



Urban living labs for sustainability and low carbon cities in Europe: towards a research agenda



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ABSTRACT

Urban living labs (ULLs) are emerging as a form of collective urban governance and experimentation to address sustainability challenges and opportunities created by urbanisation. ULLs have different goals, they are initiated by various actors, and they form different types of partnerships. There is no uniform ULL definition. However, many projects studying and testing living lab methodologies are focusing on urban sustainability and low carbon challenges, as demonstrated by the current projects funded by the Joint Programming Initiative (JPI) Urban Europe. At the same time, there is no clear understanding of what the ultimate role of ULLs is in urban governance, and whether they represent a completely new phenomenon that is replacing other forms of participation, collaboration, experimentation, learning and governing in cities. There is a need to clarify what makes the ULL approach attractive and novel. The aim of this article is to develop current understandings through an examination of how the ULL concept is being operationalised in contemporary urban governance for sustainability and low carbon cities. This is undertaken through the analysis of academic literature complemented with five snapshot case studies of major ongoing ULL projects funded by JPI Urban Europe. Five key ULL characteristics are identified and elaborated: geographical embeddedness, experimentation and learning, participation and user involvement, leadership and ownership, and evaluation and refinement. The paper concludes by outlining a research agenda that highlights four key topics: ways in which the ULL approach is operationalised, the nature of ULL partnerships and the role of research institutions, the types of challenges addressed by different ULLs, and the role of sustainability and low carbon issues in framing ULLs.

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1. Introduction and background

In Europe around 75% of the population lives in urban areas and this number is expected to increase to 80% by 2020 (Anderson and Galatsidas, 2014; EC, 2014). As cities become more and more

economically productive, urbanisation trends are likely to lead to even further deterioration of natural resources, aggravation of climate change and other environmental problems, as well as pose social challenges such as poverty, inequality and segregation. It is increasingly recognised that achieving urban sustainability is not a matter of gathering more data, creating technical fixes or establishing the right institutions. Changes are required in the ways in which systems of provision and services are designed, organised and delivered in diverse urban contexts. Besides encompassing new technologies and infrastructures, such transformations also require shifts in markets, practices, policy and culture (Bulkeley et al., 2010; Frantzeskaki and Loorbach 2010).

In response to these challenges, different forms of urban governance are being developed and tested in European cities. Urban living labs (ULLs) constitute a form of experimental governance, whereby urban stakeholders develop and test new technologies, products, services and ways of living to produce innovative solutions to the challenges of climate change, resilience

Abbreviations: APRILab, Action Oriented Research on Planning, Regulation and Investment Dilemmas in a Living Lab Experience; CASUAL, Co-creating Attractive and Sustainable Urban Areas and Lifestyles; ENoLL, European Network of Living Labs; Green/Blue Cities, Green/Blue Infrastructure for Sustainable, Attractive Cities; ICT, Intellectual Communication Technology; JPI, Joint Programming Initiative; NORDREGIO, Nordic Centre for Spatial Development; SubUrbanLab, Social Uplifting and Modernization of Suburban Areas with the Urban Living Lab Approach; ULLs, urban living lab; URB@EXP, Towards New Forms of Urban Governance and City Development: Learning from Urban Experiments with Living Labs and City Labs.

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and urban sustainability (Bulkeley and Castán Broto, 2013). Importantly, ULLs are not just focused on technologies but also issues of consumption, behaviour and lifestyles. For cities trying to position themselves as innovation leaders in the race to decarbonise and become sustainable, ULLs appeal as high profile statements of intent and vehicles to secure funding for sustainable urban development. For funding bodies and governments, promoting ULLs offers a way to encourage cities to adopt innovative solutions.

Living labs for sustainability and low carbon cities emerging in Europe have different goals and ways of working, they are initiated by various actors, and they form different types of partnerships. There is clearly no uniform definition of living labs (Schliwa, 2013; Ståhlbröst, 2008; Hillgren, 2013). Some scholars and organisations define them as partnerships between sectors (often between public, private and people) (Börjeson, 2008; Rösch and Kaltschmitt, 1999; EC, 2015; ENoLL, 2015) where universities play a key role (Evans and Karvonen, 2010), while others look at living labs more in the light of pilot and demonstration projects, which function as supportive tools for private actors and industry helping them commercialise their services, products and technology (Kommonen and Botero, 2013; Hellström et al. 2012). Living labs can be considered both as an *arena* (i.e. geographically or institutionally bounded spaces), and as an *approach* for intentional collaborative experimentation of researchers, citizens, companies and local governments (Schliwa, 2013).

The Joint Programming Initiative (JPI) Urban Europe, which is the main funding agency for living lab related projects in European cities, introduced the term “urban living lab” and defines it as “a forum for innovation, applied to the development of new products, systems, services, and processes, employing working methods to integrate people into the entire development process as users and co-creators, to explore, examine, experiment, test and evaluate new ideas, scenarios, processes, systems, concepts and creative solutions in complex and real contexts” (JPI Urban Europe, 2013). ULLs can also be viewed as spaces designed for interactions between a context and a research process to test, develop and/or apply social practices and/or technology to a building or infrastructure.

Debate concerning whether a living lab approach can help govern urban sustainability and low carbon transitions has been heightened in academic and professional circles by their recent and rapid proliferation. In Europe, many projects studying, exploring, testing and applying living lab methodologies have emerged in response to sustainability challenges and opportunities that cities are facing (ENoLL, 2015; JPI Urban Europe, 2015). This is directly linked to the availability of the targeted funding by JPI Urban Europe for researchers, practitioners, innovators, municipalities and other stakeholders to develop European urban areas. JPI Urban Europe has had two calls for project proposals, in which the need to explore the role of ULLs has been specified. In total, 20 projects have been granted funding in 2013 and 2014, out of which six either study or employ ULL methodology. One of these projects is the Governance of Urban Sustainability Transitions: Advancing the role of living labs (GUST),¹ which aims to examine, inform and advance the governance of sustainability transitions in cities through ULL. This article forms part of the GUST project and its research to investigate the design and development of ULLs in Europe.

While many ULL related projects are emerging, there is no clear understanding of the ultimate role ULLs can or should play in urban governance and the degree to which they represent a completely new phenomenon that is replacing other forms of participation, collaboration, experimentation, learning and governance in cities.

There is an obvious need to clarify what makes the ULL approach attractive and novel, including why funding agencies are investing in exploring its usefulness and why local collaborations are trying to operationalise the ULL concept in real-life settings, and the potential impacts of ULLs and their ability to catalyse urban sustainability and low carbon cities.

The aim of this article is to frame understanding of how ULLs are being operationalised in contemporary urban governance for sustainability and low carbon cities. The article responds to the following research questions (RQs):

- 1) How is the ULL concept articulated and applied by ongoing research projects in Europe?
- 2) How are ULLs in selected projects designed, what are their goals and visions, and in which ways is their design similar and varied across urban contexts?

The RQs are examined through the analysis of academic literature on the forms of urban governance complemented with five snapshot case studies of major ongoing ULL projects in Europe that aim to contribute to sustainability and low carbon transitions in cities.

2. Methodology

2.1. General approach and methods for data collection and analysis

The basis of this article is a review of academic publications, policy and grey literature, and current projects on urban governance and living labs in Europe. It is supported by a snapshot case study analysis of five ongoing research projects, which are designed to explore or apply ULL methodology with the purpose to contribute to sustainability and low carbon cities. Criteria to select case studies are outlined in sub-section 2.2.

This work applies a qualitative methodology to data collection and analysis, which is preferred when the phenomenon is new and when the investigator seeks to answer “why” and “how” questions (Yin, 2014). It is also used when a researcher has little control over events and when the focus is on a contemporary phenomenon (projects exploring or testing living lab methodology) within real-life context (cities and urban areas). The qualitative approach is used in this work as it aims to explore the conditions under which specific outcomes occur (e.g. ULLs emerge), the mechanisms through which they occur (e.g. mechanisms to study or establish ULLs), “rather than uncovering the frequency with which those conditions and their outcomes arise” (George and Bennett, 2005).

The article is based on a triangulation approach (Denzin, 1978) to the collection and analysis of data. First, a literature analysis consolidated the schools of thought on urban governance, and positioned the living labs approach within these studies (section 3). Second, the snapshot cases were selected (sub-section 2.2), a literature analysis of project material was performed, and the data was structured and rationalised. In-case analysis sought to answer RQ 1: *How is the ULL concept articulated and applied by ongoing research projects in Europe?* It focused on the project aim, definitions of ULL, and how the ULL approach is theoretically and practically operationalised in each case study. The units of analysis were thus distinct JPI Urban Europe projects. Third, a cross-case comparison was performed to respond to RQ 2: *How are ULLs in selected projects designed, what are their goals and visions, and in which ways is their design similar and varied across urban contexts?* The primary units of analysis were thus specific ULL examples under selected projects. The cross-case comparison further identified similarities and differences of ULL projects in terms of

¹ <http://www.urbanlivinglabs.net/>.

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