## Contents

### Part I  Introduction

1. **Towards Sustainable Living** ........................................... 3  
   Arjan van Timmeren and David V. Keyson

2. **The Emergence of Living Lab Methods** .......................... 9  
   Natalia Romero Herrera

3. **Social Practices as a Main Focus in Living Lab Research** ... 23  
   Marco Hasselkuß, Carolin Baedeker and Christa Liedtke

4. **Green Economy as a Framework for Product-Service Systems Development: The Role of Sustainable Living Labs** .... 35  
   Carolin Baedeker, Christa Liedtke and Maria Jolanta Welfens

### Part II  Research Methods for Living Labs

5. **Living Labs to Accelerate Innovation** .......................... 55  
   David V. Keyson, Gregory M. Morrison, Carolin Baedeker and Christa Liedtke

6. **Splashing: The Iterative Development of a Novel Type of Personal Washing** ........................................... 63  
   Lenneke Kuijer

7. **Design with Intent and the Field of Design for Sustainable Behaviour** ........................................... 75  
   Dan Lockton

8. **Architectural Research in Living Labs: Exploring Occupier Driven Changes in Homes** .................................... 89  
   Paula Femenias, Liane Thuvander, Cecilia Holmström, Lina Jonsdotter and Madeleine Larsson
Part III Sustainable Living Labs

9 DARE2Build ................................................................. 103
Shea Hagy, Peter Selberg, Larry Toups and Paula Femenias

10 The Storyline for the Design Process that Shaped
the HSB Living Lab ....................................................... 113
Peter Elfstrand, Gregory M. Morrison, Larry Toups and Shea Hagy

11 Exploring the German Living Lab Research Infrastructure:
Opportunities for Sustainable Products and Services ............. 131
Justus von Geibler, Carolin Baedeker, Christa Liedtke,
Holger Rohn and Lorenz Erdmann

Part IV Living Labs and User Engagement

12 In-Situ and Mixed-Design Interventions ......................... 157
Natalia Romero Herrera

13 Co-creation in Living Labs ........................................... 169
Shea Hagy, Gregory M. Morrison and Peter Elfstrand

14 Participatory Drawing in Ethnographic Research ............... 179
Flora Bowden, Dan Lockton, Rama Gheerawo and Clare Brass

15 Actor and Network Analysis .......................................... 191
Carolin Baedeker, Marco Hasselkuß and Johannes Buhl

16 Design Participation in Sustainable Renovation and Living .... 205
Stella Boess

17 Supporting Iterative Research and Design Explorations
in the Living Lab Context ............................................... 227
Tomasz Jaskiewicz, David V. Keyson and Jantien M. Doolaard

18 Recruitment of Participants (Households in City District
and Companies) for Insight Research and Prototyping .......... 241
Kamil Folta, Dan Lockton and Flora Bowden

Part V Sustainable Production and Consumption

19 Analysing Social Milieus and Lifestyles—Their Contribution
to a Better Understanding of Heating Practices ................... 249
Johannes Buhl, Kathrin Greiff, Carolin Baedeker
and Christa Liedtke

20 Material and Carbon Footprint of Household Activities ....... 259
Kathrin Greiff, Jens Teubler, Carolin Baedeker,
Christa Liedtke and Holger Rohn

21 FoodWatch and Food Resource Flows ......................... 277
Jesper Knutsson
Part VI  Case Studies on Exploring Energy Feedback and Visualisation with Users

22 Making Energy Feedback Understandable .......................... 291
    David V. Keyson and Natalia Romero Herrera

23 Powerchord: Exploring Ambient Audio Feedback on Energy Use ........................................ 297
    Dan Lockton, Flora Bowden and Claire Matthews

24 Designing Ampul: Empowerment to Home Energy Prosumers 309
    Natalia Romero Herrera, Jaap Rutten and David V. Keyson

25 Energy Feedback Objects .......................... 325
    Tomasz Jaskiewicz, Aadjan van der Helm and David V. Keyson


26 Relationship Between Building Technologies, Energy Performance and Occupancy in Domestic Buildings ........................................................................ 333
    Olivia Guerra-Santin

27 Influence of User-Behavior on Energy Efficiency .................. 345
    Tanja Lovrić and Viktor Grinewitschus

Part VIII  The Way Forwards: Business Models for Living Labs

28 Concept House Village; A Next Step in the Development of Sustainable Housing in the Netherlands ........................................ 371
    Sacha Silvester, Bert Hooijer, Ria van Oosterhout and Floor van der Kemp

29 Commercial Consortia ........................................... 385
    Maria Ådahl

30 Business Models for Sustainability in Living Labs .................. 391
    Mike Burbidge, Gregory M. Morrison, Menno van Rijn, Sacha Silvester, David V. Keyson, Lali Virdee, Carolin Baedeker and Christa Liedtke

31 Reflecting on Living Labs and Future Trends .................. 405
    David V. Keyson and Carolin Baedeker