

Chapter 2

Green Building as Urban Sustainability Transitions



Abstract Over the past decade, the term *transitions* has been adopted widely in policy and academic circles, and notions of green transitions, sustainability transitions and low-carbon transitions now frequently replace the common *Leitbild* of sustainable development in local, regional and national visions and analyses. Transition studies present one particular approach to analysing and understanding fundamental changes in societies. While transition studies originally comprised historic and technocentric innovation studies that considered sociocultural dimensions as enabling context for change, the multi-level framework developed in transition studies has been recently adopted and adapted by economic and urban geographers resulting in a focus on urban transitions. The multi-level perspective in particular provides a compelling heuristic for the assessment of sustainability transitions. This chapter introduces work in transition studies and discusses the strengths and limitations of the multi-level perspective in analysing shifts in green building as urban climate change mitigation strategy. It develops a transition perspective for the green building sector that focuses on the urban in these transition processes.

2.1 Introduction

Over the last decade, debates around climate change have changed as the notion of sustainable development has increasingly been replaced by the idea of sustainability transitions or its variations including *green*, *energy* and *low-carbon* transitions. Even though the term *development* in sustainable development implies a process character of this objective, the semantic shift towards transition more strongly underlines the directed process towards a better or more sustainable state. The notion of transition also indicates a change in direction, a shift from one state to another whether set as normative goal or actual process (historical and contemporary). From a transition perspective, this change is considered to be fundamental or radical rather than incremental including a digression from the status quo which is not inherent in the notion

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of sustainable development. Be it for its novelty, for its normative if not programmatic connotation or for its presumable notion of comprehensive change, it has become a real buzzword over the past few years, increasingly marking political, scientific and media discourses on sustainable development.

The notion of transition has particularly marked debates around low-carbon policies in cities including green building strategies as one particular subset of these greening efforts. One of the aims of this book is to illustrate the various facets of transition processes in the building sector by looking at different political, regulatory and sociocultural contexts. This broad empirical scope allows for a critical revision of transition concepts prevailing in the literature. The following subchapter (Sect. 2.2) introduces the diverse transition terminology in use. For the purpose of this book, two of the concepts presented will be discussed in more detail: transition studies and urban transitions. Based on a presentation of the core characteristics of transition studies (Sect. 2.3), Sect. 2.4 provides a critical assessment of current debates and limitations of the approach. Finally, Sect. 2.5 discusses the value and suitability of the transition studies approach in respect to sustainability endeavours in urban contexts. The discussion contributes to the growing literature on the spatialities of transitions or, more conceptually speaking, on the role of geographical contexts and spatial relations to further the current understanding of the drivers of and barriers to urban sustainability transitions.

2.2 Multiple Understandings of Sustainability Transitions

The transition approach shares the destiny of other emerging terms and concepts: the multiplicity of interpretations and uses that results in terminological confusion and lack of clarity of what sustainability transitions actually are. The term transition is currently used in various fields and contexts so that an all-encompassing definition seems impossible. Box 2.1 provides an overview of different, co-existing definitions, interpretations and applications of the term transition in the realm of sustainability research. The list does not seek to be exhaustive but provides the most relevant concepts of sustainability transitions and as they relate to green building.

2.3 Transition Studies and Sustainability Research

Sustainability transition research analyses how societies can achieve a more sustainable future. The core assumption of the transition studies approach is that technological innovations are crucial to deliver change but that they always result from the interplay between social and technological processes. Initially conceived by engineers recognising the role of social sciences for the understanding of innovation processes, the concept is increasingly taken up by human geographers in innovation research in general, and more and more frequently with a focus on sustainability issues, for example, related to manufacturing, urban development, energy production or mobility and transport systems. Today, some literatures almost equal transitions with green transitions (see the debate about urban low-carbon transitions in Chap. 3).

Box 2.1 Transitions: Multiple Understandings and Common Ideas*Transition Studies*

One important strand of literature at the green innovation and sustainable spatial development nexus can be found in the social studies of technologies (SST), also known as transition studies (overviews in Truffer and Coenen 2012; Elzen et al. 2004; Hansen and Coenen 2015). Compared with the more traditional work on green innovations, of which one central question relates to identifying technologies that have the greatest potential for assisting (green) transitions, transition studies widens the focus towards the interplay or co-evolution of societal and technological changes. The approach increasingly resonates with economic and urban geographers interested in local and regional sustainability transitions (Lawhon and Murphy 2012; Hansen and Coenen 2015; Hodson and Marvin 2012; Murphy 2015). Their work will be discussed in further detail below (see Sect. 2.3).

Transition Management

Following the logic of the SST approach, a more normative and planning-oriented group of scholars develops and monitors strategic niche management (SNM) schemes. These strategies aim at creating and nurturing protective spaces for niche development and innovation (Schot and Geels 2008). The term management emphasises the operational aspects of the approach. The local or regional level plays a crucial role in the way its political, administrative, economic and civil society actors co-determine the framework conditions for niche developments and possible regime changes (Schepelmann et al. 2016). For a critical assessment of the (post-)political dimension of transition management practices that questions how environmental objectives and strategies are constructed and implemented, see Kenis et al. (2016).

Low-Carbon Transitions

The notion of low-carbon transitions is prominently used as a programmatic label for recent policy strategies presenting largely normative initiatives in response to global climate change (e.g. the United Kingdom's (UK) Low-Carbon Transition Plan from 2009). Furthermore, the term energy transition has become widely used as a synonym for the German *Energiewende*, often literally translated as *energy turnaround*. Besides national policies, numerous municipalities and regional entities have committed themselves to low-carbon targets, for example, in the framework of the Climate Alliance network in Europe.

Transition Towns

Organised since 2006 under the banner of the Transition Towns Network, a growing number of communities and cities around the world see “the end of growth” as inevitable (Bailey et al. 2010) and ambitiously try to mediate low-carbon transitions at the local level (Hodson and Marvin 2012). Initiatives are usually characterised as small-scale, community-focused and bottom-up processes. Today, the transition network comprises numerous towns and cities,

but also neighbourhoods, single-community projects, enterprises, universities, schools or livelihoods, fulfilling the minimum criteria defined by the association (Transition Network 2017).

Urban Transitions

In contrast but related to the preceding notion of transition towns, urban studies scholars interested in climate change mitigation and local sustainability strategies identify cities as “critical arenas for addressing climate change” (Bulkeley et al. 2011: 3) and speak of low-carbon transitions at the local level, for example, when analysing relevant actors, institutional framework conditions and urban development and resource management policies (see more in Chap. 3).

Transition Regions

The idea of transition regions was introduced by Philip Cooke as a conceptual notion linked to successful regional development models. In his work on regional innovation processes and competitiveness, he focuses on the role of eco-innovations for regional competitiveness, that is, innovations that are not restricted to mere technical advances, but that comprise products, technologies and processes that help reduce environmental impacts. Based on internationally comparative case studies, Cooke defines transition regions as “sub-national territories, usually with some degree of devolved governance in the fields of innovation, economic development and energy that [...] act as regional ‘lighthouses’ for eco-innovation both to other regions and countries. These are the places that are subject to ‘learning visits’ by global policy-makers and other interested parties eager to learn how success was achieved” (Cooke 2011: 106; see also Gibbs and O’Neill 2014). Besides this analytical and conceptual understanding, the term can also be found in the more normative and activist debates on transition towns and initiatives (see above) where it describes initiatives above the neighbourhood, village or city level (e.g. the Bangor/Brewer Region in Penobscot County of Maine) or an umbrella association of several transition towns (e.g. the Transition-Region Ammersee in Bavaria).

Within the broader school of transition studies, the multi-level perspective (MLP) is one concept that has in particular resonated with scholars in geography and social sciences. Probably due to its compelling heuristic, the MLP developed by Frank Geels and colleagues (Geels 2002) has been adopted widely and has led to a proliferating number of empirical contributions (overview in Hansen and Coenen 2015). The MLP provides an analytical framework to understand and explain socio-technical transitions using both a temporal dimension and an institutional perspective with the latter focusing on the interplay between actor groups that leads to changing norms and conventions (Fuenfschilling and Truffer 2014). The MLP distinguishes between three mutually dependent levels: landscape, regime and niche.

The *landscape* captures the overarching (exogenous) socio-technical context that sets the regulatory, political, cultural (norms and values) and environmental conditions for a particular sector or activity.

The *regime* level acts as meso-level of socio-technical systems and describes predominant organisational standards and norms, for example, prevailing rules and conventions of an established industry.

Niches act as test beds for (radical) innovations and new socio-technical constellations. They usually consist of spaces that are protected from rules and structures at the higher scales of the regime and landscape (e.g. exemptions from certain regulations or free market forces).

Successful niche innovations can evoke changes at the regime and landscape level, but change can also be triggered by changes at the landscape level. For example, environmental disasters can lead to an increased environmental awareness of the general public resulting in fundamental shifts of global climate or energy policies.

As such, transitions do not only result from path-breaking innovations at the niche level but are at least influenced by changes of the general socio-technical environment, opening windows of opportunities via regulation, research policies, tax systems, etc. This mutual articulation goes beyond the usual bottom-up and top-down logics. Rather, it has to be understood as a continuous interplay of various actors at all levels marked by power relations and vested interests on all sides. Illustrations for this can be found, for example, in Jesse Hoffman and Anne Loeber’s study on the micropolitics of greenhouse innovations in the Netherlands in which they develop what they call “a relational perspective on power in transitional change” (Hoffman and Loeber 2015: 693).

Figure 2.1 relates the MLP framework to the building sector and its potential greening. Here, the landscape and highest level of the perspective comprises international and national policies of energy and climate change mitigation which provide the contextual framework (Moore et al. 2014) of the building sector. The recent EU energy policy, for example, immediately impacts building standards and practices.

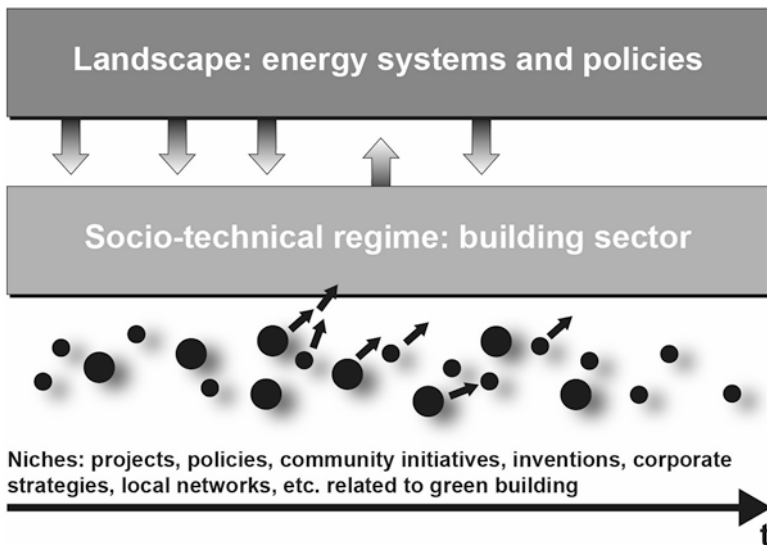


Fig. 2.1 The multi-level perspective adapted to the building sector (Illustration: Ulrike Schwedler, based on Schulz and Preller 2016: 274)

As discussed later in Chap. 9 in more detail, the landscape level by no means is limited to superior administrative or political levels. The cases of Freiburg and Vancouver, for example, show that local policies and regulations are a pertinent part of the landscape thus creating a particular local context. The latter may also include specific attitudes and value systems (e.g. in the case of Vancouver, this is captured in the notion of the West Coast spirit characterised by strong environmental consciousness amongst the public) which are the outcomes of more general societal transformations (e.g. changes in policy objectives, lifestyles and consumption patterns). In cases where sustainability goals are shared by many stakeholders and decision-makers, like in Freiburg's collective efforts to set vanguard energy standards, the context conditions are more likely to have a transformative impact on the regime level. There, the predominant or established building sector usually tends to perpetuate existing routines, norms and other institutions.

Again, the regime *level* is not to be understood as another spatial *scale*, for example, in the sense of a regional milieu of building practices being the localised articulation of framework conditions set at a superior scale (national/international). Rather, the notion of level helps to analytically distinguish particularities of a single sector or field of activities (regime) from the more general context (landscape). Obviously, the relationships and interactions between the levels are reciprocal and in no way hierarchical (top-down or bottom-up); they constitute the co-evolutionary dimension put forward in institutionalist and evolutionary approaches in economic geography and further operationalised in transition studies.

The niche level may encompass all sorts of heterodox, experimental and pioneering endeavours in the building sector, practised in a particular context and relying on individual actors' decisions and agency (co-)produced in specific actor networks, potentially determining innovations and further development trajectories. But actor constellations are far from limited to local arenas and can connect places and people over longer distances (see policy mobility in Chap. 3).

2.4 Limitations of the Transition Studies Approach and Current Debates

Most empirical studies on socio-technical transition follow a sectoral approach by looking at one particular industry or technology, usually in a given national context (see Geels (2002) on the steamship industry in the Netherlands or Schot et al. (1994) on car manufacturing). While the aforementioned examples were primarily led by an interest in technological innovation and new market configuration, sustainability aspects have gained traction over the last years. Verbong and Geels (2010), for example, look at the role of the electricity sector's infrastructure in energy transitions, while innovation trajectories in the photovoltaics (PV) industry are analysed by Dewald and Fromhold-Eisebith (2015). Geels et al. (2017) focus explicitly on decarbonisation approaches, and Zademach and Dichtl (2016) are probably the first applying the MLP to the greening of the financial sector in relation to energy transitions.

Avelino and Wittmayer (2015) provide a cross-sectoral view that brings together an explicit interest in sustainability transitions and a differentiated understanding of actors and their agency. In their multi-actor perspective (MaP), they seek to overcome too rigid distinctions made between both levels (see MLP) and actor groups. They draw on so-called third sector organisations which are not-for-profit civil society actors that neither belong to the public nor to the commercial sector (Evers 2008; Pestoff 2014) with the potential to form hybrid organisations around unusual actor constellations (Schulz and Preller 2016).

Through its institutional perspective, the MLP thus can help to focus on relevant actor groups, framework conditions (political programmes, research policies, funding and tax systems, consumption practices, cultural meanings, etc.) and temporal dimensions that “can be used to shift the gaze of human geographers from particular artefacts or static socio-material patterns towards the co-evolution of technology and society, and the dynamic interactions between multiple social, political, and economic scales” (Lawhon and Murphy 2012: 355). As such, it offers a heuristic analytical framework to unravel the complex nature of sustainability transitions.

While the mutual ties between the social and the technical dimensions of innovation processes (i.e. the necessity for a co-evolutionary perspective) are widely recognised, the rather rigid, hierarchical logic of the multi-level transition framework has been increasingly criticised. Geographers have been most critical about the lack of spatial sensitivity (Coenen et al. 2012; Hodson and Marvin 2012; Raven et al. 2012; Truffer and Coenen 2012; Schwanen 2017) and the neglect of the socio-political nature of urban sustainability transitions (Lawhon and Murphy 2012; Meadowcroft 2011; Smith et al. 2005; Shove and Walker 2007). The latter encompasses the power relationships between actors, which need to be addressed in order to grasp the diversity of sustainability experiments and inventions including failed and successful and changing and stabilising ones. This requires a sensitivity for the respective spatial context (e.g. specific governance patterns), as Raven et al. (2016) demonstrate in their analysis of six low-carbon technology case studies in the United Kingdom and the Netherlands.

One major limitation of the MLP lies in the common (but maybe intuitive) equalisation of multiple levels with hierarchical spatial scales where socio-technical regimes and niches are conceptualised as separate entities that are being conflated with the national and local scale (Bulkeley et al. 2014). In a cross-fertilising way, spatial concepts can help address limitations of socio-technical transition theory by opening up the clear-cut multi-level perspective to a relational thinking that blurs the boundaries between niches and regimes. For example, the multi-level perspective has mainly been employed to describe historical developments of how successful innovations spread but neglects to explain ongoing developments as well as where, how and through which actor constellation innovations come into being. Nevertheless, sensitive applications of the MLP perspective complemented with a relational spatial understanding provide a helpful heuristic to empirically address ongoing

transitions [that] are shaped both by the ways in which socio-technical systems are embedded in particular territorial contexts, and by the multi-scalar relationships linking their heterogeneous elements to actors, materials, and forces situated or emanating from different locations or scales. (Murphy 2015: 75)

As argued by Binz et al. (2014), a relational perspective is needed to conquer the use of national *containers* as contextual frameworks for localised transitions. It allows to direct inquiry towards the actual spatial and temporal articulations of the respective actor networks, learning processes and knowledge diffusion. Relational thinking further helps to avoid the frequent reification of spatial scales or political levels preventing an overrating of particular structural elements. Shove and Walker (2010) postulate a more horizontal view of co-existing developments or practices to avoid hierarchical perspectives and allow overcoming structure and agency dichotomies.

The project presented in this book aims to overcome the structural rigidity often associated with the MLP by dissolving the idea of clearly bounded levels and, simultaneously, seeks to avoid “the trap of reducing and flattening these governance arrangements to the level of the city” (Hodson et al. 2017: 2). Furthermore, the approach taken here abstains from defining clear borders of the case study cities or city regions. Rather, they are understood as being the places where different scales as well as different influences from different places interact. Cities are conceived as nodes in a network of relations between and flows of policy ideas, tools and concepts that are partly travelling between remote places and co-shaping landscapes, regimes and niches in a given setting. These relational aspects will be discussed in more detail and further conceptualised in Chap. 3.

Another criticism of technocratic transition research lies in its focus on “narrow social interests” and elite actors as technical experts and entrepreneurs (Hodson and Marvin 2011; Lawhon and Murphy 2012) that ignores political contestations, inequalities in power relationships and access to transition decisions as well as failed experiments. There is hence a risk in the urban sustainability transition literature to ignore “the multiple facets of ‘the urban’” that “are both constructed on and imply quite different financial, socio-spatial, metabolic and governance configurations” (Coutard and Rutherford 2011: 122). In their case study on off-grid energy production in Stockholm’s emblematic Hammarby Sjöstad, Coutard and Rutherford (2011) show that there can be divergent imaginations of and strategies towards low-carbon transitions, rivalling simultaneously in the same urban context. What is celebrated as success by some can be contested by others. For example, local electricity production through PV panels is promoted by some as green energy solution, while they are criticised by others as relatively expensive infrastructure that not all dwellers can afford.

Several human geographers have brought spatial dimensions into transition studies through a number of conceptual proposals. For example, Coenen and Truffer (2012) as well as Raven et al. (2012) aim at making MLP compatible with contemporary thinking in regional development and innovation research. Similarly, Bulkeley et al. (2014) and Lawhon and Murphy (2012) refer to political ecology to introduce a spatially informed understanding of agency and power relationships in

a transition context. Gibbs and O'Neill (2014), however, argue that these proposals remain at a high level of abstraction themselves and provide only limited empirical illustrations and evidence. There are a few exceptions though including, for example, Anna Davies' work (2013) on clean-tech clusters as well as Bridge et al. (2013) on energy transitions.

2.5 Transitioning Towards Green Cities

One particular strand of sustainability transitions research has identified the urban arena as a critical area for the study of low-carbon transitions due to the impact that cities have and are likely to experience in the future regarding climate change mitigation. Recent contributions to urban sustainability transitions contain more specific illustrations of how cities can be integrated into transition studies (Rohracher and Späth 2014; Späth and Rohracher 2015; Roberts et al. 2014; Hodson et al. 2017). Following the assumption prevalent in strategic niche management that

sustainable innovation journeys can be facilitated by modulating of technological niches, i.e. protected spaces that allow nurturing and experimentation with the co-evolution of technology, user practices, and regulatory structures (Schot and Geels 2008: 538)

The local and urban scale are seen as central to the ways political, administrative, economic and civil society actors co-determine the framework conditions for niche developments and regime changes. For example, contributions have highlighted the role of cities as sites of niche experiments (Coenen et al. 2010; Healy and Morgan 2012; McCauley and Stephens 2012), living laboratories (Evans 2011; König 2013) and "sites of feasibility demonstrations" (Rohracher and Späth 2014: 1427). This includes not only the support of concrete projects and pioneering initiatives or the proactive shielding of recognised niches (e.g. through specific building codes and tax incentives) by local governments and other stakeholders. It also encompasses the specific local context conditions or sociocultural characteristics that may make certain places more fertile for sustainability transitions. This includes the existence of what Longhurst (2015) calls *alternative milieus*. Alternative milieus are characterised by a high density of alternative institutions and structures which are linked to environmental, social or cultural values and norms that challenge the status quo and existing institutions. Rather, they promote alternative forms of development and can provide a niche for experimentation. One expression of alternative milieus are the transition towns (Longhurst 2013), but these milieus may also be found within larger cities. For example, Longhurst links alternative milieus to the counterculture movement in the 1960s which emerged out of large cities such as New York City, San Francisco and London. Similarly today, different cities can be associated with different political orientations that may promote or inhibit sustainability transitions.

As highlighted by the relational understanding of cities (Sect. 2.4), niches are not autonomous or shielded spaces but rather shaped through spatial processes of exchange and learning. Numerous transnational and environmental associations

including Local Governments for Sustainability (ICLEI) with its Cities for Climate Change Protection (CCP) programme, the Climate Alliance, the Energy Cities and the C40 Cities Climate Leadership Group attest to the prevalence of local and case-specific strategies in climate change mitigation initiatives that connect local and municipal actors around the globe (see also Healy and Morgan 2012).

An adaptation of transition studies (and the MLP in particular) to more spatially sensitive concepts still risks reifying space and scales. Raven et al. (2012) plead for a relational understanding to grasp the complexity of institutional settings and actor constellations and to avoid an essentialist view on absolute scales (local, regional, national, etc.). Also, case study research tends to isolate local spaces from superior levels of governance and of other forms of spatial interaction (e.g. international corporate sector) and thus ignore “wider social, economic and political processes which shape sustainability in urban places” (Bulkeley and Betsill 2005: 58). In particular, urban or other local scales must not be equalised with the MLP’s niche, regime and landscape levels nor with other spatial scales. Rather, niches, regimes and landscapes are simultaneously present in any place where niche activities can (or cannot) articulate with incumbent regime actors in the context of specific landscape conditions. Similarly, cities (i.e. actors based in a city or activities emerging from a city) can themselves be “shapers” (Hodson and Marvin 2010: 59) of transitions at the landscape level. In a similar vein, it is argued that there is a need to move “beyond a view of cities and regions as simply places for experimentation and demonstration [linking] together the niche with the regime and landscape” (Gibbs and O’Neill 2014: 204–205).

Transition studies scholarship has received multifaceted criticism and has been very receptive to critical voices illustrated by its effort to improve the approach and the high level of reflexivity with which protagonists of the approach react to critical comments from neighbouring disciplines. In his *self-defending* paper, Geels responds to the seven most frequent criticisms (Geels 2011). Amongst others, he relativises the initial understanding of MLP as a nested hierarchy and tries to counter-balance the *bottom-up bias* inherent to the MLP approach. This relates to the risk to overrate the role of niches in socio-technical change while underestimating the importance of or the interplay with other levels. Fuenfschilling and Truffer (2014) plead for a stronger conceptualisation of the role of institutions in MLP in order to better assess the articulation between structures and agency. Regarding the use of the MLP in urban sustainability research, Hodson et al. (2017) argue in favour of multiplicity when looking at the wide range of urban experiments (both social and technological) that co-constitute urban reconfigurations. Most recently, Geels et al. (2017) in their contribution to decarbonisation policies acknowledge the pertinent role of non-technological niche developments (e.g. forms of organisation, participation and behaviour) and their frequent co-occurrence with major changes at the landscape levels so that short policy window opportunities may help accelerate change at a given tipping point.

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