European Network of Living Labs

2025

Living Lab origins, developments, and future perspectives

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Contributors: Teemu Santonen, Giulia Campodonico, Koen Vervoort

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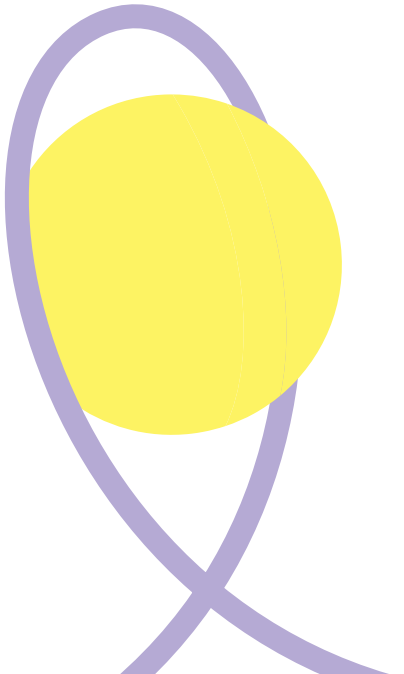

European Network of Living Labs

Authors & Attribution

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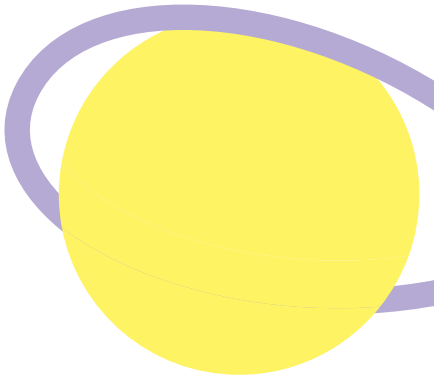
About this publication

This booklet provides a comprehensive introduction to the origins, evolution, and future outlook of the Living Lab movement. It has been created to guide readers through the development of Living Labs over the years and highlight the path ahead. While earlier publications, such as the *"ENoLL & Its Community"* booklet from 2014, covered certain aspects of Living Labs, this publication is the first to focus solely on the full trajectory of the movement—from its roots to the dynamic, expanding ecosystem it represents today.

In recent years, the *ENoLL Members Catalogue* has focused on showcasing the community aspect of Living Labs, but there has been no single, consolidated publication devoted to exploring the historical background and future ambitions of this ever-growing movement. Over the past decade, both Living Lab research and practice have thrived. Certain foundational principles have converged, creating a shared framework for the movement, while other aspects, such as specific application domains, have diversified, demonstrating the adaptability of Living Labs to a wide range of challenges and contexts.

As deeply rooted entities within their respective environments, Living Labs are inherently shaped by their unique surroundings and networks of stakeholders. This connection makes them responsive to change and, in many instances, powerful drivers of positive transformation. By fostering more sustainable and desirable futures, Living Labs play an active role in shaping the course of innovation, amplifying their impact and societal relevance.

This booklet is envisioned as a *living document,* evolving in step with the Living Lab movement. Developed from existing research, documentation, and practical experiences, it provides a reflection on the history and policies that have supported Living Labs, a snapshot of the current landscape, and a forward-looking perspective on emerging opportunities and challenges. Regular updates and contributions are planned to ensure that this publication remains relevant and aligned with the latest advancements in the Living Lab community.



As part of ENoLL's communication materials, this booklet is intended for a broad audience. It aims to be a valuable resource for professionals, institutions, and individuals with an interest in open and user-centred innovation, innovation management, policy development, and social and territorial innovation. Whether the reader is a researcher, policy-maker, business leader, or simply someone with a passion for innovative solutions, this booklet is designed to inform, inspire, and offer guidance on the transformative impact of Living Labs.

A Message to Our Readers

Wim de Kinderen
Chairperson ENoLL

Readers already familiar with ENoLL, the European Network of Living Labs, will know the year 2006 marks an important moment in time, as it is the founding year of our association. More than a starting moment, ENoLL's birth date is more a marker point which captured an existing and growing global innovation movement that can be traced back in time, as this publication clearly describes. The core goal of Living Labs, i.e. advancing user-driven innovation in real-life context, has been gaining momentum over the years and it continues to do so. Indeed, the time for Living Labs lasts to be right, as it is ever more widely acknowledged and proven that the integration of all quadruple helix's perspectives adds value in every meaning of the term.

Thanks to the growth of our association and its strengthened capacities, ENoLL has been able to serve ever better the broad Living Labs community – both within as outside of the network's membership – and to act as an accelerator to Living Labs research and practice, thereby enhancing impact and relevance of the work by all. The association is also a safe environment for all to grow steadily within, or to jump on in any stage of maturity you are in as an entity and from any core interest you have or represent. As a proud president, representing an organisation which has been growing steadily within, I invite all to (continue to) grow and explore, to get in touch and inspire.

This booklet captures the work so far. I am confident Living Labs will continue to be drivers of positive transformation, taking on new challenges which will present themselves in an agile and responsive way. I am eager to look to follow-up editions of this publication, in which your contribution will undoubtedly be reflected as well.

A Message to Our Readers

Martina Desole
Director ENoLL

The Living Lab movement represents a remarkable journey of innovation, collaboration, and societal impact. Over the years, it has evolved from an emergent concept into a thriving ecosystem—one that empowers diverse stakeholders to co-create solutions tailored to real-world challenges. This booklet takes us on a comprehensive exploration of that journey, tracing the roots of Living Labs, celebrating their accomplishments, and envisioning their role in addressing the complexities of our shared future.

As Director of the European Network of Living Labs (ENoLL), I have had the privilege to witness first-hand the profound contributions of Living Labs in fostering user-centric and participatory innovation. Living Labs thrive at the intersection of research, policy, and practice. They are not only spaces for experimentation but also catalysts for systemic transformation. Their strength lies in their adaptability—responding to the unique challenges and opportunities of their respective environments while adhering to shared principles that define the movement.

This booklet reflects the collective experiences and aspirations of the Living Lab community. It serves as both a testament to the progress achieved and a guide for navigating the path ahead.

Our intention is for this publication to remain dynamic, just like the movement it represents. We envision it as a 'living document' that will grow and evolve through regular updates and contributions from practitioners, researchers, and other stakeholders. By doing so, we aim to ensure that it continues to inspire and inform, remaining relevant to the ever-changing innovation landscape.

As Living Labs look to the future, their potential to address global challenges has never been greater. Whether it is fostering resilience in our cities, advancing inclusive technologies, or supporting the green and digital transitions, the Living Lab methodology offers a framework for creating meaningful and impactful solutions. This publication is an invitation to engage with this transformative movement—to learn, to share, and to contribute.

I extend my deepest gratitude to all those who have contributed to this booklet, as well as to the wider ENoLL community. Your dedication and vision drive the Living Lab movement forward, ensuring its continued relevance and societal impact.

I hope that this booklet serves as a source of knowledge and inspiration for all readers, whether you are new to the concept of Living Labs or a long-standing member of our community. Together, let us continue to shape a future that is sustainable, inclusive, and innovative.

General Assembly December 2024

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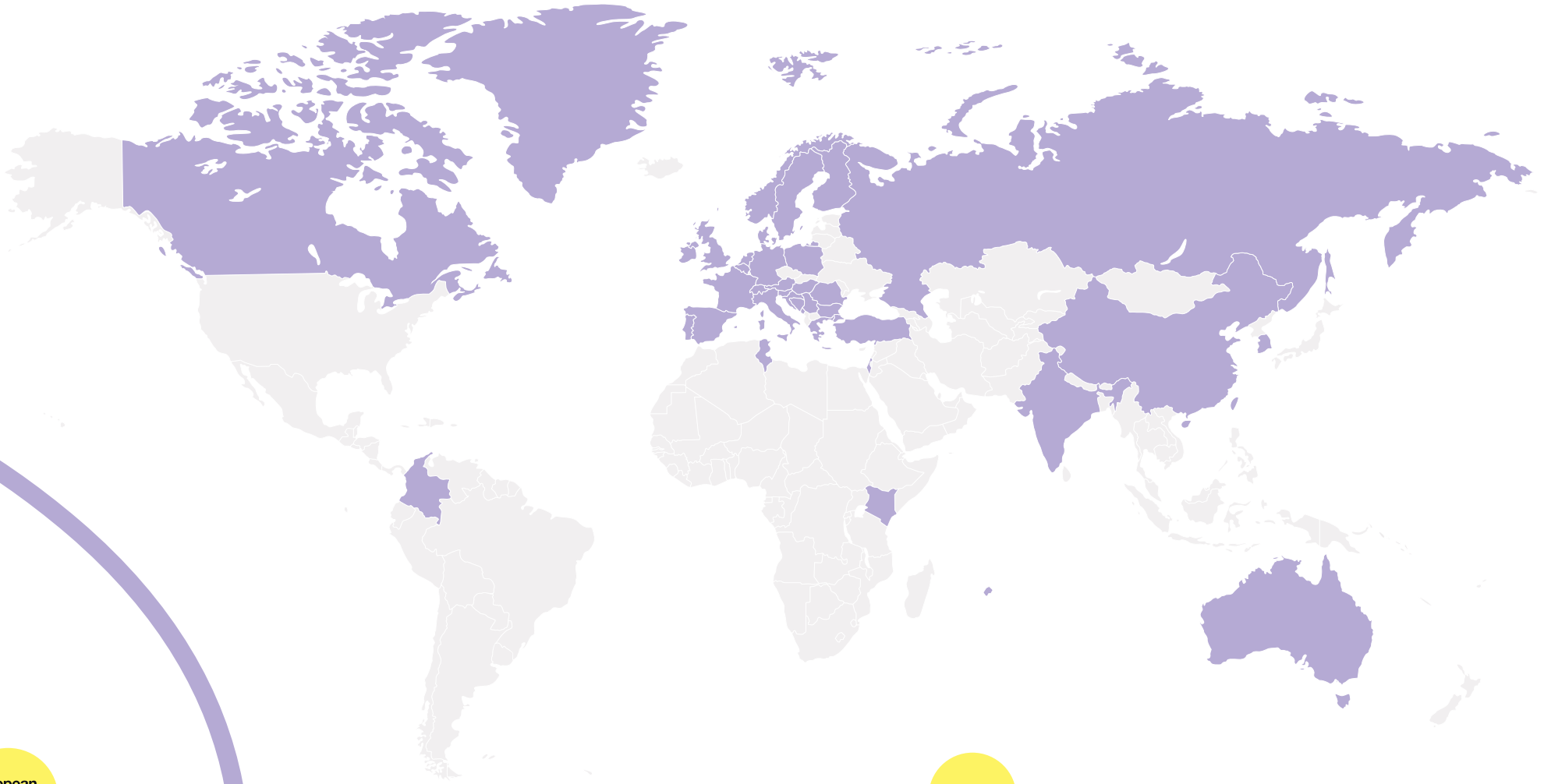


European Network of Living Labs

About the European Network of Living Labs (ENoLL)

The European Network of Living Labs (ENoLL) is an international non-profit association headquartered in Brussels, Belgium, dedicated to advancing user-driven innovation ecosystems through the Living Lab approach. Established in 2006, ENoLL has grown into the only certification body and world's largest Living Lab network, bringing together over 480 historically recognised Living Labs to foster collaboration, experimentation, and co-creation that drive societal and economic impact.

ENoLL facilitates knowledge exchange, supports joint initiatives, and promotes project partnerships among its members while advocating for the adoption of Living Lab methodologies globally. Through its work, ENoLL influences public policy at both European and international levels, enabling the creation of innovative solutions that address societal challenges.

Living Labs are innovation environments where citizens, public authorities, private enterprises, and research institutions collaborate (Quadruple Helix model) to co-design, test, and validate new products, services, and systems. ENoLL empowers its members to apply this approach across diverse domains, such as health and wellbeing, soil-health, energy, mobility, agriculture, culture and creativity, social innovation, among others, fostering experimentation and the development of new business models.

With over 170 members spanning Europe and beyond—20% of whom are based outside the European Union (EU)—ENoLL represents a vibrant, global ecosystem of change makers dedicated to advancing innovation through collaborative, user-centred practices.

Supporting and Expanding the Living Lab Community

ENoLL provides its members with a comprehensive range of benefits, including:

Capacity Building: A robust training programme designed to enhance Living Lab expertise through various formats, including the online *ENoLL Living Labbers Academy*[1]. The bespoke training opportunities include the *Virtual Learning Lab* online course, the *Learning Lab – Day 0* crash course, the *Deep Dive Sessions* immersive approach and *Tailored Trainings* designed to enhance Living Lab expertise.

Networking Opportunities: ENoLL offers a wide range of networking activities to connect with like-minded professionals, form partnerships, and enhance collaboration within the Living Lab community. Members have the opportunity to participate in thematic Working Groups, brokerage events, the yearly conference *OpenLivingLab Days*[2], thematic symposia, info days, and other networking events. These platforms foster knowledge exchange, peer debate, and open innovation, providing continuous opportunities for members to expand their connections, engage in collaborative research, and actively contribute to shaping the future of Living Labs.

Visibility and Recognition: ENoLL members benefit from exclusive opportunities to showcase their Living Labs at high-profile events and conferences, including EU working groups, thematic symposia, and other key gatherings. ENoLL actively promotes its certified members, advocating for their work and contributions within the wider Living Lab community. As part of its role as a network enabler, ENoLL ensures that members are well-represented in the projects and events the network participates in.

Funding and Projects: ENoLL actively supports its members in accessing funding opportunities and participating in European and International-funded projects. The network promotes open calls, fosters partnerships, and represents members at brokerage events, ensuring they are well-prepared to secure funding. Additionally, ENoLL itself participates in European projects alongside its members, promoting the Living Lab methodology and supporting initiatives that aim to adopt and apply this innovative approach. By facilitating collaboration and proposal-building activities, ENoLL empowers its members to maximise their involvement in impactful projects while expanding their global reach.

Policy Advocacy: ENoLL represents the Living Lab community in influential forums, shaping public policy at European and global levels. By advocating for user-driven innovation, ENoLL ensures the Living Lab approach remains at the forefront of policymaking and implementation.

Research: The ENoLL Research Unit focuses on fostering collaborative research within the Living Lab community. It aims to increase the number of Living Lab-related publications and define a comprehensive research agenda that spans various interdisciplinary topics. Through this unit, ENoLL Members and Living Lab researchers can participate in collaborative research projects, boosting their visibility and impact in both the academic and innovation fields.

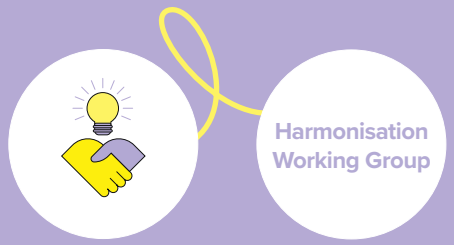
[1] *Learn more: https://academy.enoll.org/*

[2] *Find more information on OpenLivingLab Days, the global gathering of international Living Labs that brings together living labbers, public officials, corporate leaders, entrepreneurs, academics, and innovators from around the world: https://openlivinglabdays.com/*

ENoLL Working Groups

ENoLL Working Groups[3] are dynamic collaborative spaces within the ENoLL community designed to foster knowledge exchange, peer debate, and open innovation. Led by ENoLL's Effective Members, Working Groups welcome both ENoLL Members and selected external stakeholders to collaborate on tackling pressing challenges and exploring emerging opportunities in key thematic areas. With a long-term vision, they foster inclusive cross-border and cross-sectorial collaboration. Through a variety of activities such as networking events, proposal writing, workshops, and virtual or in-person staff exchanges and visits, ENoLL Working Groups offer a platform for continuous learning and experience sharing.

Besides the thematic working groups that address specific challenges, **the Harmonisation Working Group** aims to reconcile differences among Living Lab practices, helping members increase efficiency, foster collaboration, and scale their impact. By providing frameworks and guidelines, this group supports members in aligning their operations with globally recognised best practices, while respecting the unique characteristics of each individual Living Lab.



Joining the Network

ENoLL offers four types of membership—Accepted to Grow, Adherent, Effective Member, and Innovation Partner—providing opportunities for organisations of all sizes and sectors to engage with the network. Membership is open to public authorities, research institutions, private companies, civil society organisations, and other organisations that operate or support Living Labs.

By becoming a member, organisations join a global community committed to advancing user-driven innovation and achieving meaningful societal impact. Further information on membership and the full list of ENoLL members is available on the ENoLL website[4].

Through its work, ENoLL continues to strengthen the Living Lab movement, empowering members and communities worldwide to co-create innovative solutions that address pressing societal challenges and contribute to a more sustainable future.

[3] *Learn more: https://enoll.org/our-network/#working-groups*

[4] *Read more: https://enoll.org/how-to-become-and-enoll-member-or-innovation-partner/*

What are Living Labs?

Living Labs are dynamic, open innovation ecosystems where innovation unfolds in real-life, operational environments. By using a systematic co-creation approach, they integrate research and innovation activities across communities, involving citizens and end-users at the centre of the innovation process. This unique approach ensures that Living Labs not only generate groundbreaking ideas but also create solutions that are deeply rooted in real-world needs.

Living Labs are particularly well-suited for addressing "wicked problems"—complex and multifaceted challenges that are difficult to define, have no clear solution, and involve numerous stakeholders with conflicting interests. Examples of wicked problems include climate change, urbanisation, and social inequality, among others. These issues require collaborative and adaptive approaches, making the Living Lab methodology highly effective. Through their multi-stakeholder and user-centred design, Living Labs offer a structured environment for tackling such challenges in a way that integrates diverse perspectives and adapts to evolving needs.

According to the ENoLL, Living Labs are defined as:

"user-centred, open innovation ecosystems based on a systematic user co-creation approach, integrating research and innovation processes in real-life communities and settings".

ENoLL's definition emphasises the importance of placing end-users at the core of the innovation process, not just as passive recipients but as active co-creators who shape the development of products, services, and policies. This user-centred focus ensures that innovations emerging from Living Labs are practical, relevant, and truly serve the needs of communities.

Living Labs are collaborative ecosystems that bring together a diverse array of stakeholders—public authorities, private companies, academia, non-profits, and citizens—to foster a shared environment for learning, experimentation, and innovation. At their core, Living Labs follow a multi-stakeholder approach, which ensures that different perspectives and expertise collectively drive the innovation process. By involving end-users and communities in real-world settings, Living Labs can test new ideas and solutions within complex, authentic environments, resulting in innovations that are more practical, adaptable, and impactful.

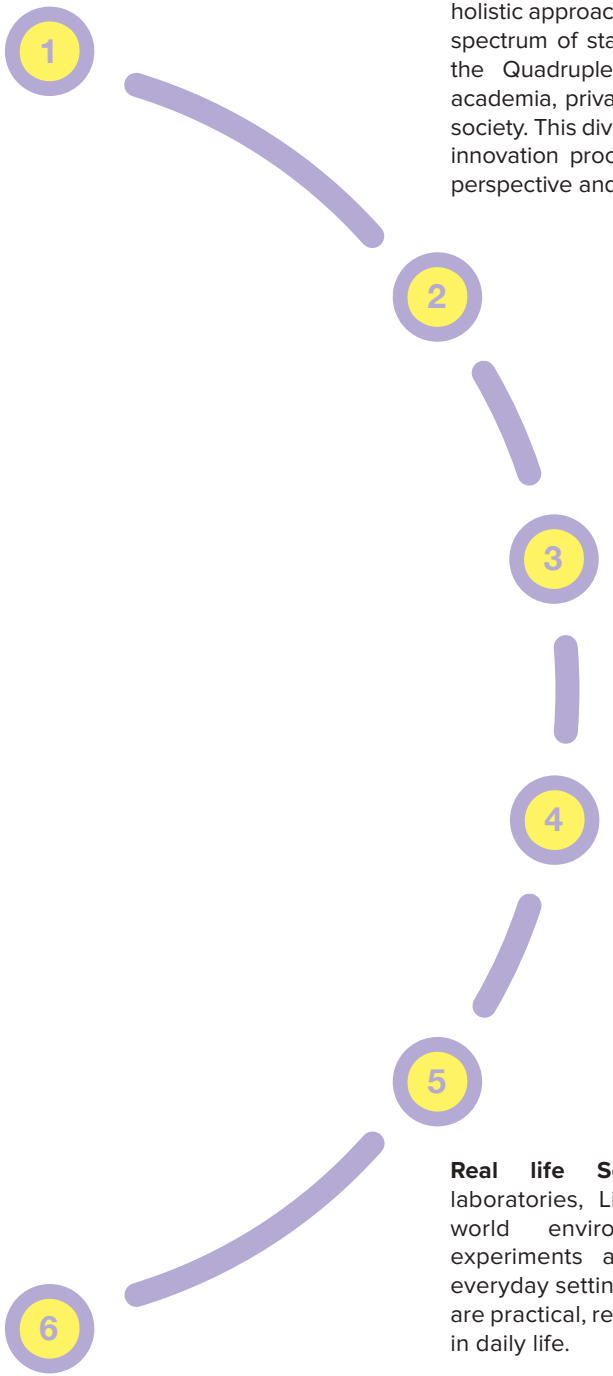
The term *Living Lab* encompasses both the organisational structure that drives innovation based on these principles and the specific projects, activities, methods, and tools that operate within this framework. A distinction can therefore be made between a *Living Lab organisation,* which is an established entity promoting innovation within a particular domain, and Living Lab projects, which focus on specific innovations or knowledge-building activities within that organisation and are time bounded. Additionally, Living Lab activities, methods, and tools refer to the various co-creation and engagement practices used within these projects to address specific challenges. Collectively, the term *Living Labs* represents the synergy of all three elements—organisation, project, and activity.

Initially, Living Labs were closely linked to the field of Information and Communication Technology (ICT) technology, particularly in large-scale applications. However, the concept has evolved and diversified significantly over time. Today, Living Labs exist in a wide variety of contexts and application domains, spanning sectors such as sustainability, healthcare, mobility, agroecology, and urban development. Despite these differences, six key characteristics define the Living Lab approach across all contexts, thematic domains, and objectives:

Active User Involvement: Living Labs emphasise the active participation of end-users and stakeholders. By involving them in multiple stages, Living Labs ensure that their feedback and insights are incorporated throughout the innovation process, from idea generation to implementation.

European Network of Living Labs

Multi-Method Approach: Each Living Lab activity is problem-driven, selecting specific methods based on the desired outcomes and stakeholders involved. As a result, Living Lab projects utilise a variety of methods and innovation activities, ranging from exploratory to confirmatory approaches, depending on the nature of the problem and the needs of the participants.



Multi-Stakeholder Participation: Adopting a holistic approach, Living Labs engage a broad spectrum of stakeholders, typically following the Quadruple Helix Model: government, academia, private sector, and citizens or civil society. This diverse involvement enriches the innovation process, allowing for a balanced perspective and collaborative synergy.

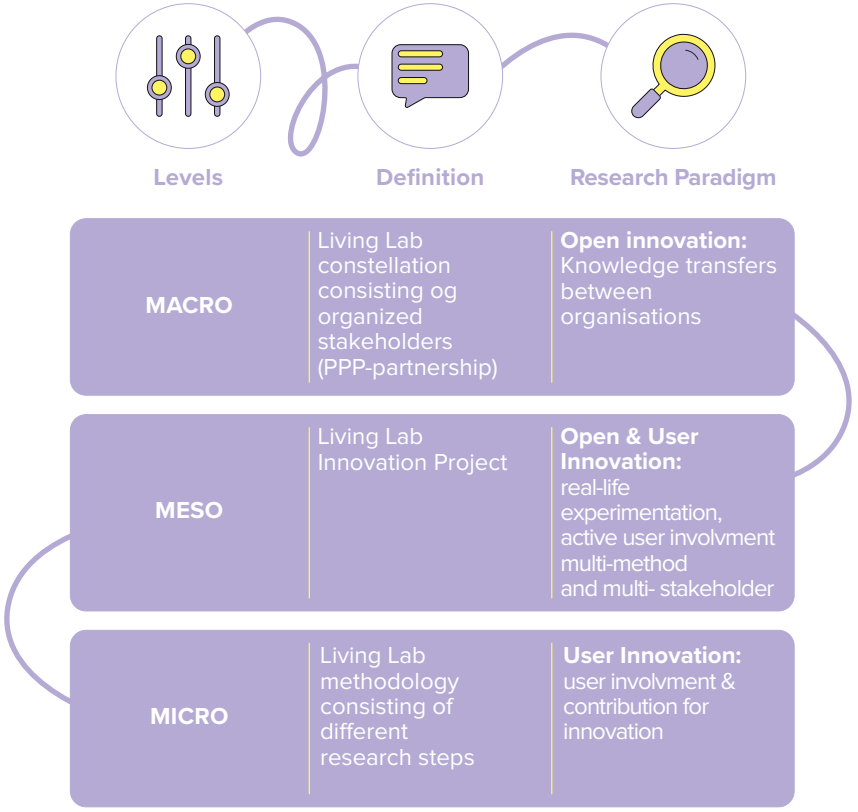
Orchestration: Within each ecosystem, Living Labs serve as orchestrators, connecting various stakeholders and managing the innovation process. They facilitate collaboration, coordinate efforts, and ensure that the innovation activities align with shared objectives.

Co-Creation: Living Labs foster co-creation by bringing together all relevant stakeholders in the design and development process. This collaborative approach can be both bottom-up, initiated by the community, and top-down, driven by overarching objectives, ensuring that the outcomes align with the community's real needs.

Real life Setting: Unlike traditional laboratories, Living Labs operate in real-world environments. By conducting experiments and gathering feedback in everyday settings, they create solutions that are practical, relevant, and readily applicable in daily life.

The Structure of Living Labs: A Three-Layered Model

While these six characteristics define the essence of Living Labs, putting them into practice requires a clear structure. To this end, a three-layered model has been developed[5], breaking down the Living Lab ecosystem into three interconnected levels: the macro, meso, and micro levels. This model helps clarify the scope and focus of Living Labs, enabling a deeper understanding of their diverse activities.



Macro Level (Living Lab Organisation):

At the macro level, we have the Living Lab organisation itself—an established, stable ecosystem designed to support long-term innovation. This organisation typically includes various actors and stakeholders, working together to foster innovation within a specific domain or geographic area. ENoLL members represent this macro level, and the term *Living Lab* is used to describe these overarching organisations. The goals, collaborations, and initiatives at this level are generally long-term and strategic.

Meso Level (Living Lab Projects):

The meso level encompasses the specific projects undertaken within the Living Lab organisation. These projects aim to develop and advance innovations or generate knowledge that supports further innovation. Living Lab projects are adaptable and problem-focused, addressing specific challenges or opportunities within their domain. Examples of these projects can be found in the websites of ENoLL members[6].

Micro Level (Living Lab Activities and Methods):

The micro level refers to individual activities, research steps, and stakeholder interactions within Living Lab projects. This includes the various methods and tools—sometimes called a "methodological toolbox"—that Living Labs employ to achieve their goals. Activities at this level might include workshops, experiments, focus groups, or other forms of user engagement. Some Living Labs have developed their own tailored methodologies, such as Forming Future IT (FormIT) by Botnia Living Lab[7], Innovatrix by imec.livinglabs[8], the Urban Living Lab methodology by the Amsterdam Institute for Advanced Metropolitan Solutions[9], the Living Lab Integrative Process developed by Energy Living Lab[10] and the Bristol Approach Framework by the Knowle West Media Centre[11], among others. Additionally, specific activities and methods crafted by a Living Lab are frequently offered as "Living Lab services," providing an opportunity to expand the Living Lab's portfolio and broaden its impact[12].

By organising these elements into macro, meso, and micro levels, the three-layered model provides a structured way to understand and implement Living Lab practices. Each level contributes uniquely to the innovation ecosystem, fostering a collaborative environment that supports practical, impactful solutions tailored to the needs of real communities.

[5] Schuurman, D. (2015). Bridging the gap between Open and User Innovation: exploring the value of Living Labs as a means to structure user contribution and manage distributed innovation. Ghent University. Faculty of Political and Social Sciences ; Vrije Universiteit Brussel. Faculty of Economic and Social Sciences, Ghent ; Brussels, Belgium. https://biblio.ugent.be/publication/5931264

[6] Find the updated list of ENoLL members: https://enoll.org/our-members/

[7] Ståhlbröst, Anna. (2008). Forming Future IT : The Living Lab Way of User Involvement. Doctoral Dissertation, Luleå: Luleå University of Technology.

[8] Schuurman, D., Herregodts, A. L., Georges, A., & Rits, O. (2019). Innovation management in Living Lab projects: the innovatrix framework. Technology innovation management review, 9(3), 63-73. https://www.academia.edu/download/108625363/TIMReview_March2019.pdf#page=63

[9] Amsterdam Insitute for Advanced Metropolitan Solutions (2017). Urban Living Labs: a Living Lab way of working.

[10] Mastelic, J. (2019). Stakeholders' engagement in the co-design of energy conservation interventions: The case of the Energy Living Lab. University of Lausanne. Doctorate Dissertation.

[11] KWMC. The Bristol Approach. https://kwmc.org.uk/projects/bristolapproach/#:~:text=Rather%20than%20'pushing'%20technology%20or,needed%20to%20tackle%20a%20problem.

[12] Read more: https://vitalise-project.eu/harmonisation-wiki/

Brief History of Living Labs: Research and Policy Context

The Living Labs movement in Europe has deep roots in the history of ICT innovation and user-centred approaches. This movement can trace its lineage back through three significant predecessors, each of which contributed unique perspectives and methodologies that have shaped modern Living Labs.

(1960s–70s)

The Scandinavian Cooperative and Participatory Design Movement (1960s–70s):

Originating in Scandinavia, this movement emphasised collaboration between researchers, designers, and end-users, particularly within workplace settings. Its focus was on participatory design, where users play an active role in the development of new technologies. This early emphasis on user involvement and cooperation laid a foundation for the participatory nature of Living Labs.

(1980s)

European Social Experiments with IT (1980s):

In the 1980s, European initiatives explored how IT could benefit society, leading to social experiments that integrated technology with community needs. These projects emphasised the societal value of IT beyond individual use, reinforcing the idea that technology should serve collective interests. This philosophy carried forward into Living Labs, which view communities as active agents in shaping innovation.

(1990s)

Digital City Projects (1990s)[13]:

The Digital City initiatives in the 1990s focused on building network infrastructure and digital platforms that provided citizens with access to increasing amounts of digital information. These projects were transformative, establishing multi-stakeholder collaborations involving citizens, public organisations, and private businesses. Despite criticisms of being overly "technology push" and deterministic, these initiatives highlighted the potential of technology to enhance urban life, a theme that continues to resonate in Living Labs today.

[13] For a more in-depth discussion, see https://backoffice.biblio.ugent.be/download/7023041/7023042

[14] Read more: https://cordis.europa.eu/article/id/3414-telecities-network-for-the-regeneration-of-urban-areas

[15] Eriksson, Mats & Niitamo, VP & Kulkki, Seija & Hribernik, Karl. (2006). Living Labs as a multi-contextual R&D methodology. The 12th International Conference Idots.

Several notable examples of these early digital city initiatives emerged in Europe, the USA, and Japan, with some founding members of ENoLL actively involved. In 1993, members of the Eurocities network collaborated to establish the first European urban telematics network, Telecities[14], now known as the Eurocities Knowledge Society Forum (KSF). These digital city projects connected diverse stakeholders on a large scale, setting the stage for multi-stakeholder involvement that is central to Living Labs.

The Birth of the Living Lab Concept[15]

The term *Living Lab* itself is attributed to Professor William ('Bill') Mitchell from the Massachusetts Institute of Technology (MIT). Professor Mitchell used the term *Living Lab* to describe a unique laboratory setting where volunteers would temporarily reside, allowing researchers to observe and record the daily routines and interactions of home life. These labs were designed as experimental environments to test and refine new technologies for home use, focusing on how well these innovations fit into everyday life, and are now known as *Home Labs.*

(2000s)

The Emergence of Living Labs in Europe

In the early 2000s, Living Labs and related user-driven innovation projects started appearing in Europe. Many cities that had initially founded the Telecities network, including Barcelona, Helsinki, and Manchester, were involved in pioneering projects. One such project was "InfoCities" (1996-1999), part of the TEN-Telecom initiative. This project was followed by "Intelligent Cities – Intelcities" (2002-2005)[16], a large-scale effort under the EU's Sixth Framework Programme (FP6).

Professor Mitchell served on the Expert Advisory Group for the Intelcities project, helping spread awareness of his work at MIT and introducing the Living Lab concept to a European audience. Upon the project's completion, the participating cities decided to establish a European network dedicated to knowledge exchange on Living Labs. This decision laid the groundwork for the formation of ENoLL, with Nokia's Veli-Pekka Niitamo emerging as one of the driving forces behind the Living Lab movement.

Official Launch of the European Network of Living Labs (ENoLL)

ENoLL was formally launched on November 20, 2006, during the Finnish Presidency of the EU. This launch represented a critical step towards creating a new European Innovation Ecosystem based on co-creation in public, private, and civic partnerships. The Living Labs approach was seen as an urgent measure to promote innovation for job creation and economic growth, aligning with the goals of the Lisbon Strategy[17].

At this time, open, user-oriented innovation principles became central to the EU's competitiveness and innovation policy. Experts from the Directorate-General for Information Society and Media, including Bror Salmelin and Olavi Luotonen, played instrumental roles in fostering the Living Labs policy. They collaborated closely with companies, cities, and regions, laying the groundwork for Living Labs to thrive within a supportive policy framework.

(2006)

A New European Interpretation of Living Labs

The European interpretation of Living Labs diverged from the USA-originated *Home Labs* pioneered by Professor Mitchell. In Europe, Living Labs evolved into a model where users were studied and involved within their real-world environments rather than in controlled, lab-based settings. This shift emphasised that innovation should be tested and shaped within the contexts where it would ultimately be used, a principle that continues to guide Living Labs today.

[16] Allwinkle, Sam & Campbell, Fiona & Deakin, Mark & Jesurethnam, Jose. (2007). The IntelCities e-Learning Platform, Knowledge Management System and Digital Library for Semantically-Rich e-Governance Services. The International Journal of Technology, Knowledge, and Society: Annual Review. 2. 31-38. 10.18848/1832-3669/CGP/v02i08/55697.

[17] Read more: https://www.europarl.europa.eu/meetdocs/2009_2014/documents/empl/dv/lisbonstrategybn_/lisbonstrategybn_en.pdf

Expansion and Policy Support

In 2006, the Living Labs movement gained further momentum with a set of EU policy measures. Two notable projects, “Corelabs” and “Clocks”[18], received funding to promote a common European innovation system for ICTs based on Living Labs. These projects also helped establish and support the newly formed ENoLL, which initially consisted of 19 Living Labs across the EU, many of which had previously participated in the Intelcities project.

From this point onward, ENoLL continued to grow, expanding its network annually as Living Labs became increasingly prominent in European research and policy discussions. The movement’s growth was accompanied by a surge in academic and practical research, which began exploring the Living Lab methodology as an emerging innovation model. By this time, Living Labs had become a familiar concept in European policy circles.

[18] Ballon, P., & Schuurman, D. (2015). Living Labs: concepts, tools and cases. info, 17(4).

[19] Read more: https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en

[20] Read more: https://environment.ec.europa.eu/strategy/zero-pollution-action-plan_en

[21] Read more: https://enoll.org/working-group/jwg-digital-sustainability-for-zero-pollution/

Living Labs in Horizon Europe and Beyond

In 2021, the Horizon Europe research initiative, the successor to Horizon 2020, introduced 22 topics explicitly referencing the involvement of Living Labs[19]. This inclusion underscored the recognition of Living Labs as a valuable tool in addressing Europe’s most pressing challenges.

The European Commission further solidified the role of Living Labs through its five EU Missions, launched to tackle critical global challenges. These include “A Soil Deal for Europe”, Climate-Neutral and Smart Cities, Adaptation to Climate Change, Beating Cancer, and Healthy Oceans, Seas, Coastal and Inland Waters.

In 2022, during the launch of Flagship 7 of the European Commission’s Zero Pollution Action Plan, the Commission acknowledged the role of Living Labs in reducing pollution in areas such as mobility, energy, waste management, and human health[20]. Living Labs were further highlighted as essential mechanisms in developing green digital solutions and supporting the digital and green transition. This initiative led to the formation of a Joint Working Group on the Green Deal and the Zero Pollution Action Plan[21], further solidifying Living Labs’ importance in EU policy. Based on the request in the Communication from The Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions ‘Pathway to a Healthy Planet for All’, especially in the statement in the Flagship 7, ENoLL in collaboration with the European Commission, developed recommendations for using Living Labs to promote climate- and environment-friendly digital solutions[22]. These recommendations emphasised the role of citizen engagement and were adopted by the Stakeholder Platform Zero Pollution.

The New European Innovation Agenda, launched in 2022 by the European Commission, aimed at positioning Europe as a leader in deep tech innovation and start-ups. This agenda identified Living Labs as a flagship initiative to help Europe address critical societal challenges and bring innovations to market through public procurement[23]. Additionally, Living Labs were also highlighted in key initiatives, including the European Research & Innovation (R&I) partnership for agroecology Living Labs[24], the Horizon Europe cancer mission, and the ambition for 100 climate-neutral and smart cities by 2030.

In 2024, the “A Soil Deal for Europe” Mission was launched with the goal of establishing 100 Living Labs and lighthouses to advance soil-health by 2030. This ambitious mission illustrates the EU’s commitment to using Living Labs as essential instruments to achieve its policy goals, focusing on sustainable solutions through participatory and collaborative approaches[25].

This historical journey highlights how Living Labs have become a cornerstone of European innovation policy, evolving from their academic and experimental roots into powerful tools for tackling real-world challenges. By placing people, collaboration, and community needs at the centre of innovation, Living Labs continue to play an indispensable role in shaping a more inclusive and sustainable Europe.

[22] Read more: https://zenodo.org/records/14050384

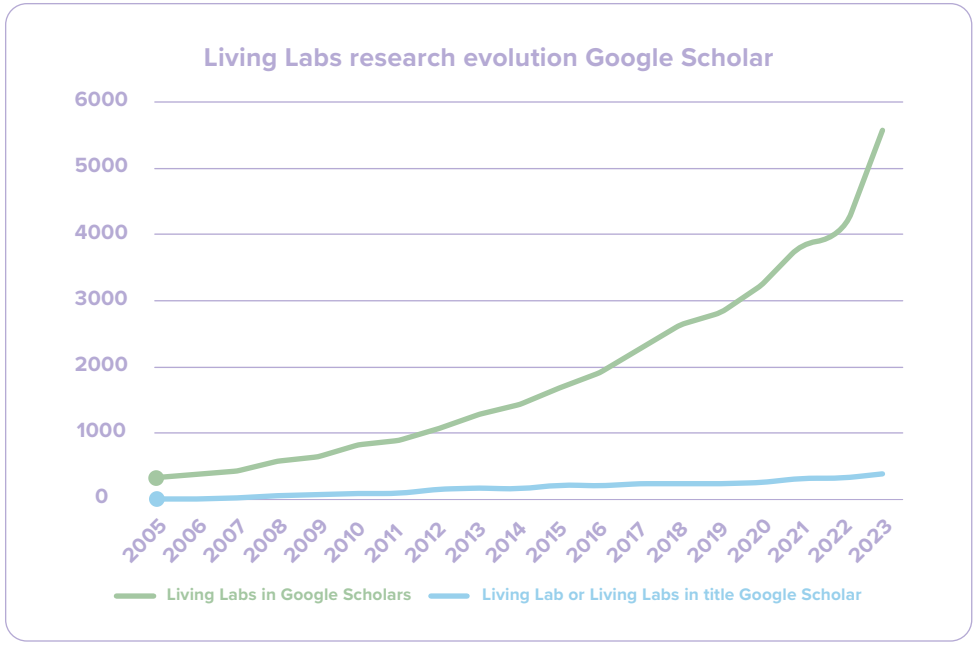
[23] Read more: https://research-and-innovation.ec.europa.eu/strategy/support-policy-making/shaping-eu-research-and-innovation-policy/new-european-innovation-agenda_en

[24] Read more: https://research-and-innovation.ec.europa.eu/research-area/agriculture-forestry-and-rural-areas/ecological-approaches-and-organic-farming/partnership-agroecology_en

[25] Read more: https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/soil-deal-europe_en

Research on Living Labs

In recent years, Living Labs have emerged as an increasingly significant topic within academic research. This growing recognition is evident in the rising number of publications that reference the term. An analysis of papers indexed in Google Scholar performed in June 2024 containing “Living Lab” or “Living Labs” highlights a steady increase in mentions over time, with a notable surge beginning in 2022. This upward trend reflects the expanding interest in Living Labs as a transformative approach to innovation and co-creation. The establishment of ENoLL in 2006 marked a pivotal moment, coinciding with the early development of Living Lab research and contributing to its steady growth.



Analysis performed in June 2024.

When focusing specifically on papers that include “Living Lab” or “Living Labs” in their titles—indicating that the concept is central to the study—the increase is more gradual. While the total number of such publications remains smaller compared to those that mention Living Labs peripherally, this gradual rise points to a growing academic focus on the core principles and methodologies of Living Labs. In 2023, for example, 385 papers centred on Living Labs as their main topic, while 4,925 publications referenced the concept more broadly.

This dual trend reflects the richness and complexity of Living Labs as both a concept and a practice. On the one hand, the breadth of references underscores the wide-ranging relevance of Living Labs across disciplines. On the other hand, it also highlights the need for continued efforts to deepen academic research, ensuring the concept is well understood and accurately applied. While Living Labs have historically been a practitioner-driven phenomenon, the evolving body of research situates them firmly within key frameworks such as Open Innovation, User Innovation, and Responsible Innovation[26].

Under the Horizon 2020 Programme, over 750 projects incorporated Living Labs, and this trend continues under Horizon Europe, with nearly 150 projects already referencing them. This growth is further supported by the explicit and consistent mention of Living Labs in Horizon Europe Work Programmes. In 2023-2024 alone, Living Labs have been cited in more than 20 topics across five different Work Programmes. ENoLL is actively contributing to this expansion, with a portfolio of over 60 projects, 25 of which are currently ongoing. Of these, ENoLL coordinates three projects and collaborates as a partner in 22 others, working closely with 52 of its members[27]. Together, these figures demonstrate the growing adoption and impact of Living Labs, particularly in addressing complex societal challenges.

Living Labs and Innovation Frameworks

Living Labs serve as dynamic platforms for applying key innovation frameworks, offering practical environments to test and refine new ideas in real-life settings. They stand at the intersection of theory and practice, enabling co-creation and collaboration among diverse stakeholders.

1. **Open Innovation:** At their core, Living Labs embody the principles of Open Innovation by fostering knowledge exchange, enabling multi-stakeholder collaboration, and promoting mutual value creation. This structured approach ensures that innovation processes are both effective and inclusive, leveraging diverse perspectives for optimal results.
2. **User Innovation:** Living Labs place users at the heart of innovation, providing structured spaces where their creative capacities can flourish and be put to productive use. By engaging with different user groups—citizens, businesses, researchers, and public sector actors—Living Labs co-create solutions that are grounded in real-world needs and insights.
3. **Responsible Innovation:** Living Labs also prioritise inclusivity, ethics, and societal impact within innovation processes, aligning closely with the principles of responsible innovation. They ensure that new solutions are not only groundbreaking but also meaningful and beneficial to society. Responsible Innovation ties in with **Transition Theory,** which emphasises that fundamental societal change often begins on a small scale, through practice-based experiments in local contexts[28]. Living Labs are ideal spaces for such experimentation, allowing both technological and social innovations to be tested with significant user and citizen involvement.

By bringing together diverse actors in real-life settings, Living Labs facilitate the development of new solutions while generating the insights needed to scale these innovations to other districts, cities, and regions. Through these collaborative, real-world experiments, Living Labs drive meaningful change and contribute to broader societal transformations.

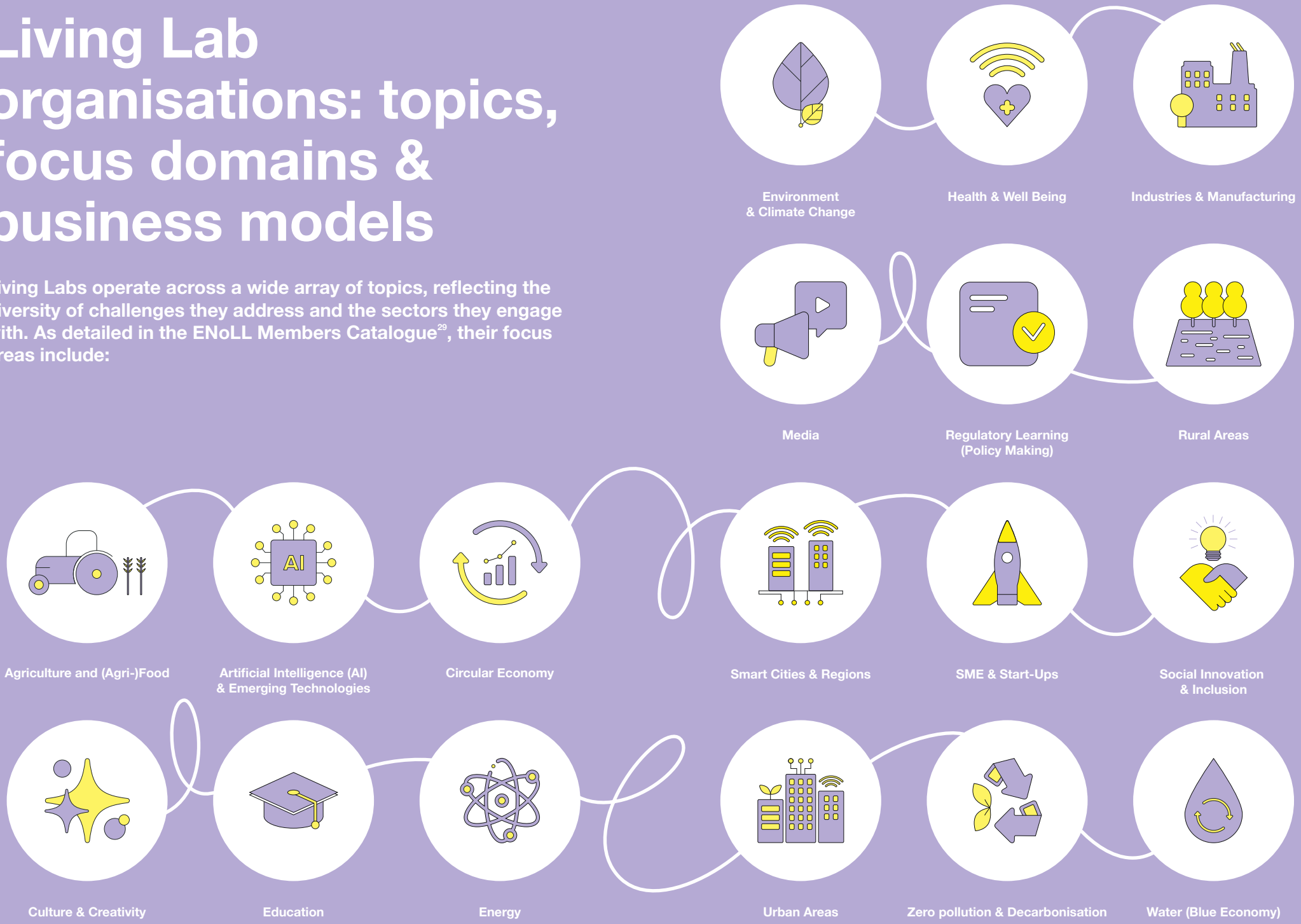
[26] *Read more: https://www.tandfonline.com/doi/full/10.1080/23299460.2024.2309060#d1e262*

[27] *Read more: https://enoll.org/projects/*

[28] *Fisher, E., Smolka, M., Owen, R., Pansera, M., Guston, D. H., Grunwald, A., ... & Ribeiro, B. (2024). Responsible innovation scholarship: normative, empirical, theoretical, and engaged. Journal of Responsible Innovation, 11(1), 2309060.*

Living Lab organisations: topics, focus domains & business models

Living Labs operate across a wide array of topics, reflecting the diversity of challenges they address and the sectors they engage with. As detailed in the ENoLL Members Catalogue[29], their focus areas include:



These categories are not mutually exclusive; many Living Labs work across multiple fields and integrate different types of innovation to achieve their goals.

To better classify Living Labs based on their objectives and ambitions, the following five categories have been identified:

- Living Labs for Grand Societal Challenges
- Living Labs for Policies, Governance, Collaboration, and Innovation Ecosystems
- Living Labs for Inclusive Soci(et)al Engagement
- Living Labs for Business and Emerging Technologies
- Campus / University Living Labs

This framework highlights the versatility and impact of Living Labs, demonstrating their capacity to tackle complex challenges, drive innovation, and create value across various sectors and communities. Each category provides a unique lens for understanding and advancing Living Lab practices, bridging the gap between academic research and real-world application.

[29] ENoLL (2024). ENoLL Member Catalogue 2024. Zenodo. https://doi.org/10.5281/zenodo.14180612

Living Labs for Grand Societal Challenges

Living Labs for Grand Societal Challenges focus on addressing complex societal challenges and advancing sustainable and inclusive development. These Living Labs are closely linked to most of the United Nations Sustainable Development Goals (SDGs) and are specifically established to tackle wicked problems—multifaceted issues such as climate change, pollution, (green) energy, health and well-being, soil health, and more. By fostering collaboration among diverse stakeholders, they aim to create innovative, long-term solutions to these pressing global challenges.

These Living Labs are predominantly enabler-driven or research-driven. In enabler-driven Living Labs, a funding body, often a public institution or policy-driven entity, takes the lead in setting the strategic direction, aligning it with relevant policy goals. In research-driven Living Labs, the focus is on research valorisation and dissemination, with universities, and research and development (R&D) organisations playing a key role in shaping their strategic objectives.

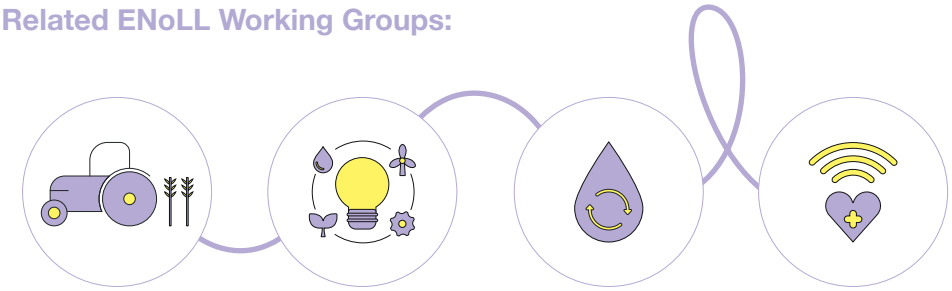
One example within this category is **Healthcare and Well-being Living Labs,** which tackle issues such as the aging population, eHealth applications, assistive technologies, and patient-centred care. These Living Labs facilitate collaboration between hospitals, healthcare providers, universities, R&D organisations, companies, and representatives of patient groups to co-create innovative solutions for improving quality of life and healthcare systems.

Another example in this category is **Energy and Environmental Living Labs** address critical topics like energy efficiency, renewable energy, climate change, and sustainability. These labs often involve partnerships between utility companies, environmental organisations, governments, universities, and tech companies. Their focus spans from renewable energy and smart grids to circular economy initiatives and biodiversity conservation. A notable subcategory of this type is circular economy Living Labs, which are dedicated to testing, promoting, and implementing circular economy principles. Key topics include waste management, product life extension, material innovation, and new circular business models.

Within the environmental sphere, significant attention is being directed toward water and soil. Policy initiatives such as Water Europe's atlas of Water-Oriented Living Labs (WOLLs)[30] highlight over 100 Living Labs addressing water quality, resilience to floods and droughts, and other water-related challenges. Similarly, the **EU Mission: A Soil Deal for Europe** aims to establish 100 Living Labs and lighthouses to lead the transition towards healthy soils by 2030[31]. These Living Labs work on topics such as soil quality, sustainable land management, and resilience against environmental degradation. ENoLL plays an active role in these policy initiatives and the associated projects, further promoting innovation in these critical domains.

Another rapidly expanding category is **Rural and Agricultural/Agrifood Living Labs,** which focus on sustainability and agriculture-related challenges in rural settings. These Living Labs emphasise responsible innovation and have seen a significant increase in activities and certified Living Labs in recent years. They are further supported by specific policy actions, international networks, and summits.

Related ENoLL Working Groups:



Agriculture, Agri-food, and Rural

Energy & Environment

Water & Oceans

Health & Well being

Link to SDGs:

SUSTAINABLE DEVELOPMENT GOALS

SDG 2 (No Hunger)
SDG 3 (Good Health and Well-Being)
SDG 6 (Clean Water and Sanitation)
SDG 7 (Affordable and Clean Energy)
SDG 11 (Sustainable Cities and Communities)
SDG 12 (Responsible Consumption and Production)
SDG 13 (Climate Action)
SDG 14 (Life Below Water)
SDG 15 (Life on Land)
SDG 17 (Partnerships for the Goals)

[30] *Water Europe (2019). Atlas of the EU Water Oriented Living Labs. https://watereurope.eu/wp-content/uploads/2019/07/Atlas-of-the-EU-Water-Oriented-Living-Labs.pdf*

[31] *Read more: https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/soil-deal-europe_en*

Living Labs for Policies, Governance, Collaboration, and Innovation Ecosystems

Living Labs for Policies, Governance, Collaboration, and Innovation Ecosystems are closely connected to the specific places or areas in which they operate. These Living Labs are typically enabler-driven, with public actors such as cities, regions, or national governments taking the lead in setting the strategic direction. Their work often aligns with the unique socio-economic and political contexts of their locations, fostering innovation and collaboration at the local, regional, or national level.

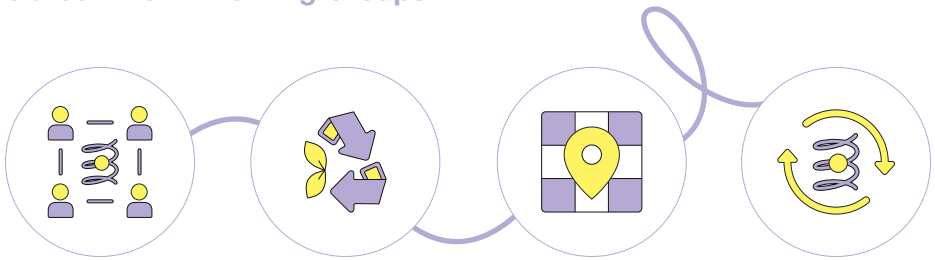
The most common type within this category is the **Urban Living Lab,** although there is a growing number of Living Labs that focus on broader regions or specific innovation ecosystems. While the concept of *Smart Cities* continues to play an important role, Urban Living Labs have emerged as a complementary and, in many cases, more inclusive approach. Smart Cities have historically been associated with technology-driven, top-down strategies, whereas Urban Living Labs adopt a more bottom-up approach that places citizens and civil society at the centre of their activities. These labs address a wide range of topics that respond to the specific needs and challenges of their urban or regional context, allowing for greater flexibility and adaptability. In some cases, Smart City initiatives provide a strong foundation for the establishment of Urban Living Labs, as the two approaches often overlap and reinforce one another. While Living Labs for Grand Societal Challenges are typically focused on addressing specific global issues, Urban Living Labs are designed to respond to the immediate, localised challenges of the areas they serve. In practice, the distinction between these types of Living Labs can sometimes become blurred.

It is worth noting that the term **Urban Living Lab** is sometimes used to describe project-based, real-life urban interventions. While these interventions often generate positive results and share many of the defining characteristics of Living Labs, they may lack the organisational framework that ensures the sustainability and scalability of their outcomes (macro level). However, these projects frequently serve as stepping stones, leading to the establishment of fully-fledged Urban Living Lab organisations.

The topics addressed by Urban Living Labs, as well as broader regional or national initiatives, often include urban planning, public services, and the development of innovation ecosystems. These initiatives provide a platform for experimenting with and implementing innovative solutions in real-life settings, tailored to the needs of the communities they serve.

In addition to Urban Living Labs, this category also encompasses **Policy Living Labs** and related initiatives such as **Regulatory Sandboxes.** The importance of this type of Living Lab has grown significantly in recent years, leading ENoLL to establish a dedicated working group on Living Labs as Regulatory Learning Tools. These initiatives focus on testing and refining policy measures, governance models, and regulatory frameworks to foster innovation and collaboration.

Related ENoLL Working Groups:



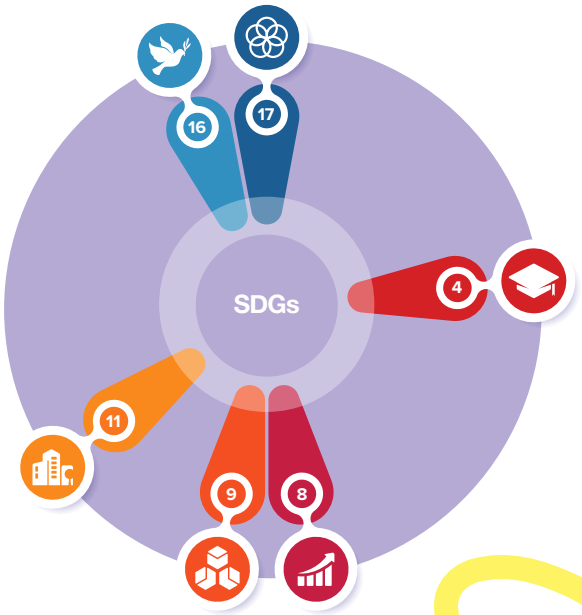
Joint Working Group Living Labs as regulatory learning tools

Joint Working Group Digital Sustainability for Zero Pollution

Mobility

Transition Super Living Labs

Link to SDGs:



SUSTAINABLE DEVELOPMENT GOALS

SDG 4 (Quality Education)
SDG 8 (Decent Work and Economic Growth)
SDG 9 (Industry, Innovation, and Infrastructure)
SDG 11 (Sustainable Cities and Communities)
SDG 16 (Peace, Justice, and Strong Institutions)
SDG 17 (Partnerships for the Goals)

Living Labs for Inclusive Soci(et)al Engagement

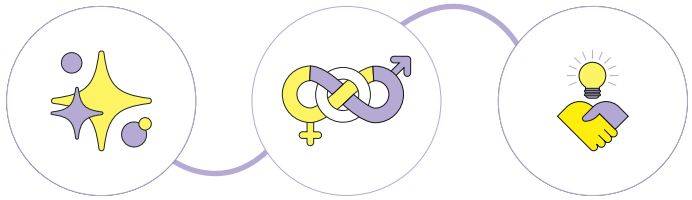
Living Labs for Inclusive Social Innovation focus on addressing social challenges by developing solutions that foster social inclusion, community resilience, and equitable economic development. These Living Labs often centre on the principles of collaboration, co-creation, and empowerment, involving a diverse array of stakeholders in their initiatives. While these labs are typically enabler-driven, with NGOs, community groups, or public sector organisations taking a leading role in their strategic direction, they can also be user-driven or utiliser-driven, depending on the context and goals.

The stakeholder ecosystem for this type of Living Lab frequently includes NGOs, community groups, public sector organisations, social science researchers, (vulnerable) citizens, artists, and creative practitioners. The inclusion of art and artists play a critical role in fostering creativity, inspiring innovative solutions, and encouraging new ways of thinking. By blending artistic expression with participatory processes, these Living Labs create inclusive spaces that empower communities and engage diverse audiences. Art also serves as a powerful medium for storytelling, advocacy, and raising awareness of social issues, amplifying the impact of these initiatives.

The key areas of operation for these Living Labs include social inclusion, participatory governance, culture, and cultural heritage. These initiatives aim to build stronger, more resilient communities and address systemic inequalities through innovative approaches. Within this category, creativity and design Living Labs also play an important role. These Living Labs harness the power of creative industries, design thinking, and artistic expression to develop innovative solutions for social issues, contributing to both cultural enrichment and social innovation.

The outcomes of Living Labs for Inclusive Social Innovation typically manifest as social innovations in the form of new policies, participatory governance models, or social entrepreneurship initiatives. These solutions often have a transformative impact, creating pathways for systemic change and fostering long-term social and economic benefits for communities.

Related ENoLL Working Groups:

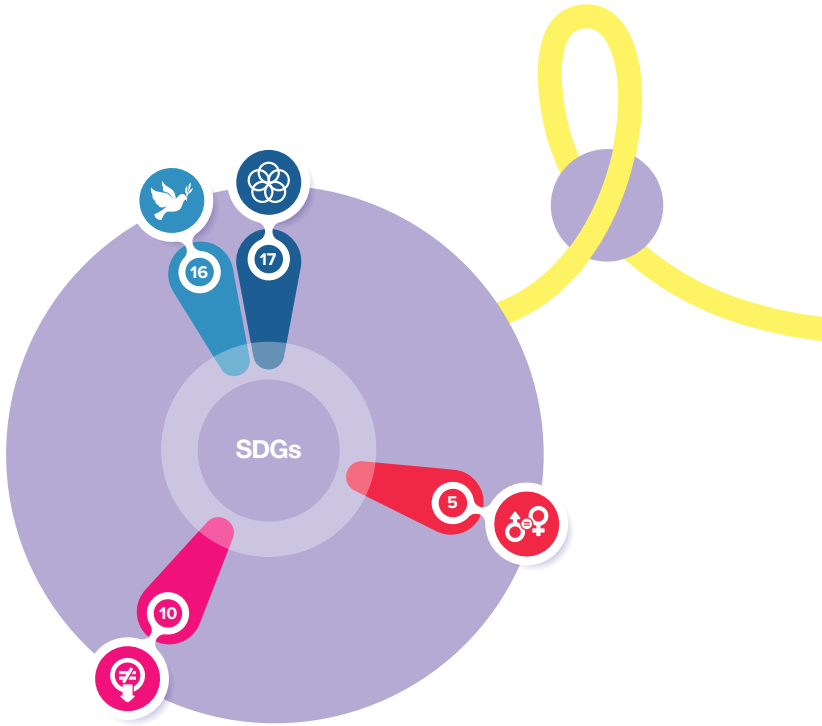


Culture & Creativity

Gender in Innovation

Social Innovation & Digital Rights

Link to SDGs:



SUSTAINABLE DEVELOPMENT GOALS

SDG 5 (Gender Equality)
SDG 10 (Reduced Inequalities)
SDG 16 (Peace, Justice, and Strong Institutions)
SDG 17 (Partnerships for the Goals)

Living Labs for Business and Emerging Technology

While some Living Labs still focus on the development and testing of digital technologies, platforms, and services, the majority now concentrate on emerging technologies such as AI, Augmented Reality (Meta/Cityverse), Quantum Computing, and EdTech, among others. These Living Labs are often provider-driven or utiliser-driven, with strategic goals defined by infrastructure providers or companies that utilise the services of the Living Lab.

Collaboration is central to this type of Living Lab, typically involving tech companies, universities, start-ups, and end-users (citizens or B2B users). By adopting co-creation and user-centred approaches, these Living Labs support the testing, refinement, and scaling of cutting-edge technologies, ensuring their practical applicability in real-world contexts.

In addition to technology-focused activities, business-oriented Living Labs often address innovation and the development of new business models within specific sectors, such as mobility, automotive, and logistics. This category also encompasses **Living Labs as a Service, Living Labs as Research Infrastructures,** and initiatives connected to incubators and tech transfer activities, which serve as platforms for fostering innovation and collaboration.

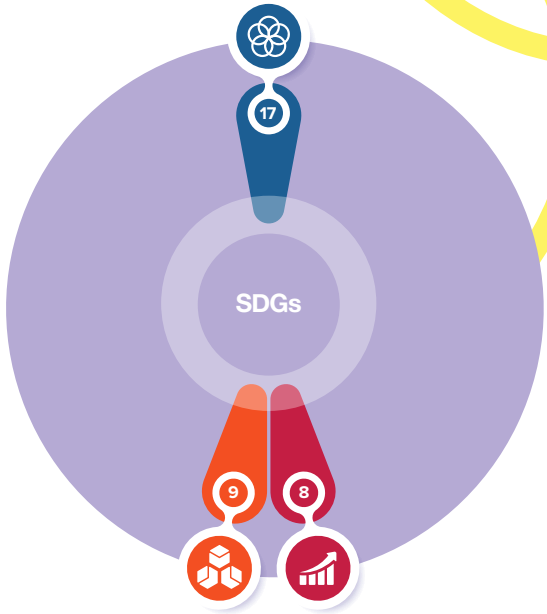
A particularly noteworthy example in this category is the emergence of **Testing and Experimentation Facilities (TEFs)**[32]. Promoted by the European Commission, TEFs represent a hybrid model combining AI test beds, regulatory sandboxes, and Living Labs.

These facilities aim to accelerate European AI innovation by creating safe and supportive environments for testing and experimentation.

Related ENoLL Working Groups:

Digital Urban Systems & Solutions for Transitions Urban Innovation

Link to SDGs:



SUSTAINABLE DEVELOPMENT GOALS

SDG 8 (Good Jobs and Economic Growth)
SDG 9 (Industry, Innovation, and Infrastructure)
SDG 17 (Partnerships for the Goals)

[32] *Read more: https://digital-strategy.ec.europa.eu/en/faqs/testing-and-experimentation-facilities-tefs-questions-and-answers*

Campus / University Living Labs

The categories of Living Labs discussed previously are not mutually exclusive, as overlaps and crossovers between them are common. However, a specific type of Living Lab warrants individual attention due to the growing interest and activity in the area: **University Living Labs** and **Campus as a Living Lab.** Despite their increasing prominence, these concepts often fall under the same terminology, even though their approaches and objectives can vary significantly.

Universities are traditionally hubs of knowledge creation and innovation. However, they often struggle with translating this knowledge into societal impact, a challenge sometimes referred to metaphorically as the “ivory tower” phenomenon. In response, many universities are adopting the Living Lab concept as a way to bridge this gap, fostering stronger connections with their local communities and addressing societal challenges more directly.

University Living Labs come in diverse forms. Some focus on student-oriented projects designed to apply theoretical knowledge to practical contexts, although these might not fully embody the characteristics of a true Living Lab. Others take a more ambitious approach, involving universities in multi-stakeholder collaborations that address pressing societal challenges. The rise of University Living Labs highlights the need for greater clarity and understanding of the Living Lab concept and its operational framework to fully realise their potential.

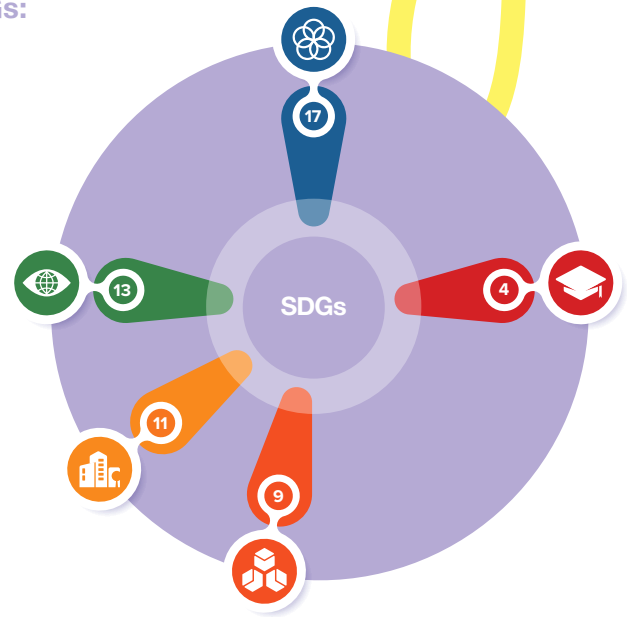
Alongside these initiatives, the concept of **Campus as a Living Lab** is also gaining traction. University campuses, often resembling small cities or villages but on a more manageable scale, provide unique opportunities for real-life testing and experimentation. These campus-based initiatives use the physical site as an asset for conducting on-site tests and experiments. However, they differ from broader University Living Labs in their place-based focus, with testing typically limited to the campus itself. A key challenge lies in assessing how well findings from these controlled environments translate to broader, real-world contexts.

Despite these differences, both University Living Labs and Campus as a Living Lab represent exciting developments with significant potential. They underscore the need for further research, support, and exchange of best practices to drive this evolution and ensure universities can maximise their societal contributions through Living Labs.

Related ENoLL Working Groups:

Education & Learning

Link to SDGs:



SUSTAINABLE DEVELOPMENT GOALS

SDG 4 (Quality Education)
SDG 9 (Industry, Innovation, and Infrastructure)
SDG 11 (Sustainable Cities and Communities)
SDG 13 (Climate Action)
SDG 17 (Partnerships for the Goals)

Living Lab Governance Model

The governance model of a Living Lab is a critical component that influences its strategic direction, operations, and long-term sustainability. The governance structure must ensure coordination and collaboration among diverse stakeholders, including local governments, academic institutions, private entities, and citizens (macro level). Effective governance promotes inclusivity, adaptability, and shared decision-making, all of which are essential for the success of Living Labs across various domains.

A key feature of Living Lab governance is the early and continuous involvement of all stakeholders in the decision-making process as well as in the operational activities. This ensures that the diverse perspectives and needs of different participants are integrated into the project design and implementation. To facilitate this, a comprehensive governance framework should be established, which clearly defines the roles and responsibilities of each stakeholder, provides mechanisms for coordination, and supports transparent communication.

Legal and Organisational Structure

The legal structure of a Living Lab can vary, with some operating as independent entities such as non-profit organisations, foundations, or trusts, while others function under the umbrella of a host organisation, such as a municipality, university, or government department. When a Living Lab operates as an independent entity, it has greater control over its finances, including the ability to manage grants, service revenues, and other funding sources. On the other hand, when operating under a host organisation, the host entity typically assumes responsibility for the management of resources, financial operations, and infrastructure.

In either case, it is crucial that the governance model aligns the objectives and activities of the Living Lab with those of the host or collaborating organisations. The model should also ensure the flexibility to adapt to changing circumstances while maintaining transparency and accountability.

[33] *Voorwinden, A., Van Bueren, E., & Verhoef, L. (2023). Experimenting with collaboration in the Smart City: Legal and governance structures of Urban Living Labs. Government Information Quarterly, 40(4), 101875. https://doi.org/10.1016/j.giq.2023.101875*

Types of Governance Models

Living Labs can adopt different governance models depending on the size, scope, and stakeholders involved. Below are three primary governance structures that can be implemented:

1. **Centralised Governance** In a centralised governance model, decision-making authority is concentrated in a single entity, such as a leading government agency or academic institution. This structure allows for a clear strategic direction and streamlined resource management, but it may limit the diversity of input from other stakeholders. Centralised governance may struggle with flexibility, and decision-making can be slow if the central entity has competing priorities or agendas[34].
2. **Decentralised Governance** In a decentralised model, decision-making is distributed among multiple stakeholders, including public institutions, private companies, citizens, and research organisations. This approach fosters innovation by leveraging the expertise and perspectives of a diverse group of actors. However, it can lead to longer decision-making processes, particularly when consensus is required. The complexity of managing collaboration among many diverse stakeholders may also pose a challenge.
3. **Collaborative Governance** A collaborative governance model seeks to combine the strengths of both centralised and decentralised approaches. Here, a central entity or core group sets the strategic direction and overall framework for the Living Lab, while actively seeking input and participation from a broader group of stakeholders. This model fosters inclusivity and encourages diverse perspectives, which can lead to more creative and adaptable solutions. However, it requires strong facilitation and conflict resolution skills to ensure that all stakeholders are engaged and that no single group dominates the decision-making process[35].

Challenges in Governance

The complexity of Living Labs often leads to specific governance challenges. These include:

- **Alignment of Goals:** Different stakeholders may have varying priorities, which can lead to misalignment between the Living Lab's objectives and those of participating entities. A shared vision and clear communication are essential to mitigate these challenges.
- **Funding and Resources:** Securing adequate funding can be difficult, especially when stakeholders have differing priorities. A governance structure that supports effective resource management and identifies diverse funding sources is crucial.
- **Bureaucracy and Regulations:** Navigating regulatory and bureaucratic processes, particularly when working with public sector entities, can delay innovation. A flexible and adaptive governance structure is needed to overcome these hurdles.
- **Stakeholder Engagement:** Ensuring active and meaningful participation from all relevant stakeholders, including citizens, businesses, and government agencies, requires effective communication and coordination.
- **Data Sharing and Privacy:** Managing data sharing between stakeholders while maintaining privacy and security can be a significant challenge. Clear policies and agreements on data governance are necessary to address this issue.
- **Sustainability:** Ensuring the long-term sustainability of a Living Lab, both in terms of funding and its ability to remain relevant to evolving urban challenges, requires careful planning and continual adaptation.

Relational Governance

Relational governance is a crucial aspect of Living Labs, emphasising continuous coordination and cooperation among stakeholders. It recognises that Living Labs are dynamic environments where goals and priorities may shift over time, and thus, governance should be flexible enough to accommodate these changes[36]. Relational governance focuses on collaborative problem-solving, joint activities, and mutual learning. The success of a Living Lab depends on the ongoing interaction and engagement of all participants, which helps to ensure that the project evolves in line with both the immediate needs and long-term goals of the stakeholders involved.

In summary, the governance model of a Living Lab plays a vital role in its ability to foster innovation, ensure stakeholder engagement, and achieve successful outcomes. Whether centralised, decentralised, or collaborative, the governance structure should facilitate continuous coordination, inclusive decision-making, and the flexibility to adapt to new challenges and opportunities. The success of a Living Lab relies on effective governance practices that support transparency, participation, and collaboration among all stakeholders[37].

[34] Hadfield, P., Sharp, D., Zarea, M., Pigeon, J., Peng, X., Rye, S., & Raven, R. (2023). Governing University Living Labs for Sustainable Development: Lessons from International Case Studies (p. 31589985 Bytes). [object Object]. https://doi.org/10.26180/22138073

[35] Lucchesi, G. P., & Rutkowski, E. W. (2019). Living Labs: Science, Society and Co-creation. In W. Leal Filho, A. M. Azul, L. Brandli, P. G. Özuyar, & T. Wall (Eds.), Industry, Innovation, and Infrastructure (pp. 1–10). Springer International Publishing. https://doi.org/10.1007/978-3-319-71059-4_74-1

[36] Colombelli, A., Paolucci, E., & Ughetto, E. (2019). Hierarchical and relational governance and the life cycle of entrepreneurial ecosystems. Small Business Economics, 52(2), 505–521. https://doi.org/10.1007/s11187-017-9957-4

[37] Nyström, A.-G., Leminen, S., Westerlund, M., & Kortelainen, M. (2014). Actor roles and role patterns influencing innovation in Living Labs. Industrial Marketing Management, 43(3), 483–495. https://doi.org/10.1016/j.indmarman.2013.12.016

Living Lab Business Models

Living Labs operate under a variety of business models[38], reflecting their diverse goals and the wide range of stakeholders involved in their activities. One of the main challenges identified in the literature is the long-term sustainability of Living Lab organisations. Research has shown that many Living Lab initiatives evolve, change form, or cease to exist over time. This is largely due to their inherent dependence on the dynamic environments and ecosystems in which they operate. Rapid changes in these environments often impact the goals, activities, and outlook of Living Labs. As a result, it is natural for Living Labs to adapt and transform over time.

The type of business model a Living Lab adopts is influenced by several factors, including its focus areas, objectives, the nature of its stakeholders and their level of involvement, the legal and regulatory context, and the scalability of its operations and solutions. Below are some of the main business models used by Living Labs:

Relational Governance

- **Public Funding Model:** Many Living Labs rely on government grants or public funding, such as EU funding programmes, particularly in their early stages. These Living Labs typically address public interests, such as urban development, social innovation, or sustainability. Starting from this model, often referred to as "Living-Lab as a Project", many Living Labs transition to other models as they mature and become more independent in their strategic ambitions. This type of Living Lab is often described as enabler-driven.

- **Partnership Model:** In this model, Living Labs operate as partnerships or consortia, pooling resources from multiple stakeholders such as businesses, universities, public authorities, and non-profit organisations. Costs and benefits are shared, often blending private investment with public funding or academic grants. This model is particularly common in thematic domains such as healthcare and wellbeing, where collaboration among diverse actors is essential to boosting regional innovation capacity.

- **Corporate Sponsorship Model:** Some Living Labs are funded primarily by one or more corporations or sector organisations interested in developing and testing new technologies or services. These Living Labs often focus on novel technical infrastructures and are typically referred to as provider-driven Living Labs.

- **Membership Model:** Some Living Labs or networks of Living Labs operate on a membership or subscription basis, where organisations or individuals pay fees to access resources, facilities, or data. This model is especially prevalent in domains such as healthcare, where access to specialised knowledge, tools, or matchmaking with specific actors is highly valuable.

- **Service-Based Model:** Living Labs can generate revenue by offering specialised services[39], such as co-creation activities, testing, setting up experiments, and panel management. These are often referred to as "Living Labs as a Service".

- **Incubator/Accelerator Model:** Some Living Labs function as incubators or accelerators, providing start-ups and SMEs with resources, mentoring, infrastructure, and networking opportunities. This model is also used by universities for technology transfer, research valorisation, and spin-offs. However, the focus on financial returns in incubators and accelerators can sometimes conflict with Living Lab principles, such as co-creation and multi-stakeholder engagement.

- **Community-Supported Model:** Certain Living Labs engage directly with local communities or the general public to secure funding or support through crowdfunding or community participation. However, these initiatives often lack sustainability unless combined with public funding, such as participatory budgeting. These are sometimes referred to as user-driven Living Labs.

- **Hybrid Model:** In reality, most Living Labs adopt a hybrid approach, blending various business models to achieve sustainability. This flexibility allows Living Labs to remain adaptable and reduces dependence on a single stakeholder or funding source, making them more resilient in the long term.

In addition to business models, **Intellectual Property (IP)** plays a vital role in the innovation ecosystem of a Living Lab. IP ensures the protection of creations, innovations, and ideas generated by stakeholders. Typically, any IP generated through Living Lab projects is owned by the partner organisations unless otherwise agreed in advance. Many countries follow international agreements, such as the World Intellectual Property Organisation (WIPO) treaties, which provide guidelines for cross-border IP protection. However, the enforcement and protection of **Intellectual Property Rights (IPR)** are primarily determined by national laws in the Living Lab's operating country.

Clear agreements on IP ownership and strategic IP management are crucial to building trust among partners and fostering long-term collaboration. By addressing both the sustainability of business models and the strategic use of IP, Living Labs can continue to thrive as innovative, multi-stakeholder ecosystems that drive real-world solutions to complex challenges.

[38] *Read more: https://urn.fi/URN:ISBN:978-951-799-573-3*
[39] *Read more: https://urn.fi/URN:NBN:fi-fe2024061753872*

Living Labs: Value Creation and Impacts

Living Labs, as dynamic innovation ecosystems, create significant value through their unique characteristics. These ecosystems foster value creation not only at the project level but also extend their influence on organisational and community levels. The most visible and measurable aspects of this value creation typically manifest within individual Living Lab projects, yet their impact can reach far beyond specific initiatives, creating ripples across multiple sectors and stakeholders.

Living Labs are instrumental in driving innovation, societal transformation, and the co-creation of solutions that meet real-world challenges. Their characteristics—such as active user involvement, multi-stakeholder participation, orchestration, co-creation, real-life experimentation, and a multi-method approach—create tangible and lasting impacts that benefit communities, industries, and regions. Through their collaborative and user-centric approach, Living Labs facilitate the development of solutions that are not only innovative but also deeply aligned with the needs and aspirations of the communities they serve.

Living Labs and Their Role in Value Creation

Living Labs drive value creation through their six defining characteristics, which not only shape the operational framework of each Living Lab but also enhance their potential for innovation outcomes and societal impact. Below is a deeper exploration of how these characteristics directly contribute to value creation:

1

Active User Involvement: Actively involving users from the outset of the innovation process ensures that their needs, preferences, and feedback are integrated throughout the project. This early and ongoing engagement helps to identify flaws and barriers in solutions before they are finalised, resulting in more user-aligned and relevant outcomes. By incorporating users in the co-design and testing stages, Living Labs increase the creativity and desirability of innovations, making them more likely to be adopted. This approach also enhances the innovation's impact as it responds directly to the practical needs of the users.

2

Involving Multiple Stakeholders: The inclusion of diverse stakeholders —including government, academia, businesses, and civil society— brings multiple perspectives, resources, and expertise into the innovation process. This broader perspective enhances problem-solving capabilities, fosters collaboration across disciplines, and creates solutions that are more sustainable and robust. By involving key decision-makers early in the process, Living Labs secure critical buy-in and support for the innovation, helping to reduce time-to-market and improve the scalability of solutions. This collaborative approach also increases the overall impact of the innovation by ensuring it is widely accepted and adopted across different sectors and communities.

3

Adopting a Multi-Method Approach: The multi-method approach within Living Labs combines various innovation techniques and tools that are tailored to the specific goals of each project. This flexibility enables Living Labs to respond to complex challenges by selecting methods that align with the problem at hand and the needs of the stakeholders involved. By incorporating diverse methods, such as qualitative research, quantitative analysis, and experimental testing, Living Labs boost creativity and problem-solving capacity, ensuring that the solutions developed are not only effective but also adaptable. This approach also enhances the validity and reliability of the results, making the innovations more trustworthy and applicable to real-world settings.

4

Orchestration: Effective orchestration ensures seamless coordination among diverse stakeholders, maintaining alignment with the shared objectives of the Living Lab. This collaborative leadership reduces fragmentation and enhances efficiency, allowing for better risk management and smoother integration of various contributions. Strong orchestration promotes a flexible, adaptive environment where innovations can evolve rapidly in response to changing conditions. This ensures that the innovation process remains coherent and goal-oriented, even when managing complex, multi-stakeholder projects. The result is an accelerated innovation cycle with greater adaptability and better alignment with community needs.

5

Real-Life Experimentation: One of the key advantages of Living Labs is their ability to co-create, co-design and test solutions in real-life settings, outside of controlled environments. This experimentation provides highly relevant and realistic feedback that can significantly improve the outcomes of innovation, in the early problem-oriented stages as well as in the solution-oriented stages. By engaging users and stakeholders directly in these real-world trials, Living Labs ensure that solutions are tested for practicality and effectiveness in actual use cases. This real-world validation of concepts helps mitigate potential risks early in the process, ensuring that the solutions developed are market-ready and applicable in everyday contexts. Additionally, this real-life testing provides a strong evidence base that can be used to demonstrate the viability of the innovation to stakeholders and investors.

6

Co-Creation: Co-creation is at the heart of Living Labs, fostering deep collaboration among all relevant stakeholders in the innovation process. By engaging stakeholders in the co-design, development, and testing phases, Living Labs ensure that the resulting innovations reflect a shared vision and are more likely to meet the diverse needs of the community. This active participation enhances creativity, ownership, and commitment to the innovation, which reduces the risk of rejection and improves adoption rates. Furthermore, by aligning the interests and objectives of different groups, Living Labs are able to accelerate time-to-market and ensure that innovations are fit for purpose and supported by the community.

Together, these characteristics create added value for Living Labs, resulting in numerous benefits:

- **Increased Learning & Intensive Knowledge Exchange:** Facilitating knowledge exchange among stakeholders extends learning beyond individual projects and encourages continuous innovation.
- **Better Understanding of Stakeholder Needs and Problems:** Direct engagement with stakeholders ensures that solutions are relevant and effective, addressing real-world challenges.
- **Open Avenues for Collaboration & Strengthening Ties:** Living Labs strengthen relationships across sectors and industries, creating opportunities for future collaborations and fostering a collaborative ecosystem.

Impact Assessment in Living Labs

Given the complexity of Living Labs, which involve multiple stakeholders and activities, measuring the impacts of Living Lab projects is no simple task. While impact measurement is a widely debated topic in the academic community, there is general consensus that the complexity of Living Labs should not deter impact assessment efforts. There are two main methods for assessing impact in Living Lab projects:

1

Top-Down Impact Assessment: This traditional approach involves defining Key Performance Indicators (KPIs) at the outset of a project. The assumption is that these KPIs are measurable and influenced by the Living Lab. A baseline measurement of the KPIs is taken before the intervention, and they are measured again after the project, with the difference being attributed to the Living Lab. While this approach can be effective, it relies on pre-defined KPIs, which may not always capture the full scope of value generated by the Living Lab.

2

Bottom-Up Impact Assessment: Aligned with the principles of Living Labs, the bottom-up approach is rooted in the *Theory of Change*[40] and focuses on a dynamic, iterative process of measuring impact. The process follows a sequence: inputs → activities → outputs → outcomes → impact. Stakeholders involved in the Living Lab define their own assumptions about change, and these assumptions are validated and iterated throughout the project. This allows for a more flexible and co-creative approach to impact assessment, enabling the identification of unforeseen outcomes or side effects and providing a more accurate reflection of the actual impact of Living Lab activities.

In conclusion, Living Labs contribute significant value not only through innovative solutions but also through fostering deeper learning, collaboration, and relationships across diverse stakeholders. Whether through top-down or bottom-up approaches to impact assessment, these initiatives provide a framework for addressing complex societal challenges and ensuring long-term positive effects. Through their integrated methodology, Living Labs continue to evolve and drive transformative change, benefiting communities and innovation ecosystems alike.

[40] Mayne, J (2017). "Theory of change analysis: Building robust theories of change". Canadian Journal of Program Evaluation. 32 (2): 155–173. doi:10.3138/cjpe.31122

Living Lab Activities: Tools, Methods, and Services

Living Lab activities leverage a range of tools, methods, and services tailored to the specific context, goals, and stages of innovation projects. Within ENoLL, a working group is focused on harmonising the terminology and definitions related to these methods and services, resulting in an ongoing development of a harmonisation wiki[41].

The methods used in Living Labs align with their core characteristics, such as active user involvement, co-creation, multi-stakeholder engagement, and real-life experimentation. These approaches draw from established methodologies in Open Innovation, User Innovation, and Responsible Innovation, which are adapted to suit the specific needs of each Living Lab project. The choice of tools and methods varies across the innovation process, with each phase requiring different techniques to ensure a comprehensive approach.

The innovation process in Living Labs typically follows a cycle of four key stages:

1. **Exploration:** At the outset, the focus is on deeply understanding the problems and needs of stakeholders. This stage involves gathering insights through various qualitative methods, such as interviews, co-creation sessions, and user journey mapping, to form a clear understanding of the challenges faced.

2. **Co-Design / Co-Creation:** In this stage, solutions are co-developed with stakeholders, ensuring that innovations directly respond to identified needs. This phase often involves collaborative workshops and prototyping to iterate on ideas and refine potential solutions.

3. **Experimentation:** The third phase emphasises testing solutions in real-world settings, validating their feasibility, and assessing their problem-solution fit. Living Labs typically conduct pilot studies, field trials, and experimental designs to test the effectiveness of the developed solutions.

4. **Evaluation:** The final phase focuses on assessing whether the solution meets stakeholder expectations and analysing the broader impacts of the Living Lab activities. Evaluation tools often include feedback gathering, testing, and impact analysis to measure the success of the project and its wider societal contributions.

For those interested in more detailed methodologies and tools, several online resources are available, including comprehensive toolkits on user innovation, co-creation, and policy design. These resources provide valuable insights into the practical application of Living Lab methodologies, offering a structured approach for stakeholders engaged in Living Lab projects.

- UNaLAB Project Toolkit
- Communi-Lab
- Living-in.EU Knowledge Base
- oPEN Lab Toolbox
- Vitalise Project Wiki for Living Lab Harmonisation
- Rewaise Living Lab Methodology Handbook
- Gendered Innovation Living Labs (GILL) Hub
- Co-create your City Toolkit
- DesignKit
- User Innovation Toolkit
- SISCODE Project Toolkit
- Pocket Book for Agile Piloting

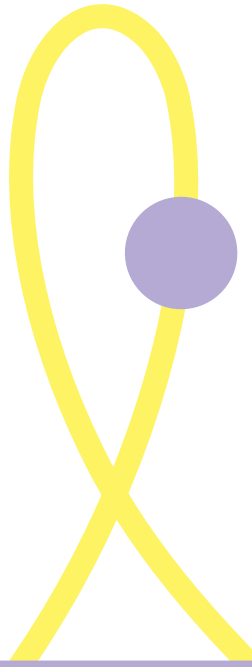
[41] *Read more: https://vitalise-project.eu/harmonisation-wiki/*

The Future of Living Labs: Perspectives and Opportunities

As highlighted throughout this booklet, Living Labs and their diverse network of actors and stakeholders represent a vibrant and innovative approach to fostering solutions that are both impactful and forward-looking. They emphasise the importance of multi-stakeholder engagement and co-creation, positioning themselves as catalysts for more inclusive, sustainable, and responsible innovation practices—essential in navigating the complexities of today's world. Through their innovation management strategies and methodological frameworks, Living Labs enhance the innovative capacity of the ecosystems in which they operate, benefiting not only organisations but also individuals and communities.

In a rapidly evolving context marked by urbanisation, climate change, the depletion of natural resources, and growing inequalities, Living Labs are uniquely positioned to address these so-called "wicked problems." By providing collaborative tools and methodologies, they empower citizens and regions to harness their innovative capabilities, fostering resilience and a sense of ownership over solutions to local and global challenges.

To ensure the continued growth and effectiveness of the Living Lab movement, several areas require focused attention:



1. **Impact Assessment:** Advancing robust evaluation practices for Living Labs' organisations, projects, and activities is critical to identifying what works, understanding what does not, and refining methods to strengthen the overall knowledge base of Living Labs.

2. **Capacity Building:** Enhancing Capacity Building efforts, both within and between Living Labs, is vital. This includes sharing lessons learned, scaling successful approaches to other contexts and regions, and fostering an environment where learning from failures is embraced as part of the innovation process.

3. **Matchmaking and Networking:** Strengthening connections between Living Labs and various stakeholders will facilitate the creation of new projects, foster the exchange of ideas, and amplify problem-solving capabilities across broader scales. By encouraging collaboration and cross-pollination of ideas, Living Labs can continue to evolve and expand their reach.

Living Labs are instrumental in creating pathways to address the multifaceted challenges of our time. By focusing on these areas of growth, they can continue to drive co-creation, innovation, and empowerment, making a lasting impact on communities and ecosystems worldwide.

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