REWAISE
Resilient Water Innovation for Smart Economy

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VALUE IN WATER
VALUE FROM WATER
VALUE THROUGH WATER

REwaise
Resilient Water Innovation for Smart Economy

Value **IN** Water

Value **FROM** Water

Value **THROUGH** Water

Living Lab Methodology and Online Handbook

Index

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With Living Labs **we value water** as a vital vector to generate new **resources**, **wealth** and **health**

Frank Rogalla

Project Coordinator AQUALIA

About The Toolkit

The REWAISE Living Labs target to demonstrate in real-life, large scale operational environment the technological innovations to extract the value in, from and through water, contributing to a **secure smart water supply** for the European society.

The REWAISE Living Lab **methodology and online handbook** aims to provide the core theoretical background on the value of Living Labs and offer hands on guidelines on setting up and running efficiently Living Lab constellations.

The preselection of the existing tools and toolkits supports the development of the **REWAISE** Living Labs and enable the running of impactful pilots. This entails the selection of design-based process from the problem analysis to the ideation of a solution, the development of a prototype and its experimentation in a real-world context.

The main goal of the **REWAISE** Living Lab handbook is **to clarify the typology of Living Labs, provide support to mature the co-creation labs** in establishing a sustainable path for them and enable the implementation of impactful pilots.

The different chapters of the handbook reveal information **on the value of Living Labs**; the essentials on **setting up a Living Lab**; the importance of **real-life experimentations in Living Labs** and **hints and tips under the Build my Living Lab stakeholder mapping; best practices on quadruple helix stakeholder engagement** and updates on the **REWAISE Living Lab mapping** activity.

The Value of Living Labs

> **"**
>
> Living Labs are increasingly facilitating new ways to stimulate innovation.
> They offer the possibility to catalyse how innovation can be carried out, focusing on user communities supported by information technology.
>
> **Maurice D. Mulvenna**
> 2011

> **"**
>
> Living Lab services can lead to an increased visibility, a shortened development process, improved products, and an enhanced learning and understanding about innovation processes and user involvement.
>
> **Anna Ståhlbröst**
> 2013

What is **Open Innovation** and a **Living Lab**?

Figure 1
Closed versus Open Innovation: Isomäki, Atte (2018). **Open Innovation - What It Is and How to Do It.** VIIMA - A Hype Innovation Company.

According to the European Commission, the basic premise of Open Innovation, is to open up the innovation process to all active players so that knowledge can circulate more freely and be transformed into sustainable products and services for all. This means that innovation can no longer be the result of predefined and isolated activities but rather the outcome of a complex co-creation process that involves knowledge flows and absorptive capacities from all actors involved across the entire economic and social environment (European Commission, 2016).

Closed Innovation

— Corporate Limit

⬥ Internal Idea

Open Innovation

- - Corporate Limit

⬥ External Idea

External Collaboration

Alternative Market

MARKET

In the case of **REWAISE** Living Labs, the engagement of external stakeholders is essential for the better uptake of the Living Lab paradigm and buy in from the external supporters and host organisation (all quadruple helix stakeholders).

The deliverable D9.1 - Stakeholder mapping and societal contexts in each Living Lab – includes a visual and preliminary overview of each interviewed **REWAISE** Living Lab's quadruple helix ecosystem, highlighting the essential contacts for:

1 Organisations that the **REWAISE** partners already have a connection with or know;

2 Actors that were mentioned during the interviews conducted under "Analysing societal context for the Living Lab" task ;

3 Actors that were added to the stakeholder database through the questionnaires.

In addition, host organisation examples and core stakeholders have been mapped for Midlands, Vigo and Skåne Living Labs under the initial Living Lab mapping canvas interviews.

By using the open innovation scheme, the developed solutions are aimed to be made **scalable and replicable** to other municipalities and utilities across Europe and the world, fostering the **transition towards resilient and smart water services**.

In this context, Living Labs operate as **intermediaries/orchestrators** among citizens, research organizations, companies & government agencies/levels.

Living Labs are open innovation ecosystems in **real-life environments** using **iterative feedback processes** throughout a **lifecycle approach** of an innovation to create **sustainable impact**.

They focus on **co-creation**, rapid **prototyping and testing** and **scaling-up** innovations & businesses, providing (different types of) joint-value to the involved stakeholders.

Within a **wide variety of types of Living Labs** and their implementation, they all have **common characteristics** (**building blocks**).

Benefits
of using the Living Lab methodology

1 CO-CREATING INNOVATION/SOLUTIONS

2 MASTERING THE VALUE CHAIN OF THE GIVEN PROJECT

3 IDENTIFYING KEY STAKEHOLDERS

4 UNDERSTANDING THE BUSINESS OF KEY STAKEHOLDERS

5 RECOGNIZING THE VALUE CREATED FOR THE STAKEHOLDERS

6 DEVELOPING MANAGEMENT CAPABILITIES TO CREATE VALUE FOR THE STAKEHOLDERS

7 PROVIDING STRATEGIC INTELLIGENCE TO GUIDE STAKEHOLDERS INTO VALUE CREATION

8 KNOWLEDGE TRANSFER TO IMPROVE VALUE FOR STAKEHOLDER

In the **REWAISE project**, water specific Living Labs contribute to:

A water-smart society

Establishing a common framework of digital innovations to support alternative water management.

⬥ Living Lab projects help to evaluate the REWAISE platform objectives, by experimenting the common digital platform. The main goal is to establish a common framework of digital innovations that support alternative water management strategies, optimizing existing infrastructure and giving insights in decision making to different stakeholders (operators, authorities, consumers, citizens) in the value chains (urban, rural, industrial, agricultural).

New business models

REWAISE will create new market niches for alternative products obtained in the project and also attract investors to the innovative processes and services in water-smart activities.

⬥ Beyond available governance models of Living Labs, the New Business Models, Alternative Funding for Market Uptake and Dissemination work package is specifically supporting this action.

New governance methods

The project will redefine the governance models and provide recommendations that can remove unnecessary legal barriers to innovation in Europe.

⬥ Besides available governance models of Living Labs, the developing governance strategy for water smart communities task is specifically supporting this action and already Deliverable 9.1 Stakeholder mapping and societal contexts in each Livign Lab addressed information about the governance profile of each Living Lab.

Social engagement

The **REWAISE** Living Labs are based on an understanding of their social context toward water-smart communities.

Water Living Lab type of activities have been previously mapped within the **Atlas of EU Water-oriented Living Labs** publication by Water Europe and categorized them by water demand zone as:

1. Living Lab Research platforms

2. EU Network platforms

3. Living Lab Project platforms

Figure 2
Water Living Lab type of activities

They are collectively called as, Water-Oriented Living Labs (WoLLs) and are defined as: real-life, water oriented and demo-type and platform-type environments with a cross-sector nexus approach, which have the involvement and commitment of multi-stakeholders (including water authorities) and a certain continuity (good chance to continue to their existence), and provide a "field lab" to develop, test, and validate a combination of solutions), which include technologies, their integration as well as combination with new business models and innovative policies based on the value of water.
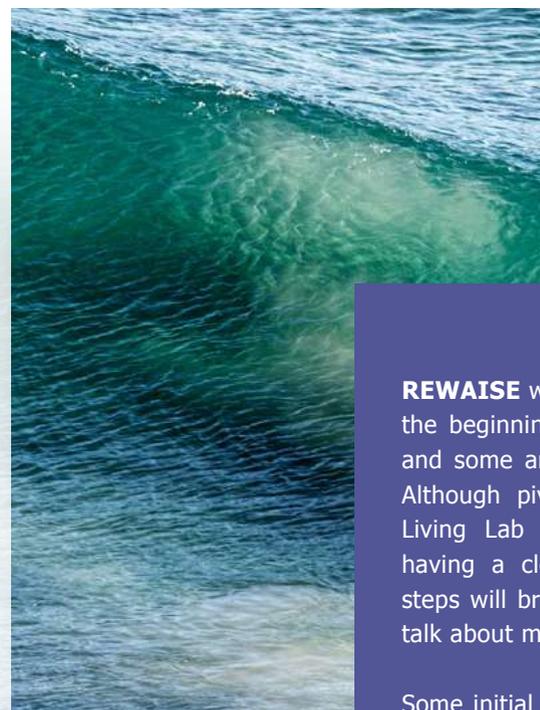
REWAISE water Living Labs are mostly at the beginning of their Living Lab journey and some are still at the initiation stage. Although pivoting between the different Living Lab models is possible anytime, having a clear strategy from the initial steps will bring better results whether we talk about micro, meso or macro level.

Some initial tools and toolkits collected at the end of the handbook are suggested to help setting up the strategic plan for the **REWAISE** Living Labs.

What a
Living Lab is **not**?

Is a Living Lab a real laboratory?

A Living Lab, in contrast to a traditional laboratory, operates in a real-life context with a user-centric approach. The physical and/or organisational boundaries of a Living Lab are defined by purpose, scope, and context. The scope, aims, objectives, duration, actor involvement, degree of participation, and boundaries of a Living Laboratory are open for definition by its participants. A Living Laboratory could thus be established on a street, in a house, within an organization, or include a whole city or industry, depending on the project.
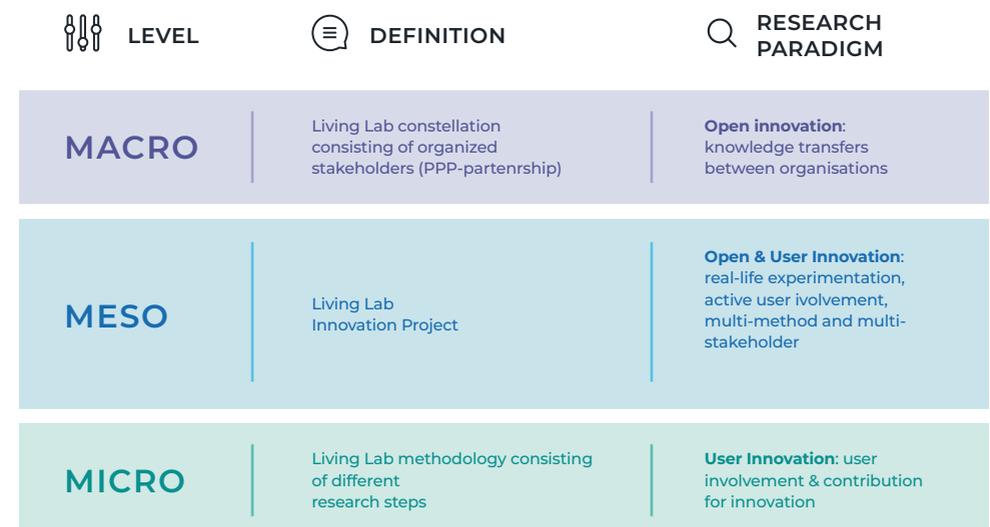
Are Living Labs testbeds?

Living Labs are often confused with early testbeds. The main difference in their philosophy is to turn users, from being traditionally considered as observed subjects for testing modules against requirements, into value creation in contributing to the co-creation and exploration of emerging ideas, breakthrough scenarios, innovative concepts and related artefacts. Hence, a Living Lab rather constitutes an experiential environment, which could be compared to the concept of experiential learning, where users are immersed in a creative social space for designing and experiencing their own future. Living Labs could also be used by policymakers and users/citizens for designing, exploring, experiencing and refining new policies and regulations in real-life scenarios for evaluating their potential impacts before their implementations.

Is a Living Lab a project, methodology or research paradigm?

It is important to make a difference between Living Lab research, a Living Lab project and Living Lab constellations.

To allow a better conceptualisation, Schuurman (2015) developed a three-layered model, consisting of a macro-level with the Living Lab constellation, the meso-level with a Living Lab innovation project and the micro-level with the different methodological research steps. Open Innovation concepts can be used to analyse the macro level, whereas the User Innovation literature could be used on the micro level. Through co-creation, both levels merge on the meso level, resulting in useful contributions to the innovation in development.

Figure 3
The three-layered Living Lab model introduced by Schuurman (2015)

| LEVEL	DEFINITION	RESEARCH PARADIGM
MACRO	Living Lab constellation consisting of organized stakeholders (PPP-partenrship)	**Open innovation**: knowledge transfers between organisations
MESO	Living Lab Innovation Project	**Open & User Innovation**: real-life experimentation, active user ivolvement, multi-method and multi-stakeholder
MICRO	Living Lab methodology consisting of different research steps	**User Innovation**: user involvement & contribution for innovation

True or False?

It has been expressed by **REWAISE** partners and **REWAISE** Living Labs that they struggle to grasp the exact meaning of the Living Lab concept and are uncertain whether their Living Lab would qualify based on the most known definitions. It was suggested to give examples where a constellation is not qualifying as a Living Lab so partners can better categorise their own cases.

For this reason, Living Lab labelling experts from the ENoLL network - Evdokimos Konstantinidis – ENoLL Chairman, Francesca Spagnoli – ENoLL Head of Projects and Capacity Building, Koen Vervoort – ENoLL Network Builder - were asked what the usual areas are where someone can have a wrong interpretation about what a Living Lab is and is not (**T: true**; **F: false**):

F Users are present to provide feedback. However, they are not an active player in the innovation loop.

T A Living Lab is not just an institution; it is an innovation ecosystem that should learn from continuous loops of failures and wins in the constant flux of generating open innovation with its stakeholders.

T A Living Lab does not create value only for one stakeholder. It is closer to a multi-value approach where the question "what's in it for me" can be answered by all the stakeholders.

F A Living Lab is something you run on the side.

T Living Labs need dedicated roles operationally and enough allocated time to make it a success.

F If we co-create, we are "Living Labbing".

T Thinking of a Living Lab as a closed system is the biggest misconception one can make in the open innovation context. The essence of Living Labs is centred around the concept of "sharing is caring". All categories of stakeholders should be involved in the process of co-design, co-developing and co-creating innovation from day zero until the end of the innovation life cycle.

F The value of the Living Lab is in the money. Inclusive values for all stakeholders on a societal, economic, and environmental scale.

F A Living Lab is working locally and is linked to a physical space.

T A Living Lab is not a "cold" testbed where an actor of the quadruple helix can test a solution by engaging the other actors of the quadruple helix. It is a process where all the actors of the quadruple helix understand better the other actors and mutually exchange experiences and lessons learnt when involved in Living Lab activities.

T A Living Lab approach cannot oblige the involved actors to follow a strict plan of actions. In Living Labs, the solutions follow the normal behaviour of the experimenters.
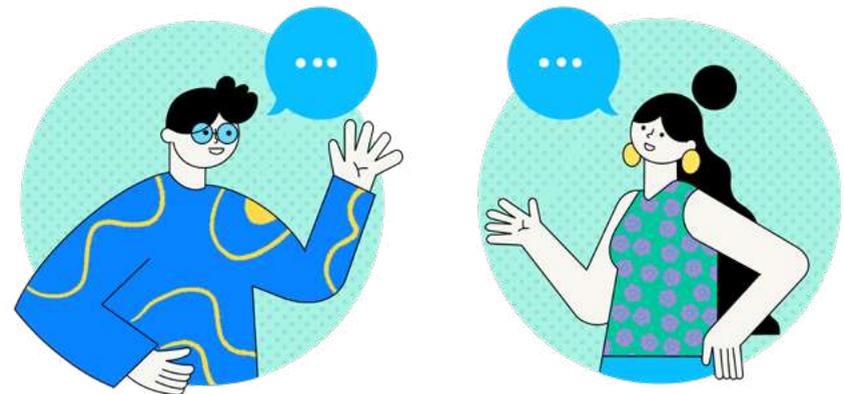
Typologies of **Living Labs** and **Quadruple Helix Engagement**

Living Labs bring experimentation out of companies' Research & Development (R&D) departments to real-life environments with the participation and co-creation of users, partners, and other parties. The study of Leminen et al. (2012) discusses Living Labs as **four different types of networks** characterized by open innovation:

Utilizer-driven
Provider-driven
Enabler-driven
User-driven

Knowing the characteristics of each type of Living Lab will help them to identify which actor drives the innovation, to

anticipate likely outcomes, and to decide what kind of role they should play while "Living Labbing".

As introduced in a previous section: **'What is Open Innovation and a Living Lab'**, there have been classifications made also for the water specific Living Labs (WoLLs): Research driven, Network driven, and Project driven. In addition to that, from the market angle, the following typologies have been identified for **WoLLs**:

	Utilizer-driven	**Provider-driven**	**Enabler-driven**	**User-driven**
PURPOSE	Strategic R&D activity with preset objectives	Strategy development through action	Operations development through increased knowledge	Problem solving by collaborative accomplishments
ORGANIZATION	Network forms around an utilizer, who organizes action for rapid knowledge results	Network forms around a region (regional development) or a funded project (e.g., public funding)	Network forms around a provider organization(s)	Network initiated by users lacks formal coordination mechanisms
ACTION	Utilizer guides information collection from the users and promotes knowledge creation that supports the achievement of preset goals	Information is collected and used together and knowledge is co-created in the network	Information is collected for immediate or postponed use; new knowledge is based on the information that provider gets from the others	Information is not collected formally and builds upon users' interest; knowledge is utilized in the network to help the user community
OUTCOMES	New knowledge for product and business development	Guided strategy change into a preferred direction	New knowledge supporting operations development	Solutions to users' everyday-life problems
LIFESPAN	Short	Short / Medium / Long	Short / Medium / Long	Long

	SOLUTION PROVIDER DRIVEN	**PUBLIC (WATER) AUTHORITY** DRIVEN	**PUBLIC-PRIVATE PARTNERSHIP** DRIVEN	**CITIZENS** DRIVEN
	Solution providers-driven Living Labs (short-term and project-based): Companies launching Living Labs to collect data on test-users of new products and services and to develop their businesses	**Public (water) authority-driven Living Labs (long-term and trans-formative):** Public sector actors launching projects thet pursue social innovation and improvements.	**PPP-driven Living Labs (short-term project based or long-term transformative):** Public and private organizations launching Living Labs to co-develop new products, services and solutions by providing their network based on their portfolio and assets.	**Citizens-driven Living Labs (long-term transformative or project-based):** Citizens communities launching Living Labs to solve users' problems and develop a community of interest in the long-term.
OBJECTIVE	Strategic R&D activity with preset objectives	Strategy development through action	Operations development through increased knowledge	Problem solving by collaborative accomplishments
ORGANIZATION	Networks forms around a solution provider, who organizes actions	Network forms around a region or a founded project	Operations development through increased knowledge	Network initiated by users lacks formal coordination mechanisms
ACTION	Solution provider guides information collection from the users to achieve preset goals	Information is collected and used together and knowledge is co-create in the network.	Information is collected for immediate or postponed use; new knowledge is based on the information that PPP partners gets from the others.	Information is not collected formally and builds upon users' interests; knowledge is utilized in the network to help the user community.
OUTCOMES	New knowledge for product and business development	Guided strategy change into a preferred direction	New knowledge supporting operations development	Solutions to users' everyday-life problems
LIFESPAN	Short	Short / Medium / Long	Short / Medium / Long	Long

During the first interactive session hosted in 2022, besides clarifying the terminologies and categorisations, each **REWAISE** Living Lab positioned their organisation within a Living Lab type and a Water oriented Living Lab WoLL typology. While some more mature Living Labs show closer connection to certain Living Lab types: i.e., Midlands could likely be going into the direction of a Provider-driven Living Lab, whereas Skåne Living Lab seems to be more an Enabler-driven one, these categorisations must be understood and self-assessed with facilitation by the Living Lab core team itself.

There are visible and clear connections between the WoLLs characterisation and the quadruple helix model representatives: Citizen Driven-Civil Society and Governmental-Public helix, while the remaining two characteristics divert somehow from the helix pillars: Solution providers – Industry and Business and Public-Private – Academia and Universities. In case of strong collaboration with universities: University of Santiago de Compostela and water companies: Aqualia this connection is vivid, such as in Vigo Living Lab.

Industry, Academia, Public Authorities and Citizens are part of the so-called **Quadruple Helix model (QHM)**, where users are placed at the heart of the innovation ecosystem. This means that citizens/users must be considered as actors, not factors, of the innovation process. Actors have their own knowledge base, individual needs, and reasons to contribute to the creation of new products and services. In this vein, co-creation relates to the various levels of involvement of end-users in the different stages of service/product development.

ACADEMIA & UNIVERSITIES

INDUSTRY & BUSINESS

GOVERNMENT & PUBLIC SECTOR

CIVIL SOCIETY

The QHM is an extension of the Triple Helix Model (THM) and was first defined by Carayannis and Campbell (2009) in order to represent the civil society and how they are invited to participate in knowledge and innovation creation.
Both models refer to structures in which innovation is stimulated by co-creation amongst the actors, in which knowledge moves without any restriction (García-Terán and Skoglund, 2018).

As defined by Cavallini et al. (2016, p. 5) both the THM and QHM are "grounded on the idea that innovation is the outcome of an interactive process involving different spheres of actors, each contributing according to its 'institutional' function in society". The four categories are described as follows (Cavallini et al., 2016; Finquelievich, 2016) and the actors of the categories are shown in Figure 6:

Academia & Universities

Historically this sector has always been fundamental in knowledge production and has recently become a contributor to innovation creation as well, thanks to the crucial role that knowledge has gained in development processes. This sector has become a key actor of economic and cultural growth.

Industry & Business

Also known as the commercial market or as the economic category. Frequently a strong actor that leads technological and organizational innovation and usually has the role of generating, producing and distributing products and services. Produces innovations alone or associated with other stakeholders.
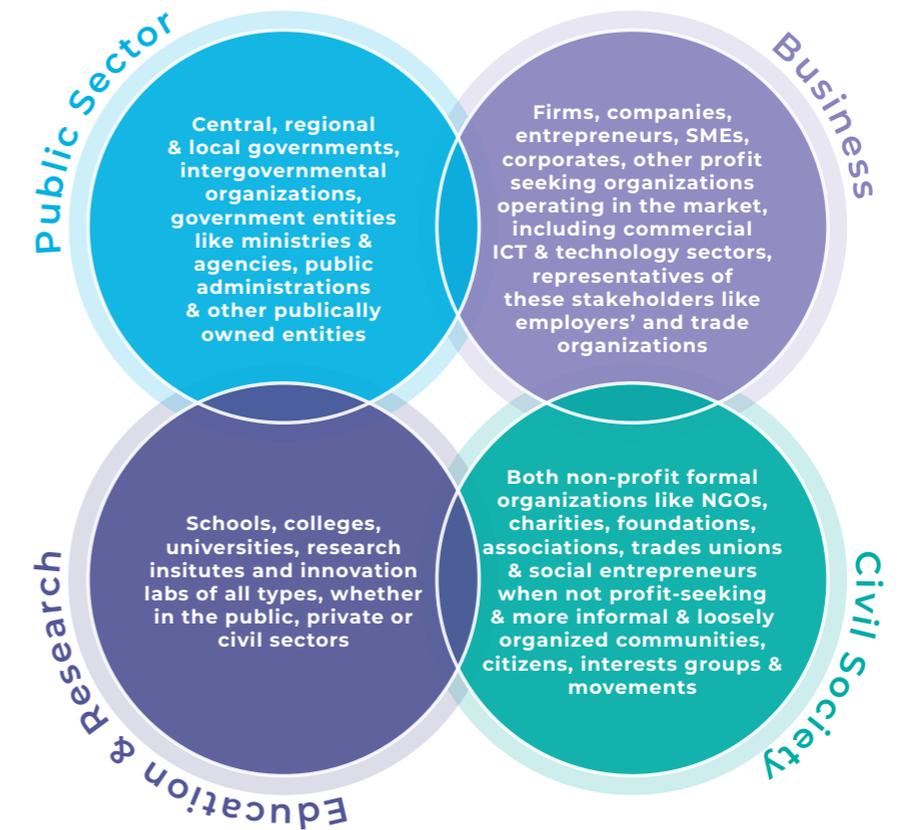
Government & Public Sector

The innovation within this sector is framed within new ideas that create value for the society and as such usually this innovation comes through policies, strategies and initiatives. The role of these institutions is to support both industry and academia for the application of information to development.

Civil Society

Represents citizens or users who provide knowledge about their needs, experiences and expectations. As they are directly affected by any changes made in an urban context, they can provide first-hand information related with the problem that is the subject of the study, becoming innovation users. By including civil society to the THM, thus creating the QHM, the innovation shifts from technical to social.

Public Sector

Central, regional & local governments, intergovernmental organizations, government entities like ministries & agencies, public administrations & other publically owned entities

Business

Firms, companies, entrepreneurs, SMEs, corporates, other profit seeking organizations operating in the market, including commercial ICT & technology sectors, representatives of these stakeholders like employers' and trade organizations

Education & Research

Schools, colleges, universities, research insitutes and innovation labs of all types, whether in the public, private or civil sectors

Both non-profit formal organizations like NGOs, charities, foundations, associations, trades unions & social entrepreneurs when not profit-seeking & more informal & loosely organized communities, citizens, interests groups & movements

Civil Society

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The Value of the Living Lab approach

Setting up a Living Lab is a long-term and ambitious commitment, therefore evaluating the risks and advantages that comes with it plays a key role when taking a final decision.

The Living Lab approach represents a dynamic and collaborative methodology that has gained prominence in the realms of innovation and research. In the case of REWAISE and water-oriented Living Labs, the governing and steering board members representing multiple stakeholder backgrounds, must get familiar with the below common benefits of running a Living Lab:

1. User-centric innovation	Living Labs prioritize user involvement in the innovation process. By integrating end-users into the development cycle of products and services from early phase until the market implementation, the products and services are designed to meet real-world needs and preferences. This user-centric focus enhances the relevance and usability of innovations, resulting in solutions that are more likely to be adopted and sustained in the market.
2. Community Engagement and Empowerment	Living Labs engage (local) communities in the innovation process, empowering citizens to actively participate in shaping their environment. This collaborative approach creates a sense of ownership and fosters a community-driven innovation ecosystem. Through this engagement, Living Labs contribute to the development of solutions that align with the values and aspirations of the communities they serve.
3. Real-world context	Living Labs bridge the gap between controlled laboratory environments and the complexities of the real world. This approach allows researchers to observe how innovations perform in authentic settings, considering the nuances and challenges that may arise. The real-world context provides valuable insights that may not be apparent in traditional research settings, contributing to the refinement and optimization of solutions, while lowering the barriers of end-users to participate.
4. Interdisciplinary collaboration	Living Labs orchestrate the collaboration among diverse stakeholders, including researchers, businesses, government agencies, and citizens. This interdisciplinary approach fosters a holistic understanding of complex problems and encourages the co-creation of solutions. The diverse perspectives and expertise brought together in Living Labs contribute to innovative and comprehensive problem-solving.
5. Rapid Prototyping and Iteration	The iterative nature of the Living Lab approach facilitates rapid prototyping and continuous improvement. Innovations can be tested, refined, and retested in real-time, reducing the time-to-market for new products and services. This agility is particularly beneficial in fast-paced industries where timely adaptation to changing circumstances is critical. Using this iterative 'lean' approach and involvement in the design also increases the acceptance by end-users.
6. User interactions and experimentation results for data-driven decision-making	Living Labs generate vast amounts of real-world data, providing researchers with valuable insights into user behaviour, preferences, and the impact of innovations. This data-driven approach enables evidence-based decision-making, allowing stakeholders to make informed choices regarding the scalability and sustainability of innovations.
7. Sustainable development	Living Labs contribute to sustainable development by addressing societal challenges through innovative solutions. Whether in the fields of health & well-being, urban planning, rural development or environmental sustainability, the Living Lab approach enables the development of solutions that are not only technologically advanced but also socially and environmentally responsible.

In conclusion, the Living Lab approach represents a transformative paradigm in innovation and research (Makter et al.2019). Its emphasis on user involvement, real-world context, interdisciplinary collaboration, and community engagement positions it as a powerful ecosystem for addressing wicked problems and holistically driving sustainable development. As we navigate an era of rapid technological advancement, the Living Lab approach stands as a beacon for inclusive, adaptive, and impactful innovation, being problem-driven instead of solution-driven.

Case studies on different Living Lab approaches

MINDLab (Spain) - User-centric innovation

MIND-Lab is built on a quadruple helix innovation ecosystem and predominantly focuses on multiple co-creation activities in the Castilla y Léon Region (North-West of Spain) to improve social-health care and to facilitate independent living of older adults and people in a situation of autonomy loss.

It is specialized in co-design, co-development, assessment & **validation of technological products and services**, mainly for people suffering from mental health disorders, older adults and people with disabilities, paying close attention to ecological validity.

Committed with quality **Open and Responsible R&I, implementing value driven participation in co-creation and co-design methodologies focused, involving users as co-designers and co-researchers.**

Of greater value is the focus on **experience-led design for value co-creation**, constituting stakeholder's networks and Groups of **Experts by Experience** for requirements elicitation and co-design in initiatives oriented towards **social and healthcare transformation.**

Co-creation activities pillared on principles of cognitive accessibility, equity, empowerment and ethical and meaningful participation of users and other stakeholders. By co-creating alongside with the users, valuing their non-formal knowledge, is a powerful mean to ensure good levels of usability and acceptance, adoption, perception of usefulness.

One of its strategical efforts is on collecting evidences regarding the participatory and co-creative methodologies and better understand the own process of participation in innovation, facilitating the uptake by other relevant players. It requires a continuous work understanding what means a win-win relationship with participants, what is the expected value (e.g. support autonomy, dignity, independence), bearing in mind ethical concerns (e.g. secure, accessible, unobtrusive, dignifying, decision-making respectful/ supporting user to hold locus of control).

Bristol Living Lab (United Kingdom) – Community engagement and empowerment	The mission of the Living Lab is 'Making fair and thriving neighbourhoods with art, tech & care'. They have +20 years of experience of working with communities and individuals to understand how creativity and digital technologies can be used to meet local needs and address system changes. An example is the WeCanMake project in which is a people-led response to the housing crisis creating affordable homes using micro-sites in big back gardens and in between buildings. It is a community-based Living lab acting as a broker between citizens and organizations like the local authorities and private sector, ensuring each participant can contribute their knowledge and experience.
LiCaLab (Belgium) - Real-world context	LiCaLab is a care Living Lab that supports business and organizations by including end users in their real-life contexts from the very beginning of the development process until market introduction. The Living Lab is strongly embedded in its region and has a large regional and international network on citizen, institutional, academic and policy level. LiCaLab gained extensive expertise in methodologies for real-life co-creation, co-design, user experience, stakeholder engagement and participatory approaches.
Eindhoven Living Lab (The Netherlands) - Interdisciplinary collaboration	Situated in the centre of the Brainport Eindhoven region, this Living Lab hosted by the city of Eindhoven has a strong commitment towards its citizens to enhance the quality of life by mobilising the creative powers of all quadruple helix parties and citizens together. An example of this is the Stratumseind 2.0 project in which the LL improved the liveability of a prominent street in the nightlife of Eindhoven by co-designing a new way of lightning and by learning how data collected by sensors can improve the life in their city. Within the project the local authority collaborated with local owners of the pubs, several technical companies, residents from Stratumseind, technical Universities and the Dutch institute for technology, Safety & Security. Bringing together partners on the one hand and creating/contributing to structures in which partners can meet on the other hand are the two main points characterizing the Eindhoven Living Lab, which is the umbrella approach to incorporate existing and future local Living Labs into a more integrated and integral approach.

PSNC Future Labs (Poland) - Rapid prototyping and iteration	PSNC Future Labs is a Living Laboratory, involving the citizens of Poznań and PSNC regional partners in the development and design of digital innovations and business models. With 2000+ sqm of advanced IT labs it is a space where cutting-edge technologies are co-created in an iterative way. With support from R&D and business partners, it developed a digital innovation hub as well.
Thessaloniki Smart Mobility Living Lab (Greece) - User & experimentation data driven decision making	ThesM@LL is one of Europe's largest Living Labs on mobility. The entire city of Thessaloniki is a platform for testing technological and innovative solutions for shared and on-demand mobility, cooperative and autonomous vehicles, and freight transport. In this ecosystem, various mobility operators and technology providers are engaged in providing data and expertise to create the right conditions for the exploitation of this infrastructure for the benefit of the whole ecosystem, which has the citizens at its centre. The Living Lab includes extended IoT equipment in vehicles, real time traffic data of the whole region of central Macedonia, short-term predictions of traffic conditions based on multi-source data and mobility & activity patterns extraction and analysis.
Energy Living Lab (Switzerland) - Sustainable development	The Energy Living Lab association has been created in 2020 as a spin-off to replicate, disseminate and communicate Living Lab approaches in the energy field. It supports an ecosystem of actors in using the methods and tools and invites people and institutions from the public, private, governmental, academic, and civil society to co-design sustainable solutions for energy decarbonisation. Their research team works on applied research, methods, and tools to further develop the knowledge on applying Living Lab methodologies in the energy field in a sustainable way. Designing research projects and teaching Living Labs on open innovation and social innovation are some of the main activities of the Energy Living Lab.

How to set up a Living Lab

A Living Lab environment should have a good relation with, and access to, users willing to be involved in the innovation processes. Any Living Lab should also have access to multi-contextual environments, as well as high-end technology and infrastructure that can support both the processes of user involvement and technology development and tests.

Each Living Lab environment also needs organisation and methodologies suitable for its specific circumstances. Finally, a Living Lab needs access to a diversity of expertise in terms of different partners that can contribute to the current activities. Equally important are the Key Principles of the approaches applied in Living Lab activities.

Living Lab
Essentials

When setting up a Living Lab, the main components of the constellation need to be walked through multiple times with the core stakeholders and the Living Lab team: Living Lab Manager, Project Manager, Pilot Manager, Panel Manager, Human Interaction specialist, etc. to agree on the initial strategy, operational and business plan. Numerous tools have been developed to facilitate this process, some of which are listed in the External Sources chapter. Gamification has been used widely to tackle complex challenges and to address strategic questions. The Bristol based Living Lab, Knowledge West Media Centre has been co-designing Tips & Tricks resources, a series of thought-provoking recommendations for collaboration, innovation and action since 2014, when they worked with academics and community activists to explore how they could better understand each other's ways of working. When creating the Tips & Tricks for Building a Sustainable Living Lab in the context of **iScape project**, the **discussion-starter cards** have been categorised in the following four themes to help reflect on the work of the Living Lab and explore new perspectives and possibilities:

Operations Looking at a Living Lab from an operational perspective offers the possibility to judge not only the Living Lab's experience, maturity of projects and activities, but also their way of developing an open-minded perspective when it comes to all stakeholders from the quadruple helix (academia, industry, government, and civil society). Important aspects in this part of the evaluation are, among others, proof of Living Lab activities, stakeholder engagement and communication strategy, evidence of how the co-creation trajectory has been established, the level of effectiveness of communication and how this is handled to keep a deeply transparent approach among all the stakeholders.

Users

Here, several elements are taken into account such as how users/citizens have been involved and engaged in the development process of new solutions, how intellectual property is managed during the co-creation process, as well as what tools and methodologies are used to engage and co-create with users/citizens. The methods and tools deployed by a Living Lab in their engagement activities are evaluated in terms of their effectiveness. Important aspects in this part of the evaluation are, among others, proof of a structured way and dedicated efforts for active user involvement, a palette of co-creational methods and tools, as well as evidence of co-created values for all types of stakeholders.

Organisation

Investigating the organisational level of a Living Lab creates insights into the foundations of the Living Lab and its strengths, focusing on the resources on the one hand and the management of the Living Lab on the other hand. Important aspects in this part of the evaluation are, among others, proof of infrastructure, equipment, and data, proof of a strong network including different types of stakeholders, as well as evidence of a clear governance model with dedicated and sufficiently supported roles and responsibilities.

Business Model

Creating a viable business model that offers value to all different types of new and/or involved stakeholders is key to the sustainability of a Living Lab. Critical elements to be considered are, for example, funding sources, value proposition, lean approach, impact, purpose, and key metrics. In addition, all the phases of a lifecycle approach should be considered: from ideation to design, experimentation and validation. Important aspects in this part of the evaluation are, among others, proof of integration of the Living Lab operations into innovation ecosystems, SWOT-analysis of a Living Lab, a roadmap for the future, and a value chain approach throughout the operations of a Living Lab.
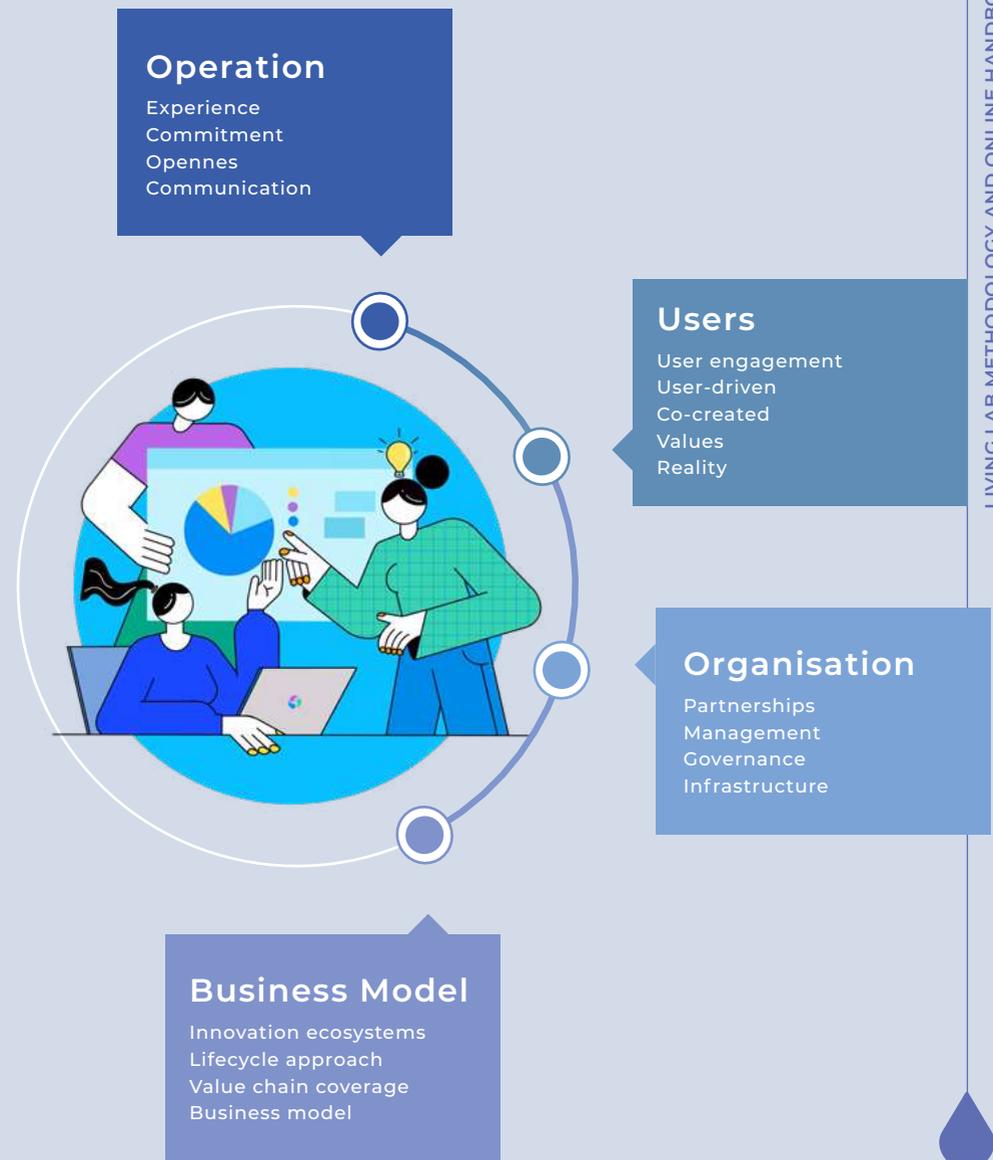

Operation
Experience
Commitment
Opennes
Communication

Users
User engagement
User-driven
Co-created
Values
Reality

Organisation
Partnerships
Management
Governance
Infrastructure

Business Model
Innovation ecosystems
Lifecycle approach
Value chain coverage
Business model

Figure 8
Essential factors when setting up a Living Lab.
Source: ENoLL (2019)

Key characteristics
of Living Labs

Contemporary definitions of Living Labs can vary, nevertheless the following elements tend to be core features in the innovation hubs. From a methodological perspective, today's Living Labs are networks composed of heterogeneous actors, resources and activities that integrate user centred research and open innovation (Leminen et al. 2012). From the infrastructure perspective, they can be seen as facilities that enable experimentation and co-creation with users in real-life environments (Sundramoorthy et al. 2011).

Orchestration

The Living Lab operates as the orchestrator within the ecosystem to connect and partner up with relevant stakeholders.

Multi Stakeholder Participation

Taking a holistic view on society, involving stakeholders from the quadruple helix model: government, academia, private sector and citizens.

Active User Involvement

A Living Lab involves relevant stakeholders 'actively' in all relevant activities, ensuring their feedback is captured and implemented throughout the whole lifecycle of the innovation.

Co-creation

In a Living Lab values are bottom-up co-created not only for but also by all relevant stakeholders, ensuring a higher adoption at the end.

Figure 9
Key characteristics of
Living Labs.
© ENoLL
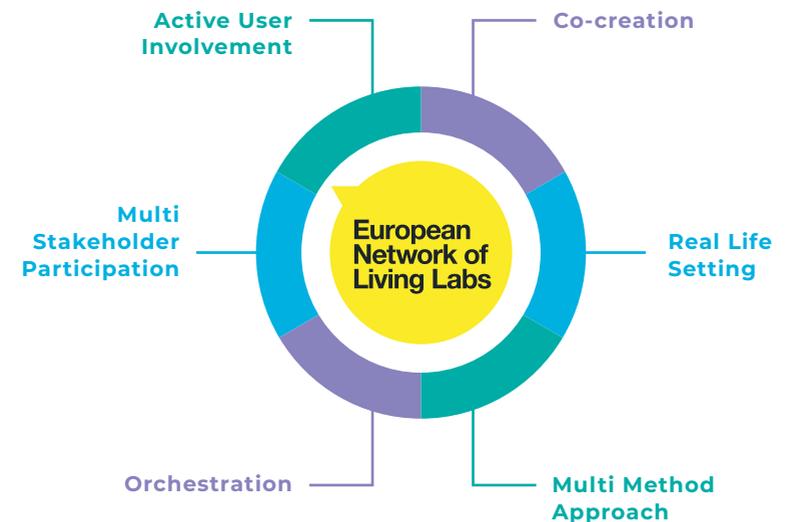
Real-Life Setting

A Living Lab operates in the real-life setting of the end users, infusing innovations into their real life instead of moving the user to test sites to explore the innovations.

Multi Method Approach

Each Living Lab activity is problem driven. Therefore, the methodological approach towards every individual activity will be selected based on the expected outcomes of the activity and the stakeholders who needs to be involved.

A comprehensive framework was established to analyse the link between the building blocks of Living Labs and their effect on the Living Lab outcomes. The Living Lab Triangle framework can be studied via analysing the following study: **Linking Living Lab Characteristics and Their Outcomes: Towards a Conceptual Framework.**

Figure 10
The Living Lab Triangle: The triangulation between environment, approach, and outcome in Living Labs. Source: Veeckman et al. (2013)
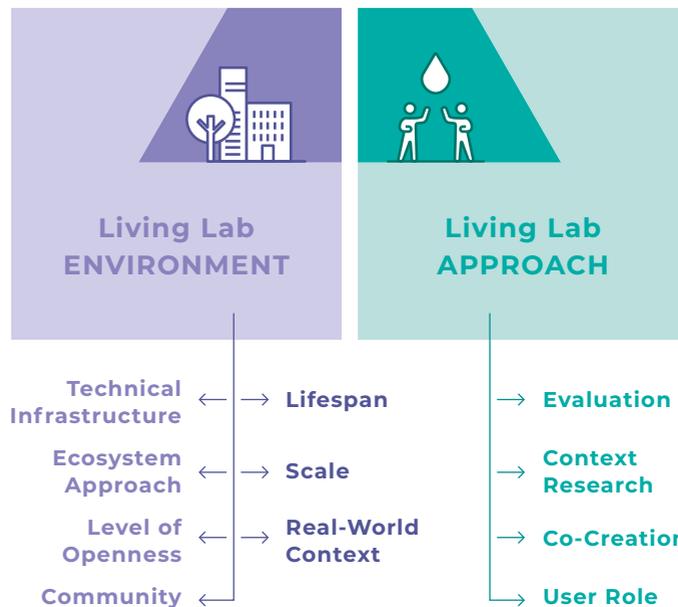
Governance models
for Living Labs

The governance and management structure reflects on the way that a Living Lab in the strategic or operational level is managed and organised. The domain specific Living Lab activities must be supported by the local governments, decision makers and the private companies. In this regard, the Living Lab vision and scope, risk management, operations, knowledge sharing as well as dissemination activities should be taken into account.

Figure 11
Research in progress - Abdolrasoul Habibipour, Luleå University of Technology, Sweden

The Living Lab constellation should provide decision-making opportunities to all stakeholders. Involving from the beginning a representative from each stakeholder group will help to form a governance model and an appropriate legal form when the Living Lab is mature enough (i.e. integrated in an association, a charity, cooperative, etc.). The model should mirror a circle of mediators where there are no dominating voices. All stakeholders are providers.

The governance model and key principles implemented by the Living Labs (LL) can entail multiple challenges on the constellation's performance and sustainability:

✳ Governance & Process-related Challenges

- Multi-business collaboration and issue of openness
- Visibility and dissemination of LL activities
- Flexibility and fast changing requirements
- Collaboration and communication with stakeholders
- Financial issues
- Technical and infrastructural challenges
- Integrating social and technical aspects of LL activities
- Keeping user motivated, in the LL projects
- Balance between research and development activities
- Mutual learning

The **below canvas** has been developed to help the Living Lab define the **most fitting governance model** for their needs by answering the following questions:

Who are the participants?

- Public administration
- Research institutions and Universities
- Companies, SMEs
- Society

Who is paying/contributing with what? Including:

- Project manager and other personnel
- Budget
- In-kind

How are decisions taken in the different levels?

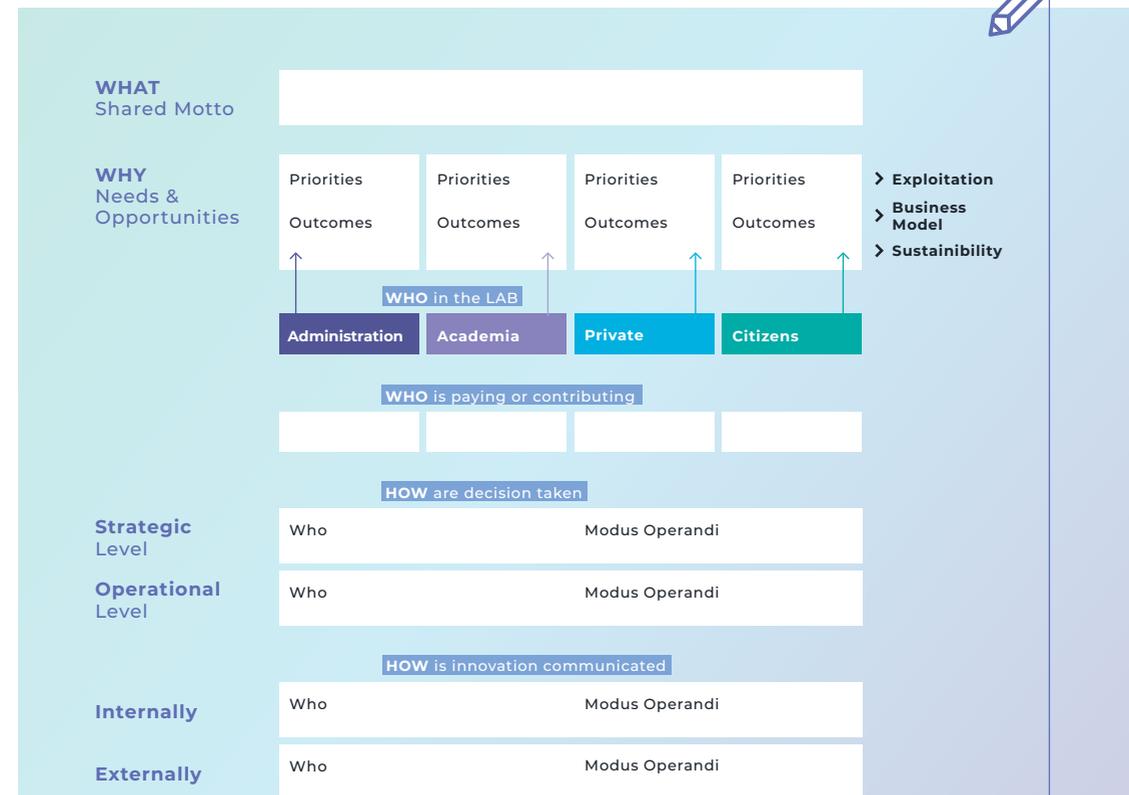- Project strategy
- Project implementation
- Day-by-day decisions

REwaise
Resilient Water Innovation for Smart Economy

Which is the communication strategy?

- Internal communication
- External communication

Figure 12
Models of Governance
Developed by
Fernando Vilariño-
CVC-UAB-ENoLL

What does each participant get?

- Money
- Social impact
- Prototypes, products or services
- Intellectual property

WHAT Shared Motto					
WHY Needs & Opportunities	Priorities / Outcomes	Priorities / Outcomes	Priorities / Outcomes	Priorities / Outcomes	❯ Exploitation / ❯ Business Model / ❯ Sustainibility
WHO in the LAB	Administration	Academia	Private	Citizens	
WHO is paying or contributing					
HOW are decision taken					
Strategic Level	Who — Modus Operandi				
Operational Level	Who — Modus Operandi				
HOW is innovation communicated					
Internally	Who — Modus Operandi				
Externally	Who — Modus Operandi				

Stakeholder **mapping** and **engagement**

Stakeholder mapping is a critical step for addressing the scope and challenges of a Living Lab. The process involves mapping, breaking down into specific stakeholders, and transposing the list into micro, meso, and macro levels. This information, when translated into the Living Labs Mapping Canvas, provides a comprehensive tool for long-term sustainability and effective stakeholder management.

The exercise involves the mapping of relationships and characterization of social bonds to identify shortcomings and missing links.

The Stakeholder mapping and societal contexts in each Living Lab report provides a preliminary analysis of the REWAISE case studies, focusing on five sites (Skåne, Poznań, Midlands, Vigo, Denia), to serve as a prelude to other social activities of the project (e.g., competency groups, Living Lab methodology, business models, communication activities, etc.). The results obtained provide an initial insight into the stakeholders mapping, issues of interest, their perceptions of governance, risks/benefits of REWAISE technologies and other aspects such as gender and ethical issues. This report also contains a review of social sciences and humanities on the "social value of water" approach that has informed the analytical framework for this study.

Partner specific factsheets have been published on the first stakeholder mapping activities' results.
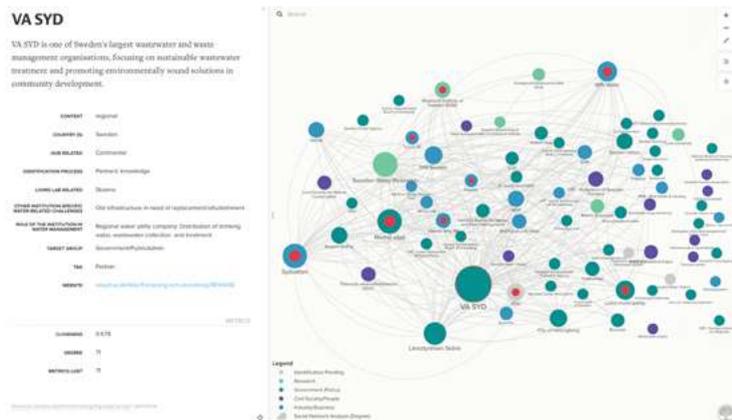
Competency Groups (CG):

As a result of the initial stakeholder mapping exercise, CGs have been formed. They are composed of multiple expert stakeholders (including those in a professional capacity and those with non-certified expertise) that use innovative and inclusive methods for co-producing knowledge (Whatmore et al 2011) and fostering collaborative action to overcome Societal Challenges. Overarching societal challenges for REWAISE will be established through the prior exploratory social analysis, while additional, competency group-specific social challenges might emerge throughout the course of competency group activities (see also 'Responsive and adaptive change' in RRI approach).

The CGs help facilitate a genuinely participatory and 2-way dialogue between the group members. Having a bottom-up process ensures the innovative approach of CGs as a method for understanding environmental controversies where they impact upon multiple stakeholders and require collaborative action to be overcome. These groups aim to ensure a mutual gain in knowledge through sharing values, developing strategies, implementing actions, and reflecting upon feedback.

Case studies **on best practices** for setting up **Living Labs**

During the first series of the REWAISE Capacity Building sessions, GAIA Living Lab from the ENoLL network was invited to introduce the strategy and their lessons learned when setting up Ozean Living Lab, a relevant model from the Water-oriented Living Lab's perspective.

OZEAN LIVING LAB
The Ozean Living Lab initiative, initiated by the GAIA cluster, strives to evolve into a larger-scale and sustainable open innovation lab. Located in Urdaibai, northern Spain, the lab capitalizes on the region's remarkable beauty and diversity, designated as a UNESCO biosphere reserve in 1984. This unique environment provides a backdrop for sustainable and innovative products and companies.

Territorial Challenges and Objectives:

The diverse nature of Urdaibai brings forth various territorial challenges, which the Ozean Living Lab addresses by promoting the natural environment and enhancing the competitiveness of local companies through open innovation. The lab aims to foster a regional strategy with an international perspective, offering a "Living Lab" space for testing by researchers and practitioners.

Innovation Focus:

Ozean Living Lab concentrates on enhancing the quality of life from environmental, social, and economic perspectives. Its innovative approach revolves around two main aspects:

1 The utilization of limitations imposed by the territory as opportunities for regional business development.

2 A distinctive management model in Living Lab format that transforms hidden opportunities into a smart growth model.

Objectives and Priority Work Areas:

The lab's objectives revolve around open innovation and sustainable projects, emphasizing ecosystem protection, improvement of ecosystem functioning, societal well-being, and support for a green economy. Ozean Living Lab prioritizes three key work areas: cleantech, sports and tourism, and safety.

Cleantech, Sports, and Tourism, Safety:

In cleantech, the lab focuses on water management and monitoring. For sports and tourism, efforts are directed towards smart systems to control tourist overcrowding and promote safe and sustainable sports. The safety priority work area aims to ensure safe sports practices and provide services for the silver economy.

Strategy:

Ozean Living Lab's strategy encompasses several key points:

- Connecting companies with smart specialization strategies.

- Promoting a culture of innovative entrepreneurship with a population focus.

- Developing an innovation strategy based on sustainability.

- Implementing and testing new technologies through the Water Lab.

- Generating a strategy for entrepreneurship and talent management to support projects arising within the territory.

- Involving the population in the transformation process through open innovation dynamics.

Water Management and Monitoring Projects:

Notable projects include the "Water W3D Project" for urban water supply management in Urdaibai, aligning with SDGs, and the "OCEAN I3: Plastics free project" combating plastics in the Urdaibai environment while encouraging local economy and culture.

Open Innovation and Scale-Up:

Ozean Living Lab adopts an open innovation perspective, boosting the scale-up system to promote startup and entrepreneurship through five pillars: federate, promote, accelerate, collaborate, and testing.

International Outreach:

Despite its regional focus, Ozean Living Lab aims to transfer know-how abroad and attract international experiences. This includes activities such as attracting startups to the region, supporting them in validation and testing of technologies, with the goal of internationalizing these innovations globally.

THE SCORE PROJECT

When analysing successful case studies on best practices for citizen engagement, more examples can be retrieved from the collaborative and citizen-based activities performed by **SCORE**, one of REWAISE's sister projects.

In particular, two activities resulted from SCORE in 2023 can be showcased in the context of citizen engagement practices, performed to increase citizen awareness on climate risks in coastal areas.

Raising students' awareness with the Smart Pebbles Workshop

To monitor coastal erosion and raise awareness among youngsters, in September 2023, students from CBC Monkstown, Holy Child School Killiney, and Rathdown School undertook the preparation of their 'smart pebbles' to be placed on Killiney beach, Ireland.

For the preparation of the pebbles, which took place on September 27, the students were divided into two groups: CBC students were shown how to perform 3D scans of the pebbles to allow for their easier monitoring over time, while Holy Child and Rathdown School students painted them to make facilitate their identification once positioned on the beach.

The subsequent day saw the students installing the pebbles at fixed locations on the North section of Killiney beach, including on the beach, at the water's edge, and in the water near the shore.

Short-term localization efforts four hours after placement revealed successful location of the pebbles, with approximately 50% of them identified.

On the third day, in collaboration with the Dalkey Tidy Towns community group, students returned and managed to locate only 15% of the total pebbles placed within 24 hours, showcasing the tidal movement's impact in a brief span.

In the next months, from November to February, students will conduct medium/long-term recovery campaigns: they will continue to monitor the coast's condition traversing the beach with the coordinator using readers similar to metal detectors and digging until the pebble is successfully located upon spotting.

Notably, the Smart Pebbles initiative is also being implemented in the Sligo Coastal City Living Lab.

Empowering communities thanks to the first SCORE Training School

On June 6-8, 2023, the inaugural **SCORE Climate Adaptation Training School** took place during the EU Green Week, focusing on empowering local communities with climate adaptation knowledge. The event, part of the SCORE Project, aimed to enhance expertise in Coastal City Living Labs (CCLL).

Each of the 10 CCLLs held their own training sessions in various languages. Iulia Anton, SCORE Project Manager at **ATU Sligo**, kicked off with a presentation on SCORE's coastal resilience strategy. Participants then attended seven parallel sessions based on language and location, covering diverse coastal climate issues with real-life project examples.

Day two featured an Online Minecraft Workshop, where participants used geospatial data to create a virtual world focused on coastal climate adaptation. Livestreamed on YouTube, the workshop engaged both younger and older audiences through gamification.

The final day was dedicated to local activities organized by the CCLLs, including geosurvey mapathons (see glossary), workshops on low-cost coastal sensors, creative classes, and field trips. These activities attracted a broad audience, from stakeholders and citizens to farmers, students, and kindergarteners, all aimed at educating and empowering communities.

To date, over 600 participants have engaged in SCORE activities across various cities, with more joining online. Additionally, participants in the REWAISE Capacity Building program were introduced to SCORE in a **February 2023 webinar** and the OLLD23 workshop - Water technology for a human centric green transition - in September 2023.

Real-life experimentation
in Living Labs

The Living Lab (LL) is an open innovation ecosystem serving to provide opportunities for local stakeholders to practice research and to experiment with meaningful improvements for cities and other organizations. Living Labs aim at involving the user as a cocreator.

A very specific characteristic of Living Labs is that the activities take place in real-life settings to gain a thorough overview of the context.
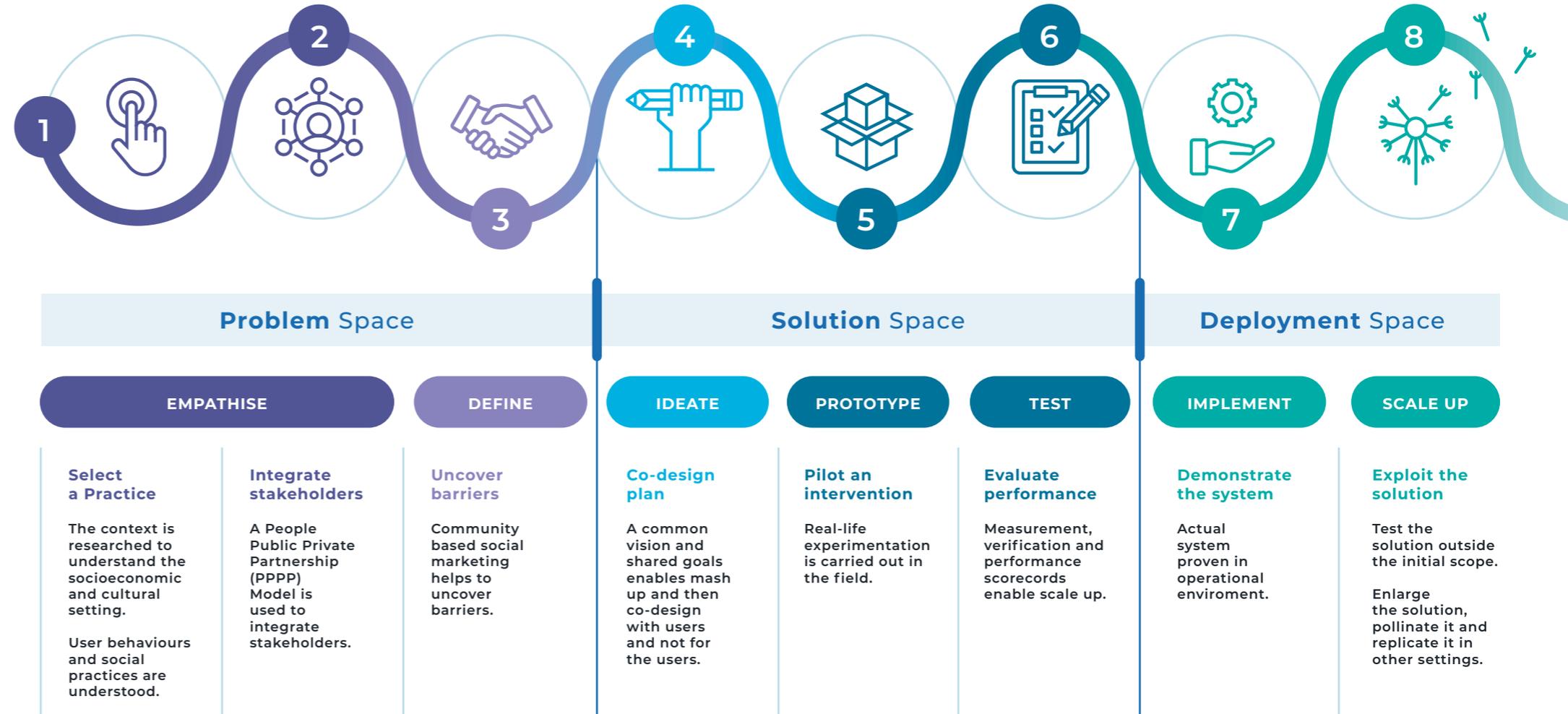
Hawk et al.
2012

Why co-creating
by following
the Living Lab
methodology?

Typically, especially in technology projects, activities are designed as top-down experiments, benefiting from users being involved as factors rather than actors. There is an increasing recognition that this needs to change so that users become equal contributors and co-creators rather than subjects of studies. The Living Lab approach strives for mutually valued outcomes that are the results of all stakeholders being actively engaged in the process from the very beginning.

Problem Space			Solution Space			Deployment Space	
EMPATHISE	DEFINE		IDEATE	PROTOTYPE	TEST	IMPLEMENT	SCALE UP
Select a Practice	**Integrate stakeholders**	**Uncover barriers**	**Co-design plan**	**Pilot an intervention**	**Evaluate performance**	**Demonstrate the system**	**Exploit the solution**
The context is researched to understand the socioeconomic and cultural setting. User behaviours and social practices are understood.	A People Public Private Partnership (PPPP) Model is used to integrate stakeholders.	Community based social marketing helps to uncover barriers.	A common vision and shared goals enables mash up and then co-design with users and not for the users.	Real-life experimentation is carried out in the field.	Measurement, verification and performance scorecords enable scale up.	Actual system proven in operational enviroment.	Test the solution outside the initial scope. Enlarge the solution, pollinate it and replicate it in other settings.

There are numerous **proven benefits of co-creation**, to mention some of them:

Ideas out of the box

By engaging external audience in the ideation of a project, or upcoming service offerings, the organisation is likely to receive inputs for new, unexpected innovative solutions. Closed innovation is outdated, fresh, customer centric solutions are needed in our rapidly changing every day.

The client becomes your developer

By putting the user in the centre of the co-creation process, the project owner can count on better uptake on the market and de-risk development costs. Not to mention that partly the staff cost becomes outsourced and economise some budget on the headcount.

Products and services better fitting the market

Tailor made clothes will fit better and will be closer to the clients' own taste than just picking a random dress in the retail store. However, it requires you to collect needs in advance, have a plan and try it on several times. This simple example can illustrate well a much more complex exercise, Living Labs are carrying out. In this case, just like with Living Lab projects, the selection of key users is essential, since they will be the ones fine-tuning the end result.

Scaling up from local to global

As a result of allowing a diverse clientele to access the prototype, you have good chances that the marketing is partly running by itself. By experimenting the product with a heterogeneous user pool, you also validate the prototype for international markets, allowing a better match possibility for a wider audience. Cross-border Living Lab services are regular to pre-validate international acceptance of a new product or service.

Trust in the community

Creating a stable community of experimenters takes time in a Living Lab constellation, nevertheless once trust is created, you can count on a solid base of users ready to jump on a new project. The behavioural change does not only happen on a meso scale, but depending on the project a whole macro level, positively affecting policy and decision-making levels.

Removing the silos

With the active use of the quadruple helix setup, communication becomes smoother between the different stakeholder groups. We can often experience the gap between academics and private sector representatives, by offering them a neutral discussion platform for joint co-creation. Through inspiring and/or heated conversations a common message will be elaborated at the end of the process.

Better financial performance

An automatic benefit of co-creation is to save certain costs of the development and de-risk investment. Based in a research study analysing Living Lab projects, the conclusion was that for 1 public euro invested in the Living Lab projects that were evaluated, 1.5€ was realised in follow-up private investment, with an additional 11€ foreseen (Ballon et al. 2018).

REWaise
Resilient Water Innovation for Smart Economy

What real-life experimentation in a Living Lab entails?

Real-life experimentation is a key requirement for Living Labs as it enables deeper insights in the potential success of innovations.

Reassuring real life setup within a Living Lab project is essential to provide the most reliable feedback from the users. The idea is, to mimic the original environment and circumstances at the venue where the experimentations are carried out. In case the venue is built, it is of utmost importance to have thorough planning and a deep understanding of the real venue's or life situations' overall behaviour and parameters as the setup cost can be significant. To be worthwhile the investment, the least post-productions are aimed.

Living Lab projects in Business-to-Business (B2B) innovation projects have some limitations however for reassuring real-life experimentation. The technological complexity, the need for integration, and the difficulty in identifying testers have been identified as barriers and potential solutions have been suggested by the following study: **Overcoming Barriers to Experimentation in Business-to-Business Living Labs**

Figure 15
Three barriers to experimentation in B2B Living Labs and possible solutions. Source: D'Hauwers et al. (2017)

BARRIER	POSSIBLE SOLUTIONS
1 Process Integration	○ Simulate innovation ○ Exclude complex technologies
2 Technological Complexity	○ Train technological Living Labs researchers ○ Exclude complex technologies
3 Tester Identification	○ Test with exixting clients ○ Conduct one-on-one field study

Why the iterative process is so important for Living Labs?

The iterative innovation model proposes that innovation activities are repeated rather than follow phases. Although Pierson and Lievens (2005) propose that Living Labs are cyclic by nature, other scholars (e.g., Bergvall-Kåreborn & Ståhlbröst, 2009) provide a guideline for the iterative Living Lab. Building on this guideline, Ståhlbröst and Bergvall-Kåreborn (2008) stress that iteration and interaction between phases foster innovation development, and Holst, Ståhlbröst, and Bergvall-Kåreborn (2010) add that openness improves and fastens innovation.

The iterative process of understanding citizens' needs and ideas has different objectives when referring to environmental projects

1. Enhance the understanding the need for the citizens' participation in the experimentation projects.

2. Build citizens' knowledge about the potential solutions and different viewpoints.

3. Value the design decisions throughout the Living Lab experimentation process. Citizens' are empowered because they can follow how their voices are heard, from an idea until the final developed solution.

During the iterative stages in large scale projects besides Living Labs, demonstrations are also appearing where the testing/piloting stage of Living Lab activities are partly integrated into demonstration activities.
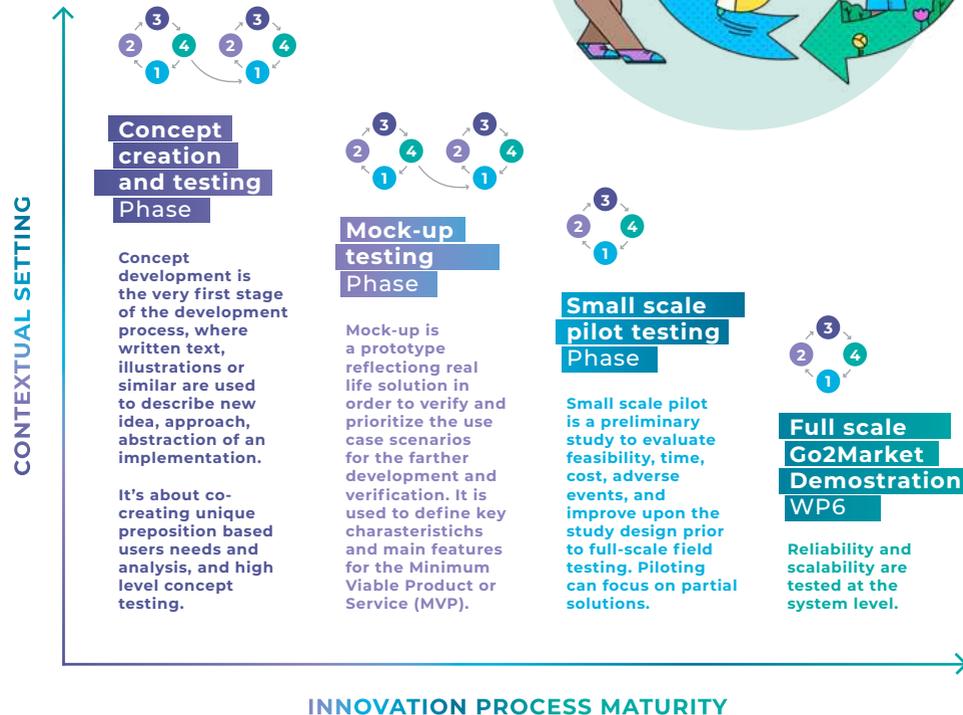
In **CIRC4Life project**, each stage of an innovation process is implemented based on iterative rounds consisting of four steps: explore, co-create, implement, and evaluate. The number and duration of the iterations varies depending on the development task. The rounds length depends on their mission and scale. Consortium meetings have been used as a milestone to evaluate the results of each round, and adjust Living Lab plans.

CONTEXTUAL SETTING

Concept creation and testing Phase

Concept development is the very first stage of the development process, where written text, illustrations or similar are used to describe new idea, approach, abstraction of an implementation.

It's about co-creating unique preposition based users needs and analysis, and high level concept testing.

Mock-up testing Phase

Mock-up is a prototype reflectiong real life solution in order to verify and prioritize the use case scenarios for the farther development and verification. It is used to define key charasteristichs and main features for the Minimum Viable Product or Service (MVP).

Small scale pilot testing Phase

Small scale pilot is a preliminary study to evaluate feasibility, time, cost, adverse events, and improve upon the study design prior to full-scale field testing. Piloting can focus on partial solutions.

Full scale Go2Market Demostration WP6

Reliability and scalability are tested at the system level.

INNOVATION PROCESS MATURITY

The importance of **user feedback gathering** for real-life experimentation

User feedback gathering is crucial for real-life experimentation across various domains, including service design, product development, marketing strategies, and more. The importance of user feedback can be summarized in several key points:

USER FEEDBACK	
User-Centred Design	◊ Involving end-users guarantees that feedback is collected in an interactive and co-creational way, increasing possible ownership and implementation of the innovation by the end-user after its development. ◊ It helps in creating solutions that solve an actual problem of the end-users.
Identifying Issues and Bugs	◊ Users often encounter problems or bugs that might not be apparent during internal testing. User feedback serves as a valuable source of information for identifying and addressing issues in real-world scenarios.
Enhancing User Experience	◊ Feedback provides insights into how users interact with a product or service. This information is invaluable for improving the overall user experience and making necessary adjustments to enhance usability.
Iterative Improvement	◊ Real-life experimentation involves iterative development. User feedback guides the iterative process by helping teams understand what works well and what needs improvement, enabling continuous refinement.

USER FEEDBACK	
Feature Prioritization	🔹 User feedback aids in prioritizing features and functionalities based on user preferences and needs. This ensures that development efforts are focused on the most impactful aspects of a product or service.
Market Validation	🔹 User feedback is a form of validation in the market. Positive feedback can indicate that the product or service is meeting expectations, while negative feedback can signal areas that require attention.
Building Customer Loyalty	🔹 Engaging with user feedback demonstrates a commitment to customer satisfaction. Actively addressing user concerns and making improvements based on their input can build trust and loyalty.
Early Detection of Trends	🔹 User feedback helps in identifying emerging trends and changing user behaviour. This information is valuable for staying ahead of the competition and adapting strategies to meet evolving user expectations.
Data-Driven Decision Making	🔹 User feedback provides concrete 'real' data for decision-making. Instead of relying on assumptions or internal opinions, organizations can make informed decisions based on the actual experiences and preferences of users.
Community Building	🔹 Encouraging and acknowledging user feedback fosters a sense of community & ownership by the involved users. Users feel more connected to a product or service when they see that their input is valued and contributes to its development.

In conclusion, user feedback gathering is an integral part of the real-life experimentation process, providing essential insights that drive improvements, inform decision-making, and contribute to the overall success of products and services in the market.

Best practices on quadruple helix stakeholder engagement

The Quadruple Helix model emphasizes collaboration between four key stakeholders: government, industry, academia, and civil society, with the goal of fostering innovation and sustainable development. Here are some best practices for Quadruple Helix stakeholder engagement:

Common Goals and Values:	🔹 Identify and establish common goals and values that align with the interests of all stakeholders. 🔹 Work towards a shared vision for innovation and sustainable development.
Mutual Understanding & trust building:	🔹 Facilitate a deep understanding of each stakeholder's perspective, goals, and constraints. 🔹 Promote a culture of mutual respect to bridge the gap between different sectors.
Open and Inclusive Communication:	🔹 Foster open and transparent communication channels between stakeholders. 🔹 Encourage active participation and ensure that all stakeholders have a voice in decision-making processes.
Collaborative Platforms:	🔹 Establish collaborative platforms, such as forums, workshops, and conferences, to facilitate interaction and collaboration. 🔹 Use digital platforms to enable ongoing communication and collaboration.
Joint Projects and Initiatives:	🔹 Encourage and support joint projects and initiatives that leverage the strengths of each stakeholder. 🔹 Foster a culture of collaboration and shared responsibility for successful outcomes.

Flexibility and Adaptability:	💧 Recognize that each stakeholder may have different priorities and timelines.
	💧 Be flexible and adaptable in accommodating diverse needs and adjusting strategies accordingly.
Capacity building:	💧 Invest in capacity building programs to enhance the Living Labs and knowledge of stakeholders.
	💧 Ensure that all parties have the necessary resources and capabilities to contribute effectively.
Incentives for Collaboration:	💧 Provide incentives for collaboration, such as funding opportunities, recognition, and shared benefits.
Policy Alignment:	💧 Align policies at the government level to support and encourage Quadruple Helix collaboration.
	💧 Enhancing the governance scheme sustaining open innovation within the Living Lab and beyond.
	💧 Remove regulatory barriers that may hinder collaborative initiatives.
Monitoring and Evaluation:	💧 Establish mechanisms for monitoring and evaluating the effectiveness of collaborative efforts.
	💧 Regularly assess the impact of Quadruple Helix engagement on innovation and sustainable development.
Long-Term Perspective:	💧 Emphasize the importance of long-term collaboration rather than focusing solely on short-term gains.
	💧 Build trust and cultivate enduring relationships among stakeholders.
Public Engagement:	💧 Involve the broader public in the decision-making process to ensure diverse perspectives are considered.
	💧 Communicate the benefits of Quadruple Helix collaboration to the public.

Implementing these best practices can contribute to the success of Quadruple Helix collaborations, fostering innovation and sustainable development through the synergies of government, industry, academia, and civil society.

04

Building a Living Lab

Understanding the strengths, values and weaknesses of each Living Lab is critical for its survival and sustainability. Given that the methodology has been used for a longer time span, numerous tools - tips and tricks cards, games, templates, strategies, ideation workshop formats -, case studies and guidelines are available to assist those landing in their new co-creation journey. Insufficient knowledge of the concept, lack of planning, negligence of formal protocols and a missing business model often led to failures when setting up a Living Lab. The REWAISE Living Lab Online Handbook offers insight into the Living Lab mapping canvas, a self-assessment tool , transition to water specific tools, insights and mapping of REWAISE Living Labs.

The Living Lab
Mapping Canvas

The Living Lab mapping canvas has been developed through an iterative process, just like all Living Lab projects are built. The canvas is a strategic tool used for visually developing or displaying a Living Lab strategic and operational model. The template helps to determine and align the key Living Lab activities and their relationship to the Living Lab's value proposition. As a preliminary analysis, three Living Labs have been selected from the three **REWAISE** Living Lab hubs based on their maturity. These Living Labs went through the canvas as early adopters to understand the strengths, values, weaknesses and to provide feedback to iterate the next edition of the canvas.

MICRO
MESO
MACRO

6 — STRENGHTS & ASSETS

WHAT skills do you have in the team that will help you achieve your goals? What interpersonal / soft skills do you have? What are you good at, individually and as a team?

7 — CHALLENGES, WEAKNESSES & DEVELOPMENT AREAS

WHAT are the weaknesses you have, individually and as a team? What your teammates should know about you? What are some obstacles you see ahead of you that you are likely to face?

8 — FINANCING & BUSINESS MODELS

WHAT does the Water Living Lab maintenance plan look like? Is it appropriate to support long-term commitment? Who are the financers? In addition, what do they bring and who will pay you and for what?

5 — PEOPLE & INTERNAL ROLES

WHAT are the roles you have in the team?

WHAT What communication channels do you already have (e.g. communication strategy, social media, website, newsletter, etc.) and are you planning on establishing any new communication channels?

9 — COMMUNICATION STRATEGY AND CHANNELS

4 — HOST ORGANIZATION

WHO is your host oganization? e.g. public body - municipality, private body, research institute

10 — NEEDS & EXPECTATIONS (Living Lab Framework)

WHAT do you need to be successful? How can others support you? What are your expectations in terms of e.g. knowledge transfer, type of assistance, others?

WHERE will the solutions will be tested / implemented?

0 — PURPOSE

WHY are we doing what we are doing in first place?

3 — THE URBAN CONTEXT

FOR WHOM What quadruple helix stakeholders are you already in touch with? Please list top 5

11 — GOVERNANCE

WHO The governance and management structure reflects on the way a Living Lab in the strategic or operational level is managed and organised. All Water Living Lab activities must be supported by the local governments, decision makers in the cities as well as the politicians.

1 — VISION & SCOPE

WHAT is the vision and scope of the Hubs /LLs? SCOPE = The extent of the area or subject matter that something deals with or to which it is relevant. VISION = What do you aim to achieve in the long-run

2 — STAKEHOLDERS & EXTERNAL ROLES

12 — CALENDAR

You should map you yearly activities ahead of time and match with your strategic plan. Please add all events - if existent - that you are already planning / anticipating, where you will be engaging with stakeholders or communicate externally.

JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY
DATE OBJECTIVE(S) STAKEHOLDERS INVOLVED	DATE OBJECTIVE(S) STAKEHOLDERS INVOLVED	DATE OBJECTIVE(S) STAKEHOLDERS INVOLVED	DATE OBJECTIVE(S) STAKEHOLDERS INVOLVED	DATE OBJECTIVE(S) STAKEHOLDERS INVOLVED	DATE OBJECTIVE(S) STAKEHOLDERS INVOLVED	DATE OBJECTIVE(S) STAKEHOLDERS INVOLVED

Case History

The above illustration demonstrates the readable version of the Living Lab Mapping canvas. The following **REWAISE**'s Living Labs were interviewed based on ENoLL canvas approach.

REwaise
Resilient Water Innovation for Smart Economy

① Preliminary mapping **with Skåne Living Lab:**

0 Purpose

◊ Skåne Living Lab's goals are three folded: to reach more efficiency in the usage of drinking water, to provide continuity on water management, recycle and to handle stormwater.
◊ Together with the citizens present in the pilot areas and organisations participating in their stakeholder map, they aim equally to reach stronger decision-making power by using matchmaking and networking amongst others.
◊ The Living Lab's ambition is to become more independent from the private sector in case when stormwater occurs, as the current offers are not sufficient for VA SYD, especially in the case of reuse.

1 Vision

◊ In the centre of Skåne Living Lab's vision, decreasing drinking water consumption takes a central stage.
◊ One of the strategies to reach this, is to follow the sharing concept (Sharing Cities), by creating a collaborative system between the buildings and making them sustainable, using community engagement.
◊ The Living Lab got inspired by the energy provider EON by using local grids, prices adjusted to specific usage time slots, which method could be applied by VA SYD during specific periods.

2 Stakeholders

◊ The core stakeholders highlighted by the Living Lab managers include: third parties as cities of Malmo and Lund; property owners and real estate developers; consumers who are the Living Lab's customers and other nearby municipalities, such as Helsingborg using the sharing cities concept.

3 Urban Context

◊ The two pilot areas are: Brunnshög with a newly built living unit and Sege Park including both refurbished and new houses. The areas both have new water networks with separate pipes for sewage/stormwater/drinking water.

4 Host Organisation

◊ The Living Lab is hosted by the municipalities of the city of Malmo and city of Lund.

5 People & Internal Roles

◊ Skåne Living Lab has a dedicated team to support operations of the organisation and realise its vision.
◊ The fulfilled positions are Technical Manager, Urban Living Lab Manager, Pilot Managers, Project Managers, Communication Manager and Senior Advisor.
◊ Further information about the organisation ca be found via the official D9.4 deliverable and **https://www.svensktvatten.se/va-chefens-verktygslada/va-organisationen/**

6 Strenghts

◊ The stakeholder groups have been engaged closely from the early days of the Living Lab's existence, including highest-level decision makers.
◊ This has been engineered purposely by a senior experienced programme coordinator, who created clear operational plan and strong internal communication for the Living Lab.
◊ The teams are working in a democratic and co-creative way, with shared responsibility, as a result creating a motivational and trusted environment.

7 Challenges

- The outdated regulations of stormwater management slow down the innovation perspective of such project.
- The timing of important project milestones arises complex questions:
- Public sector representatives do not necessarily follow the outcome of R&D and innovation projects, decisions can be made faster than a real experimentation would be carried out.
- The private sector stakeholders, in this case builders work on a timeline as per their services agreement stipulates.
- The Living Lab team REWAISE is not the only unique running project.

8 Financing & Business Models

- The financial means of the Living Lab are covered by the municipality from local taxes and the European Commission co-funding. The project budgets are defining the Living Labs' activities.

9 Communication

- Skåne Living Lab works with a written communications strategy that is updated regularly, based on structured communication channels and dedicated personnel.
- The team uses a website and LinkedIn channel, and newsletters are sent every 3 months to the cities, stakeholders, and citizens.
- It took approximately a year for the communications team to get to a mature level of communication tools usage and techniques on a common platform with the cities.

10 Needs & Expectations

- While local level communication works fluently, the hub level cooperation and communication with the Polish and Czech continental hub sites need to be structured and strengthened.

11 Governance

- The steering committee is managing the advisory and strategic activities of the LL.

② Preliminary mapping **with Vigo Living Lab**

0 Purpose

Vigo Living Lab's objectives are two-folded:
- To demonstrate resource recovery from wastewater streams
- Create new service assignments by offering pre-validation services.

1 Vision

- The Living Lab project's main mission is to offer better water management and recovery of nutrients from wastewater.
- By implementing and upscaling the developed technology in other locations, the goal is to achieve significant impact for a lower energy footprint.

2 Stakeholders

Vigo Living Lab functions in a triple helix setup:
- based on a PPP collaboration, having Zona Franca de Vigo the public owner of the area representing a governmental institution and Aqualia private company who is the promoter and host of the Living Lab.
- the research pillar of the triple helix is represented by the University of Santiago de Compostela and the University of Valencia
- In addition, WE&B as a social facilitator joins the Living Lab project.

There is no direct representation of citizens (yet) in the project and Living Lab constellation.

3 Urban Context

- The primary focus is on Spain and the city of Nigran at this stage of the pilot and the Stellantis plant in Vigo.
- Decentralized wastewater sanitation brings new opportunities for hybridizing industrial/urban and energy/water/waste sectors.
- Soon, the demonstration plant is targeting other zones to join, that could use the same technology. In the selection process it is essential to have similar climate environment.

4 Host Organisation

◆ There is an agreement between Aqualia and Zona Franca de Vigo to operationally run and host the Living Lab.

5 People & Internal Roles

◆ The current team includes an Operational Manager, a Project manager, Visiting researchers and an Investigator/Operator. In addition, University of Santiago de Compostela to be the visiting researchers and WE&B to be the operator of the Living Lab. Further identification of Living Lab roles is yet to happen for a sustainable future of the Living Lab. Further information about the organisation ca be found via the official D9.4 deliverable.

6 Strenghts

◆ The host of the Living Lab and owner of the area is a strong and genuine promoter of sustainability commitments (with certificates such as BREEAM), the team is well connected and is working successfully together. The main client has been engaged from an early stage of the project, therefore there is a good perception of achieved results and the scale-up phase can be already experienced.

7 Challenges

◆ It is challenging to reach the appropriate technology readiness level and cost/benefit ratio to make the solution attractive for external clients and reach their buy in.

◆ During this process the engagement of the final client would help to win their interest, but it is difficult to get hold of the right decision level, especially external big companies' or other cities and rural communities' representatives.

8 Financing & Business Models

◆ Vigo Living Lab and communication activities will be financed by its hosts. The goal is to create a business model based on the developed technology and its replication, interlinking different sectors (water, energy, waste, industry, etc.) need to be validated and demonstrated.

◆ The living lab scale up into an industrial solution would include a B2B agreement between the affected stakeholders, which will help the Living Lab become self-sustaining from its client's base.

9 Communication

◆ The current communications strategy functions across the project. Selected messages are shared to the Living Labs' stakeholders and audience.

10 Needs & Expectations

◆ Easing up regulations and finding waivers for certain barriers would help to speed up the innovation potential of REWAISE Living Lab alike constellations, as was introduced by Prof. Aurora Seco of UV as leader of innovation deal.

◆ Mass stakeholder board influence from the right decision level and providing direct policy recommendations can help to achieve some flexibility.

11 Governance

◆ There is no formal Board set up yet.

③ Preliminary mapping **with Midlands Living Lab**

0 Purpose

Midlands Living Lab's objectives are two-folded:
◆ To save and reduce water loss, by using bioenergy and waste recovery on a local level.
◆ Educating customers on water consumption.

1 Vision

◆ Midlands Living Lab aims to set up water and wastewater networks in the area, in a circular economy setup.

2 Stakeholders

- Midlands Living Lab is functioning in a quadruple helix setup, involving universities and other research institutions, private, public water networks, government bodies and the policy level.
- Through the Living Lab activities, the voice of customers is brought in.

3 Urban Context

- The Living Lab is located in central England, Coventry.
- The core project partners are Severn Trent (STW), Organics (ORG), Coventry University (COVU) and Environmental Monitoring Solutions Ltd (EMS)

4 Host Organisation

- Midlands Living Lab is hosted by Severn Trent Water, which is a private water company in the United Kingdom.

5 People & Internal Roles

- At the Living Lab, Project Manager and Technical Lead positions are filled in currently. The promotional activities are carried out by an internal communications team. The Living Lab staff belongs to Severn Trent Water's innovation department.
- On the academic helix pillar the core partners are Coventry University, University of Exeter, KTN/KTP Knowledge Transfer partnerships, University of Sheffield, Innovate UK KTN.

6 Strenghts

- With the setup of Midlands Living Lab, a new operational structure was set up at Severn Trent Water which improved the efficiency of the organisation.

7 Challenges

  Two major challenges were identified by the Living Lab at this stage of the project:
- The new constellation brought operational tasks where the new staff is adjusting to the projects' needs.

- Strengthening the REWAISE Atlantic hub level communication could improve knowledge transfer capacity.

8 Financing & Business Models

- Midlands Living Lab is financed by its host and the European Commission co-funding allocated to REWAISE project.

9 Communication

- Severn Trent (STW) have both external & internal communication teams. The external communication team create and oversee all communications shared publicly.
- The Innovation, internal, communication team receive input about the project and share this internally within the business through company news posts, large screen displays etc.; and prepare, in liaison with the external comms. team, articles for publication.
- In addition, there is a dedicated Programme Manager assigned for better information flow.
- Currently there are quarterly meetings scheduled between the hubs and the labs as well.
- Communication towards external stakeholders has some limitations due to confidentiality measures of some innovative technologies or new technical solutions.

10 Needs & Expectations

- Based on the current steps the work is going as planned. Challenges are mainly expected at the time of the pilots, where more internal support will be needed.

11 Governance

- The Living Lab is managed by its host, its Living Lab governance structure is yet to be defined.
- Overall governance, as with internal, Innovation, governance is to support project managers in delivery of their projects, validating new processes and technologies, against STW's feasibility, desirability, and viability requirements, ensuring the continued provision of wholesome drinking water and safe removal and treatment of sewage.
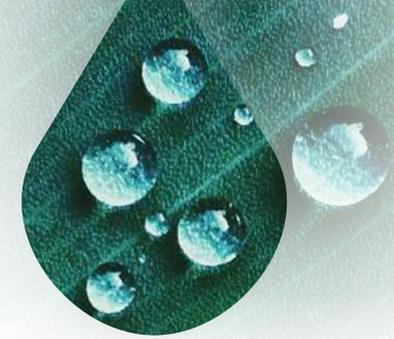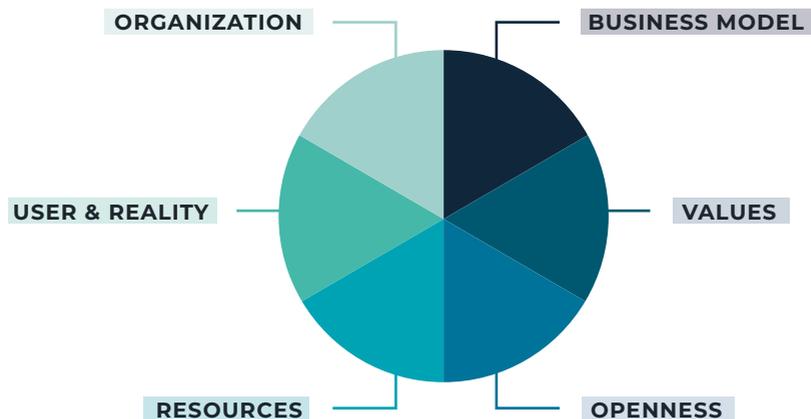
Self-assessment
for Living Labs

In the previous chapters, it has been presented that different definitions for the term Living Labs exist. What is common in all are, the involvement of users as co-creators on equal grounds with the rest of the participants and experimentation in real world settings (Almirall, Lee and Wareham, 2012).

These definitions are rather complementary than contradicting, and therefore it can be concluded that Living Labs are both practice-driven organisations that facilitate and foster open, collaborative innovation, as well as real-life environments or arenas where both open innovation and user innovation processes are studied and new solutions are co-created (Leminen, Seppo & Westerlund, Mika & Nyström, Anna-Greta, 2012).

For organisations on their Living Lab path, working towards a sustainable future, a self-assessment exercise helps to understand where they are standing on their maturity scale and identify strong and weak points:

Organization

Tackling the operational setup of the Living Lab: management and governance structures.

User & Reality

Assessment of end-user engagement, and realization of real-life setup for the Living Lab projects and experimentations.

Resources

Different kinds of resources within the Living Lab: infrastructures, materials, tools etc.

Openness

Applying the open innovation principle, the inclusion of. all quadruple helix stakeholders.

Value

Impact realized by the Living Lab by running its programmes and projects, monitoring the value created for its stakeholders.

Business Model & Plans For The Future

Operating business plan of the Living. Lab, including sustainability measures, cash flow and SWOT analysis.

Key Evaluation Indicators

Evaluation committee members take into consideration the following indicators to assess the degree of maturity of a given Living Lab.

- Organisation, management and governance of the Living Lab
- Experience in Living Lab operations
- Interest and ability to participate in regional, national and international innovation systems
- Users and people engagement approach
- Application of iterative Living Lab process and usage of real-life settings
- Quality assessment of used methods and tools
- Roles and responsibilities of staff and their qualification
- Internal and external communication strategy
- Access to infrastructures and availability of equipment
- Openness of innovation processes and collaborations
- Intellectual property rights and fair data management
- Values generated for stakeholders by co-creation activities
- Understanding and coverage of the value chain
- Business model and access to funding
- Sustainability plan, SWOT analysis

For the **REWAISE** specific assessment to be prepared will be aligned with WP7 leader (CETIM) for stakeholder assessment.

Once the Living Lab mapping activity is walked through by the management team and the self-assessment is covered, the Living Lab team is ready to work on their action plan towards the future. It is included in the 2022 activity roadmap to help the **REWAISE** - and potentially WATER-MINING and B-WaterSmart - Living Labs complete this activity including the water specific categorisation.

Transformation to water specific tools

Living Labs can combine European vertical specialisation domains (health, smart cities, environment, education etc.) with horizontal and territorial specialization.

Based on the mapping activity realised in the context of the Atlas of the EU WoLL, the research found the following shared characteristics of the Water Oriented Living Labs:

- Demo-type and platform-type research and innovation settings, with context specific needs and enabling conditions
- Water-oriented interventions with a cross-sector nexus approach in real-world and/or realistic environments
- Proactive learning and innovation ecosystem with R&D continuity and reproducibility
- Open and local multi-stakeholder governance structure with democratic control systems

Based on the mapping of 105 WoLL research sites (in 92 organizational structures), 12 are network platforms, 26 are Living Lab project-platforms, and 67 are Living Lab research platforms. 71 water Living Labs have the maturity levels of between 2.5 and 3 out of 4.

Living Labs maturity levels:

Level 1

Preparation of Living Labs Development

- Stakeholders involvement
- Vision building
- User community building
- Innovative scenarios and use cases
- Requirements analysis and definition of services

Level 2

Limited scale experimentation based on user experience

- Mock-up development
- User experience and idea generation
- Limited applications development and testing based on ideas
- Limited user interaction and user experience
- Integration of tools
- Limited proof of principle experimentation at reference laboratory
- New concepts and ideas

Level 3

More extensive application development and field experimentation

- Experimentation and validation with users
- Full-scale software development
- Integration of tools and services
- Sound methods for extended testing and validation
- LL field trials preparation and initiation
- Training and demonstration capabilities

Level 4

User-led co-creation & Living Lab business model operation

- LL field trials extended to full user experience
- Experimentation with new ways of collaboration
- Evaluation of LL as innovation environment and impact on rural development
- Functioning LL business model and innovation system
- LL as Service provison to stakeholders

Figure 19
Maturity levels of water Living Labs @. Source: Water Europe, Brussels, 2019.

In addition, while the basic principles have been provided on self-assessment criterions for Living Labs under the previous chapter, a water Living Lab specific labelling methodology is under preparation to be experimented by the **REWAISE** Water Living Labs and gradually the CIRSEAU cluster: firstly **REWAISE**, secondly Water-Ming and B-Water Smart and thirdly, Wider Uptake and ULTIMATE.

Through direct interviews and joint workshops common findings will be shared to the Water Living Lab communities:

While the basic principles have been provided on self-assessment criterions for Living Labs under the previous chapter, a water Living Lab specific labelling methodology is under preparation to be experimented by the **REWAISE** Water Living Labs and other twin projects: **Water-Mining** and **B-WaterSmart**.

Water-Mining project aims for the creation of two living labs in Rotterdam (the Netherlands) and Almeria (Spain) which will offer an engaging environment around the different innovations demonstrated. For them the **REWAISE** Living Lab handbook can become helpful in the setup phase, and they will have the opportunity to consult with the peer Living Labs through joint workshops and activities.

Findings from B-WaterSmart projects' D4.1 deliverable, which seeks to provide a general manual of data specifications and acquisition, from a technical and a socio-economic view will be reused in the **REWAISE** context. The report is focusing on Water-Energy-Waste-Materials from each project Living Lab, to define circular opportunities for Living Lab owners and their stakeholders.

# Insights from the
REWAISE Living Labs

The REWAISE technology implementation pilots and Living Lab activities gradually started to take place by applying tools and methods acquired also through the Capacity building series and based on the organisation's own know-how and existing stakeholder groups. The following case studies give insight to the current state of the art of citizen engagement activities and challenges the REWAISE Living Labs are facing.

Engagement actions, particularly those related to Competency Groups, are the product of an iterative process. This means that the decisions and actions outlined here represent the current status of the Competency Groups' work. It is important to understand that this is a snapshot in time, capturing the actions that have been decided upon or selected for implementation at this point. As the Living Labs and their Competency Groups continue their work, these actions may be subject to adjustments, modifications, or even significant reorientations. This flexibility is necessary to accommodate evolving insights and circumstances. Therefore, while the report details the present course of action, it is possible that the final outcomes of the project may differ from what is currently described.

Skåne Living Lab – Sege Park Pilot

MEDITERRANEAN HUB
ATLANTIC HUB
CONTINENTAL HUB
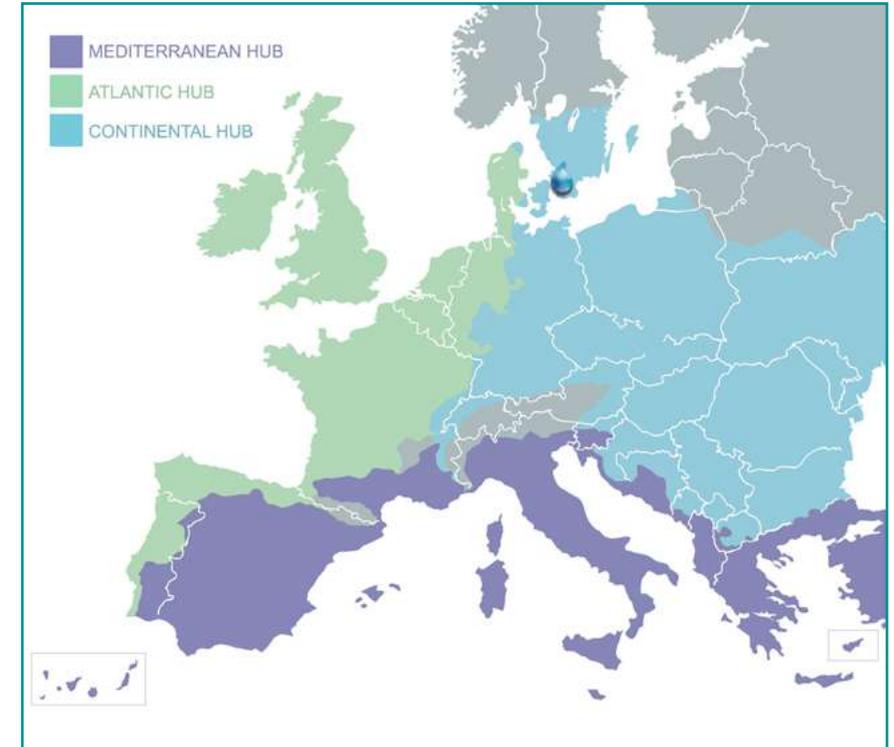
1 Overview

Sege Park stands as one key experimental site within the Skåne Living Lab, showcasing innovative residential solutions with an emphasis on water efficiency and reuse. The area has both old buildings, and new buildings under construction. The area consists of 12 different property owners and will include 1200 households. Noteworthy developments include the integration of water-smart technologies in residences, a wooded parking house equipped with photovoltaic installations, and a rainwater harvesting system that sustains the green walls of the building. VA SYD and the city of Malmö are working tightly together in the Living Lab by putting a strong focus on stakeholder involvement and following continuous dialogues with priority owners and residents.

2 Main challenges

One of the main challenges is that the property owners must finance most of the technical investments themselves and currently several of them and the constructors face economic difficulties.

Another challenge is that there is risk involved when deploying new technologies. Consequently, there is a need for increased knowledge of the water sector and the available techniques. This translates into extended discussion periods and the provision of guidance and knowledge. Understanding diverse perspectives is crucial, as collaboration is the linchpin for success. Organizations bring distinct expertise to the table, and the effective utilization of these varied skills is pivotal for driving innovation in a Living Lab project. Constructing innovations in the community fabric necessitates robust communication regarding the alterations, challenges, and societal benefits arising from such initiatives.

3 Citizen engagement

The city of Malmö, in collaboration with VA SYD, has arranged citizen meetings. These meetings involve the residents of the area, particularly in Sege Park, where the Living Lab team discusses topics on water, stormwater sustainability, and provide explanations about ongoing projects while addressing any questions. Additionally, there have been open study visits welcoming politicians, the public, and representatives from other municipalities and water utilities.

One of the challenges the team faces is the need to work on weekends to attract a higher number of participants. However, municipalities no longer agree to have their employees work during weekends. Consequently, they must organize events during working hours, risking lower attendance.

4 Impact on society

- Residents have a water source available when drinking water is limited.
- Awareness of stormwater as a resource.
- Reduced drinking water consumption.
- Knowledge of the meaning of a water-smart society and the importance of drinking water consumption.

Further impact studies will be performed at a later phase in the project when additional data and information is accessible.

5 Competency group

The Skåne CG has outlined specific actions for implementation. First, it will facilitate the gathering of insights from tenants and stakeholders of the Sege Park area, focusing on the utilisation of rain/storm water and other water saving techniques. This will result in identifying social learnings and in undertaking an analysis of the social context within Sege Park. Secondly, the CG will help strengthen engagement with the real estate developers and the tenants. This will be implemented in the frame of the developers' current activities on waste and water, aiding tenants in utilising existing solutions in their residences. In parallel, the focus will also be placed on optimizing engagement of these two categories of stakeholders within the context of the showroom establishment in the parking house.

Skåne Living Lab – Bellevue Garden

1 Overview

Bellevue Garden is another key pilot site in the Skåne Living Lab, where garden areas are being designed and a water park playground is being developed with reused stormwater using the ultrafiltration technique. Bellevue Garden has residents with a different socioeconomic status and engagement level compared to Sege Park. Older buildings are decisive in the area.

2 Main challenges

Ensuring the success of a water purification system involves addressing various crucial aspects. Securing finances is paramount to initiate and sustain the project. Simultaneously, legal considerations, particularly those related to water quality, demand meticulous attention to meet regulatory standards. Operational efficiency and transparent communication are equally vital, guiding users on the intended use of purified water. Recognizing diverse socio-economic statuses underscores the need for justified communication actions, such as multilingual outreach, bridging gaps, and ensuring broad community engagement for the desired outcome. In summary, for the project's success, the following barriers need to be resolved: financial stability, legal adherence, operational effectiveness, and inclusive communication strategies.

3 Citizen engagement

The engagement of residents in redesigning their surroundings enables a bottom-up type of co-design activity. They will equally learn more about the innovative process of applying reused stormwater for the irrigation of the area's playground.

4 Impact on society

- Access to an alternative water source for residents when drinking water is scarce.

- Increased awareness of stormwater as a valuable resource.

- Decreased consumption of drinking water.

- Understanding the significance of a water-smart society and the importance of managing drinking water consumption.

5 Competency group

The CG aims to build upon the outcomes of the 'Housing Dialogues' event organized by MKB during the summer of 2023, which engaged children and architects in informal talks to gather insights about their interests in developing the area. The CG members are eager to leverage this input for further development. One potential action to be implemented through the CG would be to organize a follow-up workshop, connecting insights from the children with the water park playground. In this context, the active participation of the entire CG would be particularly crucial to integrate a technological aspect into this activity.

💧 Midlands Living Lab

MEDITERRANEAN HUB
ATLANTIC HUB
CONTINENTAL HUB
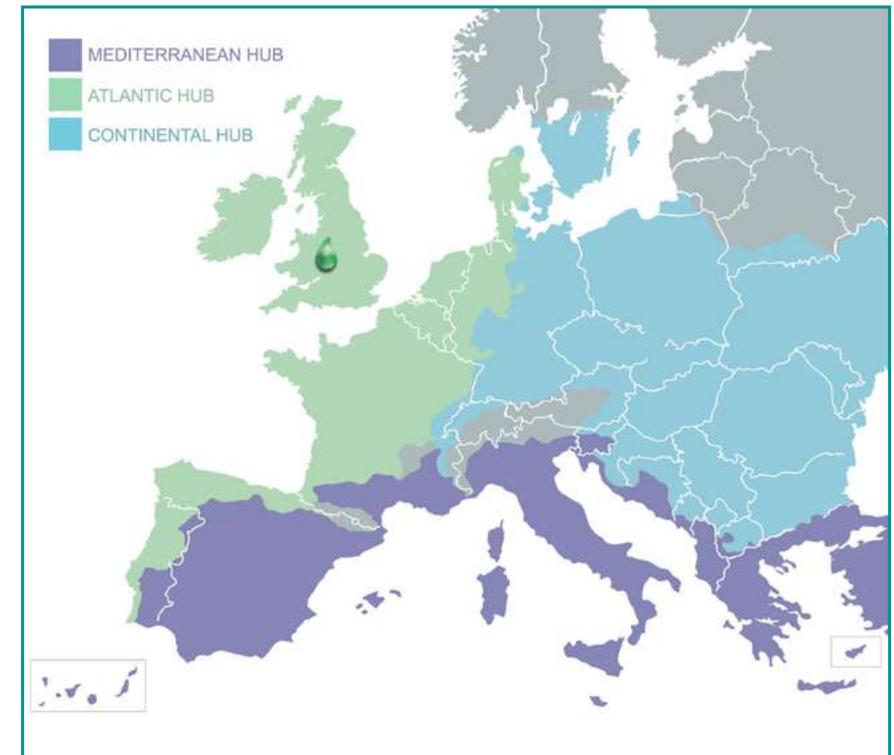
1 Overview

Severn Trent Water (STW) region serves 8 M citizens, but only 35 % in urban areas are considered in this project. It has an Atlantic climate, cold, cloudy, wet winters and comfortable, sunny summers. Within this hub the aim is to demonstrate:

- Ammonia scrubbing (OTAR) and H2 generation by ammonia hydrolysis

- Develop an integrated approach to leakage detection (FIDO)

- Smart wastewater networks for asset stretching (IWAN)

The Midlands Living Lab is still evolving and currently consists of a mixture of physical sites (which act as testbeds for new technologies) and a range of non-site-specific engagement activities.

2 Main challenges

The establishment of a Living Lab is a process that needs time and buy-in from a range of stakeholders. The specialist nature and complexity of the technology trials STW are running as part of REWAISE will require several strategies to help bridge the knowledge gap of customers, build trust, and create a collaborative environment that fosters a successful Living Lab.

At present STW are working with their Technology solution partners to complete the commissioning designs, with a plan to complete these by Spring/summer 2024. At this point STW will deploy their engagement strategies and launch the Midlands Living Lab.

From a citizen engagement perspective, establishing a Living Lab presents several challenges. For example, for ammonia scrubbing and hydrogen generation via ammonia hydrolysis:

1. Public Awareness and Education: From a citizen engagement perspective, establishing a Living Lab for ammonia scrubbing and hydrogen generation via ammonia hydrolysis presents several challenges. First, citizens may lack awareness about ammonia-based technologies. Educating them about the benefits, risks, and mechanisms involved is crucial. Additionally, promoting clean energy alternatives and discussing citizens' roles in reducing emissions are essential components of public awareness efforts.

2. Community Acceptance and Perception: Another challenge lies in community acceptance and perception. Citizens might perceive ammonia handling and hydrogen production as risky due to toxicity and flammability. To address this, building trust and addressing safety concerns becomes paramount. Clear communication about safety protocols and risk mitigation strategies is necessary.

3. Participation and Inclusivity: Engaging diverse stakeholders is vital for the success of the Living Lab. Involving citizens from various backgrounds—residents, industry workers, and environmental advocates—ensures representation and inclusivity. Their input can shape the lab's design, research goals, and project milestones.

4. Transparency and Accountability: Transparency is key to maintaining citizen trust. In decision-making processes, involving citizens ensures their voices are heard. Transparent communication about lab activities fosters trust. Additionally, regular monitoring and reporting keep citizens informed about progress, challenges, and outcomes, ensuring credibility.

5. Balancing Local and Global Interests: The Living Lab must strike a balance between local and global interests. Locally, demonstrating how the lab benefits the community—such as job creation and reduced pollution—is crucial. Simultaneously, highlighting the lab's contribution to global sustainability goals emphasizes its broader impact.

6. Behavioural Change and Adoption: Encouraging citizen participation is essential. Motivating citizens to actively engage, attend workshops, and provide feedback fosters a sense of ownership. Beyond the lab setting, promoting behavioural shifts toward clean energy practices becomes a long-term goal.

7. Long-Term Engagement: To sustain interest, the Living Lab must keep citizens engaged beyond their initial curiosity. Regular events, workshops, and community forums provide opportunities for ongoing involvement. Establishing a feedback loop allows citizens to contribute ideas, express concerns, and stay connected.

This encapsulates the multifaceted challenges and considerations involved in creating an effective Living Lab for ammonia scrubbing and hydrogen generation.

3 Citizen engagement

STW have a successful track record of Citizen Engagement and Living Labs. An example of this is the open engagement with customers during the Price Review 24 (PR24). The price review is a process led by Ofwat to determine prices for the period 2025-2030. As part of this process Severn Trent have engaged with around 68,000 of their customers to produce a business plan for 2025-2030 setting out what they intend to deliver for customers and the environment.

Wavemakers

Wavemakers is an annual ideas challenge that seeks to nurture talent and create innovation in the community.

Wavemakers takes a distinct approach. Rather than fixating on established businesses, supply chain partners, or pure research, it centres around discovering fresh, innovative solutions from across our communities. How? By collaborating with local talent, universities, and training programs. These partnerships provide the necessary support— both financial and educational—to nurture these solutions into products or services that benefit everyone. Wavemakers specifically seeks out unique ideas related to water, emphasising underrepresented areas and diverse backgrounds. Ultimately, it aims to foster entrepreneurship within the Severn Trent community, with the goal of discovering, developing and scaling these novel concepts

River Rangers

At Severn Trent the team is always looking at what more they can do to support their communities and to enhance the local environment. Finding new and innovative ways to do this is a key component of their environmental strategy and it's one of the reasons they frequently achieve the Environment Agency's highest four-star rating for environmental performance.

Since the team of dedicated River Rangers was established in January 2022, they have carried out over 3,500 riverside inspections. These additional sampling and monitoring activities provide STW with further data so they can better understand the quality of rivers in their regions and inform any further action that may be required.

The River Rangers engage with local groups who love the rivers STW looks to protect such as local fishing groups and join them in activities like litter picks along stretches of river. The team has also taken children to the waterside to pond dip to show what wildlife there is in the river – spreading the word on how important it is to keep rivers healthy.

Mansfield Green Recovery Site

Funded by STW's regulator, OFWAT, the Green Recovery Programme was launched in July 2020 to help the country's green economic recovery from the pandemic and will deliver benefits and improvements to the environment and our communities.

This project focused on reducing flood risk in Mansfield by promoting nature-based solutions, such as planting vegetation and permeable pavements. Community involvement was central to the success of the scheme and local schools, businesses, and community groups were provided with information about the different types of action they could take to install sustainable drainage in their own environments.

4 Impact on society

Engaging with communities will bring about a range of benefits to all parties:

- Help to foster more open innovation, generating the best ideas to improve customer experience and help to develop new talent within the water sector, focusing on individuals from diverse backgrounds.

- Identifying new ideas and new talent (often from under-represented backgrounds) and it also provides ongoing support via partnerships with universities, training, and funding to grow their ideas into a product or service which benefits end users.

- Provide further data e.g. to better understand the quality of rivers in the Midlands regions and inform any further action that may be required.

- Community involvement is central to the success of some schemes and local schools, businesses, and community groups can provide information about the different types of action they could take to contribute to the solutions whilst also benefitting their communities and the environment.

- Work closely with local stakeholders to build vital relationships with the goal of improving services in the Midlands.

- Engaging with partners, environmental and community groups, and customers to raise awareness of STW's challenges and explain their solutions to common problems.

5 Competency group

Midlands Wastewater Competency Group (MWWCG)

The Midlands Wastewater Competency Group is a multi-stakeholder group that focuses on issues surrounding the production, transport, treatment, and use of wastewater in the Midlands region. MWWCG is co-coordinated by CAWR at Coventry University and supported by Severn Trent and includes participants from the Consumer Council for Water, Coventry University, Organics, Severn Trent and Warwickshire Wildlife Council. Co-developed through an iterative process (including a workshop with twelve REWAISE project linked stakeholders, about five reflective meetings between a core group of project stakeholders and during the Kick-off meeting of the MWWCG with twelve participants), MWWCG is addressing the following problem statement:

"Our current system responsible for treating wastewater and sewage is under extreme pressure. How can this system be made more resilient and sustainable? Specifically, what role can science, technology and society have in improving the current system? And how will such changes impact on the roles, rights and responsibilities of stakeholder groups?"

MWWCG has met twice (one 2-day, one 3-hour meeting) to establish its code of conduct, to agree on the problem statement and to identify MWWCG topic areas, possible solution pathways and MWWCG action areas for subsequent in-depth work. MWWCG aims to be both a reflection space for its participants but to also produce tangible outputs for REWAISE and for wastewater management improvements in the UK Midlands and beyond.

Severn Trent Water's Wavemakers initiative serves as an excellent platform for launching a Living Lab focused on REWAISE themes. Let's delve into how they can effectively leverage Wavemakers to drive this innovative project:

1. Project Proposal and Ideation:

Begin by defining a clear challenge related to REWAISE topics within the water sector. Encourage community members, researchers, and students to actively participate in brainstorming sessions. Host workshops where participants can propose creative ideas and practical solutions.

2. Collaboration and Partnerships:

Foster collaborations with relevant stakeholders, including academia, industry experts, and other organizations.

3. Research and Development:

Collaborate with academia to optimize lab-scale trials of proposed technologies. Conduct small-scale trials to validate concepts and assess feasibility.

4. Community Engagement:

Introduce the challenge topic to the community. Educate citizens about the project's goals, benefits, and safety measures. Organize workshops involving residents, schools, and local businesses to foster community participation.

5. Data Collection and Analysis:

Utilize citizen science and/or academic resources to collect relevant data. Share findings with participants and actively seek their input for continuous improvement.

6. Scaling Up and Demonstration:

Host open days or events to showcase the Living Lab's progress and innovations. Engage policymakers to promote and implement effective solutions.

7. Long-Term Sustainability:

Ensure the Living Lab continues beyond the initial phase, leaving a lasting impact. Offer training programs to nurture local talent interested in water and wastewater treatment technologies.

By following this comprehensive approach, Severn Trent can create a thriving Living Lab that not only addresses water challenges but also contributes to the well-being of the community and the environment.

Poznań Living Lab – Reuse of treated wastewater
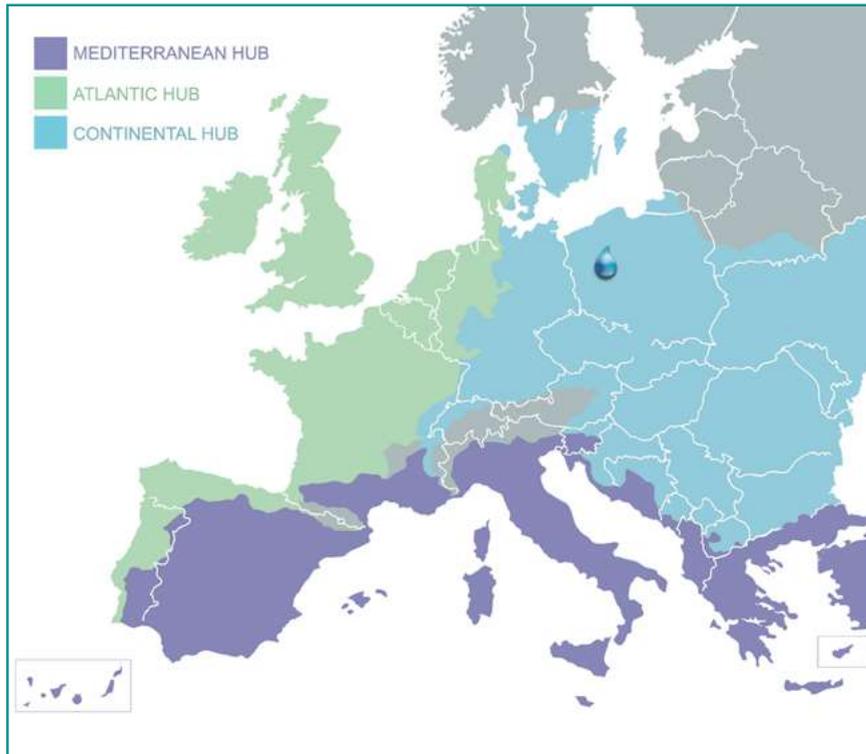
1 Overview

The progressive steppe formation observed over many years and the depletion of groundwater resources in ANET's area of operation is becoming an increasing problem, and not just for geologists and hydrologists. Water utilities (including ANET) may face significant problems soon in providing their customers with uninterrupted access to potable water. Faced with the potential threat of disruption to the water cycle, it is reasonable to look for ways to mitigate this. One of these, developed and promoted in ANET's area of operation, is the disinfection of treated wastewater produced at the wastewater treatment plant.

ANET operates seven wastewater treatment plants located in different areas, i.e. urban, suburban, and rural areas. Thanks to the diverse land use in which ANET operates, the team sees many possibilities for showcasing the treated effluent, including

- watering of urban green spaces,
- street cleaning,
- irrigation of agricultural fields and allotments,
- use of water in industries not requiring tap water.

In the context of the Living Lab, the project aims to raise awareness among the local community, authorities and entrepreneurs about limited drinking water resources, its saving and reuse.

This will be achieved by actively promoting the case study at various family picnics, environmental and scientific events organised by local authorities, activists, and entrepreneurs.

The programme of the presentations will include a demonstration of the case study, which everyone, regardless of age, will be able to see live and learn about its principles and effects. All this will be combined with a children's workshop to raise awareness of the importance of rational water management.

In addition, the Living Lab team plans to reach out directly to local authorities and businesses at dedicated meetings, where they will present the potential opportunities for using disinfected wastewater in their areas of activity in a professional and accessible manner.

2 Main challenges

The main challenges the Living Lab face are the low awareness of the local community and businesses of the threat posed by decreasing availability of drinking water and the low willingness to adopt innovative solutions. This is due to the fact that water in ANET areas is low cost and there have been no significant supply disruptions so far - the public takes access to water for granted. In addition, innovative solutions raise concerns among citizens about the inadequacy of the implemented technology and the resulting problems. Businesses, on the other hand, are uncertain about the quality of the treated wastewater and potential risks to the continuity of their processes.

3 Citizen engagement

So far, the Living Lab has held initial discussions with local authorities and some businesses potentially interested in using disinfected treated wastewater. During the meetings, potential customers have shown interest, asking questions about disinfection methods, the quality and potential volume of water supplied and the cost of the service. This is indicative of a willingness to cooperate, but concerns were repeatedly raised about the fact that potential customers still regard it as "wastewater". The word "sewage" itself has a negative connotation in Polish society. This causes fears among companies about the quality of water and potential problems in the technological processes where it would be used. In view of the above, the team sees even more reason to start talking about the secondary use of wastewater in Polish society. What is required is the building of mutual trust, a thorough understanding of the disinfection process by potential consumers and the use of the scientific authority of a university such as Poznań University of Technology (PUT).

4 Impact on society

Poznań Living Lab's ambition is to spread knowledge and good practice on how to make the best use of the available water resources. The team wants to reach out to everyone, both the elderly and children, to help them develop good habits from an early age and to raise their awareness of the high value of water for society as a whole.

Poznań Living Lab also wants to create awareness among local authorities and entrepreneurs so that their willingness to use innovative water reuse technologies becomes part of their political agendas and business strategies. The team believes that the word "wastewater" will no longer have negative connotations in Polish society and will no longer be associated solely with waste and pollution, but will become a source of valuable raw materials, such as water.

5 Competency group

The Poznań Living Lab is in the early stages of setting up a competency group, consisting of the recipients of the product, which will be wastewater treated by entrepreneurs and farmers, among others.

REWAISE Living Labs
mapped

As part of the REWAISE capacity building activities, three Living Lab mapping activities took place:

1 Stakeholder engagement and mapping through the **Lotus exercise**

2 **Living Lab Business Model Canvas**

3 **Living Lab mapping Canvas**

The canvases are strategic tools used for visually developing or displaying a Living Lab strategic and operational model. The canvas methodology was built based on experience from different large-scale pilot projects: **Urbanome** and **OpenLab** projects, to help Living Labs outline the key components of their strategic and operational model and understand the state of their maturity. The canvases are available upon request from ENoLL.

Outcomes:

Skåne Living Lab – Macro level

Synthesis:	Living Lab constellation consisting of organised stakeholders (PPP partnership - consult Figure 3).
Overview:	Two Living Lap pilots: Sege Park and Bellevue Garden

Lotus exercise: Good balance between the quadruple helix participation.

Key ingredients from impact:

- Exhibition, visual pilots, platform for information sharing;
- Urban farming city+ (**living on-site**);
- Workshops/seminars (public);
- Malmö/Lund showrooms inviting REWAISE.

Business Model canvas:

- Purpose driven business model activities.
- The Living Lab's core mission is to: **Provide continuity on water management, recycle, and ensure circularity on how to build new cities and handle storm water.**
- There is no dependence on the private market.

Living Lab mapping canvas:

Challenges:

- Public sector representatives not necessarily follow the outcome of other R&D and Innovation projects, decisions can be made faster than a real experimentation would be carried out;
- Lack of clear boundaries, burden of old regulations;
- REWAISE is not the only running project, to get to synergies and optimisation from the multitude of projects can be complicated.

Strength:

- Early start of the steering groups of the Living Labs, in this group the highest-level decision makers are present; operating with shared responsibility.
- Strong expert to coordinate the main organisation.
- Strong communication, openness from partners to participate.

Synthesis: Living Lab projects

Overview: Meso level Living Lab projects have been run by the Midlands team:

- **Love water network**;
- **River Rangers**;
- **Kickstarters** (pop-up academy);
- Midlands playbook: **Beast from the East**; **Wave makers**.

Lotus exercise: Universities are involved (Coventry University) and other research institutions, private, public water networks, government bodies, policy level.

Mission: Bringing in the voice of customers.

Key ingredient for impact: **The FABLAB**

Business Model canvas:

- Purpose driven business model activities.
- The Living Lab's core mission is to: **Reduce water losses, educate on consumption, reuse, recycle.**
- Current activities and Living Lab projects are driven by the mission to educate the customers on water consumption and save as much as possible on water waste.

Living Lab mapping canvas:

Challenges:

Since REWAISE is not the only project within the Living Lab, the challenge is to ensure the right effort and time are dedicated. Some delays have been experienced due to a significant structural and operational reorganization in the host organisation.

Strength:

- The projects are supported by the local government, which has established checkpoints to ensure compliance with their requirements.
- Severn Trent's innovation team is fully assigned and committed to these initiatives.
- Additionally, dedicated sites have been established to set up a Living Lab constellation.

Synthesis:

Living Lab methodology consisting of different research steps

Overview:

Showcasing Poznan Living Labs' experiments at festivals, science days, schools and in the city centre with educational and experimental purposes, encouraging people to get involved

- Carrying out learning sessions and experimental activities in Poznań.
- Conducting surveys among people regarding their knowledge of the REWAISE project and of treated wastewater.
- The team is in touch with universities and local business owners with a view to involving them in the Living Lab ecosystem and assess the possibility of implementing the technology (feasibility, costs etc).
- Successive engagement via sending of newsletters on project implementation and new results to keep the public informed.

REWAISE Living Labs mapped
Next Steps

As the REWAISE Living Labs move forward in achieving their set objectives, it is crucial to delineate clear and actionable follow-up steps to ensure sustained progress and impact. These follow-up actions will focus on consolidating initial gains, fostering continuous stakeholder engagement, and implementing iterative improvements based on real-world feedback. By systematically tracking outcomes, refining processes, and leveraging collaborative insights, Living Labs can effectively translate innovative solutions into tangible, scalable results. This strategic approach will not only enhance the efficacy of the current projects but also lay a robust foundation for future water-oriented citizen driven initiatives, reinforcing the dynamic and adaptive nature of Living Labs in driving social, economic, and environmental transformation.
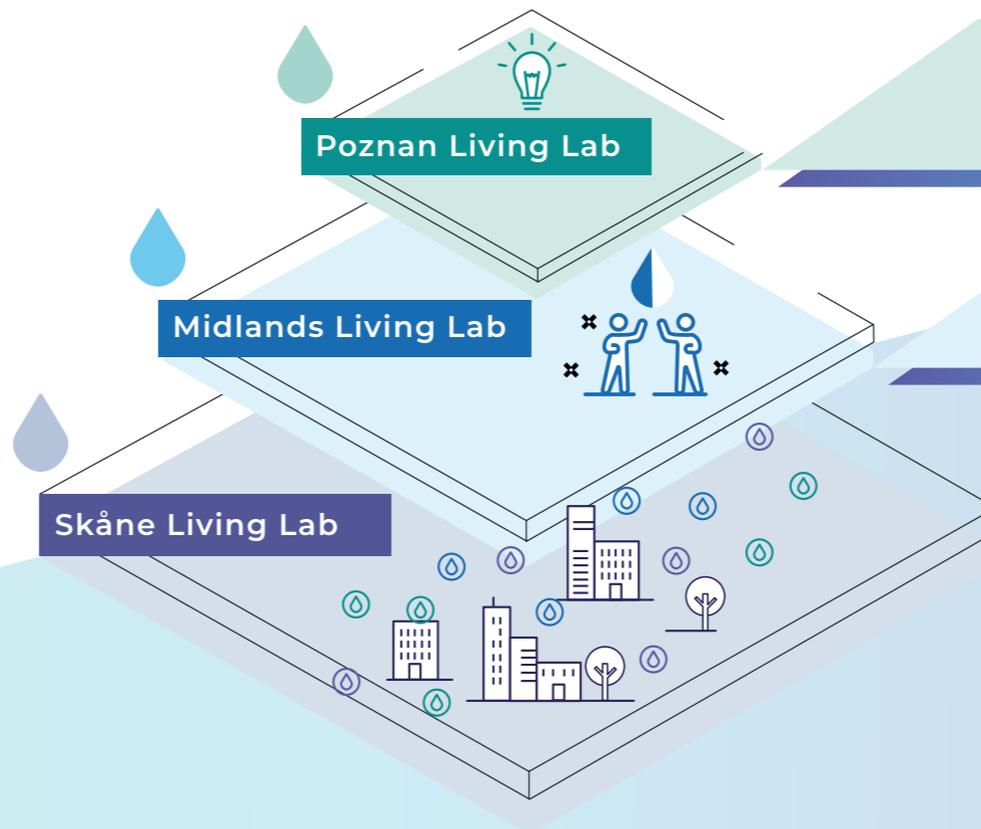
MICRO
MESO
MACRO

Poznan Living Lab

The key objective for Poznan Living Lab is to reach meso level, where they can experiment their technical pilot case study with the engagement of citizens and students.

Midlands Living Lab

Midlands Living Lab aims to form a structural setup for the Living Lab type of projects and be able to implement it in the REWAISE context.

Skåne Living Lab

Skåne Living Lab set as objective to transition towards a more sustainable Living Lab setup in their region and to find sustainable business models to continue their activities.

Poznan Living Lab

Current maturity > Micro level
Targeting > Meso level

Actions

• A planned **stakeholder mapping activity** is on the horizon, where final details can be adjusted both on the experimentation level and for the future Living Lab stakeholder board.
• **Define set metrics for success and performance measurement** for the citizen engagement study.
• Once the pilot study evaluation is concluded, it is suggested that Poznan Living Lab also **experiment with the Living Lab Business Model and mapping Canvases**.

Midlands Living Lab

Current maturity > Meso level
Targeting > Macro level

Actions

• **Put together a portfolio of former citizen-engagement projects** and check if lessons learnt are already included at the Business Model and Living Lab Mapping canvas.
• **Revisit the two canvases** with the support of facilitators and create an action plan for the calendar year about maturity ambitions.
• **Define an action plan for the calendar year** to create the necessary steps for the operational setup.
• **Work with peers from the ENoLL network** to overcome barriers and learn faster.

Skåne Living Lab

Current maturity > Macro level
Targeting > Sustainable well-established Living Lab constellation

Actions

• It is suggested to plan a **follow-up online session to revisit the Business model canvas** and update it following the next competency group meeting (identification of joint project opportunities, planning on exploitation following the project's timeline, interest of mapped stakeholders).
• **Evaluation of engagement**: It was found particularly challenging to find a method to measure and evaluate the engagement throughout the Living Lab and competency group activities. Finding an actionable methodology will help the Living Lab to show its impact and results to their stakeholders and governing board.
• Skåne Living Lab **shows the potential to become a labelled ENoLL network member Living Lab** during the lifetime of the REWAISE project, which would open additional funding sources for the constellation.

ENoLL

The European Network of Living Labs (ENoLL) is an international non-profit association which aims to promote and enhance user-driven innovation ecosystems, more precise the Living Labs concept globally. ENoLL focuses on facilitating knowledge exchange, joint actions and project partnerships among its historically labelled +480 members, influencing EU policies, promoting Living Labs and enabling their implementation worldwide.

Competency Groups (CGs)

In REWAISE three CGs will be established to help facilitate a genuinely participatory and 2-way wisdom dialogue between parties. CGs are an innovative method for understanding environmental knowledge controversies where they impact upon multiple stakeholders and require collaborative actions.

Living Labs

Living Labs (LLs) 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.

Living Lab labelling

To ensure high value-added exchanges within the network and quality outputs from ENoLL certified Living Labs, membership is limited to those organisations able to demonstrate the consistent use of a Living Lab approach. ENoLL Living Labs undergo a structural and methodological quality assessment on their maturity as an innovation ecosystem. This seal of quality makes ENoLL Living Labs the global standard on user-driven innovation.

Open Innovation

The term Open Innovation (OI) was coined in 2003 by Henry Chesbrough, is the opening of the innovation process. Once new products have been developed secretly and behind closed doors, today a targeted integration of customers, researchers, suppliers and partners into the innovation activities takes place.

REWAISE Living Labs

REWAISE provided **capacity building s**essions to 9 living labs grouped into three main European hubs:

- 💧 **MEDITERRANEAN** (Levante, Salamanca, Extremadura)
- 💧 **ATLANTIC** (Galicia, Midlands, Northern - Cantabria/Asturias - region)
- 💧 **CONTINENTAL** (Poznan, Ostrava, Skåne)

They were grouped according to hydrological resources, needs and also geography and climate. The goal is to **demonstrate in real life, large scale and operational environment the technological innovations** to extract the value in, from and through water.

Optimisation and **evaluation** activities are in place at three strategic locations: Skåne, Midlands and Poznan.

In terms of practical actions of **stakeholder involvement**, 2 Competency groups have been set in the Midlands and in Skåne, to maintain an open dialogue in a **problem-oriented approach**. The set up of a Spanish level CG in currently underway.

The **nine Living Labs** address:

- 💧 Different water sources: surface, rain, ground, sea, brackish water and municipal and industrial wastewater streams.
- 💧 Various water users: urban, rural, industrial, and agricultural.
- 💧 Different raw materials, nutrients, bioproducts and bioenergy recovery.
- 💧 Five main governance models: Public Company, Delegated Public
- 💧 Management, Direct Private Management, Delegated Private Operation and Concession.

Stakeholder

Any individual or group who has an interest in the outcome of an action provided by an organisation or a company.

Quadruple Helix model

The Quadruple Helix Model (QHM) of innovation recognizes four major actors in the innovation system: science, policy, industry, and society. In keeping with this model, more and more governments are prioritizing greater public involvement in innovation processes.

Glossary

REWAISE
Resilient Water Innovation for Smart Economy

Triple Helix mode

The Triple Helix model (THM) of innovation refers to a set of interactions between academia (the university), industry and government, to foster economic and social development, as described in concepts such as the knowledge economy and knowledge society.[4]

Users

Users bring their own specific wealth of knowledge and expertise to the collective, helping to achieve boundary spanning knowledge transfer. Users can also be involved and have influence on innovation processes for democracy reasons, learning reasons or economical reasons. Adding to that is the emerging trend of customers and users who want the opportunity to influence products and services. In a Living Lab setup, users change roles from passive consumers to active prosumers of content. The users of the **REWAISE** Living Labs are considered to be the ones that will be using the smart water solutions.

Water Europe

Initiated by the European Commission (EC) in 2004 as the European Technology Platform (ETP) for water with the name WssTP. This ETP status was renewed by the EC in 2013 in line with its ETP2020 strategy. In 2007, Water Europe (WE) was transformed into a member-based multistakeholder platform under Belgian law. Since then, the membership and activities of the organisation have continuously grown and evolved in line with its ambition to represent the whole value-chain of water and achieve a European Water-Smart Society.

Water-Oriented Living Labs

Water-Oriented Living Labs (WoLLs) are real-life, water oriented and demo-type and platform-type environments with a cross-sector nexus approach, which have the involvement and commitment of multi-stakeholders (including water authorities) and a certain continuity (good chance to continue to their existence), and provide a "field lab" to develop, test, and validate a combination of solutions as defined in the SIRA, which include technologies, their integration as well as combination with new business models and innovative policies based on the value of water.

External
Resource

- **Atlas-of-the-EU-Water-Oriented-Living-Labs**
- **CIRC4Life project**
- **Co-creative workshop book**
- **ENoLL Learning Lab and Capacity Building**
- **ENoLL Living Labs as Regulatory Learning Tools**
- **FISSAC Living Labs**
- **Living Labs**
- **Living Lab HANDBOOK FOR URBAN Living LabS DEVELOPING NATURE-BASED SOLUTIONS**
- **Living Lab services for business support and internationalisation**
- **OpenLivingLab Days**
- **REWAISE Living Labs**
- **REWAISE Living Labs methodology and online handbook first edition**
- **SCORE project**
- **Short History of Living Labs - Research and Policy context**
- **U4IoT LivingLabMethodology Handbook**
- **The Living Lab Guidebook for cities fighting against air pollution**
- **The Living Lab Methodology Handbook**
- **Tips and Tricks**
- **UnaLab – Urban Living Lab handbook**
- **VITALISE project**

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The
Consortium

25 research and water industry entities working together to create a new "**smart water ecosystem**"; mobilising all relevant stakeholdres so that **society can embrace the true value of water**; and reducing freshwater and energy use; resulting in a carbon-free, sustainable hydrological cycle to transition into a resilient circular economy.

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