

Urban Retrofitting for Sustainability: Mapping the Transition to 2050, Tim Dixon, Malcolm Eames, Miriam Hunt and Simon Lannon (Editors), Routledge 2014, 304 pages, ISBN: 978-0-415-64251-4, £60.00 (hardback)

Urban Retrofitting for Sustainability: Mapping the Transition to 2050 aims to identify and explain the key trends in urban retrofitting which are likely to transform cities in the next decades. According to the prominent discussion about cities as key arenas of tackling climate change and cities as seedbeds of innovation, the book draws attention to urban sustainability transitions. The edited volume brings together 15 chapters written by different scholars and researchers, and provides insights from architecture, planning, engineering, geography and economics. This interesting multidisciplinary approach differs from many other mono-disciplinary publications in this field. Understanding urban retrofitting as a complex, systemic socio-technical process, Tim Dixon et al. follow the highly relevant and currently well-cited literature on transition studies and elaborate the idea that large-scale urban retrofitting requires systemic change in terms of technical and societal transitions. This promising theoretical framework quickly catches the reader's attention. There are some contributions in the book which present new aspects and move knowledge forward. However, other contributions leave the reader wanting more. The reader is also likely to expect further details on retrofitting-related key trends such as transportation, e-mobility and innovative patterns of consumption and production.

Urban Retrofitting for Sustainability: Mapping the Transition to 2050 is structured in four parts. The first part leads to the complexity of urban retrofitting and constitutes the theoretical framework which was examined in the context of the *EPSRC Retrofit 2050* research programme. All chapters in the book are results of this UK research programme which was launched in 2010. Referring to literature on transition studies which understand technological change as a socio-technical process occurring 'as a result of experimentation and emergence of new socio-technical configurations (innovations)' (p.3), Dixon et al. transfer these ideas into the context of urban retrofitting transitions. Hence, cities are complex socio-technical systems with different regimes and seedbeds for innovation. Nevertheless, some contributions in the book only provide an overview of aspects of urban

retrofitting, leaving complexity out. It would be useful to analyse more case studies on new socio-technical configurations dealing with questions such as: How were the different projects realised? Who was involved? Which barriers and challenges occurred in the planning, construction or operating process?

Chapter 2.7 describes briefly the following critical success factors: governance, integration of a wide range of regime actors, socio-economic issues, green financing and new forms of partnerships. Only a few chapters highlight these important aspects in more detail. In Chapter 5, Kate Theobald and Keith Shaw explain the important role of urban governance in the context of retrofitting buildings. Focusing on building policy and regulations in the UK, the contribution discusses barriers and challenges by adopting UK's Green Deal programme on local and regional levels. As a conclusion the authors point out that 'local governments need to be given wider regulatory powers in the area of planning and retrofit of buildings' (p.37). Furthermore, there is a need to develop new Public-Private Partnerships or new connections with local authorities or industries.

In Chapter 8, Duncan McLaren highlights issues on social justice. He gives examples of new sustainable building policies from Austria, Germany and the USA which seek to bring ecological, economic and social issues together. He also emphasizes the importance of new policies and funding mechanism. The "learning from" approach in this chapter is highly relevant. Chapter 6 also focuses on policy issues, but emphasizes issue of retrofitting of dynamic BRICS cities. Jonathan Silver elaborates drivers and challenges of sustainable development in Sao Paulo, Mumbai and Cape Town, but doesn't go very deep. Discussing different urban development policy concepts of the three cities, Silver explores the difficulties local governments have to cope with when trying to reach different goals: poverty reduction, economic growth, energy security and climate change adaptation.

Earlier in the book, Chapters 3 and 4 provide modelling tools. Chapter 3 describes a modelling tool which calculates current and future housing energy consumption and related energy cost. The other chapter deals with another important issue in current and future urban sustainability transitions – financing. The authors present their model and conclude that city regions would highly benefit from these investments in different matters: reducing

energy bills and carbon footprints, job creation, wider economic benefits. However, Gouldson and co-authors do not elaborate on about what low-carbon investments in cities are. It's the appendix which presents a long list of potential investments from mini wind turbines, to photocopiers, and rail electrification. The next aspect of urban retrofitting is discussed in Chapter 7, which brings 'art-based' (p. 137) urban design and scientific approaches together. The contribution mainly focuses on large scale infrastructure developments in terms of urban greening and open space initiatives. Using examples of the Boston city centre and the neighbourhood of London Islington, Georgia Butina Watson shows how these initiatives can help cities to improve their environmental and social conditions.

One of the best chapters in the book is the one by Andrés Luque, who discusses the 'interface between smart grids and cities' (p.159). Following the literature on transition studies, the contribution makes clear that the energy transition must be a 'transformation of the modes of integration between technology, resources and society' (p.159), which leads to the emergence of new politics. Luque discusses different international examples and concludes that the retrofit of local and regional electricity is a gradual process. More focused on policy and incentive instruments promoting a change in energy systems, Stuart J.C. Irvine provides an overview of the topic of solar energy in urban retrofitting. The contribution analyses retrospectively the development of solar energy and looks on new policy instruments that support solar energy. There are also strengths in elaborating the solar energy market development and representing future technologies in this field. Writing from the UK's perspective, the authors in Chapter 11 discuss the status quo of the energy mix and the potential evolution of the energy system. After reviewing the UK's policy on energy efficiency, renewable energy, and waste to energy, the authors describe different future scenarios and the low-carbon model 'thousand flowers pathway' (p.202), which proposes a diversified mix of energy. Sadly, however, the ambiguous text structure does not really help the reader in understanding the approach.

Finally, Part 3 of the book deals with the role of water and waste, again written from a UK perspective. While Chapter 12 is about change in large-scale urban water infrastructure systems and urban water cycles, Chapter 13 focuses on water infrastructure issues at the

household scale. First, David Butler et al. explain the 'sustainable integrated water management' (SIWM) (p.221) approach which integrates all aspects of urban water cycles. Second, considering transition theories, the authors discuss future scenarios and analyse 'critical pathways' towards a water infrastructure system transition: technical and market-based, political and governance-based, and cultural and water-user-based. Third, they discuss the retrofitting for domestic water efficiency which includes technical components such as water meters and a social component regarding changes in user behaviour. Finally, Geoff Watson and William Powrie give a historical overview of the UK's waste production and its related governance approaches. Then, they highlight different challenges in the waste sector towards a sustainable transition.

The book considers a wide range of topics in the context of sustainable urban transitions and brings multidisciplinary research results together. Focusing on buildings and infrastructure the book highlights new aspects of governance, green technologies, and modelling tools on energy consumption and financing. In the case of some contributions, however, the reader will probably be left wanting more.

Sebastian Fastenrath

University of Cologne