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Reflections on the State of Climate Change Policy

From COP21 to Cities

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Abstract

This Ernst Strüngmann Forum seeks to link justice, sustainability, and diversity agendas. In support, this chapter discusses how linkages between these three concepts have formed and changed in the climate change discourse, particularly in light of the recent Paris Agreement. As the latest addition to the portfolio of international climate change agreements, the Paris Agreement establishes a landscape in which nation-states, subnational actors, and transnational networks will be able to reconfigure existing linkages between sustainability, diversity, and justice, and perhaps improve upon them.

Here, three possible developments are identified which may substantially influence the reconfiguration process. Recognition is given to the sustainability and justice deficits that have plagued the “top-down” character of the international climate change discourse, and it is hypothesized that the Paris Agreement opens the door for “bottom-up” movements to claim a larger segment of climate change policy decision making and design. In turn, the “polycentric” landscape created by such “movement from below” appears to emphasize concepts such as inclusivity and transparency perhaps allowing for explicit climate justice commitments. Finally, to advance societal transformation and embrace diversity, it is hypothesized that the scientific endeavor needs to be transformed from a purely analytical pursuit to an effort that makes use of the wide range of scientific competences and provides support for transformative innovations to change unsustainable sociotechnical systems.

Introduction

Climate change is transforming global society. Will humanity respond by initiating social transformation through cooperative and reflexive change to remove

future risks and protect vulnerable communities from present and mounting harm? A comprehensive vision of a truly sustainable and zero- or low-carbon society, associated with a clear and convincing implementation strategy, does not yet exist. Sustainability science can tell us much about the components of such a society and potential implementation pathways, but the true challenge is to attract political backing for functional models that bring different stakeholders together in support of chosen approaches. In brief, a social transformation would appear to require envisioning and enacting sustainability simultaneously. If we are to succeed in limiting global warming “well below 2°C” as stipulated in the Paris Agreement (UNFCCC 2016a, Art. 2), the global community needs to confront this challenge and take action immediately.

The Paris Agreement has sent a strong signal for societal transformation. It ingrains a new collective understanding of the challenge ahead and captures a strong normative obligation for nation-state action. Still, the agreement also suffers from a significant ambition gap and lacks enforceable mandated action (Civil Society Review 2015; Rogelj et al. 2016). Civil movements will continue to contest the continued dominance of the constituents of unsustainable sociotechnical systems worldwide (Hermwille et al. 2015). The policy landscape emerging from the Paris Agreement challenges nation-states, subnational actors, and civil society networks (from local to transnational scales) to reconfigure existing linkages between sustainability, diversity, and justice, as well as significantly improve upon them. The Paris Agreement forcefully reconsiders previously accepted global emission management strategies and opens the door for new ideas and experimentation.

In this chapter, we situate climate change policy and science in this post-Paris landscape, exploring three hypotheses that potentially provide for simultaneous envisioning and enacting of the needed societal transformation. First, cities and regions can and must play an important role in leveraging climate action through a multilevel governance system (Hypothesis 1). Showing signs of innovative experimentation and diffusion, the inclusion of these subnational actors, often articulated through regional, national, and transnational networks, departs from the overarching and singular story perpetuated throughout two decades of climate change negotiations. In addition it ties with the post-Paris multinarrative, nonlinear, and versatile landscape. Second, the climate justice deficit experienced throughout the world can be confronted by “polycentric” design and implementation that expressly incorporates civil society strategies to halt the use of unburned fuels and to empower local energy development (Hypothesis 2). Shared learning, adaptive management, and democratic legitimacy are key components of such strategies. Finally, a new line of inquiry needs to reflect more fully a social purpose of realizing a sustainable and equitable future (Hypothesis 3). Such “transformative inquiry” (i.e., science that makes use of the wide range of scientific competencies to support broad societal change) is required to address the complexity and diversity of our climate and societal challenge. Transformative inquiry can help to provide innovations

that have the potential and power to change proactively unsustainable socio-technical systems, to gain a better understanding of system behavior and the decision-making processes, and to help serve the dual aims of a just and sustainable future.

Three Hypotheses

Changing Governance Architecture: Cities and Regions as Pioneers of Climate Governance

Hypothesis 1: A shift is already underway from the nation-state basis of policy design to more regional and locally based policy design. Local and regional levels of policy design are, or can be, motivated by very different political drivers. The concrete measures and investments they promote can shape a climate policy landscape better focused on sustainability and justice.

Subnational policy design efforts have increasingly positioned themselves as drivers of appropriate climate policy formulation (Jordan et al. 2015). Drivers of this emerging and accelerating activity include the “painfully slow” and seemingly paralytic character of global climate change negotiations (Neslen 2015). This movement “from below” embodies a pluralism that extends beyond previously introduced ideas of “regime complexes” that remained international, top-down, and state-centric (Biermann 2014). Captured under the designation of “polycentricity,” this movement places the thrust of innovative climate governance within diverse, experiential, and multilevel engagements (Ostrom 2014). Polycentricity is positioned as a new means to organize political space, enable societal response and action, and importantly, govern climate change in the presence of “governance gaps” (Abbott 2014). Indeed, intensifying action at the local level has, for many, advanced the notion that polycentricity is a credible alternative strategy for climate change (e.g., Martinez-Alier et al. 2016; Ostrom 2014).

Cities and regions, in particular, have openly argued for their relevance in a polycentric system of governance (Castán Broto and Bulkeley 2013). With urbanization as a defining feature of modernity, cities are a key source of leadership potential grounded in features such as population (by 2030, about 60% of the global population will live in cities), capital (cities produce about 85% of global GDP), and energy use with its associated greenhouse gas emissions (cities generate 71–76% of energy-related greenhouse gas emissions). In addition, the high-density urban morphologies of cities face vulnerability to climate impacts, especially in coastal regions and along rivers. Proponents of city action furthermore posit the economic advantage (Colenbrander et al. 2015; Gouldson et al. 2015; Sudmant et al. 2015): a recent report by the New Climate Economy, for instance, put the global economic opportunity for low-carbon urban actions at USD 16.6 trillion over 2015–2050 (New Climate Economy

2015). Advantages of such urban climate strategies include economic benefits (such as energy cost savings and mitigation of energy price volatility), environmental improvements (e.g., local air-pollution abatement), and social advancement (e.g., green job growth).

Following a “governance by diffusion” strategy, urban climate change action and experimentation is gaining significant momentum (Hakelberg 2014).

The Urban Climate Change Governance Survey, based on results from 350 cities worldwide, underscores the widespread diffusion of climate change action as 75% report activity in both mitigation and adaptation (Aylett 2014). Moreover, city commitments to climate change frequently outstrip their national counterparts in terms of ambition and coverage (e.g., Lombardi et al. 2014; Reckien et al. 2014) inspiring “hope that climate governance *in toto* is more active than critics transfixed by UNFCCC-related meetings have assumed” (Jordan et al. 2015). Often driven by co-benefits (e.g., improvement of local air quality, regional economic impulses, job effects) and backed by their citizens, cities play an active role, even in those cases where an enforcing legislative climate policy framework is missing.

Estimates of potential performance use these commitments to arrive at impressive totals (e.g., ARUP 2014). Empirical insight into the comprehensive performance of the strategy, however, remains challenging in part due to the strategy’s strong reliance on “soft results” such as awareness raising, iterative learning, trust building, and democratic legitimacy as key distinguishing parameters (Jordan et al. 2015). Examples of potentially transformative efforts are listed in Table 9.1.

A common expression of urban climate change planning is the formation of (transnational) municipal networks (e.g., C40, ICLEI, Covenant of Mayors, European Green Capital). Such networks can deliver at least three strategies to facilitate effective governance: (a) an information and communication function promotes knowledge exchange, “best practices” diffusion, or improves local-technical expertise; (b) a project funding and cooperation function assists in the rollout of urban projects; and (c) a recognition, benchmarking, and certification function encourages experimentation and rewards leadership (Kern and Bulkeley 2009). Moreover, bottom-up activity can provide political pressure to raise ambition at other levels of government or drive deeper levels of cooperation (Keohane and Victor 2016).

The finding that (transnational) municipal networks (e.g., C40, ICLEI, Covenant of Mayors) themselves promote diffusion and implementation (Hakelberg 2014) combined with evidence of horizontal diffusion (i.e., where communities adjacent to other communities that participate in climate protection efforts are more likely to do so themselves) suggests a possibility of (urban) climate governance outgrowth. Additionally, evidence that “orchestration” of cooperation in climate change can be facilitated by states and inter-governmental organizations further allows for the possibility of governance outgrowth—meaning that these traditional actors often guide, broaden, and

Table 9.1 Overview of a selection of urban climate change activities and experiments (Bartlett and Satterthwaite 2016; Bond 2012; Bulkeley and Schroeder 2012; Francesch-Huidobro 2016; Reckien et al. 2014).

Region	City	Actions
Global	100% renewable energy movement	Dynamic movement of so-called 100% renewable energy cities/regions. Throughout the world, cities or regions pursue 100% renewable energy supply.
Africa	Cape Town	The “One Million Climate Jobs!” social movement brings together labor officials, community activists, and environmentalists to stimulate green job creation on a large scale.
Asia	Shanghai, China	While dominated by hierarchical governance, Shanghai has positioned itself as a leader in experimentation with low- or no-emission public transportation, particularly buses.
East Asia	Seoul, South Korea	One Less Nuclear Power Plant Initiative: innovative energy solution-searching effort seeking to avoid or sustainably generate energy within Seoul’s jurisdiction equal to replacing one nuclear power plant, eliminating energy risks, reducing transmission losses, and enhancing citywide resiliency and sustainability.
Europe	Collection of Dutch, Danish, and Belgian cities	Cities pursue aggressive carbon-neutral emission profile by 2020 or 2025.
Middle America	Mexico City, Mexico	Actively exchanges best practices with other cities.
North America	Portland, OR, U.S.A.	Full-scale reconceptualization of the urban form.
	Los Angeles, CA, U.S.A.	World’s largest LED streetlight retrofit program.
	New York, NY, U.S.A.	Climate justice agenda includes actions on health-care access, high-speed internet access, and addressing racial and ethnic disparities.
South America	Manizales, Colombia	Multiple risk exposure conditions accelerate shift to prevention, resilience, and vulnerability reduction (as opposed to emergency response).
	Quito, Bogotá, Curitiba	Pioneering cities for bus rapid-transit systems.

strengthen transnational and subnational climate governance (Hale and Roger 2014). The process can be self-intensifying: communities currently dissuaded from climate action due to perceived costs of greenhouse gas reduction efforts could be convinced by the mounting initiatives of neighboring jurisdictions and by the growing stock of learned good practices and demonstrable action

benefits. The “driver’s seat” for appropriate climate policy making, therefore, could be shifting to regional and locally based policy design.

Climate Justice in a Polycentric World

Hypothesis 2: Polycentric design and implementation can enhance climate justice prospects by moving decision making closer to those who are impacted. Open question: Can transformative change from the bottom up work globally only if an overarching set of justice principles are imposed?

A fracture of monocentric, top-down governance strategy into a polycentric movement of policy design and implementation (Hypothesis 1) will likely be accompanied with broad repercussions for climate justice (Hypothesis 2). While the top-down climate change approach employed throughout much of the negotiations raised questions of justice and equity in relation to operational principles (Okereke 2010), the approach has received frequent criticism for its failure to bring about climate justice (Barrett 2014; Ciplet et al. 2013; Shue 1993). Polycentric governance structures, captured in local movements, domestic networks, and transnational “bottom-up” agreements to share information, lessons learned, and political strategies reorient the subject of governance from the administrative state and technical experts to the “chaotic” landscape of cities, NGOs, communities, and so forth. (Bäckstrand and Lövbrand 2016). This landscape could be a source of transformative change through processes of critique, resistance, and new action. Divestment movements, for instance, enforce change by redirecting financial support away from conventional energy actors while local policy design and innovation opens new areas for community-prioritized and designed investment.

Polycentric policy design efforts could expand from the dominant reform process of environmental commodification and equally consider previously neglected dimensions of sustainability and justice (Bond 2012, 2015). For instance, an evaluation of four polycentric transnational networks found that such action can produce benefits for equity, inclusivity, information, accountability, organizational multiplicity, and adaptability (Sovacool 2011). Global measurement, reporting, and disclosure databases, capturing commitments and plans for thousands of cities, further stress the apparent desire for (global) accountability and responsibility in urban climate governance (Gordon 2016).

Experimentation by a diverse group of subnational actors has produced climate policy actions with impacts beyond the Kyoto Protocol mechanisms, especially of carbon trading (e.g., Hoffmann 2011). Similarly, polycentric response strategies deployed by subnational actors exhibit features such as “individual as coauthor” and other participatory characteristics. Thus, a recent study found that 34 out of the 627 urban climate change experiments surveyed were led by community-based organizations such as grassroots movements and that 296 of 627 experiments were performed by a partnership involving a multitude of diverse actors often including community-based organizations or

citizens directly (Castán Broto and Bulkeley 2013). Community-based organizations, nongovernmental organizations, and the general population are often considered key supporting partners for local climate change action (Aylett 2014; Castán Broto and Bulkeley 2013; Hoffmann 2011).

Furthermore, public involvement can bring new knowledge and goals to the fore and can contribute to the determination of what is considered a “good outcome” depending on context. A comparative case study of the multistress environment of Delhi, Bogotá, and Santiago de Chile shows, for instance, that policy makers emphasize policy directions that advance local adaptive capacity and realization of co-benefits (Heinrichs et al. 2013). Participants in polycentric climate change action also emphasize and value the social and technical learning components provided by their membership in the effort (Galaz et al. 2012). Moreover, learning establishes a trust-building process as participants engage each other through successive rounds of experimentation and problem resolution (Ostrom 2014; Wilkinson 2010).

At a provincial scale, the process of developing a “climate protection plan” for North Rhine-Westphalia is an important example for broader stakeholder participation aiming (among other things) for introduction of additional competences and implementation culture for the proposed measures (Fischedick 2015). Actually, more than 400 different stakeholders have been involved in this process (including energy utilities, energy intensive industries, consumer associations, labor unions, NGOs, city networks) which has included common efforts to identify robust mitigation strategies for the state level, to bundle them in consistent scenarios, to discuss results of a comprehensive impact analysis of different future pathways (including socioeconomic aspects), and to propose and assess suitable policy instruments for the implementation process.

In terms of enhancing climate justice, polycentric policy can be seen to underscore the following:

1. Inclusivity or active involvement from a diverse number of stakeholders is important.
2. Internal and external accountability as project sponsors of polycentric policy designs have community ties and disclose intent and progress in (inter)national databases.
3. “One-way street” thinking prevalent in technocratic solutions (such as fiscal regulation, subsidies, and technical efficiency) is inadequate and inappropriate; the search for solutions is time and space contingent.
4. Adaptive management “demands constant revisability of ends as these are rethought and adjusted or altered in the course of experimentation and mutual learning” (Wilkinson 2010) or when placed in different contexts.
5. Shared learning and, through successive rounds of successful experimentation and problem resolution, trust building is necessary.
6. Democratic legitimacy of community representation is key.

Transformative Inquiry on the Rise?

Hypothesis 3: Successful implementation of ambitious greenhouse gas (GHG) mitigation strategies requires increased participatory approaches and a more proactive role of science (e.g., more societally relevant and impactful research, greater concerted action/practice).

In the face of persistent justice and sustainability problems challenging economic development, transformational changes are crucial. Proposed changes can include, for instance, large-scale transitions of practices, infrastructures, as well as values and priorities. The problems we are facing are “wicked” (Jahn et al. 2012), meaning that they are global, complex, and urgent. As such, science needs to move past its descriptive analytic role and should orient toward the society/nonscientific public (Lele and Norgaard 2005).

Recent approaches to this topic include Responsible Research and Innovation—a solution-oriented sustainability research strategy which embodies societal impact assessment frameworks. Sustainability research, in particular, has developed methods and approaches for transdisciplinary (stakeholder) participation (Clark 2007; Clark and Dickson 2003; Kates et al. 2001; Lele and Norgaard 2005; Miller 2013), knowledge integration (Jahn et al. 2012; Lang et al. 2012; Scholz and Tietje 2002), and for strengthening the science–society interfaces (Schäpke et al. 2015; Schneidewind and Scheck 2013) aiming to understand and contribute to transformations.

The latter, in particular, implies a reorientation toward experimental approaches by developing a new generation of experimental settings, such as living laboratories (e.g., Voytenko et al. 2016), urban (sustainability) transition labs (e.g., Loorbach and Rotmans 2010; Wiek and Kay 2015; Wittmayer et al. 2014), and “real-world” laboratories (e.g., Schäpke et al. 2015). Despite their differences, the settings share a focus on interventions in actual political-economic contexts undertaken by stakeholders in transdisciplinary collaborations with scientists and researchers. Furthermore, they share a double aim of understanding and at the same time contributing to societal change toward sustainability (see Schneidewind 2013). Accordingly, they are research endeavors, meaning they produce evidence regarding possible solutions to given sustainability problems (Wiek and Kay 2015) and at the same time pursue a transformational mission and therefore apply solutions with explicit climate justice objectives (Voytenko et al. 2016).

Another common goal of these approaches is to change the relationship of science and society from clearly disconnected to closely intertwined by (a) focusing on societally relevant problems, (b) enabling mutual learning processes among researchers from different disciplines (from within academia and from other research institutions) as well as actors from outside academia, and (c) aiming to create knowledge that is solution oriented, socially robust (see, e.g., Gibbons 1999), and transferable to both scientific and societal practice.

In light of these challenges, the role of science in society has been critically scrutinized, leading to calls for a new “social contract” (Funtowicz and Ravetz 1993; Gibbons 1999; Lubchenco 1998). Such a contract holds science accountable for its role in fostering or hindering progress toward sustainability around the world. This position endorses research in pursuit of effective solutions to complex societal problems. In return, it demands a fundamental shift in research design (Miller et al. 2014; Sarewitz et al. 2012; Wiek et al. 2012) and of the institutional science and funding system.

The Paris Agreement: Harbinger of a New Climate Policy Paradigm?

Over time, the perception of the climate change problem has shifted significantly. The scope of the problem definition gradually increased from a rather narrowly defined environmental problem to include the developmental perspective, and ultimately to a fundamental transformation of global societies (Hermwille 2016). The “collective action” paradigm shaped decision making as the global character of the issue and was argued to necessitate international consensus as well as, more importantly, planetary carbon-emission management. When assessing the Paris Agreement, it is this paradigm that commonly guides the analysis. Can the Paris Agreement provide a basis for international governance of the great transformation? Is it inclusive enough to overcome the current confrontational style of climate policy and establish a sense of meaningful cooperation? Will it help to establish a common understanding that this transformation needs political guidance? And, ultimately, will it help global leaders to take the right decisions?

A separate assessment of the Paris Agreement seeks answers to a different set of questions. Testimony to the confrontation and disagreement among global leaders can be found in the realization that the pursuit of such a global collective action solution has been over two decades in the making. To date, global commitments have been unable to slow the pulse of the key identifier of climate change: the climbing pattern of atmospheric greenhouse gas concentrations first measured in Mauna Loa. Further, negotiation failures—most prominently in 2009 at the Copenhagen Bella Center—underline the sustainability and justice deficit which led to many openly questioning the viability and desirability of the collective action paradigm (e.g., Ostrom 2012). Can the Paris Agreement motivate and facilitate subnational and local creativity, innovation, and leadership to a globally meaningful level that can overcome the deficit left by 20 years of top-down negotiation impasse? Do communities embrace climate action due to global enforcement or due to the local climate, economic, and justice benefits of intervention? Does the Paris Agreement allow for local stakeholders to be decision makers?

The Paris Agreement provides six elements which, in our view, and in spite of all the remaining shortcomings of the international negotiation process and format, offer a promising foundation for successful governance of the required transformation:

1. An arena in which stakeholders can engage in a spirit of trust and cooperation
2. A shared transformational vision, not necessarily in terms of a clear picture about a mutual way forward, but at least as a common sense of direction
3. Sufficient resources, though not enough to finance the transformation, but at least to get the implementation process started
4. Transparency to provide the required information to further build trust and to allow for reflexivity
5. A mode to address undesired effects of the transformation
6. A process with a shared agenda and schedule

The following analysis is based on the Wuppertal Institute's more extensive analysis of COP21 and the Paris Agreement (Obergassel et al. 2016).

The Return of Environmental Multilateralism

After the diplomatic disaster of Copenhagen, confidence in the multilateral negotiation process had declined dramatically. As the French COP President Laurent Fabius stated in his speech before the final draft was tabled: “[I]f, today, we were so misfortunate as to fail, how could we rebuild hope? Confidence in the very ability of the concert of nations to make progress on climate issues would be forever shaken” (Fabius 2015).

To avoid the breakdown of environmental multilateralism, three elements were crucial: First, diligent preparation and outstanding leadership was provided by the French COP Presidency and the UNFCCC Secretariat. Second, a “high ambition coalition” emerged, comprised of Small Island States, Least Developed Countries, and the EU, and ultimately even included countries like Japan, Brazil, and the United States. This coalition helped to push the outcome toward the upper end of what seemed politically possible. Third, by allowing national determination of intended effort, Parties were able to reach an agreement which envisages climate action by all nations, partly repairing the deep schism between developed and developing countries within the UNFCCC. The success of the Paris conference, therefore, restored some of the confidence that had been lost over the last decade (cf. Bodle et al. 2016).

Normative Vision: The Long-Term Goal

The agreement's ambition of limiting global warming to “well below 2°C above preindustrial levels and to pursue efforts to limit temperature increase

to 1.5°C above preindustrial levels, recognizing that this would significantly reduce the risks and impacts of climate change” (UNFCCC 2016a, Art. 2), represents a quantitative increase compared to the previous wording, but it is also a qualitative modification.¹ The 2°C threshold of the Copenhagen Accord and consequently the Cancún Agreements has been widely interpreted as a goal to be “achieved.” This implies an economic cost-benefit calculation in which the 2°C threshold marks the point at or around which the cost of abatement of GHG emissions and the expected benefits of avoided cost through climate change impacts are deemed to break even (for comprehensive discussion, see Grubb et al. 2014). The sense of urgency of the 2°C goal was never beyond question to those familiar with the matter, but it may still have linguistically created a “comfort zone” and a sense of remaining flexibility that was never justified. The ultimate objective of the Convention is to avoid dangerous climate change. The long-term goal of the Paris Agreement can only be understood one way: any global warming is dangerous.

Furthermore, countries agreed that the temperature limit is to be reached by achieving “a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century.” Other formulations would probably have worked better as a norm to guide the behavior of actors. For example, a goal of full decarbonization would have provided a much less ambiguous mandate. However, from a climate science point of view, the actual formulation is even more inclusive, as it also encompasses greenhouse gases other than CO₂ and particularly the land-use sector. The opportunity becomes even more pressing when open questions and various risks are considered that are associated with “net negative emissions.” If action is delayed, many climate protection scenarios do require negative emissions (most likely after 2050) to limit global warming to just 2°C. From the current perspective, it is hard to imagine, for instance, that the combination of the usage of huge amounts of biomass and carbon capture and storage, that is, the combination of two problematic strategies, could do the job and help extend the fossil fuels era. The Paris Agreement, thus, provides a strong mandate to accelerate the global societal transformation away from the age of fossil fuels. However, as elaborated above, the Paris Agreement insufficiently considers the justice consequences of its provisions, relegating the active pursuit of climate justice to the actions of polycentric actors.

Legal Construction

Unlike the Kyoto Protocol, the Paris Agreement does not take the shape of a protocol as per Article 17 of the UNFCCC. It follows an innovative legal

¹ Due to unequal distribution of warming effect, we note that by limiting the average *global* temperature increase to 1.5°C, some regions may experience temperature increase well above 1.5°C accompanied by more severe impact and threats.

approach: it is neither an amendment to the Convention nor a protocol. The Paris Agreement constitutes a new form of a (dependent) treaty under international law (Obergassel et al. 2016). This somewhat peculiar legal construction was chosen owing to the domestic politics of the United States as this construction would allow the ratification per executive order by the President of the United States as opposed to ratification through the Senate.

The domestic politics of the United States' constituted a secondary condition to the international negotiations in even more ways. For the same reasons, the U.S. delegation was not prepared to accept any legally binding obligations that go beyond what was already ratified in preceding international agreements or what is already reflected under current national legislation (i.e., predominantly the existing Clean Air Act). Hence, the Paris Agreement obliges Parties to communicate nationally determined contributions (NDCs) and to implement policies accordingly, but not to actually achieve them. Pledges are voluntary, but the process is compulsory (Cléménçon 2016). Since a system of accountability through formal obligations was not possible under the current political realities, Parties reverted to a compromise: an accounting and transparency system paired with periodic moments of concentrated political attention.

Transparency

The Paris Agreement establishes, for the first time, a universal transparency system. While previously there had been separate reporting and review systems for industrialized and developing countries, now there will be only one system. This could substantially increase the transparency requirements for mitigation actions by developing countries. At the same time, the new system meets the demands of developing countries by also including adaptation and requiring developed countries to increase transparency on their provision of (financial) support. The details of the transparency framework will be part of the fine print in the Paris Agreement to be drafted in the coming years.

Climate Finance

The finance section of the Paris Agreement is weak. It does not contain any compulsion to scale-up climate finance (cf. Cléménçon 2016). Only the accompanying decision text reiterates that the goal of mobilizing an annual USD 100 billion of North–South financial flows in 2020 and beyond, promised in Copenhagen, is still valid. What is more, industrialized countries were not prepared to provide a clear road map for how this goal could be achieved. The only step forward in Paris, albeit a small one, was that Parties agreed to set a new collective financing target by 2025. In this context, the USD 100 billion figure is now considered the bottom floor of financial contributions, rather than the ceiling as it was before Paris.

Addressing the Downsides: Loss and Damage, and Adaptation

One reason the Paris Agreement won the support of developing countries was its recognition of two decade-long demands: First, it elevates the standing of adaptation in the international climate regime. Crucially, action on adaptation is to be reviewed and accelerated every five years in parallel to the contribution cycles for mitigation.

Second, the Paris Agreement recognizes that there are adverse climate impacts that cannot be adapted to, but can only be dealt with. This was a crunch issue until the very end because developed countries feared that the inclusion of the concept of “loss and damage” in the agreement could be used to justify compensation and liability claims. The final outcome acknowledges both positions. The Paris Agreement features a separate article on loss and damage, while the decision text contains a clause that excludes compensation and liability claims. Treating “loss and damage” as a distinct issue, as opposed to a subcategory of adaptation, focuses and legitimizes ongoing international discussion on specifics such as possible appropriate response options and responsibility to act to assist recovery from damages and losses.

The Post-Paris Landscape

The Paris Agreement clearly does not “resolve” climate change as an environmental problem. The agreement imposes legal obligations on signatories to formulate and communicate climate policy objectives, the so-called NDCs. However, it does not obligate them to achieve those contributions.

The emissions reductions pledged by countries are out of line with its global target. Assuming these pledges are fully implemented, the global mean temperature would most likely still increase substantially (see Figure 9.1). Yet it is important to observe that this shortfall of ambition has been explicitly highlighted in the decisions accompanying the Agreement (UNFCCC 2016b, para. 17).

The Paris Agreement aims to address the lack of legal compulsion by creating a reputational risk through the establishment of mandatory transparency framework and review provisions. Parties agreed that “successive nationally determined contribution will represent a progression beyond the Part[ies’] then current nationally determined contribution” (UNFCCC 2016a, Art. 4.3), ensuring that the policy cycles induced by the Agreement resemble a ratchet mechanism. Reneging on earlier pledges is prevented. Starting in 2018, these mandated “stocktakes” will create moments of concentrated political attention every five years that may be used to foster political pressure on governments and corporations, strengthening a growing critique of the global political economy. Operating at all scales, civil society movements and networks are expected to provide ammunition for critique of nation-state and corporate action by revealing any shortcomings in goal fulfillment while simultaneously broadcasting promising results of experimentation and local leadership.

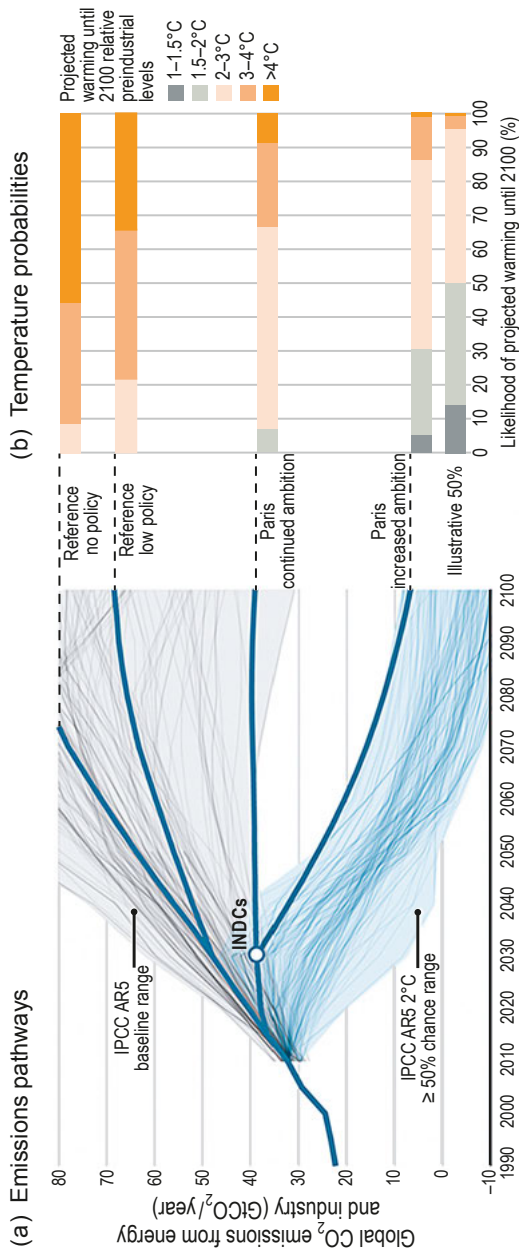


Figure 9.1 Global CO₂ emissions and probabilistic temperature outcomes of Paris. (a) Global CO₂ emissions from energy and industry (includes CO₂ emissions from all fossil fuel production and use, and industrial processes such as cement manufacture that also produce CO₂ as a by-product) for the four emissions scenarios explored in this study. The IPCC AR5 emissions ranges are from the IPCC scenario database. The IPCC AR5 baseline range comprises scenarios that do not include new explicit GHG mitigation policies throughout the century. The IPCC AR5 2°C 50% range comprises scenarios that limit global warming until 2100 to less than 2°C with at least a 50% chance. The faint lines within the IPCC ranges represent the actual emissions trajectories that determine the range. (b) Likelihoods of different levels of increase in global mean surface temperature change during the twenty-first century relative to preindustrial levels for the four scenarios. Although (a) shows only CO₂ emissions from energy and industry, temperature outcomes are based on the full suite of GHG, aerosol, and short-lived species emissions generated by the GCAM simulations. The illustrative 50% scenario in (b) corresponds to an emissions pathway that achieves a 50% chance of maintaining temperature change below 2°C until 2100. Other 50% pathways could lead to a range of temperature distributions depending on cumulative CO₂ emissions and representations of other GHGs. Reprinted with permission from AAAS (Fawcett et al. 2015).

Furthermore, the Paris Agreement has no termination date. This fact should promote a long-term outlook for the development of national policies and investment decisions in line with long-term goals. Also, Parties are urged to develop long-term low greenhouse gas emission-development strategies. This exercise could further facilitate the anchoring of climate protection in all government decisions.

As such, the Paris Agreement now deploys a pacemaker that stimulates and synchronizes the climate policy making on national and international levels. It creates periodic political moments, each of which can move us closer to a sustainable, carbon-free future. The intensity and effectiveness of these moments will depend, in part, on whether the spirit of cooperation experienced in Paris can be continued and transferred to a number of challenges that are not directly linked to the core of the Paris Agreement (see, e.g., Spencer et al. 2015). The prospect of transformation could grow if cooperation or even coordination can be achieved on issues such as

- exchanging competences (e.g., in terms of providing long-term strategies or scenarios²) (DDPP 2015);
- expanding and improving effectiveness of public-private R&D for the most promising technologies and mutual efforts to expedite the deployment of low-carbon technologies;
- avoiding frictions and incoherent market signals through uncoordinated or even contradictory (national) policies;
- addressing concerns of carbon leakage through concerted policy interventions among competing states;
- aligning global financial flows and the financial sector with the long-term goal of the Paris Agreement (see also UNFCCC 2016a, Art. 2.1c); and
- increasingly managing “exnovation”—deliberate divestment and phase-out (Kimberly 1981)—of unsustainable, high-carbon technologies, and industries, including the mitigation of social and economic disruptions that this may entail.

The pledge-and-review architecture provides an opportunity for strategic experimentation that was largely unavailable during the past two decades of “top-down” climate change negotiations. The multilevel character of climate policy could drive much of the national improvements in each successive “stocktake”: “Diplomacy does not happen in a vacuum. The positions countries take internationally are determined by their domestic political situations” (Obergassel et al. 2016:39). The opening of such a “bottom-up” avenue for climate action could seek to fill sustainability and justice deficits that have been a part of the

² Scenarios play an important role for sketching plausible future pathways and giving an orientation about room for maneuver if pursuing a specific mitigation goal. However, very often scenarios focus mainly on technological effects and do not fully reflect the role of behavior. As such, more advanced scenarios and underlying modeling instruments are needed in the future.

international governance effort. Climate justice, with its emphasis on unequal distributions across local communities, has an inherent bottom-up feature that has remained largely illegible to the international governance structure evidenced by, for example, the observation that financial flows to stem injustice are not being delivered to the communities that are most at risk and least responsible (e.g., Barrett 2014; Ciplet et al. 2013).

This “bottom-up” opportunity could drive the emergence of a “polycentric” paradigm that distinguishes itself from the technocratic strategy of planetary emissions control and focuses, instead, on creativity, experimentation, and innovation. The capacity for success in a polycentric system depends partly on (a) the successful roll-out of climate change action by a diversity of actors, (b) an enhanced prospect for climate justice, and (c) a societally relevant and impactful role for the scientific community. These three elements, discussed above in the three hypotheses, are critical questions that will shape the narrative and future evaluation of the Paris Agreement.

Conclusions

The Paris Agreement marks a new stage in the long history of climate change negotiations as it entrenches a trajectory first embarked upon in the wake of the Copenhagen COP failure. Ultimately, how this will play out remains uncertain. The provisions of the Paris Agreement offer promising conditions for renewed and vigorous climate change action despite its apparent shortcomings. Moving forward, the “heartbeat” of the Paris Agreement architecture will be shaped by national, subnational, and transnational efforts and innovation.

The official commitments by nation-states will likely fuel much of the discussion on the international stage at each successive point of stocktaking. Of particular interest to the international arena will be the efforts and improvements made by those nation-states heretofore unwilling to lock themselves into international agreement. However, concerns about sustainability and justice deficits linger as early evidence evaluating commitments suggests that nation-states will have to substantially raise ambition levels in order to meet their self-imposed objectives and avoid dangerous climate change, and that more needs to be done to advance fair burden sharing.

Leadership on climate change action might emerge from a new angle. The experimentation in subnational and transnational networks could form a distributed policy design pathway capable of overtaking the observed glacial speed of nation-state decision making. Community-based trial and error, negotiation, and creativity could produce sustainability and justice models available for rapid diffusion and adaptation to other contexts. A possible path forward for the Paris Agreement and the UNFCCC, in this light, is to act as a facilitator of such diffusion and recombination.

New sustainability and justice ideas could also emerge from a redirection of scientific effort. Past analytical endeavors have firmly established the importance of climate change and the need for societal transformation. A collaborative, solution-oriented scientific approach could reinvigorate the production of societal transformation options and help clarify to all participants its actual implementation.

The questions addressed in this chapter, in the form of three hypotheses, do not presume to establish the answers to existing sustainability and justice concerns. Rather, our intent was to highlight key trends and developments that could have substantial effects on the overall direction and level of change generated by the Paris Agreement, in an effort to advance understanding and stimulate further conversation.

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