

Living Labs as bridges from R&I to uptake: Lessons from the Green Deal Call projects

Green Deal Projects Support Office



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Green Deal Projects Support Office

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ABOUT THE GREEN DEAL PROJECTS SUPPORT OFFICE

The Green Deal Projects Support Office has been developed to facilitate coordination between projects funded under the Horizon 2020 Green Deal Call and maximise their positive impact in the longer term. The Green Deal Projects Support Office will operate until November 2026, and its key activities include supporting Green Deal projects in effective collaboration, providing networking and knowledge exchange opportunities to develop synergies, and helping projects boost the communication efforts of their results. The Green Deal Projects Support Office support networking, knowledge exchange and common capacity building activities through five working groups:



For more information on the Green Deal Projects Support Office, please contact:
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EXECUTIVE SUMMARY

This report adopts a qualitative and comparative approach to analysing living lab implementation across selected Green Deal Call projects. It is based on a combination of desk research and semi-structured interviews with representatives of seven Green Deal Call projects which have made use of the Living Lab methodology or of a Living-Lab-like approach. The analysis combines a systematic screening of publicly available sources with an in-depth examination of selected case studies, complemented by interview insights. The Living Labs set up by these projects cover 16 Member States and other geographical areas (including Africa, the Middle East and Central Asia) as well as various topics, ranging from clean energy innovations to sustainable agricultural practices, climate services, energy solutions for buildings or sustainable innovation for ports and airports.

KEY FINDINGS

The analysis confirms that Living Labs are an effective instrument to support innovation (both technological and social), stakeholder engagement and co-creation, and real-world testing of solutions. However, their implementation faces several recurring challenges and structural constraints.

- **Uncertain and evolving environments:** While project frameworks are often defined in advance, real-world conditions frequently require adjustments to timelines, approaches and sometimes even the solutions themselves. This is particularly evident in projects implementing high-TRL innovations, where regulatory, technical, and operational constraints may become critical as the project progresses. At the same time, the effectiveness, uptake and scalability of Living Labs are shaped by broader external conditions beyond the project's control, including regulatory frameworks, market dynamics, infrastructure availability and socio-economic factors. This is especially evident in non-European contexts, where affordability and logistical constraints can significantly influence real-world adoption and long-term impact.
- **Stakeholder engagement is both a core strength and a major challenge:** Living Labs rely on the active participation of diverse stakeholders, including public authorities, private actors, researchers and local communities. While this diversity enhances relevance, ownership and legitimacy, it also increases coordination complexity and can give rise to conflicts, if not managed properly. Effective engagement requires continuous facilitation, tailored approaches and sustained effort over time.
- **Co-creation processes are time-intensive and resource-demanding:** Building trust, enabling meaningful participation and supporting collaboration cannot be achieved through isolated activities. Instead, they require iterative engagement, capacity building

and long-term interaction. This also highlights the importance of strengthening learning processes within projects, ensuring that adaptation, feedback, and knowledge exchange are systematically embedded throughout implementation.

- **Need for a stronger systemic innovation perspective:** Many sustainability challenges addressed through Living Labs can be understood as “wicked problems”, characterised by complexity, uncertainty, and interdependencies across sectors and governance levels. Addressing these challenges requires moving beyond isolated solutions towards more systemic approaches, including integrated technological, social, organisational, and financial innovations. This implies embedding long-term and systemic thinking within living lab design, ensuring that experimentation is linked to broader system change processes rather than short-term project outputs.
- **Sustainability beyond project funding remains a key challenge:** While Living Labs can generate strong results during their implementation phase, their scope often remains limited to the duration of the project. Ensuring continuity requires designing Living Labs with a longer-term perspective, including institutional embedding, sustainable business models, and continued stakeholder engagement mechanisms. This also points to the need to support not only solutions, but also longer-term problem-solving processes that can evolve over time.

In conclusion, Living Labs represent a key and increasingly fundamental approach for bridging R&I and real-world implementation. They play a central role in supporting the transition towards climate neutrality and sustainable innovation by enabling experimentation in real-life conditions and fostering collaboration across sectors and governance levels. Their effectiveness can be further enhanced through careful design and adaptive management aligned with specific contextual conditions.

Evidence from the analysed projects shows that Living Labs are most effective when they combine structured methodological frameworks with a certain degree of flexibility to adapt to real-world constraints, invest significantly in stakeholder engagement and local coordination, and provide clear value to participants.

Moreover, their impact remains limited when sustainability and scaling are not addressed from the outset. Without dedicated mechanisms for long-term funding, institutional embedding, or viable business models, many Living Labs risk ending with the project funding. Scaling is most effective when it focuses on transferring methods, tools, and learning processes, rather than replicating individual solutions in different contexts.

To maximise their contribution to EU R&I programmes, future initiatives should move beyond treating Living Labs as standalone project activities and instead use them as structured processes for continuous problem-solving, learning, and stakeholder collaboration, embedded within broader

policy and innovation ecosystems. In practice, this requires integrating social, organisational and financial dimensions alongside technological innovation, and systematically linking living lab activities to relevant local and national policy processes (e.g. through the involvement of public authorities and alignment with regulatory frameworks).

Projects should also adopt more targeted approaches to engage vulnerable and underrepresented groups, for example by working through intermediary organisations or adapting participation formats and incentives to reduce barriers to involvement. At the same time, they should develop diversified sustainability strategies from the outset, combining public funding, private sector involvement, and context-specific business models. Finally, EU R&I programmes should prioritise funding approaches that support iterative testing, adaptation, and continuous learning, rather than relying primarily on predefined solutions and fixed implementation pathways.

1 INTRODUCTION

The transition towards climate neutrality and sustainability in Europe requires profound transformations across social, economic and technological systems. These transformations are inherently complex, involving multiple actors, uncertain pathways and context-specific challenges. Traditional linear models of research and innovation (R&I), in which knowledge is produced and subsequently transferred to users, have proven insufficient to address such complexity. Instead, there is growing recognition that innovation must be co-created, tested and refined in real-world contexts, involving those who are directly affected by and capable of implementing change (Voytenko et al., 2016; European Commission, 2022).

Within this evolving landscape, Living Labs have emerged as a promising approach to bridge the gap between research and real-world uptake. Living Labs are collaborative environments where stakeholders, including researchers, public authorities, businesses, and citizens, jointly experiment with innovative solutions in real-life settings. By enabling iterative learning, co-creation, and experimentation, Living Labs allow research outputs to be adapted to local needs, increasing their relevance, usability, and potential for adoption (Müller, 2026; De Vita and De Vita, 2021).

The increasing prominence of Living Labs aligns closely with the ambitions of the European Green Deal, which calls for systemic transformations across sectors such as energy, mobility, food systems, and the built environment. Achieving these transformations requires not only technological innovation but also new forms of governance, social innovation, and citizen engagement. In this context, the European Commission has increasingly promoted participatory and place-based approaches to innovation, including Living Labs, as key instruments for enhancing the societal impact and uptake of R&I results (European Commission, 2022). Initiatives such as the Knowledge Valorisation Platform emphasise the importance of translating research outcomes into practical applications that deliver tangible benefits for society and the economy.

The European Green Deal Call projects, supported by the Green Deal Support Office (GDSO), represent a significant investment in advancing sustainability transitions through research and innovation. Many of these projects have adopted Living Lab or living-lab-like approaches to support experimentation, stakeholder engagement, and implementation in real-world contexts. However, despite their growing use, there is still limited systematic understanding of how Living Labs are applied in practice across these projects, what makes them effective, and what challenges they face in achieving long-term impact. While previous studies have explored Living Labs in urban and sustainability contexts (Voytenko et al., 2016; Bouwma et al., 2022; Evans et al., 2015; Hossain et al., 2019; von Wirth et al., 2019; Westerink et al., 2026; Kim et al., 2019) and identified key success factors and evaluation dimensions (Müller, 2026), there remains a need for more targeted analysis within the specific context of Green Deal-funded initiatives.

This report addresses this gap by analysing how Living Labs have been implemented across Green Deal Call projects and how they help bridge R&I activities with real-world experimentation and uptake. It aims to provide a structured assessment of living lab practices, identify enabling conditions and barriers, and draw lessons for strengthening their role in future European research and innovation programmes.

More specifically, the report pursues five main objectives:

- to review how Green Deal Call projects have implemented Living Labs or similar approaches;
- to examine how these approaches support the translation of R&I results into real-world experimentation and uptake;
- to identify key enabling factors and barriers in establishing and maintaining Living Labs;
- to assess the contribution of Living Labs to policy learning, stakeholder engagement, and systemic sustainability transitions;
- to provide recommendations for strengthening the use of Living Labs in future EU R&I programmes.

1.1 LIVING LABS: CONCEPTS AND PRINCIPLES

The concept of Living Labs has evolved across policy, academic, and practitioner communities, resulting in a diversity of definitions and interpretations. Within the European policy context, Living Labs are generally understood as user-centred, open innovation ecosystems that integrate research and innovation processes within real-life communities and settings. They are seen as instruments for knowledge valorisation, enabling the co-creation and testing of solutions with users and stakeholders, thereby accelerating the uptake of research results (European Commission, 2022).

Academic literature further conceptualises Living Labs as spaces for experimentation within sustainability transitions. They are often associated with the notion of “transition experiments,” where new socio-technical configurations are tested in controlled yet real-world environments. These experiments enable learning about what works, for whom, and under what conditions, contributing to broader processes of systemic change (Voytenko et al., 2016). Living Labs are, therefore, not only sites of innovation but also arenas for governance innovation, where new forms of collaboration and decision-making can emerge.

Practitioner networks, such as the European Network of Living Labs (ENoLL), emphasise the operational dimensions of Living Labs, highlighting their role as multi-actor platforms that facilitate co-creation, prototyping, testing, and scaling of innovations (ENoLL, 2025). From this perspective, Living Labs are characterised by their ability to bring diverse stakeholders together, foster user engagement, and support iterative development processes.

Across these perspectives, several core principles can be identified:

- **Real-life experimentation:** Living Labs operate in real-world environments, allowing solutions to be tested under actual conditions rather than in controlled laboratory settings. This enhances the relevance and robustness of innovation outcomes (Voytenko et al., 2016).
- **Co-creation and participatory innovation:** Stakeholders, including end-users, are actively involved in the design, development, and evaluation of solutions, ensuring that innovations respond to real needs and contexts (De Vita and De Vita, 2021).
- **Multi-stakeholder governance:** Living Labs involve collaboration among a wide range of actors, including public authorities, research institutions, businesses, and civil society organisations, often requiring new governance arrangements (Müller, 2026).
- **Iterative learning and adaptation:** Living Labs support continuous feedback loops, enabling solutions to be refined over time based on user experiences and changing conditions (Müller, 2026).
- **Policy learning and systemic innovation:** By generating practical insights and evidence, Living Labs can inform policymaking and contribute to broader systemic transformations (European Commission, 2022; Voytenko et al., 2016; von Wirth et al., 2019).

These principles make Living Labs particularly suitable for addressing complex sustainability challenges, where solutions must be context-specific, socially acceptable, and adaptable over time.

1.2 RATIONALE AND RELEVANCE FOR THE GREEN DEAL CALL

The relevance of Living Labs for Green Deal Call projects lies in their potential to operationalise key principles of the European Green Deal, including inclusiveness, place-based innovation and systemic transformation. Many sustainability challenges, such as decarbonising cities, promoting circular economy practices, or enhancing climate resilience, require coordinated action across multiple sectors and levels of governance. Living Labs provide a framework for organising such coordination, enabling stakeholders to jointly explore solutions and align their actions (Voytenko et al., 2016; Bulkeley et al., 2017; von Wirth et al., 2019).

More specifically, Living Labs function as spaces for real-world experimentation and co-creation, where diverse actors, including public authorities, private sector actors, researchers, and citizens, can collaboratively design, test, and refine solutions to complex sustainability challenges (Hernando Florez Ayala et al., 2022; Galway et al., 2022; De Vita and De Vita, 2021). By facilitating multi-actor governance arrangements and iterative learning processes, they contribute to the development of context-specific and socially robust innovation pathways (Müller, 2026), while also advancing co-creation practices and addressing questions of governance, social inclusion and justice (Galway et al., 2022; Mahmoud et al., 2021).

In the European policy context, this approach is closely aligned with the principles of knowledge valorisation and uptake of research results, which emphasise the importance of linking research, policy, industry and society to generate social and economic value (European Commission, 2022). Living Labs can therefore be seen as practical instruments for implementing these principles, supporting the translation of research and innovation into actionable solutions in real-world settings (ENoLL, 2025).

2 SCREENING AND MAPPING OF LIVING LAB APPROACHES IN GREEN DEAL CALL PROJECTS

This section provides an overview of how living lab approaches are applied across Green Deal Call (GDC) projects. It builds on a targeted screening of projects funded under the Green Deal Call, with the aim of identifying where and how living lab or living lab-like methodologies have been adopted.

2.1 SCREENING APPROACH AND CRITERIA

The screening focused on identifying projects that explicitly refer to Living Labs or that apply similar principles, even if not formally labelled as such. The analysis relied on publicly available information, including project descriptions, deliverables, websites and communication materials (e.g. Masih et al., 2025; oPEN Lab, 2026; oPEN Lab, 2025; PROBONO, 2026; PROBONO, 2025; I-CHANGE, 2026; I-CHANGE, 2025; I-CISK, 2026; SESA, 2026; SESA, 2025; MAGPIE, 2026; MAGPIE, 2025; ClieNFarms, 2026; ClieNFarms, 2025) and tried to ensure a balanced representation of projects from the different GD-SO working groups.

To ensure consistency, the identification of living lab approaches across GDC projects was based on a set of core criteria derived from the literature (Section 1.1), including:

- **Urban and district-level Living Labs**, focusing on integrated solutions in built environment contexts, often combining technological innovation with governance and behavioural dimensions (e.g. PROBONO, oPEN Lab).
- **Sector-specific Living Labs**, targeting particular domains such as agriculture or climate services, with a stronger emphasis on peer learning and knowledge exchange (e.g. ClieNFarms, I-CISK).
- **Infrastructure and system-focused Living Lab environments**, where innovation is tested in operational settings such as ports or energy systems (e.g. MAGPIE).
- **Context-adapted Living Labs in non-European settings**, where the design and implementation of Living Labs are strongly shaped by local governance structures, socio-economic conditions, and cultural contexts. In these cases, co-creation processes, stakeholder roles, and organisational arrangements are tailored to local realities, sometimes involving non-traditional actors such as community leaders, intermediaries, or informal institutions (e.g., SESA, I-CHANGE).

- **Technology-specific Living Labs**, where each living lab is centred on the development, testing, and deployment of a specific solution rather than functioning as a multi-purpose experimentation space. This approach is particularly evident in projects such as SESA, where Living Labs are linked to individual technologies (e.g. clean cooking, solar irrigation, or energy access solutions) and operate as focused environments for validation, user uptake, and business model development, often in close collaboration with local SMEs.

These typologies highlight the flexibility of the living lab concept and its capacity to be adapted to different thematic areas, scales, and governance contexts. The table below provides an overview of the seven projects selected for the comparative analysis, highlighting the diversity of living lab approaches implemented under the Green Deal Call. It summarises key characteristics of each case, including the number and geographical distribution of Living Labs, their thematic focus, and the specific functions they fulfil within the projects. Together, these cases illustrate the wide range of configurations through which living lab principles are applied, from urban neighbourhood-scale demonstrators and citizen science initiatives to sector-specific platforms and infrastructure-based experimentation environments. This diversity forms the basis for the comparative analysis developed in the following section.

Building on the screening, the selected projects were subject to a more detailed comparative analysis in Section 3. The selection aimed to ensure diversity in terms of: a) thematic focus (e.g. energy, agriculture, climate services, urban systems); b) geographic scope (including both European and non-European contexts); c) type of living lab approach (formal, hybrid, or implicit); d) stakeholder configurations and governance models.

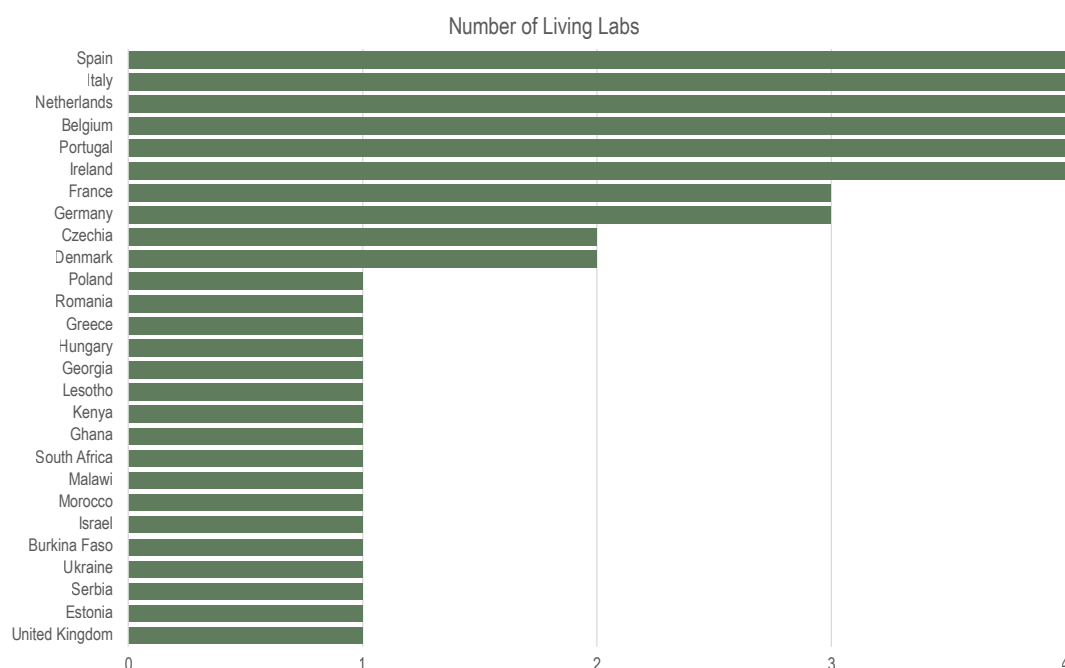
Together, these projects provide a representative sample of how living lab approaches are implemented across the GDC, enabling the identification of cross-cutting patterns and context-specific dynamics.

Table 1 provides an overview of the seven selected Green Deal Call projects included in the comparative analysis, highlighting the diversity of living lab approaches in terms of geographical scope, thematic focus, and functional roles. Figure 1 shows the list of countries hosting the GDC projects' Living Labs.

Table 1. Overview of the seven selected GDC projects.

PROJECT	NUMBER OF LIVING LABS (LL) AND LOCATIONS	TOPIC OF INTEREST
oPEN Lab	3 LLs: Genk (BE), Pamplona (ES), Tartu (EE)	Real-life testing for positive energy neighbourhoods (PENs): co-creation and testing of integrated solutions for energy-positive districts, including building renovation, renewable energy, energy communities, mobility and citizen engagement, and development of business models.
PROBONO	6 LLs: Madrid (ES), Dublin (IE) – demonstrators; Porto (PT), Brussels (BE), Aarhus (DK), Prague (CZ) – LLs	Carbon-neutral and healthy built environments: digital twins, smart buildings, energy efficiency, circular construction, and citizen-centred urban regeneration.
I-CHANGE	8 LLs: Amsterdam (NL), Barcelona (ES), Bologna (IT), Dublin (IE), Genoa (IT), Hasselt (BE), Jerusalem (Israel), Ouagadougou (Burkina Faso)	Urban citizen-science Living Labs: Behaviour change and citizen science Living Labs and data-driven actions to encourage sustainable lifestyles and climate adaptation across air pollution, mobility, energy, water, waste, and extreme events.
I-CISK	7 LLs in climate hotspots located in ES, IT, NL, GR, HU, Georgia and Lesotho	Climate-services Living Labs: Co-production of climate services and decision support tools across sectors (agriculture, tourism, forestry, urban planning).
SESA	2 main LLs: Kenya + 4 validation LLs: Ghana, South Africa, Malawi, Morocco	Sustainable energy transition in Africa Living Labs: Testing business models, technologies and governance approaches for decentralised energy solutions along with capacity building and replication across Africa.
MAGPIE	Not counted as LL sites but uses living lab environment in Rotterdam (NL), DeltaPort (DE), Port of Sines (PT), and HAROPA (FR)	Living-lab environment in ports: Demonstration of port-system innovations supporting zero-emission operations, alternative fuels, renewable energy integration and sustainable freight transport (autonomous barges, digital twins, clean energy carriers).
ClieNFarms	Living lab-like structure across 20 demonstration farms in multiple countries including IE, BE, FR, ES, IT, PT, RO, NL, PL, DE, UK, Ukraine, and Serbia	Climate-neutral farming systems: Co-design with farmers; real-world trials of practices and business models to reduce greenhouse gas emissions while maintaining farm productivity and resilience.

Figure 1: Countries hosting Living Labs as part of the seven selected GDC projects.



2.2 OVERVIEW OF LIVING LAB APPLICATIONS ACROSS PROJECTS

The screening confirms that living lab approaches are widely used across GDC projects, although with significant variation in how they are defined, structured and operationalised.

A first group of projects explicitly adopts Living Labs as a central methodological component. In these cases, Living Labs are clearly defined as dedicated spaces or structures for experimentation and co-creation. Projects such as oPEN Lab and PROBONO fall into this category, where Living Labs are formally established in specific locations and used to test integrated solutions in real-life conditions.

A second group of projects applies living lab principles without consistently using the terminology. For example, ClieNFarms refers to “Innovative Systemic Solution Spaces” (ISS) networks, which function as multi-actor platforms for experimentation and knowledge exchange in agricultural contexts. Similarly, MAGPIE uses port environments as testing grounds for innovations, effectively operating as living lab settings even if not explicitly framed as such.

A third group of projects implements hybrid or context-dependent approaches, combining living lab elements with other methodologies such as citizen science or climate service co-production. Projects such as I-CHANGE and I-CISK illustrate this hybridisation, where living lab approaches are embedded within broader participatory or knowledge co-creation processes.

3 COMPARATIVE ANALYSIS OF LIVING LAB IMPLEMENTATION ACROSS GDC PROJECTS

This section synthesises insights from the seven GDC projects to analyse how Living Labs are implemented in practice. It draws on a combination of desk research and primary data collected through seven semi structured interviews (lasting between 45 minutes and one hour) with project coordinators and other representatives involved in these initiatives. Building on this evidence base, the analysis identifies recurring patterns, challenges, and strategic approaches across different contexts.

The analysis adopts a cross cutting perspective, highlighting common dynamics while using selected project examples to illustrate key issues.

Across the analysed projects, Living Labs are implemented through diverse design logics, reflecting differences in thematic focus, geographic scope, and innovation maturity. In projects such as **PROBONO**, Living Labs are selected through a strategic process that aligns with core project objectives and key performance indicators, combining existing flagship sites (which usually have previous experience and legacy) with additional locations that complement the overall portfolio. This results in a structured yet diversified set of environments for testing multiple innovations.

Importantly, the **PROBONO** interview confirms that this diversity is a deliberate design choice: Living Labs were selected to represent different organisational typologies (e.g. public-led, private-led, academic-led), with the explicit aim of testing solutions across contexts and reducing implementation risks. For example, flagship sites such as Madrid and Dublin built on existing large-scale initiatives, while follower sites provided additional geographic and functional diversity.

In contrast, the **ClieNFarms** project adopts a system-based selection process, focusing on geographic, pedoclimatic, and production system diversity. While not always labelled explicitly as “Living Labs”, the approach follows similar principles but is more strongly driven by scientific representativeness and comparability across agricultural contexts. The interview further clarifies that sites were selected, ensuring that lessons could be compared across different agricultural realities. This reflects a more research-driven rationale compared to urban demonstration projects.

The **SESA** project further illustrates how selection processes are highly context-dependent, particularly outside Europe. Here, sites are often predefined at the proposal stage, together with several trusted local actors, and dependent on practical considerations such as land rights,

availability of local partners, and implementation feasibility. These differences show that living lab design is not only a methodological choice, but also a strategic and context-sensitive process that shapes what each living lab can realistically achieve.

The interview evidence shows that in these contexts, site selection is not only technical but deeply socio-institutional: for example, securing land rights and obtaining approval from local chiefs or community leaders is a prerequisite for implementation, sometimes more decisive than formal municipal approval.

Taken together, these examples show that the way Living Labs are selected and configured shapes not only their geographical and organisational diversity, but also their role within the project and the types of innovation processes they support. Building on this observation, the analysis now turns to how these different design logics translate into distinct functions and operational roles of Living Labs in practice.

Building on the diversity of approaches and selection processes identified above, the analysed cases demonstrate that Living Labs can fulfil multiple functions depending on project objectives and contextual conditions. In **PROBONO**, they operate as large-scale demonstration environments for high-TRL innovations in urban contexts, integrating technological, social, and governance dimensions. In **ClieNFarms**, they function primarily as knowledge exchange platforms supporting peer-to-peer learning and co-creation among farmers, researchers, and industry stakeholders. In **SESA**, Living Labs are closely linked to the deployment of concrete technologies and the testing of business models in real-world conditions, particularly in underserved or rural areas.

In projects such as **oPEN Lab**, Living Labs combine experimentation with system-level innovation at neighbourhood scale, focusing on the development and real-life testing of integrated solutions for positive energy neighbourhoods, including governance models, business cases and user engagement approaches. This illustrates an intermediate configuration, where Living Labs are neither limited to single technologies nor as broadly scoped as large-scale urban demonstrators, but focus on integrating multiple solutions within a defined local system.

In the **I-CISK** project, Living Labs function as platforms for the co-production of climate services, bringing together actors from different sectors to jointly develop and apply knowledge-based tools for decision-making. This highlights a distinct function of Living Labs as environments for producing and testing intangible outputs, such as data, services, and knowledge frameworks, rather than only physical or technological solutions.

The interview evidence refines this distinction: while in **PROBONO** Living Labs act as integrated demonstration sites for multiple innovations (up to dozens per site), in **SESA** they often function as “implementation hubs” where a specific technology (e.g. cookstoves, solar kiosks, e-mobility) is tested together with business models and user uptake mechanisms. This highlights that Living Labs can operate at very different levels of complexity and integration.

This comparison shows that Living Labs can span a broad spectrum of functions, ranging from technology-specific validation environments to multi-dimensional, system-oriented experimentation platforms, depending on project objectives and contextual conditions. It also suggests that the complexity of implementation depends not only on the number of stakeholders involved, but on the degree of integration between technologies, business models, governance arrangements and social processes.

To provide a consolidated overview of these findings and support navigation across the different characteristics and dynamics discussed in this section, Table 2 summarises the main insights emerging from the analysis and links them to the relevant sections of the report.

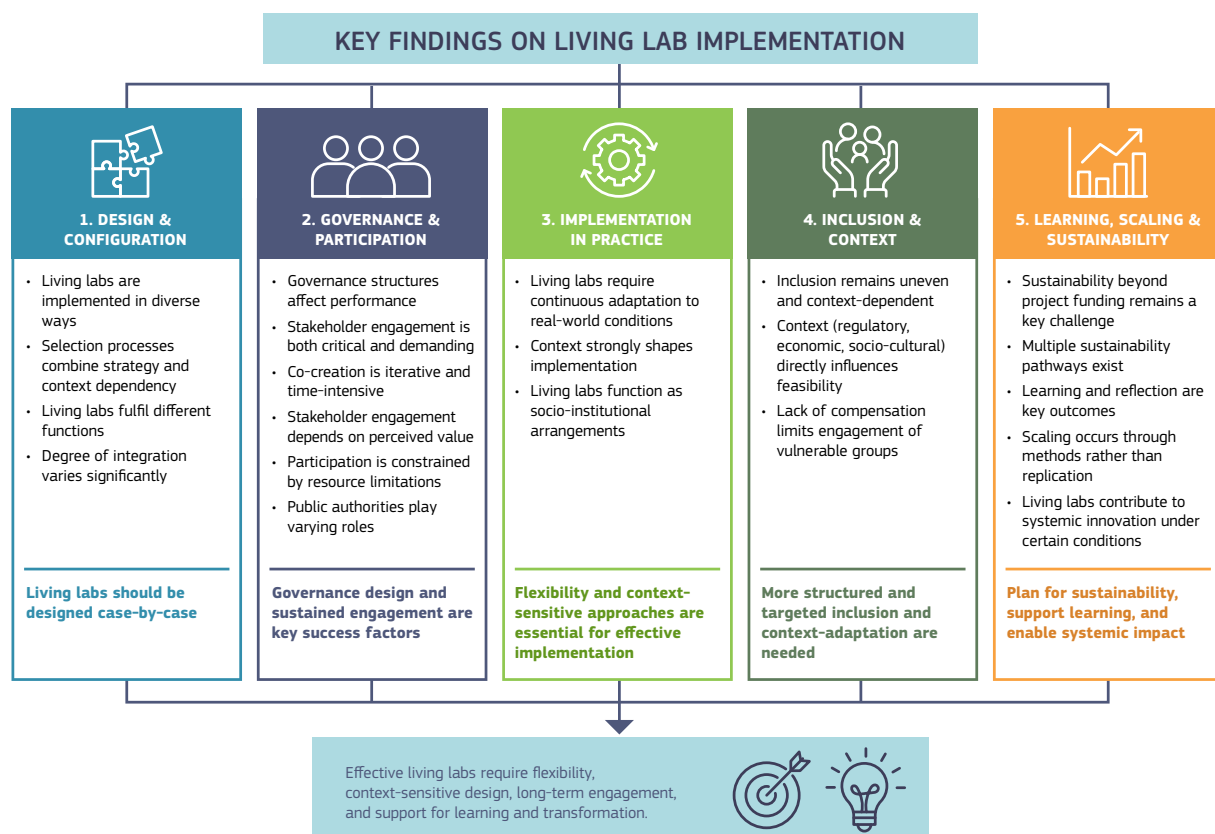
Table 2. Overview of key findings of living lab implementation across GDC projects.

MAIN FINDINGS	WHAT THE ANALYSIS SHOWS	IMPLICATION	SECTION REFERENCE
1. Living Labs are implemented in diverse ways	No single model exists; approaches vary by sector, scale, and objectives	Living Labs should be designed case-by-case	2.2, 3.1
2. Selection processes combine strategy and context dependency	Some projects use structured selection (PROBONO), others depend on feasibility and local constraints (SESA)	Project design must allow both planning and flexibility	3.1
3. Living Labs fulfil different functions	They act as demonstration sites, co-creation platforms, knowledge exchange spaces, or implementation hubs	The function should be clearly defined from the outset	3.1
4. Degree of integration varies significantly	Some Living Labs integrate multiple innovations; others focus on single technologies	Complexity and potential impact depend on integration level	3.1

MAIN FINDINGS	WHAT THE ANALYSIS SHOWS	IMPLICATION	SECTION REFERENCE
5. Governance structures affect performance	Simpler governance enables faster progress; complex public structures can slow implementation	Governance design is a key success factor	3.2
6. Living Labs require continuous adaptation to real-world conditions	Projects frequently adjust timelines, methods, and solutions during implementation	Project frameworks should allow flexibility and adaptation	3.1, 3.2
7. Stakeholder engagement is both critical and demanding	Multi-actor participation improves relevance but increases coordination complexity	Requires sustained facilitation and dedicated resources	3.1, 3.3
8. Co-creation is iterative and time-intensive	Requires repeated interaction, trust-building, and capacity building	Should be planned as a continuous process, not a one-off activity	3.1, 3.2, 3.3
9. Stakeholder engagement depends on perceived value	Participation is sustained when stakeholders see clear benefits ("give-to-get" logic)	Living Labs must provide tangible value to participants	3.3
10. Participation is constrained by resource limitations	Lack of compensation limits engagement of vulnerable groups	Projects should allocate resources to support participation	3.5
11. Context strongly shapes implementation	Regulatory, economic, and socio-cultural conditions directly influence feasibility	Living Labs must be adapted to local conditions rather than standardised	3.1
12. Living Labs function as socio-institutional arrangements	Local governance, informal institutions, and community actors can shape implementation	Requires context-sensitive design beyond formal project structures	3.1, 3.4

MAIN FINDINGS	WHAT THE ANALYSIS SHOWS	IMPLICATION	SECTION REFERENCE
13. Public authorities play varying roles	Their role ranges from central actors to secondary or contextual actors	Engagement strategies should reflect local governance contexts	3.4
14. Inclusion remains uneven and context-dependent	Inclusion is recognised but often limited or indirect in practice	More structured and targeted inclusion strategies are needed	3.5
15. Sustainability beyond project funding remains a key challenge	Many Living Labs lack mechanisms for continuation beyond project duration	Sustainability should be planned from the outset (institutional, financial, organisational)	3.6
16. Multiple sustainability pathways exist	Continuation can rely on institutional embedding, networks, or market-based approaches	Different sustainability models should be supported depending on context	3.6
17. Learning and reflection are key outcomes	Documenting adaptation processes is a central output of Living Labs	Learning processes should be formalised and supported for knowledge transfer	3.2, 3.3
18. Scaling occurs through methods rather than replication	Transfer focuses on tools, methodologies and learning rather than copying solutions	Scaling strategies should prioritise transferability and adaptation	3.7
19. Living Labs contribute to systemic innovation under certain conditions	They enable cross-sector collaboration and reveal system interdependencies, but do not automatically deliver system change	Stronger links to policy frameworks and long-term transformation processes are needed	3.8

Figure 2: Overview of key findings of living lab implementation across GDC projects.



3.1 KEY CHALLENGES IN IMPLEMENTING LIVING LABS

Across projects, the implementation of Living Labs is characterised by a set of recurring challenges linked to uncertainty, coordination complexity and contextual constraints.

A central challenge concerns the need to adapt to real world conditions, which often diverge from initial project assumptions. Living Lab processes are inherently flexible, while project frameworks (e.g. grant agreements) tend to be relatively rigid. As a result, projects frequently need to revise timelines, approaches, or even technical solutions during implementation. For example, in the case of the **MAGPIE** project, planned demonstrations had to be significantly adjusted due to feasibility issues and evolving technological conditions, requiring a shift to alternative solutions while maintaining the overall objectives.

This tension is also visible in projects operating with high-TRL innovations, such as **PROBONO**, where Living Labs were primarily not spaces for early-stage experimentation but settings for implementing technologies that were already considered market-ready. In these cases, projects had to deal with very concrete constraints such as permitting procedures, public acceptance, technical installation requirements, and alignment with existing urban development processes. As interviewees stressed, this made living lab implementation less about testing abstract ideas and more about managing real-world implementation barriers.

Similarly, **SESA** showed how solutions initially envisaged in the proposal had to be adapted in light of local realities. In some cases, technologies proposed at the design stage were replaced by alternatives that were considered more feasible or more appropriate to local conditions. This underlines that flexibility is not only a methodological feature of Living Labs, but a practical necessity if projects are to remain relevant and viable during implementation.

A second challenge relates to the complexity of multi actor coordination. Living Labs involve diverse stakeholders with different knowledge levels, interests, and institutional roles. Achieving alignment across these groups is resource intensive and requires continuous facilitation. This is particularly evident in projects such as **I-CISK**, where actors from multiple sectors (e.g. water management, tourism, agriculture) needed to be brought together, and where additional effort was required to establish a shared understanding of key concepts such as climate services.

The same issue appears in **PROBONO**, where the complexity of stakeholder coordination varied strongly across Living Labs, depending on governance structure. Simpler and more focused stakeholder configurations, such as the Porto case, enabled faster progress, while more complex public arrangements, such as Dublin, involved multiple departments and layers of decision-making, slowing implementation. This suggests that the internal governance architecture of the living lab itself is a key determinant of its operational effectiveness.

In addition, co-creation processes are time intensive, often progressing more slowly than expected. Projects consistently highlight the need for repeated engagement, iterative discussions, and capacity building. In **I-CISK**, this translated into a combination of workshops, training sessions, and bilateral engagement formats to ensure that stakeholders could effectively participate in the process.

This challenge is equally visible in **ClieNFarms**, where considerable time was needed to recruit farmers, build trust, and convince them to share data or open their farms for demonstration activities. Interviewees stressed that these processes required persistence and repeated interaction, especially in countries where living lab approaches were less familiar in the agricultural sector. The same point emerged in relation to the Creative Arenas, whose preparation sometimes required several months of planning before the first event could take place. In the context of ClieNFarms, Creative Arenas can be understood as structured, facilitated co-creation spaces that bring together farmers, researchers, advisors, and other relevant stakeholders to jointly explore challenges, share

practical experience, and co-develop solutions. Rather than one-off workshops, they function as iterative engagement processes, supported by specific guidelines and facilitation approaches, and are designed to enable peer learning, build trust among participants, and support the co-design and testing of innovative farming practices in real-world conditions (ClieNFarms, 2026).

Finally, Living Labs are strongly influenced by external contextual factors, including market developments, regulatory frameworks, or broader socio economic dynamics. For example, several projects reported delays linked to technology availability or shifts in external conditions, while **oPEN Lab** highlighted the influence of regulatory constraints and sectoral fragmentation on the feasibility of certain solutions.

In non-European contexts, these external constraints can be even more decisive. **SESA** highlighted the impact of customs delays, transport problems, currency fluctuations, and affordability constraints on implementation. In some countries, changes in exchange rates made technologies significantly more expensive for local users, undermining uptake. These examples confirm yet again that Living Labs do not operate in a vacuum: their feasibility and effectiveness are deeply shaped by surrounding economic and infrastructural conditions.

3.2 STRATEGIES AND APPROACHES TO MANAGING COMPLEXITY

To address these challenges, projects have developed a set of strategies that combine structured approaches with adaptive implementation.

A key feature across projects is the adoption of iterative, learning-based processes, where activities are continuously adjusted based on feedback and emerging conditions. For instance, in **MAGPIE**, Living Lab activities were implemented through repeated cycles of development, testing, and adaptation, enabling the project to respond to unexpected challenges without deviating from its overall objectives.

At the same time, projects often rely on structured frameworks to guide co creation, ensuring coherence across different sites while allowing for local flexibility. In **I-CISK**, a shared co creation framework was developed and applied across Living Labs, providing a common structure (e.g. co-exploration, co-design, testing) while allowing each case to adapt the approach to its specific context.

A similar logic can be observed in **PROBONO**, where the project used a structured methodological framework based on Archimate to connect high-level objectives, innovations, Living Labs, and expected impacts. This allowed the consortium to maintain an overview of how different innovations and sites related to each other, while still accommodating local specificities.

Another important strategy concerns the use of tailored engagement methods. Projects recognise that different stakeholder groups require different approaches and therefore combine a variety of formats. For example, **I-CISK** used a mix of surveys, bilateral exchanges, workshops, and group discussions, while **MAGPIE** complemented its technical demonstrations with public-facing events and exhibitions to make results visible and maintain interest over time.

In **ClieNFarms**, this tailoring was particularly evident in the design of Creative Arenas and demonstration events. These were not one-off activities, but carefully structured processes involving guidelines, facilitation methods, and support to local coordinators. Interviewees emphasised that the methodology had to be continuously adjusted depending on country context, farming culture, and local stakeholder dynamics, confirming that structured does not mean rigid. A recurring lesson across the interviews is therefore that structured methodologies matter, but only when they remain flexible enough to be adapted to sectoral, cultural and local conditions.

The interviews also point to two additional enabling factors that deserve stronger emphasis. First, early and context-sensitive stakeholder mapping appears to be critical for effective implementation. Projects that invested early in identifying the relevant stakeholder ecosystem, including who matters, who influences decisions, who may resist change, and what motivates participation, were generally better able to build ownership and align activities with local needs. In **ClieNFarms**, this included identifying farmers, advisory services and local influencers; in **SESA**, it required understanding the role of SMEs, chiefs, communities and end users; and in **I-CISK** it meant grounding Living Labs in pre-existing networks from the proposal stage.

Additionally, the agency of project coordinators and especially dedicated local managers appears to be a critical operational factor. Interview evidence from **ClieNFarms** shows that project coordinators played a central role in maintaining local ownership, adapting methodologies and sustaining engagement, supported by a peer network of managers. In **PROBONO**, interviewees also stressed that strong leadership, conviction in the project, and the ability to mediate between strategic objectives and local realities were essential. These findings suggest that Living Labs depend not only on formal governance structures, but also on the active role of committed individuals who can navigate complexity, connect actors and keep the process moving.

SESA also illustrates the importance of combining technology deployment with flexible business model experimentation. Solutions were frequently tested – with their end users – applying alternative financing or ownership models, such as pay-as-you-go, lease-to-own, or shared-use arrangements. This reflects a broader understanding of innovation, where the living lab is used not only to test the technical functionality of a solution, but also its organisational, financial, and social viability.

Finally, several projects emphasise the importance of continuous learning and reflection, including the systematic documentation of challenges and adaptations. This not only supports internal management but also contributes to knowledge transfer and policy learning.

Interviewees from **MAGPIE** and **ClieNFarms** both stressed that documenting “what changed and why” is itself an important output of living lab work, since many of the most relevant lessons emerge not from the final solution alone but from the adaptation process followed along the way.

3.3 STAKEHOLDER ENGAGEMENT AND CO-CREATION DYNAMICS

Stakeholder engagement is a defining feature of Living Labs, but also one of their most demanding components.

A common pattern across projects is the importance of early and continuous engagement. Involving stakeholders from the outset helps ensure that activities are aligned with local needs and fosters ownership of results. For example, in **I-CISK**, stakeholder engagement started during the proposal phase, building on existing networks and ensuring that Living Labs were grounded in real challenges from the beginning.

At the same time, Living Labs typically involve highly diverse stakeholder ecosystems, spanning public authorities, research organisations, private sector actors, and civil society. This diversity strengthens the relevance and legitimacy of outcomes but also increases coordination complexity. In **MAGPIE**, for instance, engagement extended from port authorities and municipalities to international industry networks, illustrating the multi level nature of stakeholder involvement.

ClieNFarms provides a particularly strong example of how co-creation can be organised around a sector-specific ecosystem. Here, stakeholder engagement centred on farmers, advisory bodies, research organisations, industry actors, and policymakers. Creative Arenas created spaces where these groups could jointly discuss barriers and opportunities, ensuring that farmers were not treated merely as data providers but as active contributors whose practical knowledge shaped the process.

Maintaining engagement over time represents a further challenge. Stakeholder interest may fluctuate, particularly in early stages when tangible results are not yet visible. Projects address this by creating visible outputs and interaction opportunities, such as demonstrations or events. In the case of **MAGPIE**, stakeholder engagement increased as demonstrators became operational and were showcased to external audiences. Interview evidence also underscores that participation is sustained when stakeholders perceive clear reciprocal value from involvement. This was the case of **ClieNFarms**, where interviewees noted that farmers remained engaged when they could see direct benefits of the solutions implemented by peers, when they received support to implement innovations, or had access to processed information and advice relevant to their own practice. This “give-to-get” principle was repeatedly described as essential to maintaining trust and avoiding the perception that participants were simply being used for project purposes.

Finally, projects must manage the risk of stakeholder fatigue, as participation is typically voluntary and competes with other priorities. In response, initiatives such as **I-CISK** deliberately diversified engagement formats and adjusted interaction intensity to maintain participation without overburdening stakeholders.

This issue was also highlighted in **ClieNFarms**, where participants stressed that long gaps between meetings could weaken engagement and that regular interaction was necessary to keep networks alive. Interviewees underlined that Living Labs should not feel episodic or extractive; rather, they need a rhythm and structure that keeps participants feeling connected, heard, and valued.

3.4 ENGAGEMENT OF PUBLIC AUTHORITIES AND IMPACT ON POLICIES

Public authorities are key actors in Living Labs, particularly in relation to policy alignment, institutional embedding, and long-term uptake. However, their role varies significantly across projects.

In most cases, public authorities are involved as participants and end-users, contributing to co creation processes and benefiting from the outputs. For example, in **I-CISK**, public authorities such as water management bodies and environmental agencies were involved in most Living Labs, reflecting their central role in decision-making and implementation.

However, the degree of engagement depends strongly on the maturity of the living lab context. In **I-CHANGE**, Living Labs building on previous initiatives (e.g. in cities like Bologna or Dublin) benefited from more active engagement of public authorities, including their involvement in co design and implementation of concrete measures. By contrast, in newly established Living Labs, public authorities were often less directly involved and sometimes adopted a more observational role.

Public authorities also play a crucial role in enabling the uptake of results, particularly through policy integration and institutionalisation. In some cases, this translated into tangible contributions to local policy processes, although the extent of this influence varies depending on context and project design.

The **PROBONO** case provides a particularly strong example of this role. The project reported that local authorities were involved from the start in flagship sites such as Madrid and Dublin, partly to secure legal and administrative alignment. In Madrid, this contributed to wider discussions around regulatory barriers affecting district heating and cooling systems, with implications that could extend beyond the local site and inform broader policy frameworks.

At the same time, their involvement is not always decisive. In projects such as **MAGPIE**, which focus on technical and infrastructure innovation, public authorities were involved (e.g. through advisory boards), but the core dynamics were often driven by industry actors and technical partners.

ClieNFarms adds a further perspective, showing that the value of public authority participation lies not only in direct decision-making but also in enabling two-way dialogue. Through Creative

Arenas, policymakers and agencies could hear directly from farmers about practical constraints, costs, or feasibility issues, while farmers were able to express what kinds of support they needed. In this sense, Living Labs can serve as spaces of mutual learning between practitioners and policy actors. This demonstrates that the role of authorities is not limited to formal decision-making; in some cases, their most important contribution is to listen, learn and connect living lab insights to broader institutional debates.

The **SESA** project, however, shows that public authority engagement can take very different forms outside Europe. In several African contexts, local municipalities were less influential than community leaders or chiefs, particularly where land rights and local legitimacy were concerned. This means that the “public authority” dimension of Living Labs needs to be understood in a context-sensitive way: in some settings, formal institutional actors matter most, while in others local traditional leadership is more decisive for uptake and implementation.

3.5 SOCIAL INCLUSION AND ENGAGEMENT OF VULNERABLE GROUPS

The inclusion of vulnerable or underrepresented groups is widely recognised as important, but its implementation remains uneven and context dependent. Evidence from several projects further highlights that inclusion is not only context dependent but also shaped by sectoral boundaries, resource availability and the level of prior experience with participatory approaches.

Projects generally attempt to address inclusion through stakeholder mapping and targeted engagement strategies. In **I-CISK**, for example, stakeholder identification explicitly considered vulnerability, including groups affected by climate risks (e.g., farmers, local communities, and disaster-prone populations in non EU contexts).

At the same time, the notion of vulnerability varies across projects. In some cases, it is defined primarily in socio-economic terms, while in others it is linked to exposure to specific risks or sectoral dynamics. For instance, actors such as tourism operators and boat users were considered vulnerable to climate impacts affecting their activities.

Despite these efforts, direct engagement of vulnerable groups is often limited. In projects such as **MAGPIE** and **ClieNFarms**, inclusion was not a central focus, reflecting the technical orientation of the activities. In ClieNFarms in particular, the living lab approach deliberately focused on actors within the agricultural ecosystem, meaning that broader societal groups (e.g. citizens) were not included, illustrating how inclusion can be intentionally bounded. In other cases, vulnerable groups were engaged indirectly through intermediary organisations rather than through direct participation.

Some projects nevertheless demonstrate more targeted approaches. For example, **oPEN Lab** explicitly engaged vulnerable neighbourhoods, including social housing areas, to ensure that energy transition solutions addressed those most affected.

SESA offers an additional perspective by showing how inclusion can be embedded into the design of technologies and engagement processes. In this case, particular attention was paid to women and youth, both through the selection of companies with female founders or co-founders and through the adaptation of solutions to gendered roles and daily practices. For example, in clean cooking, women were understood as the main users and therefore central to user needs assessment and technology adaptation. Similarly, training and capacity-building activities aimed to ensure women's and young people's participation wherever possible.

At the same time, interviews also showed the limits of inclusion when participation is not compensated. In both **ClieNFarms** and **SESA**, respondents noted that vulnerable participants often face time or resource constraints that make sustained engagement difficult. In **SESA** this was partly mitigated by bringing the solutions directly to local spaces where people already gather, while in **ClieNFarms** interviewees explicitly suggested that future projects should include budget lines or cascade funding to compensate farmers for their time.

This analysis shows that inclusion in Living Labs is rarely automatic: it depends on who is deliberately identified as relevant, how the scope of participation is defined, and whether sufficient resources are available to support engagement.

3.6 SUSTAINABILITY OF LIVING LABS OVER TIME

Ensuring the continuation of Living Labs beyond project funding remains a major challenge.

A key issue is the strong dependence on project-based funding, which often limits the lifespan of living lab activities. While projects can establish strong partnerships and processes, these do not always translate into long-term structures. For example, in **I-CISK**, collaboration between stakeholders is expected to continue informally, but no formal mechanism ensures sustained support after the project ends. This suggests that the continuation of living lab activities beyond H2020 funding is not guaranteed and depends largely on the ability of projects to embed their approaches into existing structures or ongoing initiatives. This means that in some cases the networks, relationships, or knowledge created through the living lab may persist, but the living lab as a structured and resourced framework may not.

At the same time, some projects demonstrate pathways towards sustainability through network-building and institutional linkages. In **MAGPIE**, for instance, collaboration around emerging technologies (e.g. alternative fuels) contributed to the development of broader networks extending beyond the project scope. Interview evidence also suggests that, in **MAGPIE**, some partners were willing to contribute additional resources beyond their formal project roles, which indicates a degree of commitment that may support continuity, even if not necessarily through a formally maintained living lab structure.

Evidence also suggests that sustainability depends on early planning and institutional embedding. Insights from **oPEN Lab** indicate that Living Labs are more likely to persist when they are integrated into broader local initiatives, governance frameworks, or organisational structures. The interviews further suggest that continuity is more plausible where living lab activities are linked to existing urban strategies, municipal processes, or organisational mandates, rather than remaining standalone project components.

ClieNFarms adds that sustainability can also emerge from stakeholders' continued willingness to maintain relationships after project closure. Interviewees explained that some farmer groups intended to continue interacting because they had experienced real value from the exchange process. However, continuation often depended on whether local managers or coordinators remained in place through permanent institutional roles. This underlines that social sustainability and long-term continuity are closely linked to the presence of trusted intermediaries and facilitation capacity, without which networks may weaken over time.

SESA provides yet another sustainability pathway, one rooted less in public or networked continuation and more in commercial incentives. Because several of the solutions were implemented by SMEs already active in the target markets, continuation was more likely where the project had helped them test or expand viable business opportunities. At the same time, the interviews show that this model remains fragile: affordability constraints, exchange-rate fluctuations, transport and customs issues, and changing local purchasing power can all affect whether a solution remains commercially viable after project funding ends.

Across the analysed cases, different sustainability trajectories can therefore be identified. In some projects, continuation is likely to take the form of informal stakeholder networks or ongoing collaboration between actors, as in **I-CISK** and partly in **ClieNFarms**. In others, continuity depends on stronger institutional embedding, as suggested in **oPEN Lab**, or on broader sectoral collaboration and partner commitment, as in **MAGPIE**. More market-based continuation pathways appear in **SESA**, where SMEs may continue deploying solutions if viable business opportunities exist. **PROBONO** adds a more formalised approach, as interviewees described ongoing efforts to build business cases for Living Labs as entities that could continue beyond the project. Importantly, these business cases do not concern single innovations in isolation, but also the synergies between multiple innovations and the extent to which they can jointly create value. The use of methodologies such as the Five Cases model illustrates a more structured attempt to address post-project sustainability.

Financial sustainability is a central dimension of these dynamics. Across projects, there is a growing recognition that reliance on EU project funding alone is insufficient to ensure continuity. Different models have been explored in response. In **oPEN Lab**, this includes combining multiple funding sources, such as public funding, private contributions, and service-based activities. In **MAGPIE**, committed partners have in some cases supported continuity by contributing resources beyond the project budget. In **PROBONO**, the focus is on building business cases that can justify continuation at

living lab level. In SESA, viability depends more directly on whether technologies and business models remain affordable and attractive to users. In **ClieNFarms**, by contrast, financial sustainability was discussed less in terms of formal business models and more in relation to the resources needed to support participation itself: interviewees stressed that the lack of compensation for farmers limited both the inclusiveness and the long-term viability of the approach, and suggested that future projects should budget more explicitly for stakeholder time and involvement.

At the same time, interview evidence shows that sustainability cannot be reduced to funding alone. The long-term continuation of Living Labs also depends on what could be described as their social sustainability: whether they generate lasting trust, ownership, and motivation among stakeholders. Across multiple interviews, a recurrent message was that participants remain engaged only when they feel they are genuinely part of the process and not simply being mobilised for project purposes. In **ClieNFarms**, this was expressed very explicitly, with interviewees stressing that farmers should not feel “used” by the project, but should instead see the living lab as a space where their knowledge is valued and where they receive practical benefits in return. Regular interaction, peer learning, visible outcomes, and the continuity of relationships were all described as essential to maintaining this sense of ownership over time. Conversely, where engagement becomes too sporadic, motivation and trust may decline, reducing the likelihood that living lab activities or networks will continue once funding ends.

Overall, the analysis shows that while many Living Labs create valuable processes, relationships, and lessons during their implementation, only a limited number currently provide concrete evidence that the living lab itself, as an organised and resourced structure, will continue beyond the project lifecycle. In practice, future continuity appears most credible where early planning for sustainability is combined with institutional embedding, diversified funding approaches, viable business models, or strong stakeholder ownership. This suggests that ensuring the sustainability of Living Labs requires an integrated approach that addresses financial, institutional, and social dimensions from the outset, rather than treating continuation as an end-of-project concern.

3.7 SCALING UP AND REPLICATION

Scaling and replication are key objectives but remain difficult to achieve. Projects often facilitate scaling through knowledge exchange and dissemination, including events, workshops, and collaboration with external stakeholders. For example, **MAGPIE** organised stakeholder events and engaged with broader sectoral networks, supporting the transfer of knowledge and practices to other contexts. Similarly, in **ClieNFarms**, scaling was supported through demonstration events, cross-country exchanges, and peer-to-peer learning among farmers and living lab managers, enabling participants to share experiences and practices across different contexts.

In addition, projects may develop tools, roadmaps, or guidelines to support replication. **MAGPIE**, for instance, worked on strategic roadmaps and tools to enable other ports to adopt similar solutions. In

ClieNFarms, structured guidelines for key processes—such as demonstration events and “Creative Arenas”—were developed and shared across partners, providing a framework that could be reused and adapted in other contexts. Similarly, **oPEN Lab** produced handbooks and capacity-building materials to synthesise lessons learned and support uptake by other cities and initiatives.

However, scaling is constrained by regulatory frameworks, local specificities, and resource limitations. As highlighted in **oPEN Lab**, sectoral fragmentation and differing regulatory regimes can make it difficult to transfer solutions across contexts. Importantly, scaling is not about replicating identical models, but about adapting approaches to new contexts, which requires flexibility and contextual understanding. This is also reflected in **ClieNFarms**, where Living Labs were intentionally designed to reflect different pedo-climatic, geographic, and production system conditions, making direct replication less relevant than context-specific adaptation.

This point is strongly reinforced by additional interviews. In **PROBONO**, replication was approached through methodological transfer, for example by using mapping tools and frameworks that can help other projects align innovations, objectives, and sites. In **ClieNFarms**, the Creative Arena method was itself seen as a transferable output: while there was no direct mass replication of whole Living Labs, partners began adapting the methodology for other purposes and sectors, showing that scaling can occur through methods and practices rather than through full structural duplication. A similar dynamic can be observed in **oPEN Lab**, where methodologies and learning processes developed in pilot sites were intended to inform other urban contexts, even if the specific solutions required adaptation to local regulatory, social, and technical conditions.

SESA likewise underlined that replication depends on context adaptation rather than copy-paste transfer. Some business models or technologies worked well in one setting but not in another, even within the same country. The interviews therefore suggest that scaling should be understood less as standardisation and more as translation: what matters is whether the principles, tools, or solutions can be reconfigured in ways that fit new local realities. Overall, both **ClieNFarms** and **oPEN Lab** reinforce this perspective, showing that scaling most often occurs through the transfer of approaches, methodologies, and knowledge products rather than through the replication of identical models.

These findings suggest that scaling should be understood less as copy-paste transfer and more as translation: the challenge is not to reproduce identical Living Labs, but to adapt principles and methodologies to different contexts.

3.8 CONTRIBUTION TO SYSTEMIC INNOVATION

Living Labs contribute to systemic innovation by enabling cross-sectoral experimentation and learning.

They support integration across sectors and governance levels, facilitating collaboration between actors that would otherwise operate in isolation. For example, **I-CISK** demonstrates how Living Labs

can connect actors across water management, agriculture, and tourism, contributing to integrated climate adaptation approaches.

Living Labs can also act as catalysts for broader transformations by identifying system gaps and generating demand for new solutions. In **MAGPIE**, experimentation with new energy solutions highlighted infrastructure and regulatory needs, contributing to developments beyond the project itself.

At the societal level, Living Labs support learning and behavioural change, although this remains a long-term and complex process. As illustrated in **I-CHANGE**, raising awareness and engaging stakeholders can be achieved at scale, but translating this into sustained behavioural change is significantly more challenging.

Finally, Living Labs reinforce the need for a systemic perspective, recognising interdependencies across sectors and domains. Insights from **oPEN Lab** underline that addressing complex sustainability challenges requires moving beyond sectoral approaches and embracing integrated, cross cutting strategies.

The additional interviews enrich this perspective by showing that systemic innovation is not limited to technological integration. In **SESA**, innovation often lies equally in the business model or in the social arrangements needed to support uptake, such as collective ownership models or new ways of organising access to services. In **ClieNFarms**, systemic innovation emerged through the creation of new exchange structures linking farmers, advisors, researchers and policymakers, thereby shifting not only what solutions were discussed but how knowledge circulated within the agricultural system. **PROBONO** similarly shows that systemic innovation may occur when demonstration activities trigger broader legal, administrative, or planning changes, particularly where innovations expose regulatory gaps or institutional misalignments.

Taken together, these findings suggest that Living Labs contribute to systemic innovation not because they solve entire systems on their own, but because they make system interdependencies visible, test practical alternatives, and create spaces where technical, social, financial, and policy dimensions can be addressed together.

At the same time, interview material from **oPEN Lab** points to a further challenge: Living Labs are often most relevant when they are problem-driven and address “wicked” issues, but the outcomes they generate are not always easy to measure, especially when they involve longer-term behavioural or institutional change. This reinforces the need to recognise intangible and longer-term effects as part of the value of Living Labs, even when these are harder to quantify than immediate technical outputs.

4 CONCLUSIONS

This report has set out to examine how Living Labs are applied within Green Deal Call (GDC) projects and to assess their contribution to bridging research and innovation (R&I) activities with real-world experimentation and uptake.

The analysis confirms that Living Labs represent a valuable and increasingly central approach for supporting the transition towards climate neutrality and sustainable innovation. By enabling co-creation, real-world testing, and collaboration across diverse stakeholders, they offer a practical framework to translate research outputs into actionable solutions.

At the same time, the findings highlight that the implementation of Living Labs is inherently complex and shaped by a range of structural challenges. Living Labs operate in uncertain and dynamic environments, where predefined project frameworks must continuously adapt to evolving technical, regulatory, and socio-economic conditions. This requires a high degree of flexibility, both in methodological design and in operational delivery, as well as iterative decision-making processes throughout the project lifecycle to ensure feasibility and relevance under changing conditions.

A central finding of the analysis is that stakeholder engagement is both a key strength and a critical challenge of Living Labs. While multi-actor participation enhances the relevance and legitimacy of outcomes, it also introduces coordination complexity and requires sustained facilitation efforts. Successful living lab implementation depends on the ability to maintain long-term engagement, ensure mutual value for participants, and build trust over time.

The report also underscores the time- and resource-intensive nature of co-creation processes. Meaningful collaboration cannot be achieved through isolated activities but requires iterative interaction, capacity building, and continuous learning within projects. In this sense, Living Labs function not only as spaces for experimentation, but also as processes of collective learning, where adaptation and knowledge exchange play a central role. Another key conclusion concerns the need to strengthen the systemic dimension of Living Lab approaches. Many of the challenges addressed through GDC projects can be understood as complex “wicked problems”, requiring integrated and long-term responses. While Living Labs provide a valuable framework for experimentation, their potential remains partially underexploited when they focus primarily on isolated solutions. To maximise their impact, Living Labs need to be more explicitly designed as instruments for systemic innovation; this means embedding long-term thinking, addressing interdependencies across sectors, and linking experimentation to broader transformation processes.

Closely related to this, the sustainability of Living Labs beyond the project lifecycle remains a major concern. In many cases, activities are closely tied to project funding and lack mechanisms for continuation. Ensuring long-term impact requires moving beyond short-term project logic and

establishing more durable structures, including institutional anchoring, viable business models, and ongoing stakeholder engagement. It also suggests a need to shift the focus of funding from individual solutions towards sustained problem-solving processes that can evolve over time.

Finally, the analysis highlights that Living Labs contribute to systemic innovation not by delivering immediate large-scale transformation, but by acting as catalysts. They create spaces where technological, social, organisational, and policy dimensions can be jointly explored, tested, and aligned. In doing so, they make system interdependencies visible, generate evidence, and support pathways for scaling and replication.

In conclusion, Living Labs represent a powerful but demanding instrument for bridging R&I and real-world uptake. Their effectiveness depends on the ability to combine flexibility with structure, short-term experimentation with long-term vision, and local relevance with systemic ambition. Strengthening these dimensions will be essential to fully realise their potential within future European research and innovation programmes.

5 RECOMMENDATIONS FOR THE DESIGN AND IMPLEMENTATION OF LIVING LABS

5.1 STRATEGIC RECOMMENDATIONS FOR PROJECT COORDINATORS

Based on the comparative analysis, several practical recommendations can be derived for project coordinators planning and implementing Living Labs:

Design flexible living lab processes supported by robust stakeholder engagement

Living Labs operate in complex, real-world environments where conditions, stakeholder needs, and opportunities often evolve over time. While structured methodologies are essential to provide direction and coherence, projects should be designed with sufficient flexibility to allow for iterative adjustments in timelines, solutions, and engagement approaches. Achieving this requires early and continuous stakeholder engagement. Coordinators should invest in comprehensive stakeholder mapping from the outset and develop tailored engagement strategies that reflect different interests, capacities, and roles. Engagement should be viewed as an ongoing process rather than a one-off activity, with adequate resources and facilitation dedicated to maintaining participation and adapting project activities as circumstances change.

Allocate sufficient time and resources for co-creation

Co-creation processes are inherently time-intensive and often underestimated. Projects should ensure that sufficient time is allocated for trust-building, iterative exchanges, and capacity building. This includes planning for repeated interactions rather than isolated consultation activities.

Strengthen local coordination and facilitation capacity

The effectiveness of Living Labs largely depends on the role of local coordinators or managers. These actors are essential for organising activities, maintaining engagement, and adapting methodologies to local contexts. Investing in their training and ensuring continuity of their role can significantly improve implementation outcomes.

Ensure tangible value for participants

Sustained engagement depends on stakeholders perceiving clear benefits from participation. Living Labs should therefore be designed as reciprocal processes, where participants gain access to knowledge, networks, or practical support. Avoiding the perception that stakeholders are only being “used” for data or testing is essential for long-term trust and engagement.

Integrate early thinking on sustainability

Sustainability should be considered from the outset, rather than as an end-of-project concern. This includes exploring business models, identifying institutional and legislative anchoring opportunities, and planning for the continuation of activities or networks beyond project funding.

Consider contextual constraints explicitly

Project design should integrate context-specific constraints from the outset, including regulatory requirements, infrastructure availability and local economic conditions. In practice, this involves assessing feasibility early on (e.g. permitting or administrative barriers), planning for adjustments where initial assumptions prove unfeasible, and accounting for affordability, market conditions, and logistical constraints such as transport or customs issues. It also requires engaging key local actors early (e.g. authorities, regulators, or community leaders) to anticipate both formal and informal barriers. Embedding these elements upfront helps reduce implementation risks, avoid delays, and improve uptake of solutions.

5.2 STRATEGIC RECOMMENDATIONS FOR THE EUROPEAN COMMISSION

The analysis also points to several areas where European-level support could further strengthen the effectiveness of living lab approaches:

Introduce greater flexibility in project frameworks

The inherent flexibility of Living Labs is often constrained by rigid project structures, including fixed work plans, milestones and deliverables. Introducing mechanisms that allow for justified adaptations during implementation - while maintaining accountability - would better reflect the realities of living lab processes.

Strengthen support for stakeholder engagement and co-creation

While projects are responsible for designing their engagement strategies, evidence from the analysed cases shows that co-creation is often under-resourced and underestimated in practice. To address this, future funding programmes could more explicitly require and enable robust stakeholder engagement by introducing clearer expectations and dedicated support mechanisms. This could include setting minimum standards or evaluation criteria for co-creation activities in proposals, explicitly recognising stakeholder engagement as a core project component (rather than a supporting activity), and allowing or encouraging dedicated budget allocations for facilitation, coordination staff, and compensation of participants where relevant. Such measures would help ensure that engagement is treated as a structural element of project design, aligned with its critical role in achieving uptake and impact.

Support continuity beyond project funding

A major challenge across projects is the discontinuity that occurs when funding ends. The Commission could consider mechanisms to support the continuation of Living Labs, such as follow-up funding schemes, integration into existing policy initiatives, or linkages with long-term programmes (e.g. missions, partnerships).

Enhance support for regulatory and institutional alignment

Projects frequently encounter regulatory and institutional barriers when implementing innovations in real-world settings. While support structures such as CSAs and National Contact Points already exist, their focus is often general rather than tailored to project-level implementation challenges. The European Commission could strengthen its role by encouraging earlier and more structured interaction between projects and relevant regulatory actors, for example by requiring or incentivising the involvement of public authorities and regulatory stakeholders from the proposal stage, and by supporting cross-project exchanges on regulatory barriers and solutions. In addition, targeted guidance or thematic workshops focused on specific regulatory challenges (e.g. energy systems, urban planning, or climate services) could help projects anticipate and navigate constraints more effectively.

Promote knowledge sharing and cross-project learning

There is significant value in sharing experiences, methodologies, and lessons learned across projects. The Commission could strengthen platforms and mechanisms for networking and exchange, enabling projects to build on existing knowledge rather than developing approaches in isolation and “reinventing the wheel”.

Encourage more explicit consideration of business models and market uptake

Sustainability is closely linked to economic viability. Encouraging projects to explore business models, involve private sector actors, and consider market conditions from the outset can improve the likelihood of long-term uptake and impact.

5.3 FUTURE PERSPECTIVES FOR LIVING LABS

Looking ahead, Living Labs have strong potential to play an increasingly important role in supporting the implementation of EU policy objectives, particularly in areas such as the Green Deal, climate adaptation, and sustainable innovation. However, several areas offer opportunities for further development and improvement:

Expanding the scope of Living Labs beyond technological innovation

The analysis shows that successful Living Labs increasingly address not only technological solutions but also organisational, social, and financial dimensions. Future initiatives could further strengthen this integrated approach by explicitly incorporating business models, governance arrangements, and behavioural aspects into Living Lab design.

Strengthening links between Living Labs and policy processes

Living Labs have the potential to inform policy development by providing real-world evidence and facilitating dialogue between stakeholders and decision-makers. Strengthening these linkages – through more structured interaction with public authorities or integration into policy cycles – could enhance their impact on systemic change.

Enhancing inclusiveness and engagement of vulnerable groups

While inclusion is widely recognised as important, its implementation remains uneven. Future projects could further develop targeted strategies for engaging vulnerable or underrepresented groups, including through adapted engagement formats, collaboration with intermediary organisations, or dedicated funding mechanisms.

Developing more robust sustainability models

Ensuring the long-term continuity of Living Labs remains a challenge. Further innovation is needed in developing sustainable models, including hybrid approaches combining public funding, private investment, and community-driven initiatives. Embedding Living Labs within existing structures – such as local organisations or policy frameworks – can also improve their long-term viability.

Supporting scaling and replication through methodologies and tools

Scaling is most effective when it focuses on transferring approaches, tools, and lessons rather than replicating identical models. Developing user-friendly methodologies, toolkits, and guidance can facilitate this process and support adaptation to new contexts.

Leveraging digital tools and data for coordination and learning

Digital solutions offer opportunities to improve coordination, data sharing, and knowledge management across Living Labs. However, their sustainability and maintenance remain key challenges that require further attention.

Strengthening cross-sectoral integration

Living Labs are particularly valuable in addressing complex challenges that cut across sectors. Future initiatives could further promote cross-sectoral collaboration, enabling more integrated approaches to sustainability challenges and fostering systemic innovation.

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