Chapter 21
The Politics of Urban Sustainability Transitions

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Introduction

Sustainability transitions present obvious engineering and policy challenges to urban governance regimes (Bulkeley et al. 2010, Makard et al. 2010, Meadowcroft 2011). The increasing salience of sustainability discourse and policies in cities across the globe has resulted in the proliferation of sustainability bureaus and agencies, large-scale public deliberations over sustainability goals, and changes in infrastructure planning and design (Bulkeley and Betsill 2005, Backstrand 2003). Despite a strong emphasis on the importance of public input and engagement, particularly in the transitions management literature (Kemp and Rotmans 2005), urban sustainability policy and planning are increasingly domains dominated by bureaucratic, scientific and technological expertise (Miller 2015). Urban sustainability is often defined by technological developments, standards and indicators focused on delivering efficiencies or lowering carbon emissions. For example, the Portland Development Commission in Portland, Oregon, USA—widely considered one of the most sustainable cities in North America—*We Build Green Cities* initiative works with the Portland policy and business community to "export our best ideas, products, and services to other cities around the world that aspire to be more sustainable." (PDC 2015) This effort is largely focused on economic development and the development and export of technical products and expertise. Similarly, urban sustainability policies and indicators are often measured by the development and implementation of technical standards for buildings (e.g., LEED in the

US), neighborhoods and communities (e.g., LEED ND, EcoDistricts, and the International Standards Organization Sustainable Development in Communities).

Largely ignored in much of the public and policy discourse on urban sustainability, however, are the social and political dimensions of sustainability—how it is interpreted, enrolled and contested by various actors and institutions, and ultimately settled and materialized in infrastructure and technological design. The emphasis on the scientific and technological aspects of sustainability *de*politicizes it—masking the degree to which technological choices are also social and political choices. This serves to black box (Latour 1987) and make invisible the values and implications of policy and design choices. It is precisely because of the relative invisibility and obduracy of past political and technical decisions embedded in our sociotechnical systems that we rarely have political conversations about infrastructure. For example, how might information and communication technologies support or hinder democratic values? How does transportation infrastructure promote or impede social equity? How does water control and delivery enhance or ignore environmental values? How do energy systems foreclose or open opportunities for innovation?

Sustainability transitions have the power to open-up conversations (Stirling 2008) about previously hidden physical systems and their political and ethical implications by engaging decision-makers, experts and publics in discussions about the future and potential transition pathways. Building on theories of the social construction of technological systems, and the larger science and technology studies (STS) literature, we explore the visions of urban sustainability to connect its multiple, shifting understandings and complexities. At the same time, this process of deconstruction and reconstruction opens up areas of political negotiation for further investigation and contestation.

In this chapter, we argue that this can only be done by politicizing sustainability, embracing and exploring the political nature of sustainability discourses (Miller and Lubitow 2014, Moore 2006). Utilizing examples from the contributions in this volume and drawing from insights from STS, we present several critical axes to develop a more robust understanding of how politics operates in urban sustainability transitions (Grin 2012). First, we discuss how power operates across sociotechnical systems, opening-up and closing-down potential pathways for urban transitions. Second, we examine the politics of scientific and technological knowledge and expertise, and the degree to which it has come to define urban sustainability discourse. Finally, we consider the importance of political dynamics in public engagement and deliberation.

Techno-Politics and Power in Sociotechnical Systems

Cities are comprised of sociotechnical systems that are acted upon, manipulated, and reconfigured in transitions to sustainability (Hodson and Marvin 2010). Political, economic, cultural and other urban processes and networks overlap and intersect with sociotechnical

systems at various scales which make transitions messy, contested, and difficult (Hodson and Marvin 2009, Monstadt 2009, Lawhon and Murphy 2012). This has led to many reflexive considerations of the multi-level perspective on transitions, fueling alternative frameworks and understandings, and reformulations of the approach (Smith, VoB and Grin 2010, Geels 2011). Spaeth and Rohracher (this volume) make explicit note of the lack of consideration of urban processes and their impacts on transitions while Elle, Braagaard Harders and Valderrama Pineda (this volume) utilize a "flatter" arenas of development approach that does not assume niche-regime-landscape interactions. In these various approaches, power, as an ability to shape the behavior of people and systems and influence outcomes, needs to be treated as a central concern.

We understand power as it relates to urban transitions processes through political, economic, ideological, and epistemological lenses. Urban political economy is concerned with the shaping of urban infrastructures and industries, the control of labor, and the role of institutions in solidifying existing relations of power (Harvey 2009). Culture and ideology can be manipulated to maintain unequal social structures and provide means of control making particular alternatives less feasible or altogether unrealizable. The power/knowledge relationship finds power in the epistemologies that shape and legitimate particular understandings of a more sustainable and democratic world (Foucault 1980; Jasanoff 2004a,b). Each of these elements of power contributes to the shaping of urban sustainability transitions (Hendriks 2009).

Building on this work and missing from both academic and public discourses around urban sustainability, however, is a thicker conception of techno-politics, i.e., how sociotechnical systems come to constitute, embody, and enact political goals (Hecht 1998). Power and politics shape sociotechnical systems, "opening-up" or "closing-down" sustainability pathways (Stirling 2008). These techno-politics then become obdurate as they become physically manifested in the built environment and in governance regimes that maintain and manage it (Hommels 2005).

The chapters in this section begin to point to a path toward this work, but lack the common conceptual and theoretical tools to examine how techno-politics acts to open-up or close-down sustainability pathways. As Spaeth and Rohracher (this volume) show in Freiburg, Germany, tensions between overlapping technological solutions for energy sustainability in the built environment (district heating and passive houses) illustrate the power of developers in partnership with the city to implement and enact particular projects, even with legitimate contestation. Likewise, in the Carlsberg City District of Copenhagen, Denmark, developers and private investors valued economic interests over environmental concerns in the allowance of parking spaces in the sustainable development area, encouraging increased car traffic in the area (Elle, Braagaard Harders & Valderrama Pineda this volume). In these cases, powerful actors are able to connect with various interests and mobilize them within and between networks to enact changes in the development of urban sustainability projects, even under conflict or competition.

These chapters also show how power is unevenly distributed in sociotechnical systems. Rohracher and Spaeth explain how sustainability in different cities' energy projects led to "zones of friction" wherein sociotechnical systems change, or transitions, conflicted in various ways. They use this general critique and framework to analyze "transition in the making" from a bottom-up perspective in Graz, Austria and Freiburg. In both cases, there is a distinct conflict over sustainability projects (hydropower in Graz and district heating/*Passivhaus* in Freiburg) that exemplifies how sustainability-focused change processes are in fact political, altering existing systems while disrupting the potential benefits of others, and reframing visions of sustainable cities.

Meadowcroft (2009, 2011) and Shove and Walker (2007), for instance, argue that power and politics in research on sustainability transitions have been weakly developed and thus need more focus in transitions research. More recent work on sustainability transitions has explicitly focused on power and politics, arguing that existing regimes actively resist change through utilizing various forms of power, and that focus should be paid on destabilizing these incumbent regimes (Geels 2014). Challenging the lock-in and obduracy of these existing networks and regimes is essential for realizing sustainability transitions (Smith and Stirling 2010). Urban sustainability transitions need to confront these various conflicts and power structures to ensure more sustainable, just and democratic outcomes. We begin with an exploration of the politics of knowledge and how it shapes urban sustainability discourse and practice.

Politics of Knowledge

Scientific and technological knowledge and expertise have come to dominate debates over the legitimacy and effectiveness of sustainability pathways (Gieryn 1999, Guy & Marvin 1999, Guy 2006). This mirrors developments in environmental governance where climate science, for instance, has come to define the contours of international discussion over policy responses (Edwards 2010**,** Jasanoff 2004a**,** Pielke and Sarewitz 2005). The emergence of smart cities illustrates this dynamic.

Under the rubric of "smart cities", advanced information and communication technology (ICT) systems, including sensor networks and data gathering and analytics, are providing enormous amounts of data to be processed and utilized by cities. The goal is often to ensure more sustainable operations and planning (IBM 2009, Allwinkle and Cruickshank 2011), albeit with some criticism and concern (Crang and Graham 2007, Hollands 2008). These systems are driven by models that make sense of the city in ways that do not rely on social, phenomenological, or affective dimensions, but rather information that is abstracted from the urban context. Alongside this ICT infrastructure, a new "science of cities" is emerging, combining elements of physics, complexity science and urban informatics, with concerns over urban structure and organization (Batty 2011, Bettencourt and West 2010). Data from these systems fuels their analysis and predictions about the future of cities, and further informs visions and actions towards addressing

sustainability. This way of studying, sensing, and knowing the city can privilege expert knowledge and top-down strategies for sustainability transitions. For example, Swilling et al. (this volume) demonstrate that information gathering is key to measurement and monitoring for sustainable resource use in cities, but that the context of African cities presents a point of diversion that illustrates the need for embracing alternative notions of urbanism in the sustainable city.

The place of scientific and technological expertise in urban sustainability transitions is of concern for three core reasons. First, scientific research on urban sustainability not only produces knowledge about the city and sustainability transitions but also helps to shape political identities, relationships, institutions, and beliefs about sustainability goals (Miller 2013, 2014). This co-production process can shape the discourse and policy choices around urban sustainability, thereby exercising political power (Jasanoff 2004b, Latour 2004). The implication is not that we should seek to thwart the ability of science and technology to foster sustainability transitions. Instead, this points to an important role for research on transitions – that is, to empirically examine the ways in which science and technology shape sustainability discourses and the social, political, and ethical implications of these dynamics.

Second, expert knowledge can lend credibility to both knowledge and value claims about the city or sustainability problems (Gieryn 2006; Miller 2014). As illustrated by Elle, Braagaard Harders, & Valderrama Pineda (this volume), parking space allotments (p-norm) were a point of contention between city officials who advocated for fewer spaces to enhance alternative modes of transit, and developers and business interests who wanted more parking for potential customers and ultimately utilized outside consulting firms who could use "unbiased" expert judgment to calculate the optimal p-norm in the Carlsberg City District. Scientific knowledge affects public deliberation over transitions as knowledge claims lend political credibility, while stakeholders without access to knowledge-generating institutions may have little power (Jasanoff 1999, Miller 2008).

Finally, scientific and technological expertise has increasingly come to shape the terms and foci of urban sustainability discourses on issues such as green buildings, energy efficiency, and carbon emissions reductions. While these core issues are central to sustainability transitions, they also rely on technological solutions with little, if any, political contestation or deliberation. Critical issues around social equity and broad-based public participation that may carry more overtly political implications are at risk of being sidelined in the research and practice of urban sustainability transitions.

Politics in Public Participation and Deliberation

The study and practice of sustainability transitions has rightly placed an emphasis on public deliberation over the meaning, goals and pathways of sustainability (Miller 2013, Loorbach

2007, Robinson 2003). This underscores the degree to which sustainability is situated in and emergent from social, ecological, and political contexts (Miller 2014; Norton 2005; Robinson 2003). Yet, largely missing from these efforts is a more critical understanding of how power and politics shape the processes and outcomes of public participation and deliberation. While public engagement is critical to the development of robust and widely shared values, goals and policies, it can also serve to mute political contestation via consensus. A brief case from Portland, Oregon illustrates the importance of considering politics in participation around sustainability transitions in urban infrastructure.

Miller and Lubitow (2014) explore the evolution of a community controversy over the expansion and redesign of cycling infrastructure along North Williams Avenue, a major commuter route and bustling neighborhood in Portland—a city consistently ranked as the most bike-friendly city in the United States (Dille 2012). In city bicycling and transportation planning documents, N. Williams had been identified in as a major bikeway and earmarked for infrastructure investment, an effort lauded by local cycling advocates. N. Williams is also situated in a historically African American community, which has been consistently marginalized in city planning and development over the last several decades and has more recently dealt with community and economic displacement due to gentrification (Gibson 2007).

At the outset, the North Williams Traffic Safety and Operations Project was defined as a infrastructure project focused on issues of pedestrian and traffic safety and cycling access. This safety and access frame represented the consensus among transportation planners at the City of Portland Bureau of Transportation (PBOT) and cycling advocate groups (Lubitow and Miller 2013). Transportation engineers and planners and cycling advocates have a long history of working together on cycling issues in Portland, and had developed a common understanding of such issues. This dominant framing was upset as a community backlash to the project emerged at several community meetings. Critiques from the African American community targeted the composition of the community Stakeholder Advisory Committee to PBOT on the project and pointed to long-lasting concerns that had remained unaddressed. Additionally, community members cited this project as being the latest in a long-line of city planning projects that marginalized the concerns of African Americans and other minorities in Portland.

How did a seemingly benign cycling infrastructure project become such a source of political controversy? More broadly, the settled consensus around cycling infrastructure on N. Williams and Portland, had been developed by transportation experts and cycling advocates, who implicitly shared certain framings and values around transportation planning and the vision of the street (Miller and Lubitow 2014). This expertise and its place in city institutions and governance dominated conversations around transportation and cycling policy and planning. Alternative views around cycling and visions for the street and community were, sometimes unintentionally, shut out by this shared frame. It took a controversy that gained wide coverage in local and national media to upset this status quo. To PBOT's credit, the Stakeholder Advisory

Committee was expanded to include a more diverse set of community members and tasked with setting community priorities for the project and developing a new design. This last development shows the power of participation, when broadly inclusive, to shape the physical design of urban sustainability transitions (Miller and Lubitow 2014).

The chapters in this section begin to chart a way to adopt a more careful, bottom-up approach to sustainability transitions that may "open-up" space for a more pluralistic politics. Swilling et al. (this volume) and Rohracher and Spaeth (this volume) advocate for a bottom-up or grassroots approach to sustainability transitions that takes into account competing conceptualizations and articulations of "the urban" and sustainability in various contexts of transitions (Hendriks and Grin 2007). Developing shared visions (Davies et al. 2012), modes of measurement and monitoring (in sustainability indicators for example (Miller 2005)), and knowledge for addressing sustainability (Miller et al. 2011) are key to the implementation of equitable transitions. However, additional research and actual progress on how to "empower" participation and deliberation are still needed, while preserving the importance of context and history in societal transitions to sustainability. Kronenberg, Krauze, and Wagner (this volume) explain that embracing and operationalizing big complex concepts, like transitions to sustainability, takes tremendous democratic collaboration between various groups and sectors. Collaboration fueled by bottom-up movements, including social unrest and protests, are powerful agents of change in sustainability-related urban transition processes. Collectively, these chapters illustrate the central need for broader engagement and deliberation about urban sustainability and ways of achieving it.

Politicizing Sustainability

This chapter has argued for a more political conceptualization of sustainability transitions. While chapters in the volume and elsewhere have begun this work, this chapter is an effort to sharpen some common theoretical and conceptual tools around how politics and power shape urban sustainability transitions. Both the study and practice of sustainability must be *politicized* to avoid limiting the debate over visions, values, and goals to those with access and control over the credibility or legitimacy of empirical claims. A political sustainability more openly embraces the normative dimensions of sustainability (Miller 2013; Norton 2005; Wiek et al 2011) as well as the various forms of power that influence particular conceptualizations and operationalized modes of sustainability.

While transitions researchers and other sustainability scholars often expound on how science and governance for sustainability ought to be reflexive and have explored cases where this occurs (Hendriks and Grin 2007; Miller 2015; Voß and Bornemann 2011; Voß et al. 2006), we also need to be attuned to how the politics of sustainability are shaped in practice. Techno-politics focuses our analyses and perhaps advocacy on how values and politics are *built into* our cities, shape our lives and communities, and become obdurate (Miller and Lubitow 2014; Winner

1986). It also challenges researchers and practitioners to explore how alternative values and politics can be designed into urban infrastructure transitions. Developing a more robust agenda around the politics of sustainability transitions offers several avenues for research and practice that build on the axes discussed in this chapter. First, researchers play a critical role in examining controversies over sustainability transitions in order to uncover how various actors and institutions understand the goals and policies for sustainability, and, more broadly, the future of their communities and cities (Voß and Bornemann 2011). This will contribute to a more diverse and plural understanding of sustainability pathways in both research and practice (Leach et al. 2010; Miller 2014; Munoz-Erickson 2013). Following this, research on the politics of sustainability transition can explore how values and politics are built into sustainability policy and technology design. This "opening up" of the black box of infrastructure and technology can empower often marginalized groups to contest expert design choices and ultimately shape outcomes. Finally, transitions scholars should continue to build on research on "transition arenas" and participation, with particular attention to how power shapes who is included and how expertise frames the terms of discussion. In addition, research of participatory dynamics can show how meaningful engagement and deliberation influence policy and design choices−and how alternative methods might do so more effectively (Davies et al. 2012).

This volume is a tribute to the dynamic, diverse and thriving research on sustainability transitions. This does not mean there is no room for critique and improvement. The research and practice of sustainability transition must focus on how power and politics shape transitions pathways and its implications not only for sustainability goals, but also for whose voices and perspectives are included or marginalized.

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