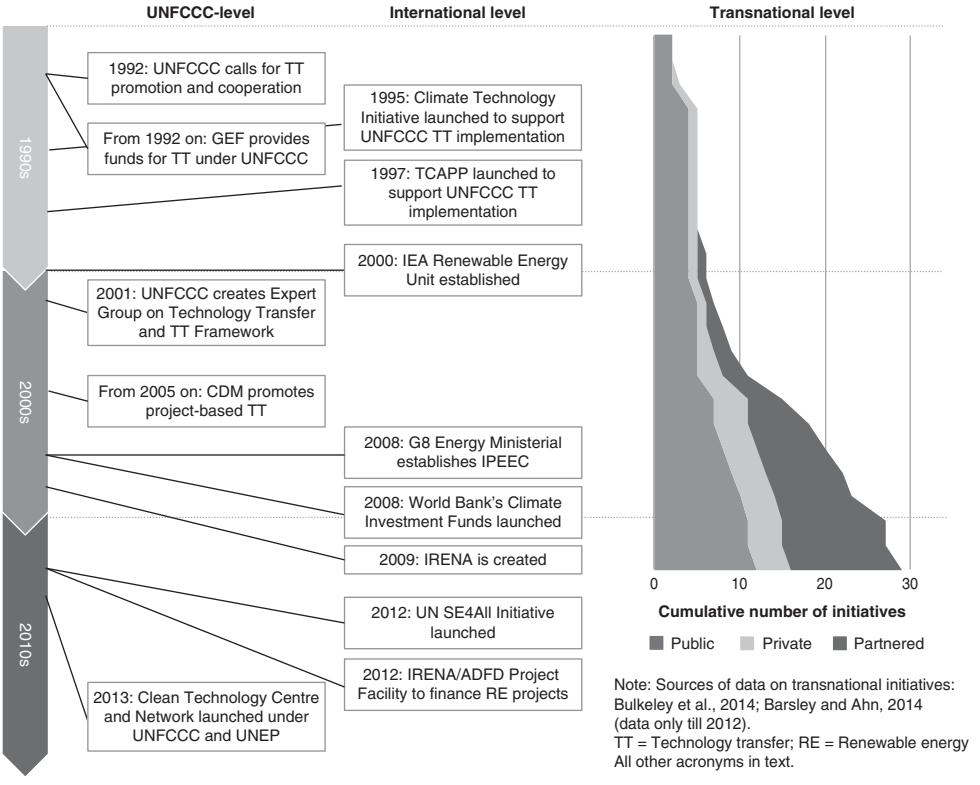

Figure 15.1 Emergence of the polycentric governance system for clean energy technology transfer. Sources: Bulkeley *et al*. (2014) and Barnsley and Ahn (2014).

through market mechanisms and foreign direct investment, encouraged importantly by the recent upsurge of national policies related to clean energy technologies in large emerging economies such as China and India (Lewis, 2007; Wang, Qin and Lewis, 2012).

The domain of transnational governance for clean technology transfer has thus created space for experimentation with innovative mechanisms of governance when intergovernmental cooperation stagnated (Hoffmann, 2011; see also Chapter 4). It also subsequently triggered linkages between local, national and transnational initiatives (Andonova *et al.*, 2017). These initiatives have performed specific functions in the larger polycentric system. Figure 15.2 reflects our coding of transnational clean energy initiatives that advance instruments specifically for technology implementation and transfer, compared to those that focus largely on knowledge barriers and policy diffusion and do not incorporate instruments such as financing of technology investment or project-based mechanisms. The sample of 34 clean energy initiatives was derived by extracting from the database on

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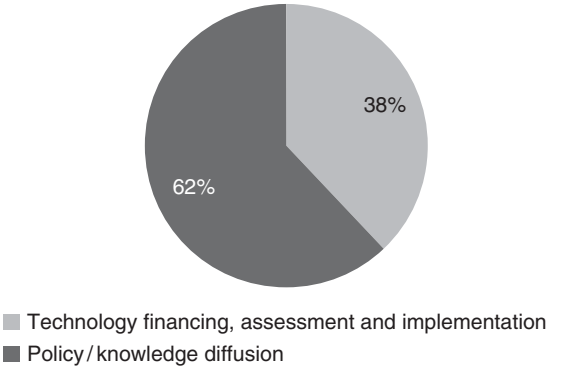

Figure 15.2 Transnational initiatives: technology implementation and policy diffusion.

transnational climate governance (Bulkeley *et al.*, 2014) only those initiatives with an explicit focus on clean energy, complemented with transnational networks listed in the IEA survey on clean energy cooperation (Barnsley and Ahn, 2014). Since almost all initiatives tend to involve capacity-building components (Bulkeley *et al.*, 2014), Figure 15.2 does not include separate coding for capacity support, but examines the extent to which transnational governance promotes more direct measures of technology transfer versus policy and knowledge diffusion.

Figure 15.2 shows that about 38 per cent of the transnational governance initiatives have promoted direct mechanisms of technology transfer, typically through project-based financing and the diffusion of technologies. They have developed in parallel with the CDM to promote a set of technologies, often reflecting the specific agenda of funding and recipient countries (Pattberg, 2010; Taplin and McGee, 2010). The larger share of clean energy initiatives (62 per cent) has placed a strong focus on policy learning, diffusion and reducing knowledge barriers. The REN21 network, for instance, was created in 2002 to address multiple information gaps by providing a platform embedded in UNEP to involve both policymakers and non-state actors, such as renewable industry associations and NGOs. During the 2000s, REN21 became a premier source of information on renewable energy technology and public policies, coordinating with institutional players such as the IEA, IRENA, UNEP and the World Bank, as well as national administrations, NGOs and researchers. Transnational initiatives have provided an important vehicle to create linkages and foster a degree of mutual adjustment in the polycentric system that has emerged – vertically across subnational and international objectives, as well as horizontally across formal and informal international institutions. The creation of Sustainable Energy for All (SE4All) in 2012 and the adoption of Affordable and Clean Energy as one of the Sustainable Development

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Goals in 2015 have codified at the level of the UN General Assembly the relevance of polycentric governance for a clean energy transition, including – as anticipated by the work of Ostrom (2010) – the need to recognise the role of multiple authorities at different scales. SE4All became possible through the leadership of Ban Ki-moon, then the UN Secretary-General, supported by other international organisations, transnational initiatives and negotiations of UN member states for the adoption of the UN General Assembly Resolution 65/151 in 2011 declaring 2012 the International Year of SE4All (UN, 2011; SE4All, 2017). The network structure of these universal commitments on clean energy under UN frameworks creates a loosely coordinated system of the multiple levels and instruments of clean energy governance that have developed over the past two decades.

15.5 Polycentric Governance and Mechanisms of Technology Transfer

The governance of clean energy technology has evolved considerably towards a polycentric system since the adoption of the UNFCCC, as shown in Figure 15.1. Multiple governance structures operate at the international and transnational levels, connecting actors engaged in the diffusion and implementation of cleaner energy technologies. What instruments and mechanisms has established this polycentric system to advance the objective of clean technology transfer?

Project-based deployment of cleaner technology appears in our analysis as the dominant mechanism of technology transfer. Supported substantially by the flexibility mechanisms of the Kyoto Protocol, a large share of the resulting projects have stimulated the deployment of cleaner energy technologies. The verdict is still out, however, if the glass is half full or half empty. As we discussed earlier, about 80 per cent of all CDM projects have a strong clean energy component. However, less than half of all projects reported involve some technology transfer to developing countries, with the rate of technology transfer varying strongly across project types and host countries and decreasing over time. Nonetheless, the CDM has also had a catalytic effect (Hoffmann, 2011) in terms of stimulating private project-based schemes for carbon offsets, many of which target either forestry projects or the advancement of a higher share of clean energy technologies. Several transnational public-private partnerships and cities networks, such as the Renewable Energy and Energy Efficiency Partnership, the UN Fund for International Partnerships and ICLEI, facilitate project-based climate actions that include the advancement of renewable energy and energy efficiency technologies.

Financial support has become another important instrument to reduce some of the financial barriers and capital risks for the development of clean energy technology in developing countries. Unlike the original centralised design of the GEF as the first international funding mechanism for climate mitigation, finance for clean

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energy technology developed laterally through expanding programmes of international organisations and donor governments. The World Bank was first to experiment with climate funds to support the development of carbon offset projects in line with CDM requirements. After the G8 Gleneagles Summit of 2005, and the greater – albeit soft – agreement among major economies to encourage clean energy diffusion, there was a substantial increase in bilateral donor funding and the creation of a new financial facility, the CIFs. The proliferation of financial mechanisms and the engagement of development banks may have created overlaps and raised concerns about the role of the UNFCCC. The creation of climate funds and donor programmes to support technology transfer in developing contexts also fostered experimentation and demonstrated that multiple mechanisms can be used to generate financial support. There is still limited systematic assessment of the impact of these multiple streams of international and transnational finance on clean energy projects; recent studies suggest that international assistance has been a key driver of reducing financial barriers to investment in sectors such as geothermal development (Chelminski, 2017). However, the polycentric structuring of governance has frequently failed to overcome the limited coordination among institutions working on the ground in developing countries. Therefore, gaps often remain between developing country needs and limited domestic capacity for project implementation, despite continued flows of international finance.

The *pooling of credible knowledge* on renewable energy technologies and on policy instruments for clean technology and energy efficiency was initially the driving mechanism of clean technology governance. The comparative advantage of organisations such as the IEA and UNEP was precisely in developing programmes for technical support and information on specific sectors or areas of low-carbon technology development. UNEP developed sector-specific strategies with member states and non-state actors, focusing on energy and agriculture, efficient lighting, sustainable biofuels and efficiency in buildings (Andonova and Chelminski, 2016). The IEA has been the main source of credible information on technology trends, but also on country- and sector-specific technologies. Before the creation of IRENA, REN21 developed as a platform for knowledge-sharing across countries, industry and development organisations. It quickly became a premier source of up-to-date information on renewable technologies and policies, drawing on governmental sources as well as on credible non-governmental and academic information (Andonova, 2017).

The structure and functions of the polycentric system governing clean technology transfer reveals *relatively limited emphasis on capacity building* as a mechanism to unblock barriers to clean technology uptake and implementation. For instance, the early climate finance mechanisms of the World Bank were criticised for predominantly funding projects in large emerging markets and

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transition countries, a pattern that replicated rather than corrected the uneven distribution of CDM projects (Michaelowa and Michaelowa, 2011). Indeed, the capacity of states to attract project-based technology transfer and financing has been an important factor shaping these flows. At the same time, targeted capacity building under the CDM or climate finance instruments remained limited and unevenly applied. The IEA provides energy statistics training for non-IEA member states (aimed at developing countries) to build institutional capacity by developing tools for governments to maintain accurate energy datasets and national energy balances. Institutional capacity building to implement reforms and new policies is an important step in technology transfer, but it has represented only a fraction of overall finance, such as in geothermal development in Indonesia and the Philippines, for example, representing a major gap in technology transfer governance (Chelminski, 2017).

Regulatory mechanisms are almost entirely lacking in international and transnational governance initiatives, reflecting the unwillingness of states to organise clean energy technology cooperation around a specific binding agreement (see Chapter 14). Instead, since the creation of IRENA and the expansion of transnational and international programmes, several coordinating mechanisms were established across levels of polycentric governance. Importantly, these coordinating structures have been enabled by institutions with broad and quasi-universal membership, including the UN General Assembly, with the endorsement of SE4All and Sustainable Development Goal 17 and the UNFCCC. For instance, under the UNFCCC, the CTCN was established to facilitate technology transfer by providing technical assistance when this is requested by developing countries, improving access to information and knowledge on climate technologies and fostering collaboration among climate technology stakeholders (UNFCCC, 2017b).

Despite this lack of emphasis on regulation at the international and transnational level, *domestic regulation still plays a crucial role* in support of such technologies, either through 'technology push' mechanisms such as the promotion of research, development and deployment programmes, or through 'demand pull' mechanisms that financially support upscaled deployment. Particularly in the more advanced and technologically proficient developing countries, it has been shown that it is mostly appropriate domestic structures – including both regulation *and an active private sector* that sees the business opportunity in deploying new technologies – that are needed to achieve technology transfer and development. This point supports the need for increased institutional capacity building at the national and subnational levels of government to support technology transfer. More research is needed to find out whether the purported catalysing role of international and transnational initiatives is stronger in less developed countries. Given the importance of the private sector, it

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may well be that transnational initiatives, which more directly involve private actors including businesses, will further gain prominence in the future.

15.6 Conclusions

The governance of clean energy technology transfer has evolved towards a polycentric system due to diverging state interests, mutual adjustment and experimentation. As state actors – from both the global North and the global South – were dissatisfied with the existing regimes, their interests to pursue other forums through forum-shopping and institutional creation led to the development of a polycentric system. The rise in multiple nodes of authority – including the UNFCCC, UNEP, SE4All and IRENA – combined with the growing actors at multiple levels of governance – including the international, regional, bilateral, national, transnational and local levels – can be conceptualised as a form of polycentric governance. The polycentric system has become more authoritative and legitimate over time, with high-level recognition of its structure at the UN level. Nonetheless, there are still questions about the extent to which a polycentric system promotes international equity, particularly for the least developed countries. This chapter shows that countries with proactive policies and financial capacity have often driven institutional development towards a more flexible and innovative polycentric system. Large emerging countries and other developing countries with relatively strong domestic policies have been, at least initially, the main beneficiaries of its various components. The increasingly polycentric structure of the governance of clean technology opens new avenues for research on its effectiveness and equity implications across jurisdictions and evolution of the system over time.

Note

1. Data provided by UNEP DTU Partnership (2017).

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16

Governing Experimental Responses
Negative Emissions Technologies and Solar Climate Engineering

JESSE REYNOLDS

16.1 Introduction

Parties to the 2015 Paris Agreement strive to 'hold . . . the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C' (UNFCCC, 2015: Article 2.1[a]). In response to the growing realisation that atmospheric greenhouse gas (GHG) levels will likely exceed the concentrations associated with these goals, some scientists and others are researching responses that are novel, experimental and technological. They suggest the consideration of intentional, large-scale interventions in earth systems to reduce climate change. Since the mid-2000s, discussions of these 'climate engineering' or 'geoengineering' techniques have steadily moved from the fringes of climate change discourses towards the mainstream.

A seminal 2009 report on climate engineering by the United Kingdom's Royal Society concluded, among other things, that '[t]he greatest challenges to the successful deployment of geoengineering may be the social, ethical, legal and political issues associated with governance, rather than scientific and technical issues' (Shepherd *et al.*, 2009: xiii). Given that some of these proposed techniques appear to have the potential to substantially reduce climate change, while posing risks of their own, climate engineering governance has emerged as a salient issue.

This chapter places the governance of climate engineering in a polycentric governance conceptual framework. Following an introduction to climate engineering proposals and their governance needs, I discuss existing climate engineering governance. The chapter then explores the extent to which climate engineering governance is polycentric, prospects for its future polycentricity and what – if anything – this implies for climate governance more generally.

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16.2 Climate Engineering

Proposed climate engineering techniques are diverse with respect to their means of operation, current levels of development and readiness, capacities to reduce climate change, forecast costs, speeds, co-benefits, environmental and social risks and uncertainties. They also vary in their political aspects, including their incentive structures, likely roles of public and private actors, degrees of integration in climate policy discourses and governance needs.

Climate engineering would operate through one of two distinct primary means. The first would be to remove carbon dioxide from the atmosphere and sequester it for a long time (McNutt *et al.*, 2015a). Generally, these 'carbon dioxide removal', 'greenhouse gas removal' or 'negative emissions technologies' (NETs) would – relative to the second primary means of climate engineering – be expensive, act slowly, pose low and local risks that differ among the specific proposed techniques, address climate change close to its cause and intervene less forcefully into natural systems.

Brief descriptions of some proposed NETs, their capacities to remove carbon dioxide and their risks can concretise the concept. First, machines could extract carbon dioxide from the air and then store or reuse it. This 'direct air capture' appears to have great sequestration capacity, poses little risk besides that of leakage (carbon dioxide is poisonous at high concentrations) and is presently being developed by a few private firms (Marshall, 2017). Second, plants could be grown – a process that captures atmospheric carbon dioxide – and then burnt to produce energy while the emitted carbon dioxide could be captured and stored. At large scales, this 'bioenergy with carbon capture and storage' would require large amounts of arable land, constraining its capacity, increasing food prices and threatening biodiversity. Bioenergy with carbon capture and storage would, like direct air capture, also have leakage risks. Third, the locally limiting nutrient could be added to marine waters, increasing the growth of plankton that indirectly incorporate atmospheric carbon dioxide. Such 'ocean fertilisation' would pose risks to marine ecosystems and would be difficult to verify. It was the subject of more than a dozen field trials in the 1990s and 2000s, but interest has since declined due to public controversy and disappointing and uncertain results. Finally, industrial processes could accelerate the natural weathering of minerals, through which carbon dioxide transforms into a dissolved salt. Some tests have been conducted, but scaling them up would be challenging. Although each NET could contribute to lower atmospheric GHG concentrations, none could resolve the problem singlehandedly.

NETs have become partially integrated into the climate policy mainstream. The more optimistic emissions scenarios include large amounts of NETs. Specifically,

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the Representative Concentration Pathways used by the Intergovernmental Panel on Climate Change (IPCC) that are expected to keep global warming below 2°C assume the implementation of bioenergy with carbon capture and storage at remarkable scales, on the order of 10 gigatons of carbon dioxide per year (van Vuuren *et al.*, 2011; Fuss *et al.*, 2014: 851). To give a sense of that magnitude, this would be more than double the mass of current annually global harvested crops, which is four gigatons per year (Alexander *et al.*, 2017: 194). Many observers note that such assumptions might have problematic consequences: unrealistic expectations could be fuelled and emission abatement efforts could be undermined (Anderson and Peters, 2016). Since the mid-2000s, NETs have become the subject of dedicated but modest funding mechanisms, academic research, attention from advocacy organisations and limited private investment.

NETs would have governance needs akin to emissions abatement. This is because, for both practices, the actor implementing the NET would bear the costs and risks while the entire globe would share the benefits of lower GHG concentrations. NETs thus present a global collective action problem and the associated challenge of free-riders. To be effective, governance would need to: incentivise NETs' research, development and implementation; monitor, report and verify their use; assure those who use them that others are not free-riding; minimise environmental and social risks; and compensate those who have been harmed. As with other climate-related technologies, governance should also facilitate knowledge transfer and learning, including internationally. Together, these needs imply that NETs governance could in principle consist of a mix of global, national, subnational and private governance instruments and institutions.

The second general means of climate engineering would be to block or reflect a small portion of the planet's incoming solar radiation, which would counteract climatic change (McNutt *et al.*, 2015b).[1] Generally, these solar climate engineering (SCE) or 'solar radiation management' techniques would – relative to NETs – be inexpensive and rapidly effective, pose serious environmental and social risks, treat merely the symptoms of climate change and intervene forcefully into natural systems. At a gross level, SCE appears to be able to greatly reduce climate change and concomitant risks. Presently, SCE remains largely outside of mainstream climate policy discourses, although that appears to be slowly changing. Research funding has been ad hoc, advocacy organisations' interest has been minimal and there are no SCE businesses. Dedicated, explicit outdoor experiments of SCE techniques are planned but have not yet been conducted (Keith, Duren and MacMartin, 2014; Gertner, 2017).

Two proposed SCE techniques hold particular potential. In the leading one, small aerosol particles would be injected into the stratosphere, blocking some

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incoming sunlight and cooling the planet, similar to how large volcanoes do. This 'stratospheric aerosol injection' appears to be technically feasible and has the capacity for nearly unlimited cooling. The second technique would involve spraying seawater upward as a fine mist. After evaporation, the remaining salt particles would act as cloud condensation nuclei and cause marine clouds to be brighter. Such 'marine cloud brightening' faces technical hurdles, but could, in theory, compensate for perhaps 1°C or 2°C warming.

As noted, SCE would pose environmental and social risks. First, it would unevenly compensate anthropogenic changes in temperature and precipitation, resulting in areas with residual climatic anomalies. Second, the leading candidate material for stratospheric aerosol injection – sulphur – could damage stratospheric ozone, although other materials are under consideration. Third, countries and other actors might disagree about the timing, form and intensity of SCE implementation, a possibility made more problematic by the apparent low direct financial costs and technical feasibility of SCE. Fourth, if SCE were to stop suddenly for some reason after a long implementation period at a strong intensity, the planet's climate would rapidly experience the previously suppressed climate change. Finally, as with NETs, SCE's development might undermine conventional emissions abatement efforts.

The primary governance needs of SCE are distinct from those of NETs and emissions abatement, for two reasons. First, not only SCE's reduction of climate change but also its environmental risks would be global. This implies that governance of SCE implementation would ultimately need to likewise be global and – given the high stakes – likely state-centric. Second, SCE appears to have such low direct implementation costs and to be so effective at reducing climatic anomalies that it could – at least in principle – be in the self-interest of a single country to implement it unilaterally and bear all the financial costs. Thus, instead of the free-rider problems of emissions abatement and NETs, SCE would face a 'free-driver' problem, in which states would provide it excessively and prematurely (Weitzman, 2015). The primary governance challenge would thus be one of mutual restraint (Barrett, 2007). At the same time, SCE shares some other governance needs with NETs. For example, within countries, its research and development would still be a public good and thus need to be encouraged through, for example, grants. Internationally, research should be coordinated and collaboration facilitated. Governance should also reduce environmental and social risks as well as arrange compensation for any harmed groups. These secondary governance activities need not be centralised, but might benefit from it.

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16.3 Current Governance

16.3.1 International Legal Instruments and Institutions

Given the transboundary and even global impacts of both climate change and climate engineering, as well as the low level of national and non-state climate engineering governance activity, existing international legal instruments and institutions offer a foundation for climate engineering governance (Reynolds, 2014). Their implications vary for the different climate engineering techniques, and especially between NETs and SCE. Furthermore, because existing international law was not developed with climate engineering in mind, interpretation is central. A central challenge here is that both climate engineering and the climate change that it would seek to reduce pose environmental risks. Indeed, both phenomena satisfy definitions of 'pollution', 'adverse effects' and 'damage' in various international environmental agreements.

International law presumptively permits countries to undertake and to allow actions conducted by legal persons under their control. Indeed, the sovereign right of states to exploit their natural resources as they see fit is a foundational principle of international law (UNGA, 1992: Annex I, Principle 2). At the same time, if their own activities or activities under their control pose risks of significant environmental harm that would cross borders or affect areas beyond national jurisdiction, countries have the obligation to prevent and reduce such transboundary harm by exercising due diligence pursuant to customary international law. This duty includes taking measures to prevent or reduce potential harm; review by national authorities; prior environmental impact assessment; notification of, consultation with and cooperation with the likely affected public and countries; emergency plans; and monitoring. Some climate engineering activities, particularly the large-scale field research and implementation of SCE and of ocean fertilisation, would pose transboundary risks, and – in those cases – countries would have these obligations. If a state's actions that are contrary to international law were to have negative transboundary impacts, then the customary international law of state responsibility would be applicable. In that case, the state should: cease the activity; assure that it will not recur; provide reparations through restitution, compensation and satisfaction; and offer victims access to legal remedies.

Among treaties, the regime established by the United Nations Framework Convention on Climate Change (UNFCCC) appears to be a logical home for international climate engineering governance. Yet the climate agreements are, in some ways, ambiguous in this respect, which is largely understandable given that the first two of the three treaties of the regime were developed before climate engineering was subject to more than marginal consideration. The UNFCCC does not restrict how states may help stabilise GHG concentrations, and the Paris

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Agreement largely leaves it up to individual states how they will contribute to limiting global warming to its targets. Furthermore, the institutions related to the UNFCCC – such as its Conferences of Parties and its Subsidiary Body for Scientific and Technological Advice – have been noticeably silent on climate engineering.

Nevertheless, NETs do fall clearly within the purview of the UNFCCC. The objective of the UNFCCC is the rapid 'stabilisation of atmospheric GHG concentrations at a level that would prevent dangerous anthropogenic interference with the climate system', and the acceptable means of doing so explicitly include the enhancement of sinks and reservoirs of GHGs (UNFCCC, 1992: Articles 2 and 4.1[d]). Parties to its 1997 Kyoto Protocol agree to research and promote 'carbon dioxide sequestration technologies' (UNFCCC, 1997: Article 2.1[a][iv]). Furthermore, the Paris Agreement calls for limiting global warming by achieving 'a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases' (UNFCCC, 2015: Article 4.1). In order to integrate NETs into the climate regime, parties to these treaties should agree upon the extent to which they may rely upon NETs in their emissions reporting and trading systems. Parties to the UNFCCC have already adopted rules with respect to land use, land use changes and forestry – which resemble NETs – but this has been protracted and challenging. Such a process for the diverse proposed NETs would likely be as well.

How the climate regime might govern SCE is much less clear. The technologies have a less clear relationship with the objective of the UNFCCC. Specifically, SCE could decrease 'anthropogenic interference with the climate system' caused by GHGs, in turn allowing for greater atmospheric GHG concentrations. Regardless, SCE could contribute to the the objective of the Paris Agreement (UNFCCC, 2015: Article 2.1[a]). Both agreements are implicitly favourable to at least the research and development of SCE. The UNFCCC's hortatory passages call for states to rapidly and inexpensively minimise the adverse effects of climate change 'so as to ensure global benefits at the lowest possible cost', for anthropocentric reasons and balanced with goals that include economic development and food production (UNFCCC, 1992: Articles 1.1, 2, 3.1 and 3.3). In addition, UNFCCC parties made multiple commitments to undertake research and to develop and diffuse new technologies (UNFCCC, 1992: Articles 4.1[g] and [h], 4.3, 4.7, 4.8, 4.9 and 11.1). SCE research, development and possible implementation could contribute to these goals.

Among climate engineering techniques, ocean fertilisation is an exception in that international legal institutions have given it specific attention. In the late 2000s, two private firms announced their intentions to fertilise the ocean in order to sell carbon credits, despite the uncertainty regarding the effectiveness of the techniques, the

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possible environmental impacts and the marketability of the credits. The United Nations General Assembly and an ad hoc consultative group to the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organisation (UNESCO) released statements that emphasised both the potential and the risks of ocean fertilisation (UNGA, 2007; IOC-UNESCO, 2008: 2–3). The parties to the London Convention and London Protocol, which regulate ocean dumping, established a working group and the Legal Intersessional Correspondence Group on ocean fertilisation, and agreed that ocean fertilisation should not be allowed except for legitimate scientific research (IMO, 2008). They later developed an assessment framework for determining whether a proposed activity qualifies as legitimate scientific research (IMO, 2010). In 2013, the London Protocol parties approved an amendment, not yet in force, to that agreement. This would apply a similar standard to the broader category of 'marine geoengineering', which could include some forms of both NETs and SCE undertaken in the marine environment (IMO, 2013). Furthermore, the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection of the International Maritime Organisation established a working group on marine geoengineering to, among other things, help operationalise this amendment (GESAMP, n.d.).

Meanwhile, the parties to the Convention on Biological Diversity (CBD) expressed their concern and requested that countries not allow ocean fertilisation, except for small-scale studies, until there is an adequate scientific basis, consideration of the risks and effective regulation (CBD COP, 2008: paragraph C.4). They went on to later broaden their statement to include all climate engineering activities that may affect biodiversity (CBD COP, 2010: Paragraph 8[w]). In 2016, they reaffirmed their previous statements while also noting that more research is needed (CBD COP, 2016). The CBD statements are the only outputs of an international legal institution with widespread participation that address climate engineering in its entirety.

The United Nations Convention of the Law of the Sea is another international legal agreement with broad participation that could contribute to international climate engineering governance. This could apply to a wide range of climate engineering techniques because its parties have committed to protect and preserve the marine environment, which is usually understood to include the marine atmosphere (UNCLOS, 1982: Article 192; Frank, 2007: 12). In this, they are to – among other things – 'prevent, reduce and control pollution of the marine environment from any source', including from land-based sources (UNCLOS, 1982: Article 194). Notably, the definition of pollution in the United Nations Convention of the Law of the Sea implicitly includes GHGs, global warming and – if it were likely to have deleterious effects on people and the marine environment – climate

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engineering (UNCLOS, 1982: Article 1.1[4]). Applying such provisions to climate engineering would require a difficult balancing of the impacts on the marine environment of climate change and climate engineering.

A handful of other international legal instruments could also play roles. First, many climate engineering techniques would satisfy the definition of 'environmental modification' under the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (UNGA, 1976: Article II). The parties to this agreement would be obligated to refrain from military and hostile uses of climate engineering that would have widespread, long-lasting or severe effects as their means of harm (UNGA, 1976: Article I.1). At the same time, the treaty calls for the peaceful development of environmental modification (UNGA, 1976: Preamble and Article III). Second, if stratospheric aerosol injection SCE were to contribute to the depletion of stratospheric ozone – as sulphur, the leading candidate substance, might – then the Vienna Convention for the Protection of the Ozone Layer and its Montreal Protocol could regulate the activity. Third, stratospheric aerosol injection SCE with sulphur could also fall within the purview of the Convention on Long-Range Transboundary Air Pollution and its protocols. Under this treaty, European and North American countries agreed to reduce acid rain precursors, including atmospheric sulphur. Finally, the Governing Council of the United Nations Environment Programme (UNEP) developed nonbinding Provisions for Co-operation between States in Weather Modification. As with the Environmental Modification Convention, many climate engineering methods – especially SCE – would satisfy this document's definition of weather modification (UNEP, 1980: footnote). It is supportive of weather modification 'dedicated to the benefit of mankind [*sic*] and the environment', asks states not to use it to harm other states' environments and areas beyond national jurisdiction and calls for international cooperation and communication (UNEP, 1980: paragraphs 1[a], 1[b], 1[f] and 1[h]).

Finally, some intergovernmental institutions have engaged with climate engineering. For example, the IPCC held an expert meeting on climate engineering and is expected to dedicate a chapter to the topic in its next Assessment Report (Edenhofer *et al.*, 2012; Goldenberg, 2016). Meanwhile, the IPCC special report on the 1.5°C goal will, among other things, assess the ability of NETs to contribute to the goal (IPCC, 2016). UNESCO hosted an expert meeting, whose participants proposed an international climate engineering research programme sponsored by UNESCO's Intergovernmental Oceanographic Commission, the International Council for Science and the World Meteorological Organization (UNESCO, 2010). That latter institution is developing a position statement on climate engineering (Bruintjes, 2015). In this process, it will reportedly cooperate with the

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World Climate Research Programme, the Intergovernmental Oceanographic Commission, the International Maritime Organization and other bodies.

16.3.2 Countries and the European Union

States either are involved in climate engineering governance only at the margin or are absent entirely. In addition to participating in the CBD and London Convention and London Protocol negotiations described earlier in this chapter, a few countries have taken specific actions in this area. The governments of both the United Kingdom and Germany have issued reports, offered dedicated funding for research and issued official statements that cautiously support the consideration of climate engineering (UK Department of Energy and Climate Change, 2010; Schütte, 2014). The governments of China, Finland, India, Japan and Norway have financially supported climate engineering research. The Russian government's comments on an IPCC report encouraged continued research into climate engineering as a 'possible solution' (IPCC, 2014: 2). In the United States, a report issued during the last month of the Obama administration recommended federal funding of climate engineering research (US Global Change Research Program, 2017). By contrast, Bolivia's leadership has opposed climate engineering (Estado Plurinacional de Bolivia, 2011). Finally, although the European Union (EU) is not a country, its leadership establishes the contours of the climate policies of its Member States in a quasi-federal manner. The EU has funded two international climate engineering research projects and its Commissioner for Climate Action and Energy implied that NETs might be part of the future climate policy mix of the EU (Neslen, 2015).

16.3.3 Non-state Actors

Some non-state actors have contributed in various ways to climate engineering governance (see also Zelli, Möller and van Asselt, 2017). This section reviews their activities in five categories, although the lines distinguishing them are not completely clear. First, several scientific and professional organisations have made assessments, offered recommendations and taken positions. The reports of the United Kingdom's Royal Society and the US National Academies have been particularly influential (Shepherd *et al.*, 2009; McNutt *et al.*, 2015a, 2015b). Other organisations that have taken positions on climate engineering include the American Meteorological Society, the American Geophysical Union, the Institution of Mechanical Engineers and the International Commission on Clouds and Precipitation of the International Association of Meteorology and Atmospheric Sciences. In the case of ocean fertilisation, more than a dozen universities and other

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research institutions formed the In-Situ Iron Studies Consortium in order to promote research, including compliance with the standards of the London Convention and London Protocol. Each of these scientific and professional organisations called for further climate engineering research.

Policy-oriented and advocacy non-governmental organisations constitute another broad category of non-state actors. The Carnegie Climate Geoengineering Governance Initiative, led by a veteran international climate policy negotiator, facilitates the development of climate engineering governance in the global policy arena. The Solar Radiation Management Governance Initiative increases the involvement of developing countries and their residents in SCE discourses. In addition, a few environmental groups have taken a range of positions regarding climate engineering. Those whose platforms are more oriented towards the inherent value of nature and are more critical of existing social and institutional arrangements more frequently oppose climate engineering (e.g. Greenpeace International, 2010). By contrast, those that are more concerned with reducing demonstrable negative impacts on people, species and ecosystems and are less critical of existing arrangements are more likely to cautiously endorse climate engineering research (e.g. Environmental Defense Fund, 2015). Environmental groups are generally more strongly opposed to (or less supportive of) SCE than NETs (e.g. Friends of the Earth UK, 2009). Regardless, even these environmental organisations dedicate few resources to climate engineering, and many are reluctant to discuss it (Nicholson *et al.*, 2013). Finally, from a different perspective, the conservative think tank American Enterprise Institute housed a small project on climate engineering for a few years.

Third, a handful of philanthropists and foundations have supported climate engineering research. For example, Bill Gates has done so via a special fund, and Richard Branson has offered a $25 million prize for a scalable and sustainable NET. Other sources include more established ones such as the Hewlett and Sloan foundations.

Businesses – primarily small ones – have invested in NETs but are absent from SCE. This is consistent with the prospect that the former, like mitigation, could be a profitable enterprise in the presence of a sufficiently large carbon price, whereas there will likely be little direct financial incentive for the latter. As noted earlier, the proposals of two now-defunct firms to commercialise ocean fertilisation catalysed its governance through international legal instruments and institutions, and a third company's actions generated further controversy. One of these first two – Climos – developed a code of responsible conduct of ocean fertilisation (Climos, 2007). Other small businesses are developing direct air capture and enhanced weathering with an eye towards eventual profit. Among large firms, Shell issued a report on net zero emissions

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that includes NETs in several scenarios, but its chief climate change adviser is sceptical of SCE (Shell, 2016; Hone, 2017).

Scholars are the final category of non-state actors who have participated in climate engineering governance. Of course, many of them have written articles, chapters and books in the natural and social sciences that might satisfy the definition of *governance*. They have also contributed to the activities of scientific and professional organisations described earlier. Some have proactively helped build bridges from the present absence of dedicated legal instruments and institutions to a future of international governance. For example, the Forum for Climate Engineering Assessment at American University expands and strengthens the discussions of climate engineering and its governance. Other scholars have proposed general principles for climate engineering, emphasising transparency, public participation and independent assessment (MacCracken *et al.*, 2010; Long *et al.*, 2011: 13–14; Rayner *et al.*, 2013). These principles are now being detailed as a proposed code of conduct for climate engineering research that is based upon international environmental law (Hubert, 2017).

16.4 Analysis

This volume describes and assesses polycentric theories of climate governance in which decision-making sites are plural, diverse and multilevel. In these, climate governance is not enacted monocentrically via national and international law, but instead through a dynamic and innovative transnational network of governing rules, institutions and actors who govern in divergent ways (see Chapter 1).

The present governance of climate engineering is consistent with a polycentric view, in that numerous varied governing units operate at multiple scales and relate to each other non-hierarchically while remaining fairly autonomous within their own domains. However, from a perspective that is somewhat sceptical of the polycentricity of SCE governance, climate engineering governance could be seen as polycentric merely by default. The technological proposals that constitute climate engineering arose in a context of existing governing instruments and institutions that had been developed for other purposes and that climate engineering and its constituent elements happen to transect. The fact that numerous international legal instruments and institutions with diverse objectives, scopes, degrees of legalisation and participation would govern climate engineering activities could be a haphazard outcome rather than a polycentric one. However, this interpretation of polycentric governance relies on a narrow, legal understanding of governance.

An alternate – and arguably more accurate – perspective rests on a broader understanding of governance. Seen through this lens, the previous section shows

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that heterogeneous intergovernmental, national and non-state actors have taken steps to intentionally direct their own and others' behaviour so that climate engineering will be more likely to develop responsibly. They have sometimes done so in ways that are innovative, arguably due to climate engineering's novel and dynamic character. For example, the UNFCCC and the IPCC are gradually incorporating NETs, while parties to the CBD voice concern regarding climate engineering more generally. Meanwhile, some countries, the EU and philanthropists are funding research, and various non-state actors help set the agenda, broker knowledge and suggest foundational norms from the bottom up. Ultimately, the resulting governance remains inchoate and inconsistent.

Climate engineering governance exhibits three specific characteristics that are at least indicative of polycentric governance. First, these instances of governance are, as Ostrom suggested, developing within an overarching set of rules, in this case international environmental law. When they have substantially diverged, it has often been due to differing interpretations of legal principles and instruments in a *de novo* situation. Second, governing actors have experimented under these dynamic and uncertain conditions. For example, the amendment to the London Protocol would expand the application of the treaty beyond marine dumping to all 'marine geoengineering'. Third, these actors have responded to each other, via processes of mutual adjustment. The dynamic between the parties to the CBD and those to the London Convention and London Protocol, as they negotiated their regulatory boundaries with respect to marine geoengineering from 2007 to 2013, is illustrative of this.

On the other hand, upon closer investigation, the latter two of these three characteristics that indicate polycentricity are less convincing. Although governing actors have experimented, this has not been the 'typical' policy experimentation that Ostrom had in mind, in which roughly similar governing units independently try different approaches to a given problem, and subsequently mutually learn. And although they have adjusted to one another, instead of learning and collaboration that usually constitutes adjustment in theories of polycentric governance, this adjustment appears necessary under legal and scientific uncertainty.

We can expect climate engineering to change in the future, both technologically and socially. How might climate engineering governance respond? In the relatively short term, it appears likely to continue to be polycentric, if not increasingly so. The various proposed techniques pose multiple opportunities and challenges, and innovation's dynamism calls for governance practices that can experiment and adapt. In fact, the speed of technological change often surpasses the ability of governance to adapt, presenting legal challenges and regulatory dilemmas (Collingridge, 1980; Brownsword, 2008). Not only are the usual sites of hierarchical and static governance (e.g. intergovernmental and national actors) poorly

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structured to govern in this way but their leaders also have little incentive to tread into this politically treacherous terrain (Horton and Reynolds, 2016). Instead, a wider array of non-state actors – including funders, research institutions, publishers, investors and entrepreneurs – could play substantial roles in coordinating climate engineering activities, fostering cooperation and ensuring responsible practices. As these activities expand, for-profit actors will likely assume a higher profile, particularly in relation to NETs (but see Reynolds, Contreras and Sarnoff, 2017). To some extent, national and subnational actors can manage some of climate engineering's local environmental and social impacts. Furthermore, several international institutions have remits that touch upon climate engineering, and these bodies can be expected to compete and cooperate in contributing to governance. Even if these diverse governing actors did seek centralised and harmonised governance, reaching agreement in such an uncertain and contested terrain would be difficult. Heterogeneity is likely to persist.

The case of ocean fertilisation lends support to this expectation of continued or growing polycentricity. That technology was researched and debated, and its governance developed, earlier and to a greater extent than the other proposed climate engineering technologies. Notably, although it is an NET, its governance needs resemble those of SCE: it would pose environmental risks in areas beyond national jurisdiction and researchers once believed (but no longer do) that it could greatly reduce climate change at low financial costs (McNutt *et al.*, 2015a: 47–53). Its governance is both more mature and noticeably more polycentric. Here, numerous and varied intergovernmental bodies, national governments, scientific and professional societies, environmental organisations, businesses and scientists have each exercised governance authority within their domains in ways that are alternately mutually reinforcing and partially conflictual.

16.5 Conclusions

In the longer term, there might be limits to this polycentricity. According to models, NETs should scale up dramatically in order to prevent dangerous climate change. Given the costs and local risks, states and other actors will be reluctant to provide such a public good without incentives to do so and assurances that others are likewise contributing. Although the bottom-up (but still centrally coordinated) Paris Agreement might offer a sufficient framework to facilitate NETs, more centralised mechanisms such as an international carbon price will be needed to grow if NETs are to scale up in practice. In the case of SCE, the long-term limits of polycentric governance are even clearer. On the scale of outdoor experiments that would have global effects, central coordination would be necessary to, at the very least, ensure that the tests do not interfere with one another. More importantly,

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activities that would affect the global climate would need some sort of international agreement in order to be perceived as legitimate. Because climate has impacts on core national interests, such as food production and extreme weather events, states – especially the powerful ones – will likely insist upon taking the lead in this process. Polycentric governance would be poorly suited to resolve possible strategic conflicts among states.

The implications of the governance of climate engineering for that of climate change more generally are uncertain, as the two phenomena have distinct histories and trajectories. The rise of concerns regarding anthropogenic climate change in the late 1980s quickly led to an international treaty that attracted universal participation. Subsequent governance was assumed – at least implicitly – to be global and hierarchical to some degree. Roughly 15 years later, both the uncertainty of the Kyoto Protocol's actual impact as well as the need for adaptation, which is less amenable to international governance, became clear. Consequently, the assumptions regarding centralised climate governance began to yield insights regarding the reality and potential of polycentric governance (see e.g. Prins *et al.*, 2010). By contrast, as described earlier, discussions of climate engineering arose within and across an already diverse governance landscape. However, in the long run, climate engineering – and especially SCE – appears likely to require a form of governance that is substantially more monocentric than is in existence in the world today. This need is more acute if we are to achieve the goals of the Paris Agreement.

Note

1. Cirrus cloud removal is a third distinct means, but is less well developed than the first two and has governance needs much like those of SCE.

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17

Adaptation

The Neglected Dimension of Polycentric Climate Governance?

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17.1 Introduction

Adaptation and mitigation are two distinctive policy responses to anthropogenic climate change. In the past, the international climate change regime established by the United Nations Framework Convention on Climate Change (UNFCCC) emphasised the importance of reducing greenhouse gas emissions. International policy efforts, therefore, were orientated towards designing laws, policies and instruments to reduce emissions globally in an attempt to prevent anthropogenic climate change. Over the past two decades, the global climate regime has created a significant architecture to govern climate change mitigation globally by setting targets and identifying uniform instruments such as emissions trading systems to be implemented by member states. The effectiveness of this centralised climate governance architecture has been contested, however. The Paris Agreement presents a welcome paradigmatic shift in the international climate regime, as it no longer tries to achieve greenhouse gas emissions using a centralised mode of governance, but rather creates room for a more polycentric mode of governance (see Chapter 1).

Adaptation, on the other hand, was considered to be further down the political agenda – a distraction from the more urgent issue of avoiding the problem in the first place via taking mitigating actions (Biesbroek, Swart and van der Knaap, 2009; Lesnikowski *et al.*, 2017). Nonetheless, adaptation is a long-standing component of the international climate policy agenda. Until recently, however, it was largely framed as an issue relevant mainly to low-income countries. This dominant discourse changed in the mid-2000s, when it was politically acknowledged that some degree of climate change was unavoidable as emissions were not reduced quickly enough and that adaptation would be necessary to manage these impacts across all regions, in spite of efforts directed at mitigation. International debates on adaptation in the global arena have mostly centred around the politically sensitive

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issue of climate adaptation finance: should industrialised countries be held responsible for current climate change (i.e. failure to mitigate sufficiently) and therefore pay the most vulnerable developing countries and societal groups? If so, how much money is needed? And how should this money be distributed? Irrespective of these interminable debates, the global arena has paid very limited political attention to adaptation, and very few specific institutions and legal mandates on adaptation exist even today.

The lack of focused political attention to adaptation at the international level has resulted in a number of institutional voids. As a result of the increasing recognition of the need for adaptation action to manage the unavailable climate impacts, state and non-state actors across the globe have started to implement adaptation in an autonomous, bottom-up and self-organising fashion (Berrang-Ford *et al.*, 2011; Berrang-Ford *et al.*, 2014), thus appearing to confirm the first and most important proposition in polycentric theory ('local action'; see Chapter 1). In 2009, for example, 9 out of 28 European Union (EU) Member States had developed national adaptation strategies (Biesbroek *et al.*, 2010). By 2013, this number had increased to 21 (EEA, 2014). With regard to concrete policy actions, longitudinal studies observe a stark increase in the past decade: Lesnikowski *et al.* (2016) observe an increase of 84 per cent of reported adaptation work among 41 Annex I (high-income) countries between 2010 and 2014. Many of these concrete adaptation initiatives, however, are not initiated as a result of monocentric steering; in many cases, there are no shared rules that set goals or standards for how to adapt, nor are there specific guidelines or enforcement mechanisms. In fact, very few countries have dedicated legal frameworks for adaptation, although the number is increasing (Lesnikowski *et al.*, 2016). Instead, actors seem to be driven by, for example, experiences of local climate impacts, entrepreneurship, cooperative learning and policy diffusion – again exemplifying some of the core propositions of polycentric governance theory.

Consequently, the current adaptation landscape is still highly fragmented, characterised by unequal progress across contexts and unstable and ephemeral governance arrangements that suffer from high transaction costs. Some networks have self-organised to push for political commitments on adaptation, promote adaptation initiatives, share lessons learned and prevent negative trade-offs. New transnational institutional arrangements such as the EU Climate Change Adaptation strategy package, as well as non-governmental initiatives under the Covenant of Mayors and alliances such as the Africa Climate Change Resilience Alliance, are just a few examples of the soft and (in)formal networks designed to coordinate across scales and contexts. The Paris Agreement, where for the first time adaptation figures prominently alongside mitigation, aims to capitalise on this momentum and push for a stronger coordinated and globalised adaptation effort by setting a global

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goal on adaptation. Indeed, while mitigation has started from a centralised mode of governance and adaptation from bottom-up modes of governance, both seem to be gradually converging in a more polycentric model of climate governance. This is evident in the Paris Agreement's emphasis on the social responsibility of multiple (non-)state actors across different scales to join forces, self-organise and implement mitigation and adaptation measures (Jordan *et al.*, 2015; see also Chapter 2).

The aim of this chapter is to critically reflect on the notion of polycentric governance and whether there are signs that a polycentric adaptation governance landscape is emerging. We first discuss in greater detail the governance of adaptation, highlighting key differences relative to governing mitigation. We then examine to what extent the existing literature on adaptation has characterised polycentric governance and its features. Finally, we use the characteristics of polycentric governance as set out at the start of this volume to assess whether there are signs of an emerging polycentric adaptation governance landscape (see Chapter 1).

17.2 Governing Climate Change Adaptation

The study of climate change adaptation largely emerged as distinct from climate change policy for mitigation in the mid-2000s. Early writing on adaptation focused on understanding key concepts like vulnerability and adaptive capacity, and assessing how the climate is expected to change, how costs and benefits of these impacts will be distributed and how vulnerability can be reduced (Smit *et al.*, 2000; Burton *et al.*, 2002; Smit and Wandel, 2006). There are two main discourses on vulnerability that have determined how adaptation is framed and governed: social vulnerability and climate impacts vulnerability (O'Brien *et al.*, 2007). The first discourse emphasises the global distribution of *social vulnerability*, highlighting societal groups and regions that will be unequally affected by climate impacts, particularly in low-income countries. The root cause of social vulnerability is not anthropogenic climate change, but rather a combination of complex social factors, including inequity and inequalities, poverty, poor education, high crime rates and limited access to healthcare. Climate change is expected to act as an amplifier of these pre-existing facets of social vulnerability. Adaptation is thus understood as the reduction of social vulnerability, which introduces a focus on intersections with development and development aid. A second discourse emphasises the *additional impacts* caused by anthropogenic climate change. Existing institutions, policies and practices were designed to deal with the natural variability of the climate system, but given the limitations of these systems to cope with projected climate change, additional policy efforts are needed to manage the increased climate risks (O'Brien *et al.*, 2007). Adaptation in this discourse revolves mostly around

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explicitly formulated and highly intentional actions that target these additional climate change impacts (Dupuis and Biesbroek, 2013).

These different discourses characterise the different sociopolitical interests in adaptation and have greatly influenced the (inter)national negotiations on climate change adaptation. Indeed, the most recent definition used by the Intergovernmental Panel on Climate Change combines both discourses by stating that adaptation is 'the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects' (IPCC, 2014: 118). Adaptation can be focused on maintaining the essence of the impacted system (*incremental* adaptation, or resilience), or changing fundamental attributes of the system to respond to the impacts of climate change or its effects (*transformational* adaptation). Furthermore, it can be the result of deliberate policy decisions and planning as to how to deal with climate change and its effects (*planned* adaptation), or the consequence of continuous independent changes of the system in response to various socio-ecological stimuli (*autonomous* adaptation). The literature on the governance of adaptation predominantly focuses on planned adaptation, which in itself has multiple dimensions.

Therefore, while mitigation and adaptation are both approaches to combating climate change, in its essence adaptation is fundamentally different from mitigation (Biesbroek *et al.*, 2009). As Table 17.1 summarises, for mitigation, there is a clear global goal (i.e. limit warming to 2 or 1.5°C), with specific measurement units (i.e. parts per million of carbon dioxide concentrations in the atmosphere, or tonnes of carbon dioxide equivalent emissions) that can be measured more or less objectively. This is not the case for adaptation. Although a global goal on adaptation is included in the Paris Agreement (i.e. enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change), the goal is very broad and does not function as a collective target to achieve. After all, the impacts of climate change are predicted to vary greatly across regions and vulnerable groups, and the capacity to adapt is distributed unequally across the globe. Moreover, adaptation is a process – there is no clear end point or final state of 'being adapted', but rather a continuous process of adjustment and change. For adaptation, the aim is thus to mainstream appropriate responses into vulnerable sectors, regions and societal groups. For example, adaptation in the public health sector aims to adjust procedures and systems to better respond to a range of risks affected by changing global temperatures, including the spread of vector-borne diseases and increased frequency and intensity of heatwaves (Austin *et al.*, 2016). Developing a quantifiable goal and universal measurement units that can be objectively applied is therefore highly problematic given the complexity of contexts in which adaptation is becoming relevant (Ford *et al.*, 2015). Although some have argued for using reduced vulnerability or climate

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Table 17.1 *Differences between mitigation and adaptation*

	Mitigation	Adaptation
Definition	Reducing the cause of anthropogenic climate change	Adjusting to the unavoidable impacts of anthropogenic *and* natural climate change
Scale of problem	Solution to global problem, but requires implementation across all scales	Solutions to mostly local and regional problems but which can have global implications (e.g. food insecurity, climate migration)
Policy goal	Limit to well below 2°C global average temperature increase since pre-industrial levels, preferably limiting to 1.5°C	Enhance adaptive capacity, strengthening resilience and reducing vulnerability to climate change
Key indicators of success	Quantifiable: e.g. reduced greenhouse gas emissions	Difficult to quantify: e.g. impacts averted, reduced vulnerability, resources dedicated to specific policies or projects
Role of politics	Highly politicised in most instances	Depoliticised and technocratic in most instances
Policy timescale	Medium to long term	Short to medium term (and increasingly long term)

Sources: Biesbroek *et al*. (2009); Locatelli *et al.* (2015).

impacts averted as indicators for successful adaptation, these indicators – and how they are designed – are highly contested in the literature, making it extremely difficult to assess progress on adaptation globally, evaluate which governance interventions work (and which do not), and determine whether current investments in adaptation finance are sufficient. Finally, adaptation is often not very appealing for private-sector finance, as building seawalls, changing building codes and enhancing water retention projects are targeting public goods that tend to fall under the responsibility of state and local governments. Private-sector finance for public goods, as is the case in, for example, clean energy projects and technological development in mitigation, rarely happens in the context of climate change adaptation.

17.3 How to Govern Adaptation: Adaptive, Multilevel and Network Governance Theory

An examination of the adaptation governance literature indicates that polycentric governance is rarely used as an explicit concept or theory in the context of climate change adaptation. Instead, most studies on the governance of adaptation build on

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three different but related strands of theory in which most adaptation research has been conducted: adaptive governance, multilevel governance and network governance.

17.3.1 Adaptive Governance

Within adaptation scholarship, polycentric governance is largely approached as a mechanism or a pathway for *adaptive governance*. Some of the adaptation scholarship that borrows from adaptive governance theory assumes that the inherent uncertainties and dynamic complexities associated with adapting to climate change impacts require governance systems to be highly flexible, with embedded redundancies that increase resilience to system shocks (Djalante *et al.*, 2013; Herrfahrdt-Pähle, 2013). Monocentric, state-based systems, on the other hand, are considered ill suited to dealing with rapid environmental change and delivering contextually sensitive solutions (Chaffin, Gosnell and Cosens, 2014), and system transformations are needed to enable more adaptive forms of governance to emerge. Pahl-Wostl *et al.* (2012) specify polycentricity as a structural feature of adaptive governance systems that distributes decision-making powers across the system and ensures coordination through an overarching system of norms and rules that defines the logic of interactions between actors. This literature also stresses the importance of the potential to encourage experimentation and bespoke solutions across scale, place and time (Becker, Huitema and Aerts, 2015), and to promote knowledge-pooling and learning opportunities (Djalante *et al.*, 2013). Plummer *et al.*'s (2012) synthesis of the adaptive co-management literature concludes that issues of scale interplay and scale fit, adaptiveness, flexibility and learning, evaluation and knowledge are crucial components of governing complex socio-ecological systems.

From a normative standpoint, successful polycentric systems for adaptation therefore require feedback pathways through which new information about human–environment interactions, values and goals and uncertainty can be integrated into decision-making processes. Without ongoing scientific monitoring, governance systems are therefore unable to adjust in light of uncertainty and nonlinear change (Chaffin *et al.*, 2014). For example, Nelson, Howden and Smith (2008) argue that the risk of failure in policy experimentation is managed through redundancies built into the institutional structure of polycentric systems, whereas in systems with irreducible scales, governing by trial and error leaves systems vulnerable to failure. Other authors try to provide concrete tools and methods to support decision-makers in designing flexible policies that deal with the uncertainties and system dynamics, for example the work on dynamic adaptation pathways (Haasnoot *et al.*, 2013). These authors argue that technocratic and linear models of

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decision-making no longer suffice as they oversimplify complex realities and cannot deal with the large uncertainties associated with climate change. Through continuous learning, experimentation and acquiring new knowledge of how the climate system changes, initial adaptation actions might need to change, thus requiring flexibility in the pathways to prevent lock-in and maladaptive decision-making.

Although a strong normative claim is made in favour of polycentric governance principles, very few studies empirically demonstrate the value of such approaches for climate change adaptation (e.g. Karpouzoglou, Dewulf and Clark, 2016). In one exception, however, Pahl-Wostl *et al.*'s (2012) comparative study of governance arrangements in water resource management indicates that regimes with multiple centres of decision-making and strong coordination mechanisms demonstrate better water management outcomes; as such, they argue that polycentric regimes may be an important pathway towards building adaptive capacity.

17.3.2 Multilevel Governance

The second strand in the literature focuses on the *multilevel governance* characteristics of the system, and the mismatch between the level(s) at which policy problems manifest and the level(s) at which they are managed. This literature responds to a strong emphasis on 'localism' that dominates much of the adaptation literature. In line with the polycentric governance literature, several scholars emphasise and advocate for decision-making empowerment at lower jurisdictional levels, particularly among local governments, while ascribing responsibility for oversight and knowledge diffusion to higher levels of government (Becker *et al.*, 2015). Much of this literature has focused on the emergence of possible tensions and mismatches that follow from connecting across levels and scales. For example, the limited powers of local governments and discursive conflicts among networks of state and non-state actors over how to frame climate policy can challenge the ability of cities to take a leading role in climate change planning (Bulkeley and Betsill, 2005; see also Chapter 5). Keskitalo *et al.* (2016), for example, observe that in Nordic countries, limited leadership from national governments has partially contributed to a pattern of soft and voluntary adaptation policy approaches at the local level, and limited observable success in advancing adaptation implementation. The authors argue that this points to the need to integrate adaptation requirements into more traditional regulatory regimes and instruments that can be more directly enforced by the state. Similarly, Westerhoff, Keskitalo and Juhola (2011), examining adaptation in Finland, Italy and Sweden, find that where adaptation is not mandated from the central government, local climate change action tends to emerge without the financial and staff resources necessary for the long-term

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success of adaptation. This trend has significant distributional effects between local governments within a country, where those larger cities with stronger tax bases and networks of experts can better substitute this lack of support using local resources. Small and medium-sized municipalities, however, might suffer from a competitive disadvantage vis-à-vis these 'early adapters' who consume much of the issue attention and scarce resources.

Empirical studies on local adaptation identify a number of structural, procedural and contextual challenges for local government engagement with adaptation, including: (1) a lack of adequate climate information and future scenarios to guide local decision-making; (2) limited or no guidance from national- and state-level governments on adaptation priorities; (3) mismatches between existing statutory and revenue-generating powers and the major decisions required for effective adaptation at the local level; (4) scarce resources and competing policy priorities that local governments have to balance; (5) departmental fragmentation and competition for scarce resources; and (6) different problem framings that lead local governments to approach adaptation in divergent ways, sometimes leading to maladaptive practices (e.g. Mukheibir *et al.*, 2013). Even in countries where adaptation emerged as a priority at the national level first, fragmentation of governance efforts across vulnerable regions is still observable. For example, Finland, an early adopter of national adaptation policy, has emphasised the mainstreaming of adaptation into national administrative sectors, while lower levels of government are pursuing separate and voluntary climate strategies, with limited input from senior government (Keskitalo, 2010). This adaptation scholarship thus recognises the fragmented adaptation landscape and, building on multilevel governance insights, stresses the need for a governance system that actively steers adaptation decision-making across levels, distributes tasks, responsibilities and resources equally and ensures cooperation and some level of conflict resolution between competing actions, referring frequently to forms of meta-governance.

17.3.3 Network Governance

The third strand of the adaptation literature that addresses polycentric characteristics is, as noted in Chapter 1, *network governance*. Much of this literature emphasises the relationship between public and private actors and seeks to address how different network configurations increase trust among different stakeholders. The literature investigates, for example, different types of governance arrangements that bring together different public and private stakeholders with vastly varying tasks and responsibilities (Tompkins and Eakin, 2012). These studies show that governments play an important role in creating and maintaining these networks in efforts to connect public and private actors. Mees (2017), for example,

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shows in her study of 20 governance arrangements in North American and European cities that local authorities are initiating most of these processes and are in the driver's seat throughout, leaving limited room for private-sector and civil society initiatives for self-governing. Many network governance studies demonstrate potential for collaboration but also highlight potential weaknesses, including the need for trust, conflicting norms and values, blurring of responsibilities, the inability to actually influence decision-making and the 'shadow of hierarchy' that might still exist. Schmidt *et al.*'s (2013) study on collaborative governance finds issues such as repeated participation of network members, appropriate information and network management and inclusive and responsive network practices amongst the most important factors for successful network governance of climate change adaptation.

Some of this literature specifically stresses the importance of network structure and relationships between stakeholders to organise connectivity within those governance arrangements (Termeer *et al.*, 2011). In the context of water governance, for example, Horning, Bauer and Cohen (2016) show the importance of the core-periphery network structure, and the consequence of asymmetry in power in terms of limited diversity of input and decision-making authority. They argue that the disconnect between core and periphery within these networks needs to be addressed through bridging and bonding efforts, i.e. by bringing in 'bridging actors' that have a high degree of contextual understanding, legitimacy and trust of the other network members. Such bridging to increase connectivity can take different forms, some of which are quite monocentric in nature.

17.4 Emergence of a Polycentric Adaptation Landscape?

The three strands of the climate change adaptation literature demonstrate that many of the studies on adaptation include key characteristics of a polycentric governance system. We bring these together here to critically reflect whether a polycentric adaptation landscape is indeed emerging using the propositions discussed in Chapter 1: local action, mutual adjustment, experimentation, trust and overarching rules.

17.4.1 Local Action

Polycentric governance emphasises the inadequacies of one-size-fits-all approaches to managing environmental issues, and instead points to small-scale, local solutions as the most effective entry point for collective action. The city of Rotterdam in the Netherlands, for example, self-organised its comprehensive adaptation programme to ensure timely adaptation (Biesbroek *et al.*, 2014).

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There is widespread evidence in adaptation scholarship that many cities and local regions across the globe have already taken measures to adapt to climate change. Reckien *et al.*'s (2014) study of 200 large and medium-sized European cities sampled from 11 countries found that 28 per cent of cities had formal climate adaptation plans. Meanwhile, participation in climate policy networks seems to correlate with increased likelihood of local adaptation policies (Ryan, 2015). In a survey of 350 local governments participating in the ICLEI network, Aylett (2015), for example, finds that nearly three-quarters of respondent cities are engaging with adaptation planning in addition to mitigation.

However, much of the local-level adaptation literature is biased towards cities that have engaged with adaptation, but does not ask why many cities are *not adapting* (see also Chapter 5). Looking at more than 400 global cities of more than one million inhabitants, Araos *et al.* (2016) found that 81 per cent of the cities do not demonstrate any signs of developing and implementing climate change adaptation initiatives. Similarly, small and medium-sized towns and cities are reported to face considerable constraints when it comes to policy capacity to start adapting, particularly in low-income countries (Wisner *et al.*, 2015). While some local governments act as key sites for adaptation planning, ongoing pressures around decentralisation and privatisation across countries frequently result in the downloading of adaptation responsibilities to regional or local governments without additional and sufficient resources or decision-making powers. Romero-Lankao (2012) argues that rather than encouraging local control of adaptation planning, this practice is in fact undermining local resilience and institutional capacity. Some scholars have argued that in the adaptation discourse, local action has become such a powerful heuristic that it is actually harming the intellectual debates and concrete policy advice on how to adapt to climate change by over-simplifying complex intersections between jurisdiction, authority and impact scales, particularly with regards to addressing underlying drivers of social vulnerability. Nalau, Preston and Maloney (2015), for example, convincingly argue that emphasis on local action is ignoring multiscale climate risks and interdependencies between different parts of the globe, and that many policy actions might need to be implemented at higher levels of government to ensure efficiency (e.g. building and maintaining national flood defence systems).

In conclusion, whilst adaptation is indeed emerging from myriad bottom-up initiatives, and many of the actions are local, there are many parts across the globe where intentional climate change adaptation is not taking place. Moreover, the 'adaptation is local' heuristic is highly problematic as it suggests that there are no trade-offs between different contexts and that higher (inter)national-level coordination is not necessary for climate action.

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17.4.2 Mutual Adjustment

Polycentric theory assumes that independent governing units mutually adjust to allow for collaborations to address a particular issue. Examples from network governance literature demonstrate the emphasis on creating self-organising structures in climate change adaptation. For example, Fünfgeld (2015) discusses how transnational municipal networks have the potential to support local adaptation as they provide greater flexibility than government adaptation policy and encourage experimentation. Other networks and partnerships have emerged to share practices, exchange ideas and distribute knowledge and often take fluid forms; they exist for a short(er) period of time before being dismantled. Of particular interest in the context of mutual adjustment is the concept of *synchronisation* that some adaptation scholars have used. Synchronisation is linked to the argument of co-evolution, where different systems exert multiple influences on each other, therefore shaping the evolution of the governance system – for example parasitic, interferential and symbiotic co-evolution. It assumes that most organisations and sectors do not have the capacity to organise stable and durable connectivity between governing units and therefore require some collaboration to govern adaptation (van Buuren and Gerrits, 2011). Coherent chains of interactions of the various interconnected governing units are needed to manage decision-making. Hence, interaction and reflection among actors is necessary to make sense of one another's actions and to allow for gradual (or abrupt) alignment. Organising synchronisation is to some extent dependent on the ability of actors to connect individuals and governance processes that all have their own development logic and self-organising dynamics. The emphasis is therefore on creating an enabling governance arena that allows for interactions. Verkerk, Teisman and van Buuren (2015), for example, show how the Dutch national government's 'Delta programme' co-produced governance arrangements that allowed for synchronisation to occur between the different levels and actors involved in decision-making about long-term water safety in the Netherlands. Mutual adjustments are thus a potentially key part of the debates on adaptation, and empirical evidence suggests that mutual adjustments are increasingly advocated, providing room for governing units to connect and collaborate and create trusting relations.

17.4.3 Experimentation

The existing literature suggests that experimentation contributes to the governance of adaptation in various ways as it offers novel options in both processes and outputs of adaptation. Across the globe, mainly local experimentations have been conducted to better understand how adaptation works, and whether lessons learned

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can be upscaled to higher levels of governance and other contexts. In their comparative urban adaptation study, Castán Broto and Bulkeley (2013), for example, assessed adaptation experimentation and innovation in 100 cities and found that local governments still play a leadership role in initiating climate adaptation experiments but that the political space becomes increasingly blurry as public and private authorities are partnering to seek specific forms of interventions in cities. Various experiments can be found, ranging from technological and architectural projects to innovative forms of public service delivery and policy implementation. The Dutch 'Building with Nature' project is an example where technological and governance experimentations are implemented by both public and private actors to better understand how natural system dynamics can be used to build flood protection. Various experiments in hydrological labs as well as in pilot study sites have helped to gain a much more thorough understanding of what possibilities this type of ecosystem-based adaptation offers (van Slobbe *et al.*, 2013). Another Dutch example is from the city of Rotterdam, where the city council heavily invested in creating a favourable political and institutional environment that allowed it to experiment with different types of adaptation measures, for example in experimenting with water plazas as temporary storage facilities for rainwater in public spaces during periods of heavy precipitation. The council considered the reward of investing in experimenting with various forms of adaptation worthwhile as it offered them a pioneering role as one of the global urban adaptation leaders (Biesbroek *et al.*, 2014). Creating political and institutional space, taking some calculated risks and learning from failure are crucial ingredients of experimentation. When the time is ripe, such experiments may diffuse or upscale to national levels or other places (see Chapter 9), as has happened in both Dutch examples. Many other such examples of local experimentation are reported in the literature, but most of these initiatives are still biased towards leading (Western democratic) cities and local contexts.

17.4.4 Trust

Trust is considered a crucial condition for adaptation, but remains an understudied topic in most studies. Studies on social capital in low-income countries have particularly stressed the importance of trust and demonstrate how new and existing relationships facilitate cooperation and collective action through trust-building (Adger, 2003). However, other studies find that too much trust and interdependency amongst community members might hamper self-organisation and mobilisation, as Paul *et al.* (2016) found in Ethiopia. Increasing social capital (and trust) could be unhelpful to strengthen ambitions, but rather results in *laissez-faire* attitudes among actors. Increasing the number and diversifying the type of actors – core

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assumptions underlying polycentric governance theory – are not necessarily generating trust to engage collectively on climate change adaptation. Consequently, introducing new actors, public or private, might rapidly erode trust, which takes time to gradually (re)build. Moreover, vicious cycles of distrust have been shown to significantly impact how local farmers in South Asia, for example, have constrained their adaptive actions as they can no longer rely on each other for community-based adaptation owing to past conflicts. Given the scarce adaptation literature on trust, it is impossible to conclude on the role of trust in polycentric climate change adaptation governance.

17.4.5 Overarching Rules

Adaptation scholarship has recognised that overarching rules are necessary. Amundsen, Berglund and Westskog (2010), for example, demonstrate that local governments prefer to have some guidance (and resources) at national and regional levels to ensure that adaptation takes place in a coherent and consistent manner, but without a formal requirement to adapt. Most adaptation is thus guided by procedural rules – for example, the requirement to have a local adaptation strategy or specific considerations of adaptation in impact assessments – rather than substantive rules of specific goals and targets to be achieved. Most of the adaptation scholarship has called for specific rules and principles to overcome barriers to adaptation that are created and/or should be removed by local governments. Very few instances of rules for conflict resolution – as suggested by Ostrom (see Chapter 1) – have been propagated. This links closely to the debate about whether climate change adaptation requires establishing a new policy field with its own logics, rules and resources. Massey and Huitema (2013), for example, show how in England, efforts are being made to develop adaptation as a specific policy field with its own substantive authority, institutional order and substantive expertise. This would mean that overarching rules are developed. However, several scholars have called for integrating climate change adaptation into existing policy subsystems, and suggest that existing rules, norms and practices in each subsystem should be considered as a starting point for adaptation (Uittenbroek, Janssen-Jansen and Runhaar, 2012), including conflict resolution. Studies show that the number of laws, policies and guidance has increased rapidly over the past years, but are particularly in place for high-income countries. In the absence of these rules, adaptation progresses in a highly uneven manner across places, jurisdictions and vulnerable groups (Lesnikowski *et al.*, 2016), even at local levels (Araos *et al.*, 2016).

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17.5 Conclusions

In this chapter, we have argued that mitigation and adaptation have followed different pathways; mitigation historically was mostly centrally governed, whereas adaptation has emerged bottom-up through processes of self-organising in the absence of strong overarching rules, principles and goals. We have demonstrated that whilst adaptation scholarship does not necessarily use polycentric governance theory, but rather adaptive governance, network governance and multilevel governance, the key characteristics of polycentric governance are nonetheless visible in the many cases from across the globe we discussed. Does this mean that adaptation mirrors the polycentric governance model that Ostrom proposed?

In several places across the globe – mostly high-income countries – early signs of the emergence of a polycentric adaptation landscape become visible. In many instances, adaptation is local, self-organising and increasingly connected, and efforts are made to create overarching sets of rules to govern adaptation. States are making efforts to seek the optimal mix between monocentric steering and polycentricity in order to reconcile some of the limitations of both modes of governance. There is ample evidence suggesting that this is proving a very successful model as early-adopting cities, regions and countries across the globe have made considerable progress.

However, these insights are biased towards high-income countries and leading cities and regions that have started to adapt. In future studies, we should be more conscious about places where adaptation is currently not taking place – or is at least not visible in current scholarship (Araos *et al.*, 2017) – and start to raise questions around whether the polycentric model is feasible in these contexts. For example, what about developing countries that are dominated by monocentric governing systems and where we currently see very few examples of experimentation, overarching rules or mutual adjustments specifically for adaptation (in contrast to, for example, disaster risk reduction or development aid)? How do these propositions of polycentricity align (or clash) with the strong state and bureaucratic structures in these contexts? Investigating the optimal mix between what is or what should be the mix between monocentric and polycentric elements in various contexts across the globe will be an important next step to govern climate change adaptation.

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18

Equity and Justice in Polycentric Climate Governance

CHUKWUMERIJE OKEREKE

18.1 Introduction

Equity and justice considerations have always been central to understanding past and current forms of global climate governance as well as the motivations and goals of different actors. Climate justice scholarship has demonstrated that concerns about equity and fairness played a significant role in shaping the form, mandate, functions and development of the United Nations Framework Convention on Climate Change (UNFCCC) (Mintzer, 1994; Grubb, 1995; Paterson, 1996; Okereke, 2007, 2010). Analyses of international climate politics after the 2015 Paris Agreement suggest that equity concerns are likely to continue to occupy a vital place in future approaches through which societal transformations in the face of climate change might be managed (Okereke and Coventry, 2016; Rajamani, 2016).

It has long been observed that while the UNFCCC was the main structure and process for coordinating the international response to climate change, the governance of climate change has involved a multiplicity of actors exercising agency and authority in a non-hierarchical mode, (co-)creating norms across different scales (Okereke, Bulkeley and Schroeder, 2009). In a sense, therefore, climate governance has always exhibited some degree of polycentricity – that is, having 'many centres of decision-making which are formally independent of each other' (Ostrom, Tiebout and Warren, 1961: 831). As one might expect, contestations for justice have also been a key feature of the different arrangements for climate governance outside of the UNFCCC, even though these have received less attention compared to analyses of justice within the international climate regime. For example, Bulkeley *et al.* (2013) and Bulkeley, Edwards and Fuller (2014) have provided an important analysis of the contestations for climate justice in global cities. Justice concerns have also been analysed in the context of transnational climate networks (Lidskog and Elander, 2010), urban climate adaptation

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(Schlosberg, 2012; Shi *et al.*, 2016), business and corporate actors (Verbruggen, 2008; Matt and Okereke, 2014) and in national climate and energy transition programmes (Newell and Phillips, 2016) – among several other issues, dimensions and scales.

In this chapter, I pursue two main objectives. First, I explore the influence of climate justice contestations on the emergence of polycentric governance. Second, I explore the implications of polycentric climate governance for climate justice as well as the potential role of equity in a more complex and fragmented global climate governance arrangement. With the entry into force of the Paris Agreement heralding a new, more voluntary approach to international climate cooperation (through nationally determined contributions), and with the increasing proliferation and diversity of actors in the climate governance space, it is fair to suggest that the global community has entered a new phase of more polycentric climate governance. It is therefore necessary to analyse, on the one hand, what this new era and architecture for climate governance means for climate justice and, on the other hand, how considerations of equity and fairness might impact the new polycentric climate governance arrangement.

This chapter starts with a brief discussion of the concept of climate justice, a mapping of the key dimensions of justice in climate policy and a review of some of the key themes and aspects of climate justice scholarship. Next, I consider the role of equity concerns in both facilitating and hindering polycentric climate governance, covering both the international and other levels of governance. I then discuss the implications of greater polycentricity for climate justice and equity, drawing attention to issues of effectiveness, transparency and accountability before ending with some concluding remarks.

18.2 Climate Justice and Equity

Broadly speaking, climate justice is concerned with the equitable distribution of rights, benefits, burdens and responsibilities associated with climate change, as well as the fair involvement of all stakeholders in the effort to address the challenge. Following Aristotle (1976), equity can be understood as decisions intended to prevent injustice arising from the rigid application of broad, just principles. Political justice and equity mostly sit on the same continuum and are here used interchangeably.

Reflecting its historical core framing as an international problem as well as the dominant role of the United Nations (UN) multilateral process in driving response options, the focus of the early climate justice literature was on the international level, especially on burden sharing between developed and developing countries (Agarwal and Narain, 1991; Shue, 1992, 1993; Grubb, 1995; Paterson, 1996a,

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1996b, 2001; Shukla, 1999). The concern for justice in the international regime is rooted in three dimensions of asymmetries, related to contributions, impacts and participation (Okereke, 2010). The first is asymmetry in the contribution, which recognises massive differences in the historical and current contributions of different countries to climate change. For example, the 20 largest economies in the world together account for 82 per cent of total global carbon dioxide emissions (Raupach *et al.*, 2014). The United States and the European Union (EU), which account for about 10 per cent of the global population, are responsible for 24 per cent of global carbon emissions, while the whole of Africa, home to about 20 per cent of the global population, accounts for just about 3 per cent of global emissions (IPCC, 2014; Wiedmann *et al.*, 2015).

The second is asymmetry in impacts, which focuses on the fact that the negative impacts of climate change will not be borne proportionately by countries (Schaeffer *et al.*, 2014). A key observation in the international climate justice literature and policy discourse is that the 'unavoidability of justice' (Shue, 1992: 373) resides in the fact that climate impacts will be disproportionately borne by the poorest nations that have contributed the least to the problem. This leads to the charge that climate change involves rich countries imposing significant risks on poorer countries (Agarwal and Narain, 1991; Okereke, 2011).

The third asymmetry relates to the ability of countries to participate in various international decision-making forums. Facing limited resources, developing countries are generally unable to attend and participate effectively in international climate meetings (Shue, 1992; Okereke, 2007; Okereke and Charlesworth, 2015). Besides being outnumbered, developing countries also very often lack the technical abilities and skills to prepare for and follow complex and lengthy negotiations (Okereke and Coventry, 2016). The lack of meaningful participation raises the possibility that climate policies may be designed in ways that fail to address the interests of the poorest countries and, in doing so, exacerbate global inequalities. Table 18.1 presents an overview of the number of delegates attending the annual UNFCCC meetings from selected developed and developing countries (based on comparable populations). It clearly demonstrates that developing countries are vastly outnumbered in the global conferences where important decisions are made.

The early climate justice literature correctly observed that the three dimensions of asymmetry (contribution, impact and participation) that characterise climate diplomacy at the international level also apply to many other dimensions and scales, such as between present and future generations (Howarth, 1992; Page, 1999), between genders (Terry, 2009) and within countries (Adger, 2001; Baer *et al.*, 2009). A running theme in the climate justice literature in the past two

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Table 18.1 *Inequity in North-South participation in UNFCCC meetings*

Country (population in millions as at 2010)	Chad (11.2)	Germany (81.8)	Ethiopia (82.1)	United Kingdom (62.4)	DR Congo (65.9)	Brazil (190)	Nigeria (160)	Canada (34)	Algeria (36)	Japan (127)
2000	2	75	5	41	2	66	15	81	8	69
2001	2	56	3	37	2	40	19	46	8	98
2002	2	54	3	43	2	30	8	54	6	73
2003	1	62	0	38	2	55	13	66	14	76
2004	1	46	2	47	6	207	18	71	13	81
2005	1	48	2	83	7	34	9	371	11	70
2006	1	45	0	40	3	15	7	48	1	39
2007	5	101	2	64	9	196	31	61	8	75
2008	2	57	2	42	2	17	11	33	2	54
2009	2	31	7	22	7	34	27	24	11	55
2010	10	110	28	75	58	736	83	93	27	135

Source: Head count by author based on UNFCCC lists of participants.

decades has been the focus on analysing climate equity *outside* the international regime. Let me briefly highlight some of the notable dimensions.

First, following the work of Paavola and Adger (2006), there has been a proliferation of literature on climate justice in the context of adaptation, reflecting the need to understand how issues of fairness are implicated at local scales of climate governance, with all the diversity and variations that characterise such geographies. More recently, there has been a growing literature on rights- and capability-based approaches to climate justice, which focus on the links between climate actions and individuals' rights to life and well-being (Schlosberg, 2012; Shi *et al.*, 2016). Somewhat related to adaptation is the issue of climate-induced loss and damage as well as migration, which has also begun to receive increasing attention in climate justice scholarship (Marino and Ribot, 2012; Cao, Wang and Cheng, 2016; Lees, 2017).

Second, there has been an increasing body of literature on climate justice in the context of subnational actors, especially cities (Bulkeley *et al*., 2013; Bulkeley *et al*., 2014). At the same time, attention has focused on the equity implications of burgeoning transnational climate governance initiatives – such as the Renewable Energy and Energy Efficiency Partnership, the CDP (formerly, Carbon Disclosure Project) and the Carbon Pricing Leadership Coalition – which often perform important governance functions including agenda setting, norms diffusion, verification and standard-setting (Derman, 2014; Castro, 2016).

Third, more light has been shed on the role of businesses, especially global corporations, in causing climate change and the need to ensure that these entities are doing their fair share in tackling climate change in the context both of mitigation and of adaptation (Heede, 2014; Frumhoff, Heede and Oreskes, 2015). Related to this are the many different lawsuits that have been brought against corporations on climate change, particularly in the United States (see also Chapter 3), as well as analysis of the justice and equity implications of market-based mechanisms or policies for tackling climate change, which have also been on the increase (Peel and Osofsky, 2015).

Fourth, there has been increasing recognition that contestations of climate justice frequently express themselves in several other resource politics at regional, national and local levels. Newell and Mulvaney (2013), Baker, Newell and Phillips (2014) and Bratman (2015) have highlighted climate justice implications in national energy transition initiatives. Schlosberg's (2013) account has focused on food justice, while Gupta (2014, 2015) has covered forest and water resources.

A fifth development, which is connected to many of the aforementioned dimensions, is the increasing attention paid to the need for procedural justice and participation, not with respect to states' participation, but also with respect to broader public engagement of laypeople (Devine-Wright, 2017), citizens' panels

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(Kahane and MacKinnon, 2015), indigenous people and local communities (Schroeder, 2010) and civil society groups in climate decision-making (Stevenson and Dryzek, 2014).

The proliferation and intensification of the climate justice literature focusing on other scales of governance in addition to the international regime is a clear indication of the appreciation of the independence, rule-making authorities and impact of these climate governance nodes, and also an implicit acknowledgement that climate governance is indeed multicentred and that justice is relevant to all nodes.

18.3 Climate Equity Impact on Polycentric Climate Governance

In this section, I advance the argument that concerns for climate justice are indeed a major factor that accounts for the development of climate governance in a more polycentric direction. First, I look at the role of justice concerns in the evolution of the international climate change regime. Next, I focus on the role of justice in facilitating the profile of adaptation and loss and damage. Then I examine the role of justice in creating global carbon markets, the involvement of cities and in the proliferation of transnational climate governance.

18.3.1 Evolution of the International Climate Regime

The first and arguably still the most significant impact of equity concerns with regard to pushing global climate governance in a more polycentric direction is the role of justice-based apprehensions in mobilising developing countries to insist that the global agreement must be negotiated under the UNFCCC. Early accounts of international climate diplomacy suggest that one of the first battles fought between developed and developing countries was over the nature of the international institution that would henceforth oversee global collaboration on climate action (Mintzer, 1994). In keeping with the view that climate change was essentially a technical problem requiring well-defined and limited collaboration over emission reduction technologies, developed countries very much favoured the formation of a narrow technical body (Bodansky, 1993). Developing countries, for their part, maintained that climate change was a developmental problem which not only implicates fundamental issues of equity but also offers the opportunity to address broader issues of economic inequality between developed and developing countries (Bodansky, 1993; Dasgupta, 1994). For these reasons, they insisted that the climate negotiations should be brought under the remit of the UN. They felt that only a UN-driven process could facilitate and oversee the large scale of structural changes needed to address the scale of climate injustices. The UN was also preferred because it would offer developing country parties the ability to express

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their voices more effectively. Two famous quotes from top developing country negotiators captured this sentiment.

> The sharing of costs and benefits implied in the conventions could significantly alter the destinies of individual countries.
>
> *(Indian negotiator in Dasgupta,1994: 131)*

> The UN system permits all sides to express their opinions from a position of sovereign equality and therefore to maintain self-respect. Countries acknowledged to have dominant economic, political and military power are forced to take into account the contrasting views of many other countries, however weak those countries may be. This balance promotes a more equitable dialogue.
>
> *(Pakistani negotiator in Hyder, 1994: 203)*

Once the developing countries had succeeded in bringing the climate negotiations under the UN's ambit, they also pressed hard, on the basis of equity concerns, for the UNFCCC to have an expansive objective that accommodated the need for adaptation, food security and economic development alongside the stabilisation of greenhouse gas concentrations. Alongside other provisions on North-South technology transfer (see Chapter 15), financial assistance and capacity building, these provisions contributed to increasing the scope of the regime and creating the space for the involvement of a range of other actors in climate governance. It is conceivable that if climate negotiations had remained within the ambit of a narrow technical body as developed countries initially canvassed, much of global climate governance today would have probably consisted of a range of emission reduction technology agreements between countries, with little or no attention paid to matters such as adaptation and loss and damage (Wrathall *et al.*, 2015).

At the same time, the replacement of the Kyoto Protocol with the Paris Agreement, with all its implications for polycentric climate governance (see Chapters 1 and 2), is also firmly rooted in concerns for justice – especially from the United States, which felt that an equitable climate agreement must create similar, if not the same, obligations for developed countries and the rest of the world, especially rapidly industrialising countries like China, India and Brazil (Okereke and Coventry, 2016; Rajamani, 2016). It is instructive that President Donald Trump cited equity and fairness concerns several times in his speech to announce the withdrawal of the United States from the Paris Agreement.

18.3.2 Adaptation and Loss and Damage

An equity-fuelled emphasis on adaptation is another distinctive way in which justice concerns have facilitated more polycentric climate governance. Although the UNFCCC has always included a mention of adaptation as a key aspect of

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international climate governance, much of the focus on early climate diplomacy focused on mitigation (see also Chapter 17). Following the signing of the Kyoto Protocol in 1997, developing countries consistently drew attention to the need to elevate climate adaptation as a key element of international climate governance. This insistence finally yielded tangible results in 2001, when the Marrakech Accords included a range of decisions on adaptation, including the undertaking to formulate the National Adaptation Programmes of Action to identify the urgent and immediate needs and priorities of the Least Developed Countries. Other landmark achievements included the establishment of the Special Climate Change Fund and the Least Developed Countries Fund, both of which were mostly targeted at funding adaptation activities in vulnerable developing countries. As of December 2016, 51 countries had submitted their National Adaptation Programme of Actions, and 46 of them have started implementing some of the National Adaptation Programme of Action activities through the funding from the Least Developed Countries Fund. Subsequently, the 2004 UNFCCC Conference of the Parties (COP) laid out the Buenos Aires Programme of Work on Adaptation and Response Measures, which led to the launch of the Nairobi Work Programme on impacts, vulnerability and adaptation to climate change at COP11 (2005). When parties adopted the Bali Action Plan at COP13 (2007), adaptation was placed alongside mitigation, technology transfer and finance as one of the four pillars of global climate policy.

The raised profile of adaptation has contributed significantly to increasing the multiplicity of climate governance nodes by widening the scope and range of climate governance activities and opening the space for a greater diversity of actors to play a part. Unlike climate mitigation, which focuses mainly on how we use energy, climate adaptation has covered an even wider range of activities, such as health management, rainwater harvesting, improving seed varieties, irrigation, desalination, tourism management, coastal zone management and land use planning, to mention a few (Burton *et al.*, 2002; Paavola and Adger, 2006; see also Chapter 17). At the same time, while the bulk of climate mitigation activities could be managed at the national level, climate adaptation and vulnerability management require local-level activities (Eriksen, Nightingale and Eakin, 2015). Furthermore, adaptation concerns, especially in developing countries, are intricately bound up with poverty reduction and efforts at the local level. These factors have all combined to expand the climate governance landscape and to draw in a diverse range of actors, such the World Health Organization and the UN Food and Agricultural Organization, into climate governance. More recently, a growing emphasis on loss and damage is drawing in more actors (e.g. the International Red Cross) and leading to the creation of additional governance platforms (e.g. the

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Hyogo Framework for Action) to deal with disaster risk management and climate insurance (Simon and Leck, 2015).

18.3.3 Carbon Markets

The Clean Development Mechanism (CDM), a market-based mechanism for climate change mitigation created through the Kyoto Protocol, has played a significant role in widening the space for non-state actors to participate in climate governance (Green, 2013). In early international climate diplomacy, developing countries – motivated by equity concerns – demanded an international fund from which they could draw to assist them to take climate action (Dasgupta, 1994; Hyder, 1994). Following contentious negotiations, where the developed countries vehemently opposed the idea of a fund, a compromise was eventually reached to establish a mechanism – the CDM – that allowed developed country governments to invest in 'clean development' projects in poor countries in return for carbon credits. The carbon offsets purchased could then be used to achieve compliance for the developed countries' Kyoto targets. The CDM was thus a product of equity-related contestation in the international regime, with developing countries seeking a fund to help address their developmental needs, and with developed countries preferring a market-based mechanism as a way of meeting this demand. One critical aspect of the CDM, which is in keeping with its market-oriented philosophy, was that it allowed for the participation of myriad companies and other entities to earn carbon credits by investing in emission reduction activities in developing countries. This provision is partly responsible for opening the climate governance space to a variety of public and private entities including firms, institutional investors and third-party validating agencies involved in the mechanism. It is evident, therefore, that the CDM has served to enhance the complexity of the climate regime (Green, 2013) and to increase the polycentric nature of global climate governance.

Alongside the larger CDM-based 'compliance' market, which yields units and credits that count towards developed countries' emission reduction obligations in the UNFCCC, a voluntary carbon offset (VCO) market also emerged, which allowed individuals, companies and governments to purchase carbon offsets to mitigate their own greenhouse gas emissions. With the emergence of VCOs, myriad activities such as electricity use, holiday flights, hotel stays and car rentals were drawn in as legitimate climate actions, and alongside this arose initiatives such as the Voluntary Carbon Standard, the Climate Registry, the Chicago Climate Exchange and numerous other transnational labelling, certification, verification and trading entities that facilitate VCO transactions (Castro, 2016).

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Several organisations selling VCOs argued that it offered opportunities for rich consumers to take action on climate change, while simultaneously supporting laudable development projects, such as installing solar panels and building schools in the poor South. Furthermore, by connecting rich, climate-aware and penitent polluters in the North with poor beneficiaries in the South, the voluntary offset programme was thought to play a useful role in the 'co-creation of global environmental values' (Gössling *et al.*, 2009: 1). However, VCOs came under a barrage of criticism: they have been described as an emotional Band-Aid for the rich, a tool for carbon colonialism (Bachram, 2004) and a primitive accumulation strategy (Bumpus and Liverman, 2008) that allows the rich to exploit the poor. The point here is not to analyse the justice implications of the CDM and VCOs (as significant as they may be), but simply to assert that: (1) the creation of both the compliance and voluntary carbon markets have at least in part their rationale in equity concerns; and (2) these carbon markets have served to create self-organising, locally acting, independent actors in ways that have increased the complexity of the regime and restructured climate governance along more polycentric lines.

18.3.4 Cities

Cities have emerged as important actors on climate, and discussions about the polycentric nature of climate governance have often included reference to cities either in their individual capacities or in the form of global transnational networks (Betsill and Bulkeley, 2006; Andonova, Betsill and Bulkeley, 2009; Okereke *et al*., 2009; see also Chapter 5). Some of the notable examples of transnational city initiatives include ICLEI's Cities for Climate Protection programme, the C40 Cities Climate Leadership Group, Climate Alliance and Energy Cities. Given that cities are homes to a significant percentage of the world population and most of the world's high-polluting corporations, and considering that they are also centres of global innovation, it was unavoidable that cities would emerge as important arenas for climate governance. It is not surprising, therefore, that cities have recently been identified as a vital arena for justice contestations about both climate mitigation and adaptation activities (Bulkeley *et al*., 2013; Bulkeley *et al*., 2014).

Lucas (2006), Byrne *et al*. (2016) and many others have noted the role of green infrastructure such as cycle lanes, green spaces and trams in promoting climate justice in cities, while Wolch, Byrne and Newell (2014) and McKendry and Janos (2015), among others, have suggested that greening in cities could have the unintended consequence of promoting injustice and inequality through, for example, increasing housing cost and inducing gentrification. Dawson (2010) has noted the role of cities as hotbeds for climate justice activism, and Bulkeley *et al.* (2014:

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31) have argued for an expansion of the concept of climate justice beyond fair procedure and equitable distribution of rights and responsibilities to encompass '"recognition" of existing forms of inequality and the ways in which climate change interventions might serve to either exacerbate or redress these underlying structural issues'. This suggests that questions of justice may manifest in unique ways and require specific contextualisation in different platforms of climate governance. Furthermore, the intense contestations for justice in cities indicate that regardless of the scale, initial rationale or origin of any given climate governance platform, it will only be a matter of time before significant and complex questions of justice arise in such arrangements. At the same time, some studies have found that despite growing visibility and claims, many cities are actually not doing much to reduce carbon emissions (Araos *et al*., 2016). This not only highlights the well-known analytical challenge of how to effectively determine the significance of many of these local level, non-traditional and 'experimental' climate governance initiatives, but it also raises the question of whether these initiatives actively distract attention from the pursuit of equity within the international regime.

18.4 Impact of Polycentricity on Equity

While global climate governance has always exhibited many of the characteristics associated with polycentric governance (see Chapter 1), the global community may have entered a new and distinctive era of even more polycentric climate governance. The question here is: what are the implications of this increasing polycentric climate governance on equity and vice versa? Here, at least three points can be made.

First, equity considerations remain important in the context of the Paris Agreement. The central concern here is whether a more polycentric governance structure has been secured at the expense of creating an effective regime. So far, it is known that the nationally determined contributions pledged by states, if fully implemented, fall far short of what is needed to keep the global mean temperature well below 2°C (du Pont *et al.*, 2016). If parties fail to find a way of ratcheting up their commitments, the result will be more severe climate change impacts on the global poor, which have done the least to cause the problem. This would constitute a gross violation of the key tenet of climate justice. Furthermore, there are serious questions as to whether parties will abide by the pledges to which they have committed themselves. Evidence from the past as well as other areas of international cooperation (e.g. human rights and development assistance) suggests that states often renege on their commitments when confronted by domestic circumstances that are considered more pressing (e.g. elections, unemployment, etc.). Also, given the non-legally binding nature of the pledges, they may be easily

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ignored or rolled back, as is evidenced by the case of the Trump administration. In this sense, the new agreement creates challenges relating to transparency and accountability (see also Chapter 12). Some (e.g. van Asselt, 2016) argue that non-state actors can play strong roles in enhancing transparency and accountability under the regime through their roles in reviewing ambition, implementation and compliance. If such roles were to be fulfilled, this would further increase the diversity of actors and push the global governance architecture towards greater polycentricity. However, it is not immediately clear what impact that will have on the actual quality of action and on climate justice.

Second, there is an important ethical question regarding whether the new voluntary and arguably more polycentric climate governance arrangement with its pledge-and-review system downgrades the concept of common but differentiated responsibilities and respective capabilities, which has been the ethical cornerstone of global climate policy. Some have indeed suggested that the new agreement, by demanding pledges from all countries (both developed and developing countries), has managed to side-step contentious equity issues that have long dogged international climate policy (Falkner, 2016). It would seem that the new agreement indeed envisages a diminished role for the principle of common but differentiated responsibilities by skirting over the vexed issue of differentiation between states. However, given that commitments for capacity building – and for North–South financial and technology transfer – remain in the agreement, it can be argued that the principle continues to be an important aspect of the regime post-Paris. One key aspect going forward will be how far the developed countries go to meet their obligations for financial assistance to poor countries under the new agreement. Many of these points are expected to re-emerge strongly in the context of the global stocktake in 2023, which will take place 'in the light of equity and the best available science' (Article 14.1 of the Paris Agreement).

Third, and going beyond the regime, there are legitimate questions as highlighted in the preceding section – especially in relation to cities and offsets – as to the extent to which these multiple sites of governance are actually resulting in meaningful climate action and carbon emissions reduction. Related to this is whether their proliferation and activities may be helping to create the illusion that something is being done and diverting attention that might be better devoted to getting traditional state actors to take ownership for and tackle the problem. It has been observed that climate voluntarism (Okereke, 2007), regime complexity (Green, 2013), carbon markets (Paterson, 1996a) and transnational climate governance (Bulkeley *et al*., 2014; Castro, 2016) are all driven by a neoliberal agenda, the ethical basis of which is not compatible with more radical interpretations of climate justice. The more radical and direct charge is that these multiple climate governance sites are in fact creating spaces for resource-rich Northern actors – including

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non-governmental organisations and businesses – to further exploit the poor South under the guise of taking climate action (Bachram, 2004; Lohmann, 2011). Even when manipulation and exploitation are not the original intention, the fact that navigating multiple sites of governance is easier for developed countries (as well as non-state actors) with greater resources raises a distinctive prospect that greater regime complexity could inadvertently exacerbate existing inequalities (Benvenisti and Downs, 2007; Okereke, 2007). One might note, however, that equity concerns have become a stronger part of some of the transnational governance initiatives (e.g. with the Gold Standard including social impacts of offset projects). However, it is interesting that considerations of equity in these initiatives often leads to the creation of additional initiatives and standards which could in turn increase regime complexity and polycentricity.

18.5 Conclusions

This chapter has argued that equity concerns have played a major role in shaping the global climate governance architecture. More specifically, it has suggested that considerations of justice have served to push climate governance in a more polycentric direction. It was shown that the decision to negotiate the international climate agreement under the UN umbrella (rather than by a narrow technical body), the expansion of objective of the agreement signed in 1992 to include adaptation, food security and economic development, the CDM, North–South technology transfer, and capacity building among many other issues, are all rooted to more or less degrees in concerns and controversies around equity and justice. At the same time, the subsequent demise of the Kyoto Protocol model of governing and the emergence of the Paris Agreement are strongly linked to equity concerns.

Furthermore, equity considerations are also central to explaining the emergence of the voluntary carbon markets and several other subnational and transnational initiatives which legitimised the involvement of a wide diversity of actors in climate governance and in so doing rendered the global climate governance architecture more polycentric.

The relationship between equity and polycentricity is complex and even seemingly paradoxical. Equity considerations may be helping to create multiple sites of governance, which may be necessary to accommodate more actors, issues and interests. However, it is not clear that the existence of these multiple sites of governance is necessarily resulting in greater climate justice. In fact, there is a legitimate concern that some of these sites have been created or at least usurped by actors with greater resources for their own advantages and operate in ways that exacerbate existing inequalities. Climate injustices are both symptoms and

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magnifiers of broader structures of historical injustice and inequality that characterise the global system. Hence, unless these fundamental structural injustices are addressed, it is not clear that more or less fragmentation will address climate justice. Yet, insofar as equity concerns are inextricably tied to any climate governance arrangement, understanding the equitability of climate action (or inaction) at multiple levels, spaces and jurisdictions – and how these both link the international regime and contribute to ambitious climate governance (or a lack thereof) in the context of global sustainable development – will remain of great relevance both intellectually and in practice.

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19

Legitimacy and Accountability in Polycentric Climate Governance

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19.1 Introduction

Polycentricity is characterised by institutional fragmentation as well as interdependence among actors. It is a situation wherein, for instance, non-state and state actors can be both regulators and regulated at the same time. Polycentricity raises a set of new questions for the core governance aspects of legitimacy and accountability: how can legitimacy and accountability be enhanced in the emergent polycentric system of climate governance where the state is not the only or even the primary source of authority? Is the democratisation of a system consisting of multiple and overlapping forms of authority feasible and even desirable? Who should be represented in the decision-making structures of the various units of the polycentric system, and to whom should such units be accountable? In addressing these questions, we analyse legitimacy and its challenges from multiple perspectives.

On the one hand, we consider their normative dimension. Normative legitimacy is grounded in democratic theory. Democratic theory defines normatively justified standards with which real-world institutions ought to comply. In this chapter, we focus on a set of core democratic values, and how they are institutionalised and can be enhanced in polycentric governance. Particular attention is given to the challenges that arise for establishing accountability in this context – i.e. the idea that those in positions of influence should be responsive to the interests of their constituencies. On the other hand, we analyse the state of sociological legitimacy in this field. Unlike normative legitimacy, sociological legitimacy is a matter of perception – i.e. whether actors accept an institution (or its decisions) as legitimate, regardless of the standards on which these judgements are based.

Not much scholarly attention has been directed towards these issues which lie at the nexus between polycentric governance, climate change, democracy, legitimacy and accountability. Much more ink has been spilt on describing the

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emergence of polycentric climate governance and weighing its implications for effectiveness. As a normative ideal, several virtues of polycentricity have been stressed, such as enhancing 'innovation, learning, adaptation, trustworthiness, levels of cooperation of participants, and the achievement of more effective, equitable, and sustainable outcomes at multiple scales' (Ostrom, 2010: 552; see also Chapter 1). To be fair, some of these virtues touch upon legitimacy concerns. Trust building, which is advanced as a core element in polycentric governance, resonates with sociological legitimacy (Dorsch and Flachsland, 2017). However, normative legitimacy – centred around criteria and values such as deliberation, accountability, participation and transparency – has featured less in the scholarship on polycentric governance, which has been preoccupied with spurring more effective collective action.

We pursue two main objectives in this chapter in order to stress the urgency of further advancing the nascent research interest in the legitimacy and accountability of polycentric climate governance. First, in Section 19.2, we make the case for a stronger research focus on the polycentricity-legitimacy-accountability nexus. We develop the argument that certain legitimacy and accountability challenges are inherent to polycentricity in general and that the policy field of climate change is no exception to this. In fact, polycentric climate governance is a prime example for such challenges given its relatively high degree of complexity – hence references in the existing literature to notions like regime complexes, networked and experimentalist governance (Bulkeley *et al.,* 2014; Falkner, 2016a; Sabel and Victor, 2017). We therefore start by examining the overall conceptual challenges raised by legitimacy and accountability in polycentric (climate) governance, distinguishing between normative and sociological legitimacy and different forms of accountability (which we will label external, internal and networked accountability).

Second, in Section 19.3, we briefly illustrate a research agenda on accountability and legitimacy dynamics for two domains of polycentric climate governance, namely (1) corporate climate action, and (2) climate minilateralism. We select these two types of institutional arrangements, as they are currently the most important manifestations of the emerging system of polycentric climate governance. At the same time, they also vary in important respects and thus provide different insights, as they are driven by very different types of agents with varying legitimacy implications, namely non-state actors and governments.

Section 19.4 concludes with a short outlook on how to address legitimacy and accountability gaps in the light of the renewed role for the state and the United Nations Framework Convention on Climate Change (UNFCCC) in polycentric climate governance. In doing so, we acknowledge that there is no 'one-size-fits-all' approach to strengthening the legitimacy and accountability of polycentric governance.

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19.2 Inherent Challenges: Polycentricity, Legitimacy and Accountability

The literature on polycentric climate governance has thus far focused on the origins, effectiveness and mitigation potential of multilayered governance arrangements. In fact, a polycentric approach has been hailed as *the* best option for climate stabilisation (Ostrom, 2010; Cole, 2015). Largely absent in the literature so far is a debate on the legitimacy challenges posed by the twin issues of representation and inclusion (who should be part of decision-making bodies in various networks?) and accountability (to whom should such bodies be accountable and how?). In line with several scholars (Black, 2008; MacDonald and MacDonald, 2017), we argue that new approaches are needed to grasp and assess the legitimacy and accountability of polycentric climate governance.

Such approaches should better reflect a polycentric governance system which encompasses a multitude of mechanisms, forums and actors, and a mix of public, private and hybrid authority engaged in governance functions such as agenda-setting, rule-making, implementation and monitoring. It echoes scholarly concerns about the general nexus of polycentricity and legitimacy 'beyond the state' and the consequences of the regulatory shift from state-centred to private and/or networked governance. Like these other forms of governance, polycentric climate governance is likely to be vulnerable to a 'legitimacy deficit' (Buchanan and Keohane, 2006).

In the following, we discuss several of these overarching and inherent challenges arising from the polycentricity-legitimacy nexus. With this, we make a case for more systematic analyses of legitimacy and accountability – and gaps thereof – in polycentric governance systems.

19.2.1 Multiple Authorities

Due to their functional and spatial differentiation, polycentric networks have a lower degree of jurisdictional integrity compared to state-centric governance. This dispersed and fragmented authority poses a challenge to democratic governance. If we take authority to mean the legitimate exercise of power (Bernstein, 2011), polycentric governance systems consist of many sites of political authority. 'Liquid' authority – meaning transnational, non-state, non-electoral authority – is replacing and/or supplementing traditional 'solid' sovereign authority (Krisch, 2017). Hickmann (2017) stresses that this does not necessarily mean a complete shift of authority away from the (inter)governmental level, but it implies a reconfiguration of the functions of central institutions in a changing authoritative landscape.

Polycentricity means the co-existence of multiple (and autonomous) territorial and non-territorial multiple centres of decision-making with different objectives,

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values and steering instruments – and ongoing shifts in the relationships and authority constellations among these different centres. Multiple authorities are often self-governing, and the principle of subsidiarity is central as local units set their own rules. However, polycentricity can be distinguished from fragmentation as it involves the existence of multiple centres of authority within an *accepted* set of overarching rules (Aligica and Tarko, 2012: 250).

Global climate governance is a prime example of a polycentric system. There are identifiable centres, notably the UNFCCC, which after the Paris Agreement has regained its role as the epicentre of climate governance. The UNFCCC provides an overarching set of norms and rules evident in the 2°C/1.5°C goals (see Chapter 2). Public and private authority are deeply intertwined in climate governance, as states have delegated authority to private actors, for instance through the Kyoto Protocol's Clean Development Mechanism (Green, 2014). Private actors also generate their own norms, rules and standards. The expansion of carbon market governance was made possible through the enrolment of private firms as auditors and monitors of carbon offsets, and scientists as experts of carbon removal methodologies. The increasing interconnections and interplay between state and non-state actors, for instance in hybrid governance arrangements, is a challenge to accountability, as the latter concerns a relationship that exists between those who wield power and those whose lives are affected or constrained by the exercise of power.

As a consequence, polycentric climate governance has many participants and regulators at subnational, intergovernmental and transnational levels involved in processes such as goal formulation, decision-making, monitoring and review – with significant implications for accountability and legitimacy (Black, 2008). How, then, can we ensure that multiple regulators spanning the public–private divide remain accountable for their actions? Polycentricity is underpinned by a normative ideal: polycentric governance enhances legitimacy by providing an opportunity for enhanced participation, deliberation and experimentation, pluralism, diversity and trust building (Ostrom, 2010). A normative assumption is that trust is promoted, or alternatively framed, such that sociological legitimacy is more likely in polycentric governance. However, as Skelcher (2005: 89) argues, 'the design of democratic governance is more problematic in a polycentric system . . . as political authority is dispersed across separately constituted bodies that do not stand in hierarchical relationship to another.'

Hence, the existence of multiple authorities does not automatically result in polycentric governance systems that stimulate participation, representation and inclusion by a multitude of actors. Achieving this remains a major challenge. As we illustrate in our brief empirical examples in Section 19.3, polycentric governance can equally be non-transparent and exclusive in providing closed venues for coalition building, trust and bargaining between powerful elites from government,

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market and civil society. This image is far from the normative ideal in polycentric theory: of multiple platforms and domains actively facilitating dialogue and deliberation between political decision-makers and affected stakeholders.

19.2.2 Normative and Sociological Legitimacy

Legitimacy is an essentially contested concept in social science and political philosophy, usually referring to the justification of authority. Two approaches can be discerned – normative or sociological legitimacy: 'To say that an institution is legitimate in a normative sense is to say that it has a *right to rule* whereas an institution is legitimate in a sociological sense when it is widely *believed* to have a right to rule' (Buchanan and Keohane, 2006: 405).

Normative legitimacy requires a normative theory of legitimate rule-making. Such a theory needs to specify and justify standards against which real-world arrangements can be assessed and evaluated, for instance in terms of their effectiveness or fairness. By contrast, sociological legitimacy means the acceptance of the rule-making authority among constituencies, regardless of the standards on which these judgements are based. They may be (but do not have to be) derived from norms, values and principles of liberal democracy, such as accountability, transparency, inclusion and deliberation.

Sociological legitimacy prevails when authority and rule-makers have the consent of those who are subject to it, while normative legitimacy can be established if the authority conforms to predefined standards. Compliance with rules and norms takes place if actors *perceive* the social and political order as acceptable (Buchanan and Keohane, 2006: 405; Bernstein and Cashore, 2007: 2). Sociological legitimacy is closely linked to the study of the *legitimation* (or delegitimation) of governance, entailing the justifications and claims to legitimate authority by global governance institutions (Bernstein, 2011).

Following a normative notion of legitimacy in the context of the European Union, Scharpf (1999) argues that legitimacy has two dimensions: input (or procedural) legitimacy and output (performance) legitimacy. Input legitimacy stems from procedural logic and asks: are policies and norms developed in a transparent, fair, inclusive and accountable manner? Output legitimacy is associated with a consequential logic, collective problem-solving and effectiveness and asks: do norms and institutions result in collective problem-solving and performance?

What does polycentricity imply for these two core dimensions of legitimacy? Following Scharpf's (1999) conceptualisation, researching normative legitimacy in polycentric climate governance would identify the sources of legitimacy in various types of polycentric arrangements. Are they effective in targeting the

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problem of climate mitigation, or do they derive legitimacy from being inclusive, representative and accountable? In this fashion, the overall legitimacy of polycentric governance rests on combining effective problem-solving (i.e. ultimately avoiding dangerous climate change) with fair, accountable, inclusive and transparent procedures.

As previously discussed, a recurrent (and largely unsubstantiated) claim is that polycentric governance can better generate trust, support and collaboration (see Chapter 1), i.e. to fare better in terms of sociological legitimacy. Dimensions such as trust and collaboration are part of major definitions of polycentricity (Dorsch and Flachsland, 2017). Another recurrent claim is that polycentric governance can also enhance normative legitimacy, in terms of promoting fairness and participation and equitable outcomes (Ostrom, 2010). Finally, the scholarship on polycentricity and climate change more frequently asserts (rather than examines) the assumption that polycentric governance generates more effective and sustainable governance across multiple levels and sites.

However, the distinction between normative and sociological legitimacy is more of an analytical device, and most researchers usually think in terms of both. A normative approach to legitimacy can make political acceptance (sociological legitimacy) part of its evaluative criteria for legitimacy. As Buchanan and Keohane (2006: 406) argue: '[i]t is important not only that global governance institutions be legitimate but that they are perceived to be legitimate. The perception of legitimacy matters, because in a democratic era, multilateral institutions will only thrive if they are viewed as legitimate by democratic publics.'

As we illustrate in our empirical examples, both the normative and sociological dimension of legitimacy remain contested terrain in polycentric climate governance. The challenges are of a theoretical (e.g. which normative principles apply to private governance?) as well as an empirical nature (e.g. what are the legitimation dynamics surrounding polycentric climate governance?).

19.2.3 Accountability

Accountability concerns those who govern as well as those who are being governed. The idea is that those in positions of power should be responsive to the interests of their constituencies. Accountability is, hence, about the relationship between an agent and a principal. It 'implies that some actors have the right to hold other actors accountable to a set of standards, to judge whether they have fulfilled their responsibilities in light of these standards, and to impose sanctions if they determine that these responsibilities have not been met' (Grant and Keohane, 2005: 29). Accountability can only result in legitimacy if there are sanctions available (e.g. voting rulers out of power, or reputational sanctions such as naming and

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shaming) once actions or decisions are incompatible with the values and preferences of principals.

Accountability becomes more complex in polycentric governance with no single, coherent principal but rather a plethora of public and private actors that operate in various transnational networks. New forms of accountability, as well as an extension of the principal-agent model in representative democracy beyond the domestic context, are needed. The principals of accountability in a polycentric system are different from the standard principal-agent model (hierarchical, state-centred and electoral). This calls for less vertical forms of accountability, moving towards a more horizontal mode of operating that stresses mutual monitoring and review, peer accountability and transparency (see also Chapter 12). By the same token, we can distinguish between internal (delegated), external (societal) and networked accountability (Grant and Keohane, 2005; Bäckstrand, 2008). The latter three non-electoral forms of accountability are more applicable to polycentric governance.

The problem of accountability at the transnational level is amplified in polycentric climate governance, where actors are both regulators and regulated, be it cities, intergovernmental agencies, carbon market actors or standard-setting organisations (Bäckstrand, 2008). The range of accountability and legitimacy challenges is so varied in polycentric climate governance that the key task becomes one of analysing the dynamics and logics of legitimacy and accountability in each. Polycentricity includes governance arrangements requiring top-down, hierarchical accountability as well as horizontal, non-hierarchical (market, peer and reputational accountability). The former, which is aligned with hierarchical forms of governance, has clear principal–agent relationships. For example, governments that are involved in different climate clubs (Falkner, 2016a) are accountable to their citizens, and international bureaucracies such as the UNFCCC Secretariat are accountable to their member states.

19.3 Legitimacy and Accountability Deficits in Polycentric Climate Governance: Two Examples

In the following, we use two major subsets of polycentric climate governance as examples to empirically illustrate the aforementioned challenges. Given space constraints, we can only provide brief and non-exhaustive explorations, for which we chose two core institutional developments. While the lines between private and public governance are often blurred in polycentric systems, our first example – transnational private governance – focuses on the former, whereas the second example – climate minilateralism – emphasises the latter. We do not claim that these cases are representative for polycentric climate governance as

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a whole, which has many more facets and dimensions. However, they provide important insights into the most salient issues at hand.

19.3.1 Transnational Private Governance

The Paris Agreement institutionalised 'hybrid multilateralism' (Bäckstrand *et al.*, 2017), denoting an intensified interplay between multilateral and transnational climate action, with the UNFCCC Secretariat taking a role as facilitator or orchestrator of transnational climate action (Hale, 2016; see also Chapter 11). The Lima-Paris Action Agenda (which later morphed into the Marrakech Partnership for Global Climate Action) and the Non-state Actor Zone for Climate Action (NAZCA) were launched to galvanize the groundswell of actions on climate change mitigation and adaptation from cities, regions, businesses and civil society organizations (Chan *et al.*, 2018). This development is part and parcel of a wider shift towards more private forms of governance in global environmental politics. Abbott, Green and Keohane (2016) observe that while the growth of formal international organisations has stalled, the population of private governance organisations has increased exponentially in recent years.

One important manifestation of this trend is non-state market-driven governance (Cashore, Auld and Newsom, 2004). Prominent examples include the Forest Stewardship Council, the Roundtable on Sustainable Palm Oil and Fairtrade International. Created by firms and civil society actors, these programmes set standards for transnational production and often operate certification programmes. The International Trade Centre, a specialised agency of the United Nations, now counts more than 230 non-state market-driven programmes in a wide range of industry sectors (ITC, 2017). While most of these initiatives are not formally integrated in NAZCA, many of them address climate change–related problems such as deforestation, land-use change, biodiversity loss and renewable energy. There are also a large number of programmes that are directly involved in climate governance, as they interact with intergovernmental, national and subnational frameworks in various ways. One example is the Rainforest Alliance's participation in the UN-REDD programme. Another example is Fairtrade International's newly created Climate Standard, aiming to enable smallholders and rural communities to better adapt to climate change.

The proliferation of non-state actors in this governance domain has led to multiple, often overlapping, authorities (Abbott, 2012). The example of renewable energy governance in the EU illustrates the issue well. To implement its policy targets (10 per cent of renewable energy in the transport sector by 2020), the European Commission closely engages with non-state market-driven governance in this area. Acting as an orchestrator, it developed a meta-standard approach and recognises

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compliant private governance programmes as equivalent (see also Chapter 11). These measures have created a regime of hybrid biofuel governance, in which public and private authority are closely intertwined. But this approach has not been without challenges. Most importantly, scholars are concerned about a 'race to the bottom' among private regulators. They describe how the EU's meta-standard approach has set a very low bar for formal recognition. Among other things, it includes no requirements for stakeholder inclusion or transparency. This has resulted in a situation in which a large number of industry-dominated programmes have outcompeted more inclusive governance arrangements, such as the Roundtable on Sustainable Biomaterials (Schleifer, 2013).

However, there are also reasons for optimism. Studying the related field of transnational forestry governance, Overdevest and Zeitlin (2014) describe how the EU assembled an experimentalist regime, which successfully combines public regulatory oversight with peer review and multi-stakeholder participation at the transnational and local levels. Non-state market-driven programmes like the Forest Stewardship Council are closely integrated in this regime, and there is evidence for the occurrence of meaningful deliberation and experimentation. Overall, the examples illustrate some of the challenges but also opportunities posed by multiple authorities. On the one hand, it can lead to regulatory conflict and competition, in which democratic principles are undermined. On the other hand, there is a possibility of assembling these multiple authorities into highly inclusive institutions that cross governance levels and geographical regions. Either way, public actors appear to retain a crucial capacity in shaping these outcomes.

Closely connected to the issue of multiple authorities, accountability and legitimacy issues continue to loom large in the private governance literature. Particularly, establishing accountability remains a major challenge. In the transnational realm, private governors are typically self-selected, and there is no demos available to hold them to account. For these reasons, principal-agent accountability – the main mechanism in liberal democracies – does not work in this context (Dingwerth, 2007). Transparency is often suggested as an alternative. Hale (2008) identifies three ways through which transparency can breed accountability in transnational governance: market pressures, public discourse and self-reflection. For example, market pressures can trigger a 'transparency action cycle' in which information disclosure triggers constructive behavioural change (Fung, Graham and Weil, 2008). Sceptics, however, question transparency's ability to truly empower accounting actors in global environmental governance (Buchanan and Keohane, 2006; Gupta and Mason, 2014). They believe that '[w]ithout standards and sanctions … accountability that is both effective and widely viewed as legitimate will remain elusive' (Grant and Keohane, 2005). Hence, there is no

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agreement amongst scholars on the relationship between transparency and accountability.

Existing empirical studies also paint a mixed picture (Auld and Gulbrandsen, 2010). In a recent quantitative analysis, Schleifer, Fiorini and Auld (2017) find that most non-state market-driven programmes do not disclose information in areas of 'deep transparency' – i.e. information about actual processes instead of information about paper procedures. They argue that transparency levels are often insufficient to promote accountability as hypothesised by Hale (2008) and others. A glance at the wider literature on accountability in global environmental governance reveals further complexities and contradictions (Gulbrandsen and Auld, 2016; Kramarz and Park, 2016). In this regard, Kramarz and Park (2016) observe how the rapid proliferation of accountability mechanisms in this domain has done little to stop the environment from deteriorating. This perceived lack of effectiveness could further exacerbate the legitimacy challenges faced by private governance institutions, damaging their output legitimacy.

In general, the legitimacy of private governance remains contested terrain. With regard to the normative dimension, multi-stakeholder participation was long hailed as the 'gold standard' of legitimate private rule-making. These ideas have their origin in deliberative democratic theory, with its focus on stakeholder participation and unconstrained dialogue (Dingwerth, 2007; Stevenson and Dryzek, 2014). However, more empirically oriented scholars increasingly question the validity of this 'inclusiveness paradigm'. This research points to the limited deliberative capacity of private multi-stakeholder governance (Schouten, Glasbergen and Leroy, 2012). Dominated by international actors and rational scientific understandings of sustainability, initiatives like the Roundtable on Sustainable Palm Oil would often exclude local discourses and critical voices. At the same time, the sociological legitimacy of private environmental governance remains fragile and in flux (Bernstein and Cashore, 2007; Bernstein, 2011). Internal challenges arise as industry and civil society actors struggle over influence and policy outcomes, sometimes destabilising multi-stakeholder processes from within (Boström and Hallström, 2012; Schleifer, 2016). External challenges include the legitimation politics surrounding the creation of industry-sponsored competitor programmes (Fransen, 2012; Ponte, 2014). A new trend is the rise of 'home-grown' initiatives in the global South, such as the Indonesian Sustainable Palm Oil Standard (Hospes, 2014; Schouten and Bitzer, 2015). Backed by state and industry actors in developing countries, they increasingly contest the authority of transnational rule-making organizations like the Roundtable on Sustainable Palm Oil.

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19.3.2 Climate Minilateralism

While transnational climate action is one of the major institutional and procedural developments driven by non-state actors, climate minilateralism is arguably the most prolific state-driven institutional development in polycentric climate governance. Minilateral climate coalitions or clubs, that is initiatives predominantly governed by a limited number of governments, have multiplied since the mid-2000s. Established by elected state governments on the one hand, but excluding a large group of countries on the other, they have distinctive legitimacy and accountability implications that we briefly explore in this section.

One can distinguish *three different types of clubs*. First, there are climate-related initiatives that have arisen from clubs with cross-cutting policy agendas that are not restricted to climate change. A prominent example is the Gleneagles Process of what was then the Group of 8 (G8, today G7), initiated by the United Kingdom in 2005 to bolster the chances of securing a strong climate agreement in Copenhagen. In 2007, the G8 also established a mainly informal dialogue with five other countries – China, India, Brazil, Mexico and South Africa – known as the G8+5, which also featured energy on its agenda.

Second, and parallel to the growing climate agendas of overarching clubs, a first rush of climate-specific minilateral arrangements emerged from the early 2000s onwards. Several new technology arrangements, all of them oriented towards mitigation, brought together member states and corporate actors, such as the Carbon Sequestration Leadership Forum and the Global Methane Initiative (see Chapter 16). Further initiatives arose after the Kyoto Protocol's entry into force, such as the (now-defunct) Asia-Pacific Partnership on Clean Development and Climate in 2006 and the Major Economies Process on Energy Security and Climate Change in 2007 (McGee and Taplin, 2009; Zelli, 2011).

After the Copenhagen climate conference, a third wave of minilateral initiatives emerged. Some of these covered new topics, for instance the Climate and Clean Air Coalition, which addresses the issue of short-lived climate pollutants. Others were directly affiliated with the United Nations and existing international organisations, such as the Carbon Pricing Leadership Coalition, convened by the World Bank and launched at the UN climate conference in Paris in 2015. Moreover, this third wave includes coalitions initiated by developing countries. As van Asselt and Bößner (2016: 54) hold, 'it is likely that climate coalitions will continue to emerge and co-exist with the UNFCCC.' This is also because, in addition to the more deeply institutionalised, implementation-oriented clubs, dialogue forums and political ad hoc coalitions come and go.

What does the trend towards greater minilateralism imply in terms of different dimensions of legitimacy and accountability? Arguably, the main focus of the

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literature has been directed towards normative legitimacy, and particularly input legitimacy. There was a considerable lack of inclusiveness of the first two waves sketched earlier. Poorer countries, such as small island states or least-developed countries, were excluded not only from overarching clubs like the G7/8 or the Group of 20 (G20) but also from technology-specific partnerships, which showed no interest in a more balanced composition in terms of economic strength or vulnerability to climate change (van Asselt, 2007). This selectivity has triggered fierce criticism from various scholars. For Eckersley (2012: 33), 'it offends the basic principles of communicative justice to restrict the negotiations of any anti-pollution treaty to the biggest polluters and to exclude victims of pollution simply because their pollution contribution is negligible.'

This picture has changed with the third wave of minilateralism that brought not only new clubs particularly targeted to developing countries but also a certain opening of some of the existing minilateral arrangements. A recent systematic comparison by Brandi and Bauer (2017) of a sample of 38 clubs shows that 33 of them have an open and inclusive approach and explicitly invite new partners to join. The 'by-invitation-only' exceptions are mostly clubs in the first and/or second waves. As a result, more than 120 countries are members of climate clubs today.

Recent minilateralism has also exhibited a growing and more diverse non-state membership. More than two-thirds of the clubs analysed by Brandi and Bauer (2017) include non-state actors. While corporate actors were often the only non-state partners in older technology clubs, the new initiatives also feature an increasing number of cities, civil society and international organisations among their members. Yet, notwithstanding a formally equal status in about half the clubs, they have a relatively low influence on decision-making and other key functions.

An even more difficult question to assess regards normative output legitimacy, i.e. how effective are climate clubs in targeting their key objective, which for most of them is mitigating climate change? Initial comparative studies by Andresen (2014) and Weischer, Morgan and Patel (2012) concluded that climate minilateralism has achieved very little in terms of carbon emissions reductions and that the clubs mostly serve as dialogue forums. Hovi *et al.* (2016: 7) caution, however, that 'scholars are still relatively early in the process of trying to understand the potential of climate clubs for being instrumental in mitigating climate change.' Their findings suggest that a combination of conditional commitments and access to a club good can be highly conducive ways to foster effective climate clubs.

While the long-term problem-solving effectiveness of climate minilateralism remains low or even uncertain, some clubs yield palpable consequences for other, more immediate aspects of output legitimacy. As Falkner (2016b: 87) stresses, one of the core ideas behind such coalitions is 'more effective bargaining', i.e. reaching

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an agreement much more quickly than in multilateral negotiation settings, due to a smaller number of like-minded countries and the prospect of the provision of club goods (cf. Kahler, 1992). Indeed, Brandi and Bauer (2017) find that 90 per cent of the climate clubs in their sample managed to set rules, principles or norms with relevance for their objectives or functions. This included some sort of quantified and thus measurable target for 12 of the 38 analysed clubs. However, comprehensive measurement, reporting and verification systems are still absent from most minilateral efforts to address climate change (Falkner, 2016b: 93).

Another aspect of output legitimacy that merits more scholarly attention is the (de)legitimating impact of climate minilateralism on multilateralism. This relates to a core argument in polycentric theory, namely that governing units 'are capable of making mutual adjustments' to develop collaborations and produce trusting interrelationships over time (Ostrom, 1999: 57). Indeed, as the comparative studies by Andresen (2014), Weischer *et al.* (2012) and Brandi and Bauer (2017) show, most climate clubs provide new venues for great powers to enhance and reinvigorate their bargaining power in UN climate negotiations. The most recent example is the G20 summit in Hamburg in July 2017. The meeting's agenda brought climate change into the debates among the world's leading economies, which in the end reaffirmed the support of 19 members for the Paris Agreement in spite of Washington's withdrawal. Furthermore, it was especially the third wave of climate minilateralism that induced a shift in narrative 'towards ways in which climate coalitions could complement the multilateral climate regime' (van Asselt and Bößner, 2016: 54).

The United States and Australia were the main drivers behind the second wave of climate minilateralism and designed some of the technology partnerships as alternative models or rival forums to the UNFCCC. This goes in particular for the Asia-Pacific Partnership (cf. van Asselt, 2007). Today, with the Partnership disbanded and especially the newer partnerships more strongly linked to the UNFCCC, most of this initial inter-club rivalry has vanished. It is too early to assume this is an irreversible trend, but if it continues it would confirm Ostrom's hypothesis on mutual adjustments in polycentric governance, for example through supporting similar goals and measures (cf. Gehring and Faude, 2014).

This prospect notwithstanding, the sociological legitimacy of climate minilateralism remains rather low. Gampfer (2016) analysed the connection between certain design features of climate clubs and their support rates. He used conjoint experiments embedded in nationally representative surveys in the United States and India and found that 'climate club approaches suffer from low public support' (Gampfer, 2016: 81). Some aspects may slightly enhance support rates though, including a higher share of carbon emissions regulated by the club, all member countries having to commit to emission reductions, the availability of club goods and

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disadvantages for non-members. While more research is needed on a larger sample of countries, Gampfer's results resonate with other observations on specific minilateral arrangements. The Asia-Pacific Partnership, for instance, 'was widely perceived to be a laggards' club (Falkner, 2016b: 92), with key countries (the United States, Australia and Canada) led by governments that were sceptical of the need for urgent climate action. More striking still, while G7/G8 or G20 meetings regularly draw major media attention and civil society protests on site, most citizens do not know about climate-specific clubs. This creates a 'shadow of legitimacy', which may put an additional burden on the UN climate regime as the one climate governance institution that is known to these audiences. Thus, while the new role of the UNFCCC as an orchestrator of different climate actions raises some legitimacy concerns, it may also have a (re-)legitimating effect by directing public attention towards the polycentric character of climate governance today (see Chapter 12).

This shadow of legitimacy also implies challenges to the accountability of climate clubs – but arguably to a lesser extent than for transnational and private climate actions. At least this may be the case for vertical or hierarchical accountability. The majority of citizens might not be aware of most climate clubs in which their respective governments participate, but they can still hold them accountable for associated climate policies (cf. Falkner, 2016a). That said, the aforementioned lack of measurement, reporting and review systems in most climate clubs (cf. Brandi and Bauer, 2017) sets certain practical limits to this form of accountability. This may be partly compensated through horizontal types of accountability. Importantly for both peer and reputational accountability, the NAZCA platform includes several minilateral arrangements. This platform gives the clubs an opportunity to showcase their commitments and achievements, and at the same time provides the UNFCCC Secretariat with the possibility to keep track of them. There is room for improvement of course: only a minority of climate clubs are registered on NAZCA and minilateral coalitions hardly report themselves but leave this to the parties involved in them (van Asselt and Bößner, 2016: 59–60). Still, the ongoing mutual adjustment between multilateral and minilateral governance arrangements also implies a rise in peer accountability as governance becomes more polycentric.

19.4 Conclusions

We argue that a normative legitimacy approach focusing on democratic values is both novel and useful to understanding polycentric climate governance. It seeks to reduce the democratic deficit by enhancing democratic values – participation, transparency, deliberation and accountability – in polycentric governance

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(Dingwerth, 2007; Bäckstrand and Kuyper, 2017). The democratisation of polycentric climate governance can be seen as a set of values that are met to different degrees.

As Ostrom would have argued, a key challenge is that there is no 'one-size-fits-all' approach to assessing the legitimacy of polycentric climate governance due to the diverse legitimating audiences with different preferences and priorities with regard to mitigation and adaptation. Given the structural diversity of polycentric climate governance, the task should be to identify the varied accountability and legitimacy logics that are operating. Scholars have proposed alternative models of accountability, representation or localised deliberation and direct participation that better accommodate shifting and overlapping authority, structures and corresponding target audiences and publics (Black, 2008; MacDonald and MacDonald, 2017). The normative grounds for assessing the legitimacy of authoritative polycentric institutional arrangements vary: 'transnational legitimization can best be accomplished, for now, through more piecemeal assemblages of mechanisms that contribute only partially, and in differing degrees, to authorities' political legitimacy' (MacDonald and MacDonald, 2017: 334). Their legitimacy rests on whether polycentric authorities are successful institutions for collective action and for addressing different audiences' concerns. Skelcher (2005: 90) discusses the challenges to democratic governance at the systems level of polycentric governance given that the different units often have their own legitimacy dynamics and realms for accountability. Frequently, polycentric networks are loosely coupled to institutions of representative democracy and have weak 'democratic anchorage' (Sörensen and Torfing, 2004).

Polycentric theory has been relatively silent on the role of the state as a facilitator of effective and legitimate climate governance. However, numerous scholars argue that the rise of polycentric and networked governance by no means implies the demise of the state. Mansbridge (2014) even calls for a strengthened role of the state in polycentric climate governance. Along similar lines, Sabel and Victor (2017) suggest that the UNFCCC could serve as a focal point for integrating and facilitating the expanding universe of transnational and intergovernmental climate governance. Polycentric governance operates in the 'shadow of hierarchy' as states and intergovernmental organisations act as orchestrators of climate governance. Oberthür (2016: 91) argues that the Paris Agreement recalibrated the role of the UNFCCC to provide direction and orchestrate the emerging polycentric governance landscape of mitigation and adaptation actions undertaken by states and non-state actors alike. As transnational and intergovernmental realms of climate action are more closely aligned in the post-Paris era, more attention should be paid to

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strengthening legitimacy and accountability in orchestration (Bäckstrand and Kuyper, 2017).

The Paris Agreement also reinforced a domestic logic to global climate politics, with nationally determined contributions as its core element (Falkner, 2016a). Recent work highlighting the role of the domestic context in promoting transnational governance initiatives confirms the return of the state (Roger, Hale and Andonova, 2017). An important normative implication is that both states and international organisations such as the UNFCCC should provide the 'democratic anchorage' (Sörensen and Torfing, 2004) for polycentric climate governance through their roles as facilitators and orchestrators.

Sociological and normative legitimacy are linked. Perceptions of the UNFCCC as a legitimate orchestrator of polycentric climate governance depend on whether it is transparent, inclusive, accountable and effective. The legitimacy crisis the UNFCCC suffered at the 2009 Copenhagen summit was related to the failure to agree to a new global climate treaty. Conversely, the success of the Paris Agreement meant that the UNFCCC regained its legitimacy among state and non-state actors. The credibility of the UNFCCC as a legitimate orchestrator or facilitator of transnational climate action will hinge on how far it can garner support among state and non-state actors alike (see also Chapter 12).

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Part V

Synthesis and Conclusions

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20

Governing Climate Change
The Promise and Limits of Polycentric Governance

ANDREW JORDAN, DAVE HUITEMA, HARRO VAN ASSELT AND JOHANNA FORSTER

20.1 Introduction

Ever since the first attempts were made to govern climate change in the late 1980s, it has been widely assumed that states and international organisations would perform key roles. But it is becoming increasingly apparent that many other actors – cities, charities, private companies, universities and faith organisations – are also directly involved in governing climate change. By the late 2000s, Elinor Ostrom was at the forefront of those arguing that these new activities were not just possible (and indeed necessary to limit warming to a safe level) but were already appearing around, below and to the side of the main international body addressing climate change – the United Nations Framework Convention on Climate Change (UNFCCC).

Ostrom's primary contribution to the debate about the rapidly changing contours of the climate governance landscape was to describe it as 'polycentric' (Ostrom, 2010a) and to invite other scholars to employ that framing to understand its emergence and modes of operation. The primary aim of this book is to critically evaluate what is to be gained by thinking about climate governance as an interconnected and evolving polycentric system. Chapter 1 noted that polycentric theory originally dates back to the early 1960s, but Elinor Ostrom was keen to explore what it added to the academic understanding and practical enactment of climate governance. In Chapter 1, we identified and explored its essential elements, which we recombined into a set of five theoretical propositions. We explored what each proposition implied for the ways in which climate governance is described, explained and subjected to normative analysis.

In this chapter, we reflect back on that aim by examining the main actors and domains (Part II), governance processes (Part III) and substantive challenges (Part IV) in the area of climate change. We structure our concluding reflections around the four main objectives identified at the end of Chapter 1. Section 20.2 investigates the degree to which climate governance is polycentric, both in its totality – as

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a broad, interconnected system – and in its constituent parts, or, as Ostrom termed them, *domains*. Section 20.3 analyses when, how and why climate governance has become more (or in some cases less) polycentric over time. Here, we critically reflect on the value of the five theoretical propositions introduced in Chapter 1. Section 20.4 considers what the implications of the shift to greater polycentricity are for the governance of substantive climate challenges (such as accelerating decarbonisation, transferring climate mitigation technologies to developing countries and adapting to climate impacts), as well as the accomplishment of broader, system-wide functions (e.g. facilitating innovation and addressing equity, justice, legitimacy and accountability concerns). Section 20.5 steps back and reflects on what could and perhaps should be the purpose of polycentric theory in the light of our findings. Ostrom (2010a) was confident that it could simultaneously serve three important purposes: *describing* the landscape of governance, *explaining* that landscape, and *prescribing* new ways to make it function more effectively. In Chapter 1 we noted that since Ostrom's death these distinct purposes have become somewhat blurred. We conclude by offering our own reflections on the promise and the limits of a polycentric perspective on climate governance.

20.2 How Polycentric Is Contemporary Climate Governance?

In what we termed her essential definition (see Chapter 1), Ostrom (2010a: 552) argued that polycentric systems have:

> multiple governing authorities at different scales rather than a monocentric unit. Each unit with a polycentric system exercises considerable independence to make norms and rules within a specific domain (such as a family, a firm, a local government, a network of local governments, a state or province, a region, a national government, or an international regime).

Chapter 2 noted that there is no single monocentric global governance arrangement in the area of climate change (the first limb of Ostrom's definition), in which a single, hierarchical unit structures the activities of all other units. Although the UNFCCC has established a common set of norms and rules, its hierarchical steering power remains relatively limited. Even during the Kyoto Protocol period, when the international community moved in a more monocentric direction by adopting and implementing a set of binding international targets, the majority of states were only loosely bound. Hence – and contrary to what some have claimed – the overall degree of monocentricity has always remained relatively limited. Moreover, over the past two decades the pattern that has gradually emerged at the international level is even more polycentric in nature, with multiple governing authorities operating on many different scales (Kim, 2013).

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Several important points flow from this observation. The first is that the resulting governance landscape incorporates but goes well beyond what Keohane and Victor (2011) have termed a 'regime complex'. Regime complexes comprise interlocking networks of international agreements and international organisations. By contrast, contemporary climate governance incorporates a much greater variety of actors and institutions operating at multiple scales (Cole, 2015; Jordan *et al.*, 2015). These include states and international organisations, but also companies, cities and non-governmental organisations (NGOs). As many of the chapters in Part II make clear, these actors have claimed the authority to address climate change in various ways, sometimes working alone, sometimes working in tandem through hybrid forms of governing. The emerging pattern is relatively fragmented, with multiple centres of authority, which are often functionally overlapping rather than nested. They tend to be linked and work across many geographical scales. The broad system of governing, therefore, is essentially polycentric in nature.

A second observation is that the system of governance is not simply multilevel (Saerbeck, Jörgensen and Jänicke, 2017), with actors operating at and across a number of discrete levels of governance. Instead, the governance landscape has a much more hybrid and modular form in which the governance activities of states and a wide array of non-state actors are not neatly separated, but functionally overlapping. Again, these patterns broadly correspond with Elinor Ostrom's essential definition of polycentric governance.

Third, her essential definition of polycentric governance also draws attention to the existence of multiple units and domains of governing within a broader system or landscape of governance. The chapters in Part II discussed a number of particularly important domains. These included international (Chapter 2) and national governance (Chapter 3). The latter – as state-based forms of governance – have a formal legal underpinning and access to unique resources such as tax receipts. Others are more novel, such as the domain of transnational climate governance (Chapter 4), which includes many forms of private governance by businesses and industry associations. Still others coalesce around a particular instrument of governing, such as emissions trading (Chapter 13) or particular actor types (e.g. city-level networks; see Chapter 5).

The fourth observation is that the degree of polycentricity varies significantly across these domains. Amongst the nation states engaging with climate change, for instance, we find relatively unitary states such as the United Kingdom that have adopted very long-term targets and strategies (Chapter 3). At the other end of the spectrum of different degrees of polycentricity, we find a loosely coupled network of national emissions trading systems, each with its own array of internal processes, emission reduction targets and carbon prices. At present – and despite the 'epistemic authority' enjoyed by emissions trading, underpinned by a strong 'instrument

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constituency' (see Chapter 6) – it is very unlikely that the various national systems will coalesce into a tightly linked structure in the short term, with harmonised rules and a single, common trading strategy.

Fifth, even within an individual domain, it is possible to observe a significant degree of internal variation, implying that the system as a whole is not simply polycentric but 'doubly polycentric' (Chapter 11). For example, Chapter 4 revealed that the transnational climate governance domain includes a wide variety of initiatives which come in many colours and seek to discharge different governance functions (e.g. agenda setting, capacity building, soft regulation, information sharing and financing). Moreover, these initiatives are unevenly distributed across the world, with consistently low levels of participation from developing country actors (Bulkeley *et al.*, 2014: 117–133). Some initiatives have a handful of members whereas others – e.g. city networks – have many hundreds. Even within a single transnational initiative, there may be a significant degree of internal variation. Likewise, within the many national domains of governance, new research is usefully revealing the huge internal variation in the types and quantity of legislation adopted. Thus, some countries have adopted more than 20 separate climate laws, but around 25 per cent have not adopted a single statute. Even within the single category of national laws, there are many subtypes, such as those incorporating legislative targets (e.g. Brazil, European Union (EU), Mexico, UK), those relying on executive orders (Indonesia, Russia, United States) and those employing non-legislative strategies (Germany, South Africa) (Averchenkova, Fankhauser and Nachmany, 2017).

20.3 Polycentric Climate Governance: Assessing the Five Propositions

To claim that contemporary climate governance is polycentric begs many questions. How did it emerge? To what extent is experimentation taking place? Do those governing climate change even believe that they are 'experimenting' and if they are, to what extent are they taking one another's behaviour into account and thus engaging in mutual adjustment? To address these and other questions, we reflect back on the five core propositions derived from polycentric governance theory. In order to maintain a logical argument and avoid repetition (in Chapter 1 we noted that the propositions are interwoven), we start with the fifth proposition and then move between the other four, illustrating our points with examples from various book chapters.

Proposition 5 – Overarching rules
Local initiatives are likely to work best when they are bound by a set of overarching rules that enshrine the broader goals to be achieved and allow any conflicts to be satisfactorily resolved.

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By definition, polycentric systems do not have a central authority that exerts significant hierarchical authority. But in Chapter 1 we also noted that most mainstream definitions of polycentric governance make repeated reference to a set of overarching rules (sometimes termed the *rule of law*). These rules are assumed to serve a number of functions. They provide a means to settle disputes between individual units and domains, and maintain the degree of diversity (i.e. polycentricity) by preventing any actor from becoming overly dominant. Consequently, climate governance scholars should try to identify whether such rules are present, and account for their form and function. In relation to climate change, the UNFCCC is the source of many of the most significant rules, norms and values. Chapter 10 refers to it as the 'centre of gravity' of the system; Hickmann (2017: 446) claims it is the 'core institution'. The UNFCCC certainly satisfies one of Ostrom's conditions for a rule to be deemed 'overarching' – i.e. it clearly defines the broad goals of climate governance (Chapter 2). These are to 'stabilise greenhouse gas concentrations in the atmosphere to prevent dangerous anthropogenic interference with the climate system'. It also defines a number of other broad norms and principles, such as the one noting that states have 'common but differentiated responsibilities and respective capabilities'. In light of this, it governs the flow of financial and technological resources from the North to the South and requires state parties to submit regular reports on their emissions and policies (see Chapter 12).

The idea that a shift has occurred from the Kyoto model to one embodying a more polycentric form is generating a great deal of lively discussion amongst scholars of climate governance (e.g. Chapter 2), but whatever the precise extent of that shift, the jury is still out on how *capable* it is of significantly accelerating decarbonisation (see also Chapter 14). After all, states have a lamentable record of achieving self-declared emission reduction targets (Bang, Hovi and Skodvin, 2016: 212), although other actors also engage in symbolic action (Chapter 12). The Paris Agreement did more than the Kyoto Protocol to clarify the overall direction of travel, for instance by establishing two temperature reduction goals (1.5°C and 2°C) and emphasising the need for emission neutrality between 2050 and 2100 (i.e. the new 'net zero' goal) (see Chapter 2). Many commentators have remarked how the main purpose of these goals is to give a clear signal (for instance to the financial sector and investors) that decarbonisation will eventually happen and hence must be taken into account when making long-term investments. The Paris Agreement also achieved two other significant innovations (Falkner, 2016): it extended emission reduction commitments to all countries, not just the richest and most industrialised ones; and it put in place a global adaptation goal. In the past, mitigation has tended to be viewed as a concern primarily of the global North, whereas the countries of the global South were widely thought to require greater adaptation

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(Chapter 17). By bringing mitigation and adaptation together and giving them a more equal status, many commentators hope that some of the unproductive disputes between developing and developed countries may eventually be resolved. Were this to happen, the international rules would become more widely shared and hence more 'overarching'.

Because practically every country in the world participates in the UNFCCC, its claims to legitimacy enjoy particularly strong authority (Chapter 19). But whether the more universalising tendencies of the Paris Agreement imply that all the conflicts around climate change are more likely to be resolved remains in serious doubt. After all, any failure by a state to honour its nationally determined contribution will not in and of itself constitute a breach of international law (Falkner, 2016). As the Trump administration in the United States demonstrated in 2017, any party to the agreement that wishes to withdraw is quite at liberty to do so, having completed the appropriate withdrawal procedures. In other words, the prevailing rules may be 'overarching', but their enforceability is limited. This may sound like the standard, rational account of international climate politics, but Ostrom was eager to explore whether the advent of greater polycentricity allows it to be reframed. After all, Ostrom was at pains to underscore the cleverness of polycentric systems, i.e. that they are not as reliant on the performance of a particular unit or domain as monocentric systems. Thus for scholars of polycentric governance, international law is not the only potential source of overarching rules; other examples could also be investigated, such as national framework laws. These establish the basic rules of the game at the national and even the subnational level. Some even embody very long-term mitigation objectives, which are justiciable and are backed up by systems of monitoring and review (Chapter 3).

To conclude, in relation to climate change there are undoubtedly many examples of 'overarching rules', but not all of them are universally overarching and relatively few are enforceable. Some are quite limited, in the sense that they are restricted to specific domains, such as particular states. Two prominent examples are Norway's Climate Change Settlement and the Climate Change Act in the United Kingdom. Although these rules are not universally overarching, they may have longer-term potency, for example in facilitating the subsequent development of more specific and binding laws in certain jurisdictions and/or governing particular sub-issues (Fankhauser, Gennaiolia and Collins, 2015a, 2015b).

Proposition 2 – Mutual adjustment
Units are likely to freely and spontaneously develop collaborations with one another, which over time produce more trusting relationships.

Once the constituent units and domains have emerged within a polycentric system, polycentric theory suggests that they will start to interact with one another. In the

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absence of a monocentric authority, their interaction is expected to be spontaneous and bottom up. This explains why polycentric systems are often likened to complex adaptive systems (Tarko, 2017: 58), the capacity for mutual adjustment being the means by which the system as a whole responds to external stimuli.

From an explanatory perspective, Chapter 1 suggests that the main implication of Proposition 2 is that analysts should seek to chart the boundaries of, and the interactions between, the constituent elements of polycentric systems. As Chapters 2 and 10 explained, scholars of international regimes were among the first to turn their hands to this task, revealing many horizontal and vertical interactions and linkages within and amongst international regimes. This work has stimulated a lively debate about the causal mechanisms of institutional interactions, and the various ways of dealing with institutional interplay at the international level (Oberthür and Gehring, 2006; Oberthür and Stokke, 2011). But polycentric governance theory argues that it is not sufficient to only explore the interactions at an international level. Betsill *et al.* (2015) have hypothesised that consequential linkages can in principle form between a much wider array of units and domains. According to Chapter 4, the linkage that has attracted the most scholarly attention thus far is that connecting international and transnational domains (see also Hickmann, 2017). The general argument here is that transnational climate governance emerges in the 'shadows' of the UNFCCC process (Bulkeley *et al.*, 2012: 693), giving substance to areas of governance that have only been partially determined by international negotiators. In the area of clean technology transfer, the provisions of the UNFCCC were sparse, so particular 'lead' states (see Chapter 8), private actors, development banks and even some international organisations stepped in to plug the gaps that had not been resolved when diplomats established the Clean Development Mechanism (CDM) (Chapter 15). Moreover, around the CDM, numerous other transnational initiatives have emerged to certify offsets and measure emissions. Finally, the 'net zero' goal enshrined in the Paris Agreement has provided a new anchor for transnational action aimed at long-term decarbonisation, principally the divestment movement (Chapter 4). The resulting pattern of governance is complex and rather web-like.

Meanwhile the international domain has mutually adjusted to these developments. With hindsight, the 2009 Copenhagen conference was a 'critical juncture' in the development of two-way interlinkages (Hale, 2016: 15). Following the failure of governments to adopt a new agreement, UN officials were anxious to present the flowering of transnational action as a complement to multilateral action, and after 2012 they established mechanisms to catalyse (or 'orchestrate') them – e.g. the Non-state Actor Zone for Climate Action, technical expert meetings, high-level events, etc. By 2015, politicians were portraying transnational climate action as an integral 'pillar' of the Paris climate summit (see Chapter 4). Time will tell whether

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President Trump's decision to pull back from the Paris Agreement marks another critical juncture in the further development of polycentric governance. Immediately after his announcement, 900 American businesses, 300 mayors and numerous universities announced that they were 'still in' the Agreement and willing to do what it takes to ensure the United States delivers on its pledge, at least on emissions if not finance (Watts, 2017: 201). In time, some observers expect the new transparency and global stocktake provisions of the Agreement to open up new windows of opportunity for non-state actors to engage in compliance and monitoring activities. Initiatives such as Climate Action Tracker certainly made their presence felt prior to Paris and seem determined to hold governments to their pledges (van Asselt, 2016). As Chapter 12 made clear, in a polycentric system, the incentive for international actors to defect also creates an incentive for non-state actors to mutually adjust and engage in surveillance activities.

Another significant axis of mutual adjustment is that connecting the international and national domains. This axis goes well beyond the classic two-level games played by substate and national actors to determine national preferences (Putnam, 1988). The cases reported in Chapter 7 confirmed that national actors use the negotiation of international agreements as a window of opportunity to push for stronger commitments at a national level and quantitative analyses have confirmed the general validity of this hypothesis. For example, Fankhauser *et al.* (2015b) have shown that the adoption of national climate policies is correlated with international-level factors (e.g. hosting the UNFCCC Conference of the Parties, ratifying the Kyoto Protocol, keeping up with what neighbouring states are doing, etc.) as well as those that are internal to jurisdictions (the partisan character of the governing party and the presence and vibrancy of NGOs, for example) (see also Fleig, Schmidt and Tosun, 2017). As argued in Chapter 9, polycentric governance does, seem to provide an opportunity structure for the diffusion of climate governance approaches, whilst at the same time being an outcome of the very same processes of diffusion.

But the axis of mutual adjustment that arguably holds the most capacity to surprise commentators is that lying between national and transnational domains. A decade ago, transnational governance was assumed to be an *alternative* to state-based action, hence little or no interaction was foreseen. Ostrom (2009) certainly did not devote much attention to it. Yet there is mounting evidence that pioneering states such as the United Kingdom, working either independently or through international organisations, have initiated around a third of the transnational climate initiatives (Hale and Roger, 2014; Roger, Hale and Andonova, 2017; see also Chapter 11). It is also becoming obvious that the extent to which national-level actors participate in a particular transnational initiative is strongly affected by prevailing national policy frameworks. For example, the existence of strong

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national policies encourages national actors to engage transnationally to build on and ensure the implementation of their state's commitments and/or ensure they achieve wider regulatory equivalence (Andonova, Hale and Roger, 2017). Meanwhile, when and where national policies are comparatively weak (e.g. in Australia, Canada and the United States) and/or local governmental capacities are inchoate (e.g. China, Indonesia), transnational action appears to provide a means to strengthen national policy action. These findings open up the thought-provoking possibility that transnational actions may provide a means by which civil society actors exert leverage on their governments to ratchet up their nationally determined contributions post-Paris (Hale, 2016: 19).

Proposition 3 – Experimentation
The willingness and capacity to experiment is likely to facilitate governance innovation, which in turn leads to learning about what works best.

According to Ostrom (2010a: 556), a polycentric approach allows – even encourages – actors within domains to experiment with different approaches. By experimenting, actors can ascertain what works in particular settings, thus facilitating upscaling. Moreover, if experiments in one domain actively inform experiments in other domains, the likelihood of mutual adjustment (Proposition 2) rises significantly.

The chapters of this book are replete with references to experimentation. If experimentation is defined loosely to refer to the act of tinkering with new governing devices, then it seems safe to conclude that climate governance is awash with experiments. From cities to private companies, to nation states and even within the UNFCCC (Chapter 2), climate change has witnessed an explosion in the number and types of governing devices, and experimentation is often cited as both an enabler of and a motivation for that growth. In the absence of strong overarching rules (see Proposition 5), actors have been able to adopt, blend and trial a number of devices. Emissions trading is probably the most emblematic of this trend (Paterson *et al.*, 2014: 426; see also Chapter 6). It started out as an experimental device within a couple of large oil companies, then over the course of two decades gradually transformed into one of the most popular instruments of national and EU policy. Ideas and knowledge about what worked were transferred horizontally between different jurisdictions via a network mostly comprised of non-state actors (Chapter 13). Cities, too, are widely regarded as active sites of experimentation (Chapter 5). The relative absence, until recently, of references to adaptation in the UNFCCC framework has meant that many actors have also had room to experiment with various approaches to building resilience at the local level (Chapter 17).

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Those that have adopted a narrower definition of an experiment (McFadgen and Huitema, 2017a; Kivimaa, Hildén and Huitema, 2017) have still been able to identify many examples of experimentation. But if an experiment is defined very narrowly as a controlled process of investigation under quasi-laboratory conditions, then the extent of experimentation is probably considerably less than Ostrom originally predicted. There are two points to take away from the discussion of experimentation. First, Ostrom did not offer a parsimonious definition of an experiment. Second, were a common analytical definition to be arrived at, experimentation would still not be an entirely unproblematic category of action amongst practitioners (McFadgen and Huitema, 2017b). In practice, many important political calculations are likely to be at work when a particular group of actors decides to come together to initiate 'an experiment'. In turn, the ways in which that experiment is designed and run are also unlikely to be entirely open and neutral (Chapter 6).

Two other important reservations about Proposition 3 are also raised in various chapters. First, does experimentation actually produce innovations in governance, as Ostrom claimed? Much depends on how narrowly or broadly one defines 'innovation' (and experimentation). If it is taken to mean the development of new policy and governance inventions (i.e. entirely new to the world), then it is fair to admit that the fruits of all the experimental activity noted earlier have not been that spectacular, at least thus far. For example, a fair degree of rebadging has taken place in relation to the announcement of new climate initiatives (Widerberg and Pattberg, 2015: 47, 52). Those that have examined city networks have concluded that a great deal of experimentation is symbolic, i.e. only a minority of networks set numerical reduction targets that are significantly more ambitious than those emerging within the UNFCCC (Bansard, Pattberg and Widerberg, 2016) or at a national level (Jordan *et al.*, 2015). Indeed, many governance initiatives arguably operate within a particular understanding of what is desirable and possible to achieve through governing – one that reflects the core tenets of liberal environmentalism. Having reviewed three sets of transnational initiatives in some detail, Chapter 4 concluded that they rely upon active collaboration with large companies and thus broadly accept their motives of profit maximisation. The only exception is the divestment movement, which is mounting a more fundamental challenge to prevailing business practices (albeit using a rather capitalistic strategy – i.e. inducing investors to invest their money elsewhere). Chapter 16 goes further still, flagging some potentially darker sides of experimentation – namely direct, sometimes uncontrolled experiments with the climate system through the use of climate engineering techniques such as iron fertilisation of the oceans. Such experiments operate in legal grey areas, backed not by states or even private companies (the economics of climate engineering are still not viable enough at scale), but wealthy

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philanthropists. In short, polycentric theory has drawn attention to the eagerness of actors to engage in governance innovation. But whether these forms of governance are themselves innovative or indeed laudable from a legal or normative perspective remains a very moot point (Jordan and Huitema, 2014a, 2014b).

Second, to what extent is experimentation generating societal learning? Almost by definition, policy experiments seek to derive transferable lessons by building in ex-ante and ex-post evaluation. In monocentric systems, there is a strong expectation that higher authorities will manage and legitimise these activities. But when governance is more polycentric, it becomes harder to work out who is doing what, let alone evaluate their activities and learn universally applicable lessons. Apart from having diverging goal and instrument preferences, different units may well adopt approaches to evaluation that actually conflict with and/or fail to share their findings with neighbours. Evaluation itself can also easily succumb to collective action problems, leading (at best) to a lack of standardised methods and (at worse) a proliferation of *à la carte* approaches that approximate a race to the bottom (Schoenefeld and Jordan, 2017a; see also Chapter 12). The picture that emerges from many chapters of this book is that climate governance is succumbing to some of these pathologies. For example, little has been done to monitor and evaluate transnational climate initiatives (e.g. Widerberg and Stripple, 2016; van der Ven, Bernstein and Hoffmann, 2017). Those evaluations that have been undertaken have tended to be few in number and mostly ex-ante in nature (i.e. approximating optimistic predictions of what could be delivered as opposed to what actually is delivered) (Hsu, Whitehouse and Schwarz, 2015; but see Chan *et al.*, 2018). In short, evaluation does not appear – at least, not yet – to be self-organising in the way that Ostrom (2009) implied, which has limited the extent to which experimentation (however defined) has facilitated an scaling up of the most promising initiatives (for a critique of the term scaling up, see Chapter 6).

Proposition 4 – Trust
Trust is likely to build up more quickly when units can self-organise, and as a result collective ambitions increase accordingly.

The basic ontology of international political studies is one of states struggling to collectively adopt credible commitments in the context of high uncertainty and very low trust. But Ostrom argued that trust is more likely in a polycentric setting, because of the greater ability of actors to interact directly with one another (Ostrom, 2010a: 554). A great deal of Ostrom's other work on environmental problem solving focused on (local) communities managing environmental resources together. At that level, monitoring is relatively easy and, through monitoring, a trusting division of labour amongst the various actors is more likely to

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emerge over time. One additional – and key – contention made by Ostrom is that trust building is possible at all levels, including the global level.

When researchers began to study governance outside and below the international regime, it was more or less expected that these assumptions would continue to apply. So, for example, the various domains outlined in Part II were assumed to be complements, not substitutes (Hale, 2016: 19). Similarly, Green (2014) suggested that global climate governance is a positive-sum game, in which efforts by state and non-state actors grow simultaneously and in a mutually reinforcing manner. The UNFCCC process, meanwhile, would simply establish long-term targets and outline possible implementing strategies (Bulkeley and Newell, 2010: 105–106). As the limits to state- and international-level action became steadily more apparent, non-state actors would be drawn into processes of delivery and implementation. And where the international regime was less prescriptive (on issues such as adaptation or technology transfer), non-state actors would self-organise to plug any remaining governance gaps (Widerberg and Pattberg, 2017: 68). In effect, a process of self-organisation was being indirectly invoked by researchers, without any explicit referencing to the work of the Ostroms.

As the landscape of governance has grown more congested with initiatives, researchers have begun to pay much closer attention to the interactions between units and domains. This work has uncovered evidence of collective self-organisation born of trust, but also of conflicting priorities and approaches. For example, in the domain of city-level initiatives, Chapter 5 documents the competition and conflict that has emerged between networks for members and between city regions for inward investment. In relation to carbon finance, banks, donor organisations and NGOs compete with one another to shape the flows of carbon finance 'creating problems of duplication and turf wars over who funds what' (Bulkeley and Newell, 2010: 106). Meanwhile, in relation to adaptation, funding conflicts are emerging between different cities and regions over how to protect themselves against impacts. If adaptive measures are not taken in a planned and coordinated fashion, they may not be sufficiently 'synchronised' (e.g. a flood defence system that ends at a political border between two administrative units; see Chapter 17). In short, the relationship between initiatives could very well be a conditional one (e.g. complementary in some conditions, but potentially substitutive in others) (Andonova *et al.*, 2017).

The central role which polycentric theory ascribes to trust should, in other words, not be taken for granted. In principle, different types of interaction are possible: climate initiatives and policies could complement one another without actually interacting; but they could also merge; they could compete and conflict with one another; or some may actively replace other types. These forms of interaction – termed *co-existence, fusion, competition* and *replacement* – should form the basis

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for a new programme of research (Jordan *et al.*, 2015), which is informed by polycentric theory, but which problematises the role of trust. For example, has the growth in polycentric governance over time increased the occurrence of competition and replacement? Similarly, how do the patterns of interaction vary between state jurisdictions that embrace different levels of climate ambition (e.g. lead states versus followers; see Chapter 8)? And is trust greater in domains which are actively and independently monitored and evaluated, or does external oversight increase conflict and competition (Chapter 12)?

Ostrom argued (2009) that trusting relationships are much more likely to emerge when there are common systems of monitoring. She expected monitoring to self-organise at all levels and in all sectors of governance (Ostrom, 2014: 98). Yet across the emerging landscape of climate governance, very few of the new forms of governing appear to be that well monitored. For example, the majority of transnational city networks have few or no monitoring provisions (Chapter 5), potentially rendering them mere talking shops. The same could be said of the initiatives reported under the UNFCCC's 'Action Agenda' (Widerberg and Pattberg, 2015: 47, 53). It seems reasonable to assume that amongst the many new forms of governing, state policies would be the most actively monitored; after all, many have been in existence for longer, and many states already have evaluative bodies that could be mobilised. Yet the rather sobering conclusion of Chapter 12 is that very patchy evaluation and monitoring make it very difficult to assess the impacts of mitigation policies across countries over time. There are a number of reasons for this, including very significant technical difficulties in demonstrating causality through to the political sensitivities that emerge when policymaking is opened up to external scrutiny (Dorsch and Flachsland, 2017: 58; Schoenefeld, Hildén and Jordan, 2018).

Greater monitoring would reveal the extent to which the various forms of governance that now exist actually contribute to a reduction in emissions. From the perspective of climate change mitigation, it does not really matter where the emission reductions are made. But from a governance perspective, it is very important to know which actors fulfil their commitments (as well as how and why), and which actors fall short. If these matters are opened up, perhaps through processes of mutual evaluation, trust may eventually start to build from the bottom up, as politicians learn. After all, most governance interventions fail to some extent, and if the causes of failure are made clear to all, then it may encourage politicians to trust one another more, not less.

It may be politically convenient at the present time to assume that the Paris Agreement's transparency framework and the five-yearly global stocktakes starting in 2023 will eventually address these issues. But when so little is being monitored, an entirely different scenario which resembles some of the characteristics of more

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monocentric governance may come to pass, i.e. disputes over technical matters such as causality may spiral, and governors could squabble over the attribution and the double counting of emissions arising from state and non-state governance (Widerberg and Pattberg, 2017: 84). Monitoring may thus mirror ongoing contestations about accountability, rather than overcoming them (Gupta and van Asselt, 2017; see also Chapter 19). If this happens, the bottom-up architecture of the Paris Agreement will struggle to generate more trust and emissions reductions could falter, making the more radical technological alternatives (climate engineering) appear even more attractive (Chapter 16). In summary, the steady progression from self-organisation through to deeper trust, by way of greater monitoring and more reflexive evaluation, appears to be more problematic than Ostrom originally assumed.

Proposition 1 – Local action
Governance initiatives are likely to take off and prosper at a local level, through processes of self-organisation.

Finally, we investigate what may be motivating the appearance of the more polycentric forms of governance. Polycentric theory generally assumes that actors will mobilise against a problem when it is in their self-interest to do so. In Chapter 1, we noted how Ostrom's original hypothesis was that many actors would address climate change to reap co-benefits such as improved human health, lower energy costs and better local air quality. Proposition 1 emerges out of decades of research on how local actors address local problems. But how well does it carry across to climate change – a more global issue, with many more actors operating across a multitude of scales?

In general, the changing landscape of climate governance suggests that more non-state actors are making a rational calculation to act against climate change. They are not waiting to be told what to do by an external authority; they are, in other words, taking matters into their own hands (Ostrom, 2010b: 6). The most powerful illustration of this point is the wide variety of non-state actions. In the past decade or so, private and civil society organisations have demonstrably shifted tactics. Instead of seeking to influence international policy processes or waiting to 'take' policy instructions from states, they have self-organised. According to Chapter 4, transnational climate governance is 'by definition' local action.

But why are actors behaving in this way? Studies confirm that the expectation of co-benefits (or at least 'non-climate' concerns) is significant across a large number of cases. For example, transnational governance appears to have many triggers, including moral concerns, a desire to forestall new regulation (or at least shape it), the pursuit of direct financial rewards and the satisfaction of consumer expectations (Hoffmann, 2011; Abbott, 2012). Meanwhile, for around 40 per cent of the 1,200

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climate change laws reported in Chapter 3, energy efficiency and energy security are primary foci, not climate change per se (Averchenkova *et al.*, 2017). Similarly, amongst businesses, local action is motivated by many calculations: pressures to minimise costs (arising from high energy prices through to supply chain disruptions caused by extreme events), the urge to exploit new market opportunities and the need to satisfy shareholder concerns (Gies, 2017). So while Proposition 1 maybe generally true, further research is required to produce more fine-grained explanations of the precise motivation(s) to act locally (Jordan *et al.*, 2015). New typologies of motivation could be tested against the many different forms of new climate governance to shed light on what is arguably the most fundamental question of all: in what conditions does polycentric governance emerge in the first place (Galaz *et al.*, 2012: 23)? This could build on the work on mutual adjustment (see Proposition 2) to parse out the relative influence of international and national governance from other factors.

It is important to note that Proposition 1 does not necessarily assume that all actors have the capacity or indeed the motivation to act locally. For example, Chapter 4 documented the uneven geographies of participation in transnational climate governance. Chapter 3 identified the equally uneven pattern of legislative activity across different countries. Chapter 4 emphasised that the membership of transnational city networks is also very heavily skewed to the richer countries. And Chapter 17 reported the existence of many capacity deficits in relation to adaptation, and suggested that even more would be revealed if analysts focused more on the 'non cases' of little or no local action, a case also made by Chapter 5. In these and other settings, action may only occur when a particular type of actor is present – a policy entrepreneur, a leader or an orchestrator (see Chapters 7, 8 and 11). Several chapters confirm that certain actors somehow manage to 'punch above their weight' (Chapter 7) in driving action (and governance) forwards. In fact, many of the more innovative examples of governance can be originally traced back to the activities of one or more of these very special types of actor.

Ostrom was attentive to the possibility that these special actors are not necessarily present in all circumstances (McGinnis, 2016: 12, 16). But two additional points about the viability of polycentric governance arise from our analysis of Proposition 1. First, if a small number of actors really do play such a disproportionately significant role in enacting climate governance, should we not critically reflect on how robust the whole system is? Ostrom (2010a) claimed that because they are multicentred, polycentric systems are inherently robust. But when the scale of climate change is so vast and the number of critical actors is so low, perhaps the implication of Proposition 1 is not how robust but how potentially fragile the whole system is in certain places. Certainly, analysts could helpfully ask who will lead when the barriers to action are especially high – for example, in

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countries with relatively closed political systems (Andonova *et al.*, 2017) or where fossil fuel industries are especially powerful actors.

Second, local action has been sufficiently vibrant thus far to generate many new forms of governance, but it has not yet triggered a significant, economy-wide process of deep decarbonisation (see Chapter 14). At the very least, accelerated decarbonisation commensurate with achieving 1.5°C seems to assume a significant scaling up of what is currently being achieved through local action motivated by co-benefits (Millar *et al.*, 2017). Perhaps polycentric governance is mainly a means to encourage experimentation within a particular trajectory of climate governance, rather than to generate a step change in the level of ambition or diffuse significantly more impactful forms of governance. We consider these questions in more detail in what follows.

20.4 Greater Polycentricity: Substantive and System-Wide Effects

Ostrom (2010a: 552) maintained that polycentric systems would drive down emissions, trigger innovation, facilitate adaptation and produce more sustainable outcomes across a range of scales. These are very big claims. The chapters in this book document the emergence and spread of climate governance, but more efforts are required to understand what effects the new forms of governance are producing 'on the ground'. To a large extent, this is a function of the immaturity of this particular field of research and the speed at which the whole landscape is evolving. As in many other areas of polycentric research, scholars have sensibly decided to 'bracket off' effects and outcomes in their analyses for now (e.g. Andersson and Ostrom, 2008: 89). To be fair, the UNFCCC was never solely about reducing emissions either – hence the multitude of references in the text to sustainable development, economic growth, capacity building and equity. And Green (2014) helpfully reminds us that for many of the newer forms of governance, 'process' contributions (sharing knowledge, enhancing awareness, etc.) were a significant initial motivation, rather than reducing emissions or rapidly accelerating technological innovation. However, the global climate is warming and the issue of substantive effects will eventually have to be addressed. Atmospheric concentrations of greenhouse gases continue to rise, and without a source of comparable and transparent information on governance outcomes (see above) it will be very difficult to determine whether the high hopes invested in polycentric governance are warranted. In fact, polycentric governance theory reminds us that when governance is interconnected, a political price may have to be paid by governors and especially politicians – for not investing in assessment capacities. Ostrom (2010a) argued that by revealing the co-benefits of acting, politicians could motivate the public to act faster on climate change. But if credible evaluations of co-benefits are

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unavailable, politicians will surely have to work that bit harder to muster a convincing case for deeper decarbonisation (Chapter 14). There is an interesting paradox at work here. Politicians may be wary of investing in new assessment capacities or imposing them on private actors in case they reveal cases of underperformance that are politically embarrassing. But if they are weak or absent, politicians may find it harder to engage in fact-based arguments in favour of stronger climate measures.

What about broader, system-wide functions such as facilitating equity, justice, legitimacy and accountability? In Chapter 1 we noted that polycentric systems are known to be weak at discharging more structural tasks such as these. Matters of equity and justice have been at the heart of political debates since the inception of the climate regime. They are clearly flagged in the text of the UNFCCC, and have directly informed the preferences and strategies of many actors, particularly those in the developing world. Indeed, Chapter 18 claims that the perception that unmitigated climate change risks perpetuating current injustices has done much to accelerate the development of new forms and sites of governing (e.g. in the areas of climate finance, market-based mechanisms and technology transfer). In other words, justice and equity concerns may have stimulated action (Proposition 1), in turn increasing the polycentricity of governance.

The link between polycentric governance on the one hand and equity and justice on the other has triggered two reactions, neither of which will surprise polycentric theorists. The first is that greater polycentricity provides new opportunities to address these concerns, which are long-standing and for the most part largely unresolved – opportunities that could not be delivered by a monocentric regime that had become more gridlocked. Thus, the Paris Agreement has given adaptation a much more prominent place, which may eventually trigger new governance innovations (Chapter 17). Many transnational forms of governance seek to effect a pragmatic interpretation of the 'common but differentiated responsibilities' principle in the UNFCCC, through enabling technology and finance to flow to developing countries. Transnational actors are in effect able to deliver on issues that had become simply too politicised in the UNFCCC (Castro, 2016: 400).

A second likely reaction is that polycentric governance suffers its own variant of the age-old North–South divide in environmental politics (Hale, 2016: 20). Thus the more bottom-up Paris Agreement allowed richer countries to make all sorts of pledges (on emissions, finance, etc.) that may not be met (Bang *et al.*, 2016). The weaker participation of developing countries in the design and running of many city networks and international cooperative networks also tells its own story. The poorest countries are being particularly badly treated in a number of key respects. Chapter 15 documents how larger developing countries with strong national policy support instruments and governance systems have benefited the

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most from cleaner technology transfer. Some go further still, arguing that polycentric climate governance does not simply legitimise the status quo (Castro, 2016), but opens up new opportunities for private companies in the North to make money from climate mitigation and adaptation, thus accentuating current injustices (see also Chapter 18).

Polycentric governance systems are also known to be vulnerable to the charge that they are illegitimate and unaccountable (see Chapter 19). This line of critique is, we think, appreciated by many polycentric theorists, but should be taken more fully on board (as we noted in Chapter 1). It is abundantly clear that many non-state actors are taking on the responsibility and thus the authority for addressing climate change, but with so many hands at work, the risk grows that no one is ultimately accountable. Legitimacy is typically founded on one of two forms: governance inputs or governance outputs (Schmidt, 2012). How well do polycentric systems of climate governance fare against these two criteria? Output legitimacy has already been alluded to. It refers to the ability of governance to satisfy the public, chiefly through the delivery of public goods such as an habitable climate. As noted earlier, it is very difficult to determine what polycentric governance is providing against this criterion, given the fragmented systems of monitoring and evaluation.

Input legitimacy on the other hand corresponds to the participation of actors in shaping the contours of governance – through the following of rules governing who should participate, when and how. But when the climate governance landscape is in such deep flux, it is rather difficult to determine who is really accountable to whom (Widerberg and Pattberg, 2017: 84). And when there are only weak overarching rules (Proposition 5), actors may find it easier to shop between domains, and engage in free-riding or greenwashing. These risks are particularly starkly revealed in relation to radical emission reduction technologies which currently fall between a number of different international regimes (Chapter 16). Similarly, many forms of transnational governance were originally designed to perform quite functional tasks. City networks, for example, are not as transparent as is often assumed (Bansard *et al.*, 2016). Indeed, they are sometimes derided as exclusive clubs – networks of pioneers for pioneers (Chapter 5). Many of the world's largest cities are not members and hence their citizens have no voice. Meanwhile, orchestration is emerging as an important means by which some actors govern the landscape (Chapter 11), yet their associated transparency and accountability mechanisms are 'nascent at best, [and] non-existent at worst' (Bäckstrand and Kuyper, 2017: 22).

It would be tempting to conclude that polycentric systems are inherently illegitimate. However, before leaping to that conclusion, it is worth reflecting on what the basis for comparing between governance systems is, because in reality none is

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perfect (see Chapter 1). Hence trade-offs across the two forms of legitimacy are probably necessary. Moreover, the legitimacy of any system is often intimately connected to that of cognate systems, which in our case include the international regime and systems of national policymaking. How well each actor goes about constructing and maintaining its legitimacy is thus a vitally important challenge deserving further research (compare Bulkeley *et al.*, 2014).

20.5 Conclusions: The Promise and Limits of a Polycentric Perspective

A vibrant debate is under way amongst analysts and practitioners concerning the origins, extent and functioning of polycentric climate governance. This debate is exciting because it appears to offer an empirical validation for a broader narrative of political dynamism in a world that remains acutely concerned about the risk of gridlock in the UNFCCC process. However, we believe that it is important that this narrative remains theoretically and empirically informed, given the tendency for overenthusiasm to creep into studies of innovative activity (Jordan *et al.* 2015). This is even more true when one is dealing with a relatively open theoretical concept such as polycentric governance. In the past, that concept has been used to inform a wide variety of empirical case studies, whose primary purpose has been to provide a proof of principle than a rigorous test of its veracity. To move the debate forward and address the criticism that it does not have a sufficiently clear core (Galaz *et al.*, 2012: 22), in Chapter 1 we unpacked the key ingredients of polycentric theory and expressed them in the form of five central propositions. In this final section, we examine the promise and the limits of a polycentric approach as a means to *describe, explain* and *prescribe* contemporary shifts in climate governance.

As a *descriptive* device, this book has revealed that polycentric terms and concepts have great value as a means to account for the rapidly changing contours of the climate governance landscape. In the past, climate governance has been examined from the standpoint of single levels and domains, producing a set of insights that are revealing but nonetheless only partial. Polycentric approaches seek to offer a more holistic perspective which furnishes a more synoptic appreciation of all the landscape's component parts and, even more crucially, the interactions between them. It goes beyond labels such as 'fragmented', 'multilevel' or 'complex'; instead, it seeks to transcend existing debates and categorisations (e.g. 'regime complexity').

The ability of a concept to offer a better description of a particular phenomenon is commonly underrated because description is automatically assumed to be inferior to causal analysis (Gerring, 2012). In practice, description often *precedes*

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(and is a precondition for) good causal work. The work summarised in this book amply demonstrates the importance of undertaking careful descriptive work in an area which is developing very rapidly and is of huge societal importance. The construction of larger databases of transnational and national policy activity has not only revealed the value of adopting a holistic perspective but also opened up many new and important research questions. Elinor Ostrom was fond of saying that analysts should 'unpack the complexity in order to understand it' (Ostrom, 2010b: 19). We think that describing climate governance as polycentric provides a fresh reason to more fully unpack and understand its internal complexity.

This takes us neatly onto the *explanatory* perspective: the chapters remind us that when a governance landscape is polycentric, causal processes are likely to go in many directions, some rather unlikely. Polycentric theory's main strengths – its breadth and openness – have, however, made it difficult to apply in the past. Structural issues, such as the exercise of political power, legitimacy and accountability are also not yet fully accounted for, although it should be remembered that all theoretical frameworks have their blind spots. The five propositions outlined here do, we think, provide a sound basis for a new, shared programme of interdisciplinary work on climate governance. As part of that broader programme, polycentricity could usefully serve as a meso-level concept around which other concepts and theories can be brought into a more productive dialogue with one another (see also Galaz *et al.*, 2012: 22). The chapters of this book have, for example, helpfully revealed what extra is learnt by drawing on theories of diffusion (Chapter 9), leadership (Chapter 8), orchestration (Chapter 11), experimentation (Chapter 6), entrepreneurship (Chapter 7) and accountability and legitimacy (Chapter 19). Many of these theoretical and empirical connections are already being made by analysts working from partial perspectives; polycentric governance provides a means to assemble the jigsaw pieces into a more complete picture.

Emerging from the chapters are at least two explanatory challenges that we think deserve further research. First, what role is the state performing in polycentric governance? The Ostroms have often been misread as being completely fixated with local action (see, for example, Mansbridge, 2014: 8), when actually polycentric theory is deeply concerned with the *balance* between monocentric and polycentric forces. At present, a rather binary view of the state risks taking hold in climate governance scholarship. One line of argument is that the state has been hollowed out by austerity, has been captured by neoliberal forces and is too deeply mistrusted by voters to make a difference (Rockman, 2017). According to this argument, non-state actors have responded by constructing new forms of governance in areas where the state cannot or does not want to go (Hoffmann, 2011). The second line of argument is that although pure monocentricity maybe a non-starter, the state nonetheless remains 'an actor like no other' (Chapter 3).

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Polycentric theory seeks to work across this binary conception by paying greater attention to the more passive and active ways in which states shape polycentric governance, whilst acknowledging that their precise role is likely to be contingent (Ostrom, 1999: 281). We know, for example, that the structure of national systems exerts a passive effect through affecting the political opportunity structures encountered by subnational and non-state actors (Roger *et al.*, 2017). In general, closed-state structures inhibit transnational action and vice versa (Andonova *et al.*, 2017). States also actively nurture governance innovation by a variety of means. They are: creating policy instrument constituencies (emissions trading and feed-in tariffs being prominent examples) by intentionally engaging in policy feedback, facilitating the diffusion of governance innovations by funding learning capacities (Chapter 9); anchoring private standards (Green, 2014) and encouraging learning by establishing bodies with evaluative capacities. They are also orchestrating other actors, both directly and via international organisations such as the UN Environment Programme and the World Bank. In other words, state power is being expressed and rearticulated in new ways (Hickmann, 2017). Similarly, it is important to understand how state structures affect how new ideas (e.g. emissions trading; see Paterson *et al.*, 2014) circulate and become transplanted in national policy systems. Until now, these political choices have mostly been seen as binary: as alternatives rather than complements.

Second, what about the temporal dynamics of polycentric governing? How long does polycentric governance take to form and how and why does it change over time? Chapter 13 offers a salutary reminder that polycentric governance may take at least as long to emerge as conventional international agreements: the first experiments with emission trading were initiated as long ago as the 1970s. Furthermore, is there, for example, a natural upper limit to the number of initiatives and domains in a polycentric system? The growth in the number of transnational initiatives and national climate policies does appear to be tailing off (see Chapters 3 and 4) and some city networks have actually lost members in recent years (see Chapter 5). Does this finding hold for other forms of non-state governance and, if so, what explains it? Finally, how long do the newer forms of climate governance last? Polycentric theory reminds us that bottom-up governance is a perilous activity, vulnerable to lapses in funding and state support (Galaz *et al.*, 2012: 31). Experience suggests that many bottom-up initiatives are indeed ephemeral and quietly 'sink' (Benson, Jordan and Smith, 2013), particularly when states actively withdraw their support. Around 40 per cent of the public-private partnerships adopted at the 2002 World Summit on Sustainable Development have suffered this very fate (Hale, 2016: 18). If simply surviving is such a challenge, it may explain why many forms of bottom-up governance set such vague targets and incorporate weak monitoring systems.

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Finally, to what extent does polycentric governance offer a means to *prescribe* how to govern climate change? The Ostroms thought that description, explanation and prescription were tightly interconnected (see also Gerring, 2012: 746). Elinor Ostrom promoted academic research that was doubly engaged – in addressing real-world problems and understanding the real-world complexity that governors confront on a daily basis. Table 1.2 in Chapter 1 is replete with policy prescriptions that are potentially testable. She maintained that they should be subjected to rigorous and critical academic analysis. It is telling that her 2010 article (Ostrom 2010a: 554) listed a number of potential weaknesses, including free-riding and carbon leakage, which should also be borne in mind. After all, she always counselled against reductionist and/or 'panacea' thinking – i.e. assuming that a prescription at one level or in one domain will neatly fix a particular problem (Ostrom, 2007). For example, making a governance intervention more effective and accountable by wrapping it in new systems of monitoring and evaluation risks removing the very sources of spontaneity that brought it into existence in the first place. Finally, she would not have been surprised to discover that in this particular area of governing, academics are still playing catch-up. The chapters of this book offer a very sobering reminder that practitioners were actively remaking and rescaling governance long before academics began to research the new landscape.

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