



Chapter 15: Governing Urban Sustainability Transformations

The New Politics of Collaboration and Contestation

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15.1 The Urban Politics of Sustainability Transformations

In December 2015, at the Twenty-First Conference of the Parties to the United Nations Framework Convention on Climate Change, 195 countries adopted an ambitious, global climate change agreement that is the first to assign binding commitments to both developing and developed countries. The Paris Agreement, which entered into force on November 4, 2016, aims to limit average warming to “well below” 2°C (potentially 1.5°C), and further highlights the depth of the climate change mitigation and adaptation challenge. Climate change and our collective responses to it represent just one dimension of the broader and more complex project of sustainability: an interwoven set of environmental, social, and economic goals that are contested, evolving, and rooted in a particular place and time. The varied and systems-oriented nature of sustainability is illustrated by the diversity of the Sustainable Development Goals, which were adopted in New York in 2015 and set out an agenda for transformation by 2030.

Calls for transformation have increasingly permeated sustainability and climate change scholarship (Burch et al. 2014; Kates et al. 2012; Westley et al. 2011), with varying foci that include the implications for governance (Biermann et al. 2012; Stirling 2014), climate change adaptation (Kates et al. 2012), urban spaces (McCormick et al. 2013; Romero-Lankao and Gnatz 2013), and the related notion of sustainability transitions (Avelino et al. 2016; Patterson et al. 2016). Even so, the idea of transformation is evolving: depending on the disciplinary bent, empirical domain, and even geographic context of the inquiry, the definition of transformation, and the boundaries of the system being transformed, may shift. For the purposes of this chapter, we understand transformations to be

nonlinear changes, including “radical shifts, directional turns or step changes in normative and technical aspects of culture, development or risk management” (Pelling et al. 2015: 113) that may pertain to climate change adaptation, mitigation, or some other dimension of sustainability. These changes may be intentional and managed, or unexpected (Folke et al. 2010; O’Brien 2012), but they always represent a fundamental rethinking of how a system (such as a city, sector, or level of government) should or could function.

The challenge of sustainability transformations intersects with the powerful, inexorable forces of urbanization that nations at all stages of industrialization and socioeconomic development are experiencing. It is clear that urban spaces present a multitude of opportunities for, and obstacles to, sustainability: cities produce approximately 70 percent of global energy-related greenhouse gas emissions (O’Brien 2012); maintain crucial (and potentially vulnerable) infrastructure; influence poverty, affordability, and social services; and shape the consumption of resources such as water and energy through their design and governing institutions. This intersection has sparked interest, in both scholarly and policy circles, in the drivers, dynamics, and sociopolitical implications of innovation at the urban scale. Not solely the domain of government, transforming cities requires the active participation of civil society (see Chapter 14), research communities, and the private sector (Johnson et al. 2015). These actors have roles that may change over the course of an urban sustainability transition (Fischer and Newig 2016), suggesting that strategies to engage them must also shift over time and space.

Despite significant interest, private sector and civil society actors are often under-engaged and underrepresented in climate change and sustainability decisions, with especially limited engagement on issues of climate change adaptation (UN-Habitat 2011). This clashes with the reality that the private sector maintains control over significant sources of emissions and urban land development, and also holds potential for creating and implementing innovative adaptation and mitigation solutions. Small businesses, for instance, may be powerful leverage points, with the potential to shift demand, innovate technologically and organizationally, and collaborate with government. This is especially important in the Global South, given governance limitations and capacity barriers.

Introducing new forms of action and innovation has implications for the urban politics of sustainability transformations. While the broadest possible definition of politics is often taken to refer to “all of the activities of co-operation and conflict” that emerge as humans make decisions about the creation and distribution of resources (Leftwich 1983: 11, as cited by Avelino et al. 2016: 557), we consider politics to involve interactions through which the identity of actors is shaped, their legitimacy established, and their values articulated in

the public realm. Transformations in urban spaces, therefore, will bring to light tensions within the process of collective action, especially given the ever-widening array of actors that hold sway over the multilevel governance of societal challenges. Such collaborative work is necessary, but is not politically neutral or uncontested (Bulkeley et al., 2014). As a result, a challenge for urban transformations will be finding ways to negotiate and resolve (or accept) differences in order to reach collaborative outcomes. Collaboration and its challenges also present an opportunity to offer a more nuanced reckoning of power (Avelino and Rotmans, 2011; Avelino and Wittmayer, 2016) in urban systems.

In this chapter, we particularly emphasize that these politics of collaboration are not confined to city hall, but rather play out in efforts to mobilize and coordinate diverse sets of resources in cities. This diffusion of power beyond the traditional realm of governmental actors has implications for the transparency and legitimacy of decision-making. We begin this chapter by collecting conceptual and theoretical tools that have emerged to understand the role of both collaboration and contestation¹ in transitions towards sustainable futures. We explore promising experiments in urban sustainability transformations that have, in turn, shaped local politics and models of governance. We pay particular attention to the capacity of local governance actors to respond to identified sustainability challenges, the networks of interaction they form among themselves and beyond, and the scale of transformation that takes place over time. We elaborate on how new partnerships among public and private actors can deliver on multiple priorities simultaneously, addressing social, economic, and environmental concerns, while also offering opportunities to elicit, explore, and negotiate values. Ultimately, we seek to understand how sustainability transformations are reshaping urban politics more broadly, and are, in turn, revealing new governance questions.

15.1.1 The Role of Collaboration and Contestation in Planting the Seeds of Urban Sustainability Transformations

The explosion of interest in pathways to carbon neutrality and deeper sustainability has led to a variety of framings with at least one dimension in common: regardless of the language used, sustainability and climate change scholars are increasingly exploring examples of policy- and decision-making at the urban scale that offer the promise of accelerated action. Novelty, experimentation, innovation, and transformation surface repeatedly in disciplines (or domains

¹ We view collaboration and contestation not as diametrically opposed processes, but rather two dynamics that often simultaneously occur in urban spaces as various actors work together to navigate sustainability transitions.

of scholarship) including public policy, urban and political geography, technology studies, entrepreneurship, social-ecological systems, resilience, and multilevel governance. With the particular goal of unearthing the implications of urban sustainability transitions for the politics and contestation of collaboration, this section explores clusters of research that cross these domains. We focus on the parallel ideas of sustainability transitions and transformations, urban living laboratories, climate change experiments, and sustainability entrepreneurship or innovation.

15.1.2 Sustainability Transitions: Adding Politics, Institutions, and Actors to the Study of Technological and Social Innovation

The diverse domain known as transitions theory has made a key contribution to the study of technological innovation by making explicit the web of social practices and institutional structures that enmesh particular technologies. In acknowledging that sustainable technologies (such as renewable energy systems, building design, and transportation infrastructure) are nested within multiple intersecting sets of rules, and sustained by habitual behaviors that are rooted in values, it becomes clear that transitions are not under the direct control of any single actor (or even any set of actors). As such, there is no single transition trajectory: sustainability represents a set of values that change over time and space, and are likely to be deeply contested.

Transitions theory has coalesced to comprise four strong strands of research (Sarzynski 2015): active intervention in sustainability pathways through *transition management* (Markard et al. 2012); the *multilevel perspective* focusing on the interplay of rules, actors, and technologies at three levels: the niche, regime, and landscape (Rotmans et al. 2001; Smith et al. 2005); cultivation of radical innovations through *strategic niche management* (Geels 2002, 2005a, 2005b; Rip and Kemp 1998); and an examination of the institutional and organizational changes that comprise *technological innovation systems* (Geels and Schot 2008; Kemp and Rip 2001). These domains are interwoven, share traits such as the contextualization of a technology within the underlying sociopolitical and economic fabric, and often explicitly consider the deeply normative and contested goal of sustainability. Transitions theory is most often applied in highly industrialized contexts, but needs to be carefully adapted to urban areas of middle- and low-income countries, where authoritarian states depending on foreign aid and revenues from the global commodities market constrain collaboration options (Lawhon and Murphy 2012; Romero-Lankao and Gnatz 2013). Politics runs throughout all aspects of transitions, acting variously as

an enabler of, or barrier to, progress along a particular pathway (Meadowcroft 2011).

Increasingly, calls are being made to add a distinctly spatial perspective to the study of sustainability transitions, which would help build understanding of the diversity of pathways that transitions can follow (given the variety of institutions, resources, and actors present in different places) (Hekkert et al. 2007). Emerging strands of transitions scholarship include calls for a deeper analysis of the politics of these transitions (Coenen et al. 2012), the power dynamics that give rise to particular transition pathways, and the realities of the Global South, where authoritarian and often failing or predatory states define different governance architectures that shape transformations (Meadowcroft 2009, 2011).

Explorations of governance in the transitions literature seek to overcome the failures that have emerged from rigid, hierarchical, fragmented, conventional, top-down, government-centric approaches by moving towards systems-based, flexible, and participatory strategies that foster social learning through governance (Lawhon and Murphy 2012; Romero-Lankao and Gnatz 2013). Urban sustainability transitions can be triggered by regulatory, political, and environmental shifts (Pickett et al. 2013). Key features in a sustainable city include the use of bottom-up management and decision-making, approaching top-down decision-making through a more holistic lens, explicitly addressing the norms and values that shape urban behavior, and creating incentives for the participation of a diverse range of actors in key decisions (van der Brugge and van Raak 2007).

As climate change and sustainability are increasingly recognized as the domain of fluid, multi-actor and multilevel governance, rather than tasks most suited to traditional hierarchical government, transitions theory provides key insights into how sustainability plays out in practice in the urban context. The interplay among an ever-widening array of actors (see, for example, Farla et al. 2012) in the sustainability space offers opportunities for conflicting values to be elicited, negotiated, and put into practice (that is, through policy decisions, technological innovations, and evolving behaviors). Tensions inevitably arise throughout this process, which raises the need for participatory processes (an issue to which we will return later in this chapter) that can account for unequal distribution of power and varying perceptions of legitimacy.

15.2 From Transition to Transformation: A Semantic or Substantive Shift?

The term “transformation” has been gaining traction since the launch of the global research network Future Earth, the Intergovernmental Panel on Climate Change, or IPCC, Special Report on Managing the Risks of Extreme Events and

Disasters to Advance Climate Change Adaptation (Hughes et al. 2013), and the subsequent IPCC Fifth Assessment Report (2012, 2014). This term has been employed and understood differently in various disciplines. For some urban ecologists, for instance, a transformation can be thought of as “radical changes in the form, metabolism, economy and demography of urban ecosystems themselves” (see for example, Revi et al. 2014). To those who employ social-ecological or complex adaptive systems approaches, transformation might be defined as “physical and/or qualitative changes in form, structure, or meaning making” (see for example, Revi et al. 2014, citing Pickett et al. 2013) or non-linear changes in fundamental dimensions of a social-ecological system such as culture, development, or risk management (O’Brien 2012). Indeed, threshold behavior is increasingly being noted in key earth systems (Folke et al. 2010; Nelson et al. 2007; Pelling 2011), suggesting the need for a transformation in underlying development pathways (Rockstrom et al. 2009; Steffen et al. 2007) or development paradigms, including deeply held values, governance regimes, and patterns of behavior (Burch et al. 2014).

Given the diverse set of “objects” of transformation, metrics may be particularly challenging to find, and will inevitably be subjective (that is, change relative to some previous state, as viewed by a particular group or individual who is shaped by their own values and context). With this subjectivity in mind, in looking for examples of transformation (or potential for transformation), we might evaluate the extent to which power relations have shifted, development priorities have changed, or new identities have developed (following Pelling et al. 2015) – issues that are central to the urban political domain. As such, we hypothesize that examples of partnerships or policies that target the root causes of unsustainable development pathways, rather than simply the symptoms, might be more likely to have transformative effects. Examples might include targeting a shift in business models (from solely profit-driven to focused equally on creating social benefit) rather than marginally reducing corporate greenhouse gas emissions through energy efficiency. Small-scale, local experiments may plant the seeds of these transformations (see the case study sections in this chapter), but other sociopolitical and economic conditions must be present to encourage these seeds to grow into systemic or global changes.

Transformations towards sustainability in the urban context focus attention on the planning and governance dimensions of change, placing a strong emphasis on strategies and policies that trigger radical change in multiple urban systems (such as transportation, lifestyle and consumption, resource management, and others) (Westley et al. 2011). In urban spaces, the pursuit of a fundamental shift in the underlying development pathway opens up the possibility of designing policies that address climate change mitigation, adaptation, and broader sustainability goals (such as biodiversity, water quality, and

social equity) simultaneously (McCormick et al. 2013). This is new territory, however, and may require urban actors to conduct “experiments” in sustainability before considering strategies for scaling these initiatives up and out, with broader urban, national, and global effects. Given the complexity of urban systems and the varied nature of the sustainability challenge, many urban sustainability experiments involve the participation of a wide variety of actors, with social learning and knowledge mobilization as explicit goals.

15.3 Collaboration and Contestation in Urban Living Labs: Moving from Experiment to Transformation

Prevalent in transitions, transformations, and climate governance scholarship is a recurring theme: The process of shifting development pathways is messy, involving networks of actors, each with their own motivations, capacities, and ways of understanding the challenges at hand. As such, collaboration among these actors becomes a crucial enabler of the types of adaptive governance that are required in the context of complex social-ecological systems (Pahl-Wostl et al. 2007). The specific character of this collaboration, including the ways that participants are equipped to engage (see for example, Burch et al. 2010; Burgess et al. 2005), and the scale at which the collaboration plays out (Burch et al. 2014), shape the pace and nature of the sustainability transition.

Urban Living Labs, or ULLs, are emerging as a form of collective urban governance that may address some of the challenges associated with path dependency, distributed authority, and varying legitimacy identified by scholars studying transformations to sustainability (Burch et al. forthcoming, see also Chapter 10). ULLs are considered a form of experiment that fosters learning in a place-explicit (urban) context with multiple actors to develop innovative, scalable sociotechnical interventions to generate a sustainable future (Westley et al. 2011). Key characteristics of ULLs identified include geographical embeddedness; experimentation and learning; participation and user involvement; leadership and ownership; and evaluation and refinement (Bulkeley et al. 2015). The agency of multiple actors is underexplored in current ULL literature, as it is in the broader field of sustainability transitions (Voytenko et al. 2016). Of the many actors who participate in sustainability transitions, small firms (or small- and medium-sized enterprises) represent an example of the value of collaboration and network-building in these urban experiments. This collaboration, however, is not a uniformly smooth or homogenous process: indeed, drawing together multiple actors with divergent motivations (and, in some cases, proprietary knowledge that is closely held) can create messy processes in which goals, and the pathways to achieving them, are disputed.

Participation in innovation networks allows small firms access to sophisticated technology and technological expertise, risks and costs sharing, access to additional market knowledge, fostering a critical mass of companies to advance certain topics and set the agenda, transferring knowledge between partners, and the ability to help develop industry standards (Coenen et al. 2012; Markard et al. 2012). The idea behind these networks is that all participants jointly formulate problems and issues and use each other's experiences and knowledge to generate new ideas and different solutions. The forum for dialogue created by a network, where managers can meet in an atmosphere of trust to discuss problems and solutions that arise in their daily activities, is what many managers of small enterprises need in order to enhance their sense of "security" and reduce their uncertainty when they decide to tackle complex environmental issues (Bos-Brouwers 2010; Hansen and Klewitz 2012). Successful collaborative efforts embrace three interconnected types of work – *conceptual*, *relational*, and *action driven* – that together build a healthy "learning ecology" for systemic change (or transformation). The most important member organizations to include in collaborative networks are those who represent the aspects and stakeholders of the problem being explored, and that wider exploration of these aspects is encouraging system-change progress (Halila 2007).

For networks to be innovative, diversity among members is paramount. Diverse views, backgrounds, and interests of members allow the network to generate more creative, innovative solutions to issues and challenges. A diversity of views gives way to more fruitful collective learning, which in itself is an essential foundation for whole-system innovation. Network convenors must ensure the network has the resources it needs to do its work over time (Senge et al. 2007). A bottom-up process where members may exercise their influence and bring new ideas into play has proven to be effective at harnessing member ideas and giving them life, leading to common goals and, subsequently, common visions (Loorbach and Wijsman 2013; Svendsen and Laberge 2005). Results from sustainability-oriented networks can be highly diverse, including product innovations (Lehmann 2006; Loorbach and Wijsman 2013), process innovations (Loorbach 2010; Loorbach and Wijsman 2013), implementation of standardized environmental initiatives (Svendsen and Laberge 2005), and the self-development of sustainability-oriented certifications reflecting the priorities of the network (Halila 2007).

Despite what we know about the value of networks, the diffusion of authority to actors beyond the state, and the potential to exploit synergies between various development and environmental priorities, it is quite likely that transformations can only be recognized with the benefit of hindsight (Lehmann 2006). At most, we can identify strategies or approaches that plant the seeds of transformation, or hold transformative *potential*. As introduced above, these

seeds could include efforts to institutionalize or embed sustainability priorities in organizational structures and practices, social learning that mobilizes information about successes and failures across niches, and multiscale governance approaches that reveal and capitalize on synergies while avoiding trade-offs.

Taken together, the literatures presented in this chapter suggest a number of characteristics of the multi-actor partnerships focused on sustainability experiments, which might most successfully navigate the tensions between collaboration and contestation. These include (1) partnerships that address the root causes of unsustainability rather than simply the symptoms; (2) participatory processes that equip actors to engage meaningfully, addressing unequal distribution of communicative power and technical knowledge; and (3) efforts that address conceptual, relational, and action-driven types of work. We propose that these characteristics have the potential to generate a more fruitful, legitimate, and transparent brand of sustainability politics in urban spaces.

In practice, sustainability experiments are being carried out in a multitude of contexts, each of which illustrates different dimensions of the dynamics of collaboration in urban spaces. In the sections that follow, we pick up the themes explored above (namely the incremental versus transformative potential of experiments, the importance of meaningful inclusion of a diverse array of actors, and the political dynamics of change) in three case studies from very different parts of the world: New York City, in the United States; London, in the United Kingdom; and Manizales, in Colombia. A robust set of qualitative or quantitative metrics of transformation have not yet been thoroughly tested in empirical settings, so we seek to explore the possibility that these cases are experimenting with strategies that address the root causes of unsustainable development, and may have ripple effects beyond the local scale.

15.4 The Politics of Urban Collaboration in Practice

Case Study 1 Reconciling Conflicting Viewpoints through a New Politics of Collaborative Regulation in New York City

In 2007, New York City, under the leadership of Mayor Michael Bloomberg, released PlaNYC, a plan for the city that aimed, in part, to reduce the city's GHG emissions by 30 percent by the year 2030. The plan was the city's response to projected population growth and the looming threat of changing temperatures, rainfall patterns, and sea level rise. While there are a range of sector-specific targets and initiatives discussed in the plan

(for example, waste, transportation, housing), they claim that “collectively these initiatives all address our greatest challenge: climate change” (see for example, Bos et al. 2013; Burch et al. 2014; Geels and Schot 2007).

One way that PlaNYC proposes to achieve this GHG reduction goal is by making the city’s buildings more energy efficient and sustainable. New York City’s buildings account for approximately 75 percent of the city’s GHG emissions due to dense development and relatively accessible public transportation. Reducing energy use in buildings is therefore an important goal, but presents two significant challenges. First, the vast majority of the city’s buildings are privately owned, so reducing energy use requires coordinating and motivating thousands of individual building owners. The second challenge is that 85 percent of the buildings that will be in the city in 2030 (when the city needs to meet its GHG emissions reduction target) have already been built. This means that energy conservation measures will have to take place by retrofitting existing buildings, which is often more difficult than building energy efficient buildings from the start. Given these parameters, the city needed a way to target energy use in existing, privately owned buildings to meet its ambitious GHG targets.

To reduce energy use in existing buildings, the city sought to update building codes to incorporate energy efficiency technologies and best practices. This is a firmly regulatory approach to reducing GHG emissions, which city governments often shy away from in fear of industry backlash. One reason New York City has been able to require systematic changes to how the city’s buildings use energy is through the use of a collaborative approach to regulation. Based on interviews with decision-makers, managers, and key stakeholders in the city, city documents, and prior scholarly work, we show that the city government used *institutionalized collaborative work* as a strategy to help overcome the challenges of conflicting views and different starting points in relation to the city’s climate change goals.

While the goal of energy efficiency might appear to fall squarely within the incrementalism category, the collaborative process followed in this case has the potential to create ripple effects across other urban systems (which could be considered an early indicator of transformation). In 2008, Mayor Bloomberg and City Council Speaker Quinn charged the Urban Green Council (the New York chapter of the US Green Buildings Council) with convening the Green Codes Task Force. The task force and its support network was composed of city managers, environmental groups, technical experts, and representatives from the private sector. Funding for the task

force was provided by the Mertz Gilmore Foundation and the New York Community Trust, and meetings were hosted by the Newman Real Estate Institute; a local law firm provided pro bono legal review of the task force's recommendations (City of New York 2007). The task force was asked to develop recommendations for revising the city's various building codes (construction, fire, water, sewer, and so on) in ways that would help the city meet their GHG reduction targets.

After 18 months of meetings, deliberation, and feedback, the task force produced a list of 111 recommendations for changes to the city's building codes. At the time of writing, 53 of these recommendations have been adopted and codified by City Council.² These include broad changes, such as introducing environmental protection as a fundamental principle of the construction codes, as well as specific changes, such as insulating exposed pipes during construction. The measures go beyond LEED certification standards for energy efficiency measures, and incorporate social equity goals (American Council for an Energy-Efficient Economy 2014). Taken together, the changes that have already been made to the building codes are estimated to generate a 5 percent reduction in the city's GHG emissions by 2030 (Urban Green Council 2010).

The collaboration underpinning the changes to the city's building code – what might be called “collaborative regulation” – is an important reason for the task force's success (Scheib et al. 2014). Members of the City Council and relevant stakeholders perceived their recommendations as being both *technically informed and supported by key political actors*. According to the American Council for an Energy-Efficient Economy (2014):

Because the project was initiated by the Mayor and City Council Speaker, it obtained *legitimacy, recognition, and industry buy-in from the outset*. Urban Green Council played a critical role as an independent advisor and convener for the project. The organization has strong ties with both city government and industry, and is viewed as having a practical approach to achieving environmental goals. As a result, the report was able to identify many changes that city agencies or the real estate industry may not have been willing to consider on their own.

Acknowledgment of the need for legitimacy, recognition, and industry buy-in highlights that it is not only the presence of collaboration, or the opportunity for participation, that was important, but rather it was the

² www.urbangreencouncil.org/proposalstatus

particular way that the collaborative process tapped into the city's critical political leverage points. At the time, New York City had a powerful and popular mayor in Michael Bloomberg, and his support for the effort lent it credibility and buy-in that other mayors may have had more difficulty generating. Likewise, the task force was convened by an organization (Urban Green Council) that was seen to be relatively politically neutral and technically competent, with one foot in the realm of industry and one foot in the realm of policy. Incorporating technical and industry expertise along with environmental advocacy organizations helped to ensure that the recommendations were seen to be feasible and reasonable.

In many ways, the larger political challenge for these efforts has been that, while "greening" the city's building codes has the potential for large-scale transformation, it is a tedious and rather technical exercise. Indeed, urban transformation can be rather boring and can actually fail to capture the imaginations of commentators (Dolan et al. 2010; Solecki 2012).

The process of greening the city's building codes in this collaborative way has had longer-term implications for the politics of climate change policy in New York City. It generated significant buy-in from the real estate and development industries to the larger project of GHG emissions reductions, such that they are now considered an ally in these efforts rather than a source of political pushback. Mayor Bloomberg went on to use other task forces as he pursued his climate change agenda, such as the Climate Change Adaptation Task Force (2008) and the Building Resiliency Task Force (2013, which followed Hurricane Sandy and was also convened by the Urban Green Council).

Norms of collaboration are developing in New York City and have the potential to significantly enhance the city's ability to meet ambitious GHG reduction targets. In 2014, after being elected mayor, Bill DeBlasio expanded the city's climate change goals to include an 80 percent reduction target by 2050. As a step towards meeting this goal, the city appears to be building on the success of previous collaborative efforts to reduce energy use in the city's buildings, and has formed a Green Buildings Technical Working Group. Like the Green Codes Task Force before it, this technical working group is composed of representatives from real estate, architecture, labor unions, affordable housing, and environmental groups. However, the working group's ability to generate ideas and recommendations that are adopted by the city may depend on the mayor's own legitimacy in this area, the legitimacy assigned to the collaborative process itself, and the technical competency of the recommendations, which remain uncertain.

Returning to our earlier criteria for collaborative approaches that hold the potential for deeper urban sustainability transformations, this case illustrates significant efforts to equip participants with the technical and other skills required to deeply engage in the process (criterion two), but shows little evidence of tackling the root causes of unsustainability (criterion one). This New York City-based collaboration also focused mostly on action-driven types of work rather than deeper conceptual thinking (criterion three), but created relationships that have implications for other climate policy efforts in the city.

Case Study 2 Engaging Small- and Medium-Sized Enterprises in London

London already has an extensive history of climate change mitigation and adaptation action. The level of actions adopted and institutions created to facilitate London's efforts has positioned it as a key player in climate action at the city level (Gronewold 2010). Furthermore, Sadiq Khan, the Labour party mayor elected in 2016, is promising to produce a sea change regarding the environment; Khan himself pledges to become "the greenest mayor ever." He ran for office on an ambitious green platform, which included the promise to "ignite a clean energy revolution" and a vision for "100 percent green energy by 2050" for London (following the footsteps of other Labour-run, major UK cities). Promised measures include banning fracking in London, planting two million trees, providing more electric buses, divesting from fossil fuel industries, and expanding the Ultra Low Emission Zone³. Having already embarked on the latter within his first weeks in office⁴, Khan's ambition is likely to make significant inroads. Based on interviews with municipal policy-makers, entrepreneurs, and other key stakeholders in London; policy documents; and prior scholarly work, we show how, on the back of strong mayoral leadership, the city is gradually developing its transformative potential through building a strategy of collaborations with the wider city, in particular with small and medium-sized enterprises, or SMEs.

One crucial enabling factor for London's climate actions is its administrative structure. Conceived as the Greater London Authority, or GLA, that administrative structure has a directly elected Assembly and Mayor and certain

³ www.edie.net/news/11/Sadiq-Khan-wins-London-Mayor-election-2016-City-Hall-green-energy/

⁴ www.theguardian.com/environment/2016/may/13/sadiq-khan-to-double-size-londons-clean-air-zone-pollution

autonomy in the areas of energy, planning, and transport policy, making it not only possible for London to govern climate change independently from the national government, but a statutory duty (Schroeder and Bulkeley 2009). Primarily under former mayor Ken Livingstone (2000–08), London set the foundations for its approach to climate governance, which is based on strategic partnerships with public and private sector actors (Bulkeley and Schroeder 2011). Livingstone set up the London Climate Change Partnership in 2001 to prepare the city for the impacts of climate change through raising awareness, developing adaptation guidance, and increasing the city's resilience more widely. In 2002, the London Hydrogen Partnership began providing research and development for new hydrogen technologies and, in 2004, the London Energy Partnership began assisting with the delivery of London's energy policy and creating new business opportunities for sustainable energy. Livingstone also issued an Energy Strategy for London in 2004, set up the London Climate Change Agency in 2005, and issued an Action Plan in 2007. This focus on partnerships emerged as a consequence of the mayor's and the GLA's rather limited ability to have significant impacts on the ways in which energy, a significant source of GHG emissions, is produced and used in London (Bulkeley and Schroeder 2008).

Mayor Boris Johnson (2008–2016) continued this trajectory to some extent by opening a cycle hire scheme in 2010 (nicknamed "Boris Bikes"), appointing a Cycling Commissioner for London in 2013, and, in the same year, announcing £1 billion of investment in infrastructure to make cycling safer in London. He also adopted a Climate Change Mitigation and Energy Strategy for London in 2011. It was based on the converging and intensifying challenges of energy security, waste management, and sustainable urban development, paired with the significant opportunities presented by investment in green energy. Crucially, SMEs are highlighted throughout the strategy, recognizing that 99 percent of total businesses in London are SMEs (employing under 250 people each). As SMEs are not covered under London's Green500, which focuses on larger organizations, the strategy outlines five programs specifically targeting energy efficiency in SMEs, some of which were already up and running in 2011, cofunded through the European Regional Development Fund. They included Ecovate – which gave businesses up to five days of support on energy efficiency and brokerage of service suppliers – and URBAN, which provided 81 SMEs with personalized climate change action plans (Bulkeley and Schroeder 2008).

In the past five to ten years, a variety of intermediary enterprises have been created to take advantage of funding (mainly through the European Regional Development Fund) to set up schemes and programmes to engage

with SMEs, often in partnership with boroughs and business improvement districts, as well as the London Chamber of Commerce and the London Development Agency (for example, Funding London and Planet Positive). The main goal has been to help SMEs cut costs through reducing carbon emissions. In the words of an interviewee,

the idea was to try to focus exclusively on the positive, the things that would have financial benefits to SMEs, recognizing that very, very few would have the time or the inclination to do anything for philanthropic or societally beneficial reasons. And so focusing on helping them understand how they could reduce energy use and therefore reduce costs, take advantage of government grants, et cetera. (Interviewee, May 2011)

Increasingly, initiatives can be found outside the mayor's purview. For example, after the GLA ended the Green500, the London Cleantech Cluster is not only continuing the concept but also extending it to all businesses, including SMEs. A key focus is on coordinating the many existing initiatives, networks, opportunities for finance, and business support services.⁵

Years of working with SMEs at small to medium scale throughout London highlights that what is needed as a next step is a more systematic approach, covering a wide range of concerns from overall policy, direction, and goals to an overhaul of procurement policies and procedures to "an organization-wide belief that this can be done" (GLA 2010). Overall, London's approach to engaging with SMEs has been more incremental than transformative, as actor-networks have expanded diagonally to including many actors outside the public sector. Will Mayor Khan reinvigorate engagement with SMEs, and perhaps push London onto a stronger sustainability paradigm? He certainly has pro-business credentials and, as of 2017, has begun to support small businesses more generally; London's SME sector is already engaging with him (for example, see Labour Business 2016).

Engaging a new set of actors – SMEs – in urban sustainability transitions presents an opportunity to deepen the capacity of an important sector to participate in the implementation of sustainability actions. The partnerships created here do not appear to address the root causes of unsustainability (criterion one), but do present an opportunity to equip SMEs to collaborate with government and civil society (criterion two). Some conceptual work (such as co-defining sustainability and identifying unsustainable business practices) and relationship building is clearly evident in this case, but ultimately, the focus here is on incremental action, and the long-term transformative potential is unclear.

⁵ www.londoncleantechcluster.co.uk/london-cleantech-cluster-2/about-us/

Case Study 3 Innovation in Manizales, Colombia

In recent decades, Manizales, Colombia, has developed an innovative sustainability agenda that has incorporated disaster risk management into urban development policies (Institute for Sustainability 2012). Since the 1970s, Manizales had been expanding over river basins, steep slopes, and other risk-prone areas as a result of the immigration of populations displaced by armed conflict and rural poverty. The housing needs of these migrants, who could not buy into the official land market for housing, were readily filled by illegal land developers, eager to turn a quick profit (Hardoy and Barrero 2014). The occupation and land-use changes in these areas increased the number of landslides and resulted in significant economic and infrastructure losses (Hardoy and Barrero 2014). For example, the 1985 eruption of Nevado de Ruiz resulted in mudslides that buried several settlements and killed about 25,000 people; it still forms part of Manizales's collective memory. In 2011, heavy rains that hit Colombia killed 300 people nationally and resulted in slope failures and mudslides that washed away the pipes that transported water from the treatment plant to Manizales, leaving the population without piped water for ten days (Barrero 2013). Based on city documents and prior comparative work (Romero-Lankao and Gnatz 2013), we attempt to explore urban transitions in cities from Latin America.

Manizales has witnessed the development of social innovations to address sustainability challenges. Actions were taken locally to restrict land and resource use in areas the city shared with Villamaría, its neighboring municipality. The two municipalities partnered with private and civil society organizations, the National University of Colombia's Institute of Environmental Studies, and the Ministry of the Environment to implement joint environmental actions to manage water, tourism, transportation, and recreation (Hardoy and Barrero 2014). The federal government also played a supportive role by launching local environmental action plans seeking to implement UN Local Agenda 21 and to foster "better cities and towns." The National Institute for Natural Resources made a diagnosis of the country's environmental situation and established the Green Municipalities of Colombia program, which gave local authorities remit over these problems. This process created green councils and generated broad popular participation in environmental management.

These multilevel policies opened windows of opportunity for social innovations that, since the 1990s, have taken place in Manizales to integrate environmental and local disaster risk management concerns with

an inclusive urban development agenda. Local authorities and universities coproduced an analysis of the risks related to urban development; that analysis supported the integration of disaster risk management with an Environmental Plan (Biomanizales), a Land Use Law (Ley de Ordenamiento Territorial), an Urban Development Plan (Manizales Calidad Siglo XXI), and a Local Agenda 21 Bioplan that fosters policy implementation (Barrero 2013). A strong tradition of participation by civil society and business organizations in implementation strategies, such as environmental observatories, the Slope Guardians program, and eco-parks, has contributed to Manizales progress in the area disaster risk management. In the 1990s, for instance, Manizales allocated 17 percent of its budget to environmental protections and disaster management. To expand the welfare and safety of poor communities situated in risk-prone areas, it constructed 2,320 houses, assimilated 168 hectares of protected green areas into the municipality, and, with university support, financed infrastructure works to lessen the risk of landslides (Hardoy et al. 2011).

Notwithstanding their innovative and pro-poor character, however, the actors involved in Manizales social experiments face a set of challenges. The city has not been able to institutionalize this socially inclusive and integrative approach, which is contingent on the support and political will of the administrations in place (Barrero 2013). Still, actors from civil society, universities, and the business sector have pressed to keep these issues within the urban development agenda of Manizales, even during the administrations of President Uribe (2002–2010), when such integrative approaches lost governmental support, and a managerial approach to disaster risk management focused on emergency responses and infrastructural works gained importance.

No matter how active and engaged civil society is, Manizales illustrates that these capacities are not enough to counter two powerful driving forces of urban development in Latin America and even in Asia: economic pressures to develop land located in risk-prone areas (Hardoy et al. 2011), and informal rules governing access to land, which continue to allow illegal developers to sell land to vulnerable groups (Romero-Lankao et al. 2015). Development in risk-prone areas is also common among developers of housing projects for middle- and high-income groups, who have the clout to obtain building permits (*curadurías*) outside of the regular permitting process. Thus, formal governmental controls and regulations are failing to protect populations even within the licensed developments of Manizales (Romero-Lankao and Gnatz 2013).

Manizales illustrates that innovative experiments can reduce risks in targeted communities and for some at risk populations. Furthermore, social experiments can empower the disenfranchised poor, who would otherwise be forced to live in illegal settlements at risk of floods and mudslides. Such social experiments also benefit sectors closer to the power structure in Manizales, such as the legal developers who build safe dwelling units for the poor. However, it has not been possible to scale up these innovations to counteract the forces of development and growth that are creating pressure for unsustainable and risky land use in Manizales and other cities worldwide. As such, these experiments remain isolated in their effect, and their transformative potential is dampened by the powerful inertia of status quo development.

In Manizales, it appears that collaboration is fraught with powerful economic pressures and informal rules, despite efforts to implement policies that benefit the most vulnerable. The partnerships described here offer evidence for the value of trust-building relational exercises (criterion three), and the value of an approach to poverty reduction that addresses the root causes of that poverty (criterion one). However, even with efforts to better equip stakeholders to engage meaningfully in participatory processes (criterion two), these small experiments are unlikely to have transformative effects without directly tackling the contested domain of pro-development forces.

15.5 Lessons for Research and Practice

As we find ourselves in the midst of the most dramatic migration in human history, from rural to urban areas, we are grappling with the social, environmental, and economic implications of rapid urbanization. The sustainability imperative demands that new strategies be explored to accelerate change, transforming urban systems, social practices, technologies, and governance models. This challenge is largely a social and political one, rather than a technical or economic one. While they are not uniquely urban, the politics we explored here illustrate that urban spaces present a compelling opportunity to draw together actors rooted in particular spaces with shared economic, ecological, and social experiences. The cases presented here demonstrate that the politics of collaboration are central to urban sustainability transformations.

Collaboration is vital as urban spaces transition towards sustainability, but the specific forms and functions of collaborations will vary by city and by objective. A lesson that can be applied in any case is that engagement and involvement serve as a transformation lubricant, allowing proposals that would previously have been politically untenable to move forward. In other words, not only

collaboration, but the “right” kind of collaboration, is an important ingredient of sustainability transitions. In order to deliver the right kind of collaboration, cities must be prepared to play the collaboration long game. It takes time to build relationships and to see incremental changes become transformative. The necessity for gradual shifts predicated on strong relationships, however, may be at odds with the urgency of climate change and sustainability goals.

In New York City, we illustrated that collaboration has been central to a desirable outcome; however, this collaboration focused squarely on the development and implementation of regulation (rather than, for instance, market-based mechanisms or voluntary approaches). This case also illustrates that legitimacy, political influence, and reputation deeply influence the effectiveness of collaborative approaches to sustainability governance in cities. It further demonstrates that even when a goal is relatively incremental, the process followed to reach this goal may itself be transformative of governance models, multi-actor relationships, and social perception of the functioning of cities.

Ultimately, the reality of transformation may be mundane: actions that appear incremental may push an urban system towards a fundamentally different state in the future. For instance, as London works to reach ambitious climate change mitigation targets, it has chosen to engage directly with small- and medium-sized enterprises as a key set of actors, although predominantly in an incremental manner. It remains to be seen whether this approach will be scaled up and out in a way that might have a more fundamental impact on emissions, especially at the global level. Leadership on the part of the mayor has always been instrumental in London’s case, as has been the availability of grants from the European Union, but many SMEs nonetheless suffer from capacity barriers that prevent equitable or pervasive uptake of opportunities offered by government

The case of Manizales, among others, demonstrates that a significant opportunity is missed by sustainability transitions scholarship that only addresses socio-technical innovation in industrialized cities. In this case, the push to mitigate risk and manage vulnerability to climate change impacts presents the chance to build social equity, public participation, and alleviate poverty. In direct contrast to the New York case, government-directed regulation was less favorable than approaches led by civil society and private sector partners in Manizales. However, experiments in Manizales have not been able to effect the systemic change necessary to move the city to a more sustainable urban development trajectory. This illustrates the power of structural development dynamics, which can promote or prevent profound changes from within urban regimes.

As it may only be possible to recognize both local and global transformations with the benefit of hindsight, it is important to more rigorously explore and test early indicators of transformation. These indicators allow urban decision-makers, scholars, and practitioners to adaptively manage these complex socioecological

systems, strengthen engagement with diverse actors, and reorient when necessary. It is clear that small changes (for instance, adjustments to building codes, job descriptions, and funding mechanisms) may gain momentum and influence over time, with powerful implications for an increasingly urbanized planet.

Ultimately, sustainability transformations may follow many paths, from the gradual reorientation of the system through accumulated incremental actions, to radical shifts or shocks that give rise to a nonlinear system shift. In a post-Paris Agreement world, it is the task of urban scholars to cast their conceptual and empirical nets widely, to explicitly acknowledge the complex politics of urban innovation, to explore models of governance that are inclusive and adaptable, and to delve into the power of a multitude of actors to effect change.

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