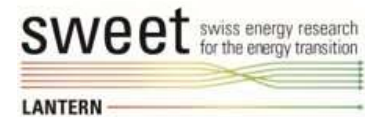


Unlocking the Power of Clean Energy Innovation with Living Labs

Part 2

From Prototypes to Validation with End users

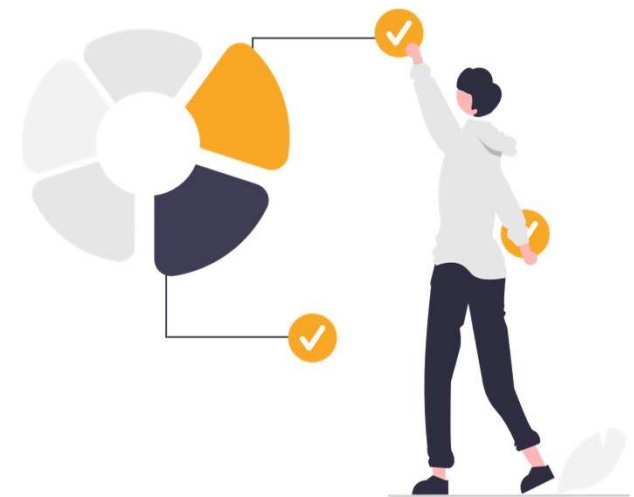


LANTERN



Agenda

- 1. Understanding end-users**
- 2. Structured way of validating with end-users**
- 3. Expert interview**
- 4. Interactive activity**



1. Understanding end-users

- "The success of innovations hinges on **the relevant stakeholders' perceptions.**
- The traditional trend of focusing on only one stakeholder, the buyer, bears **the risk of failing innovation adoption.**
- **Innovations that can contribute to societal challenges** need to incorporate the engagement of multiple stakeholders.
- **The innovation that was not adopted – consequently fails".**

What is a socio-technical system?



© Mastelic 2017

**Example of UserGap, Sustainable Neighborhood,
Gland, Switzerland**



2 measurements to assess readiness

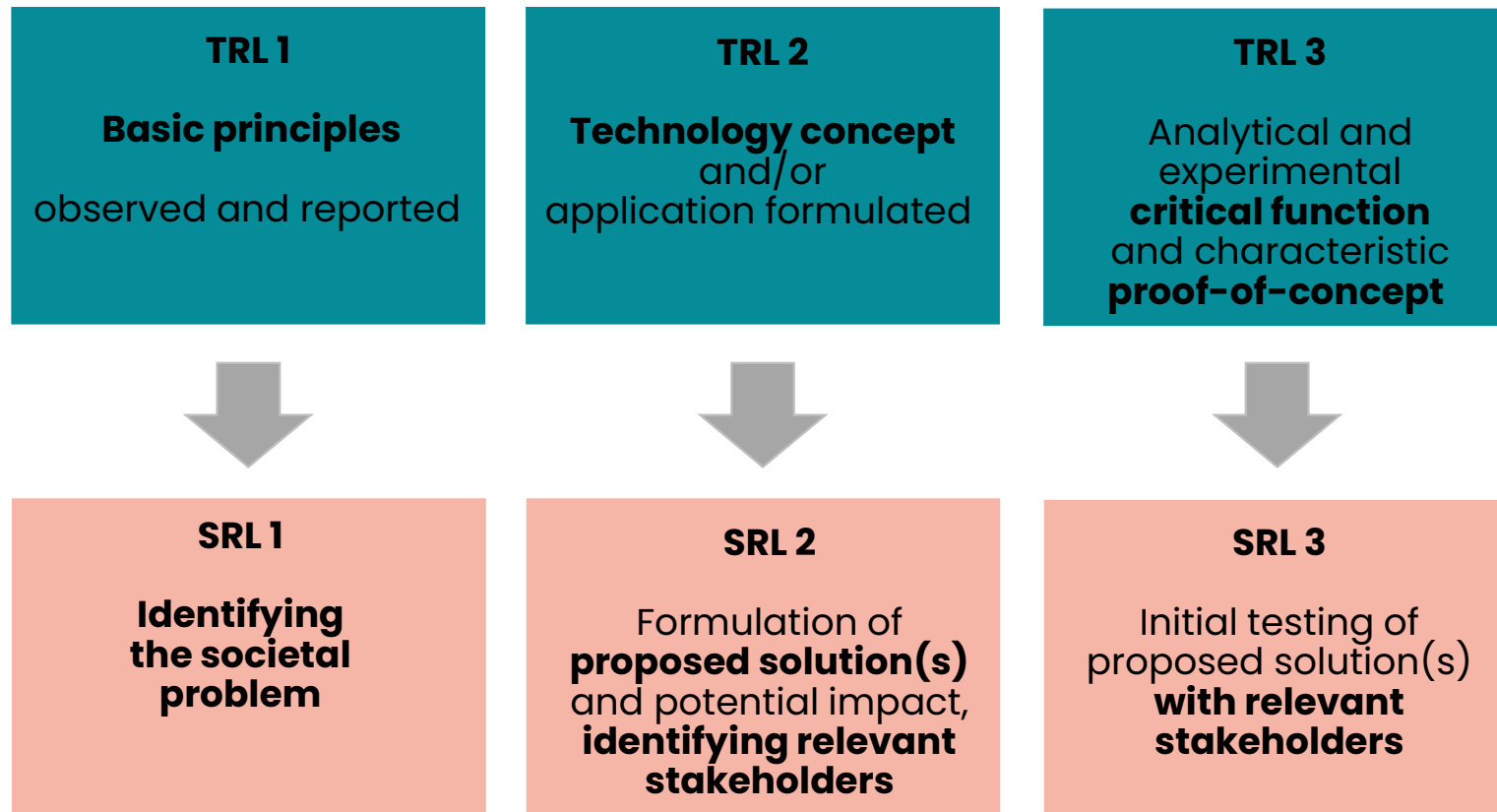
**Technological
Readiness
Level**

TRL

**Societal
Readiness
Level**

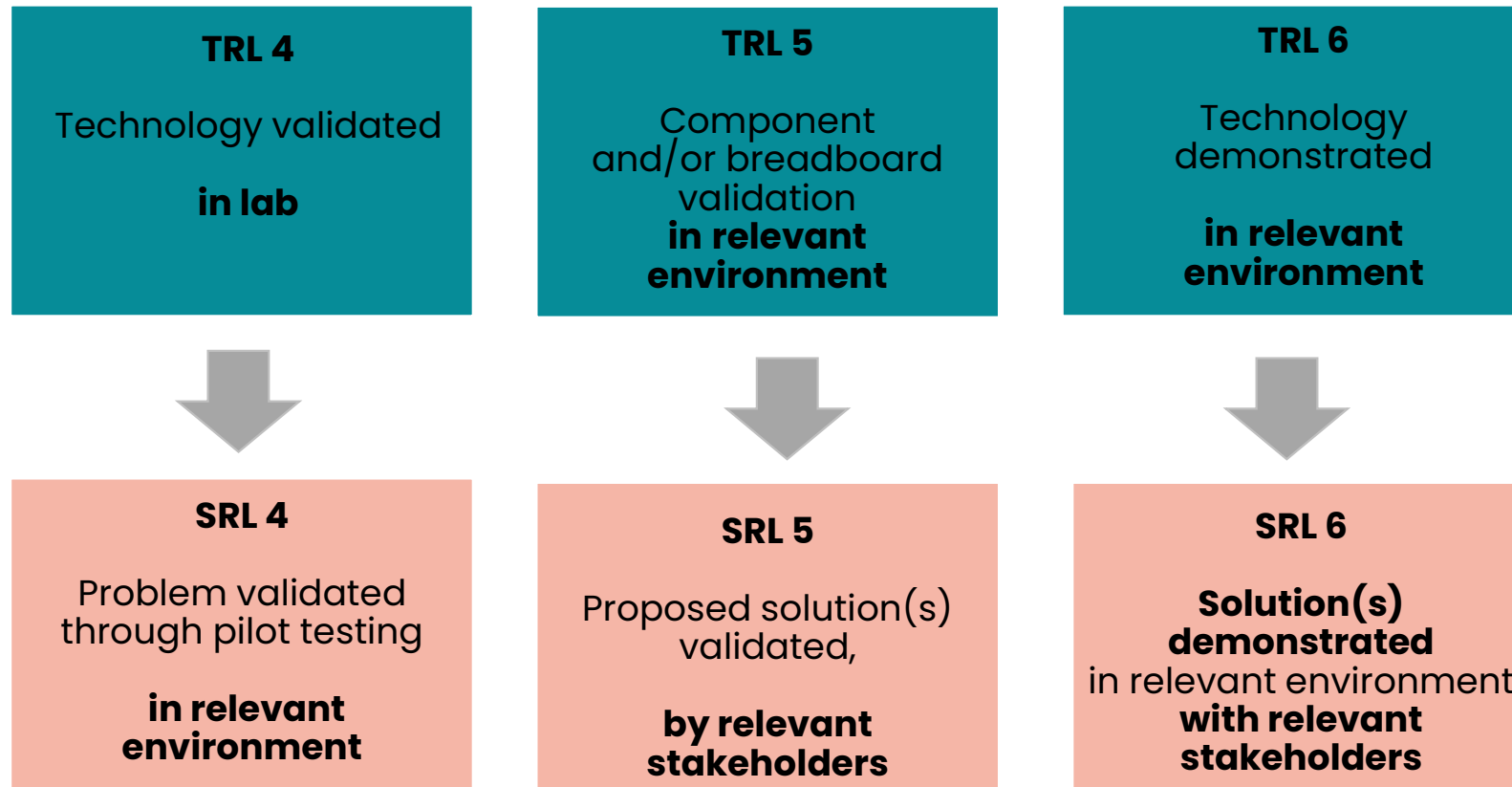
SRL

Technological Readiness Levels 1-2-3



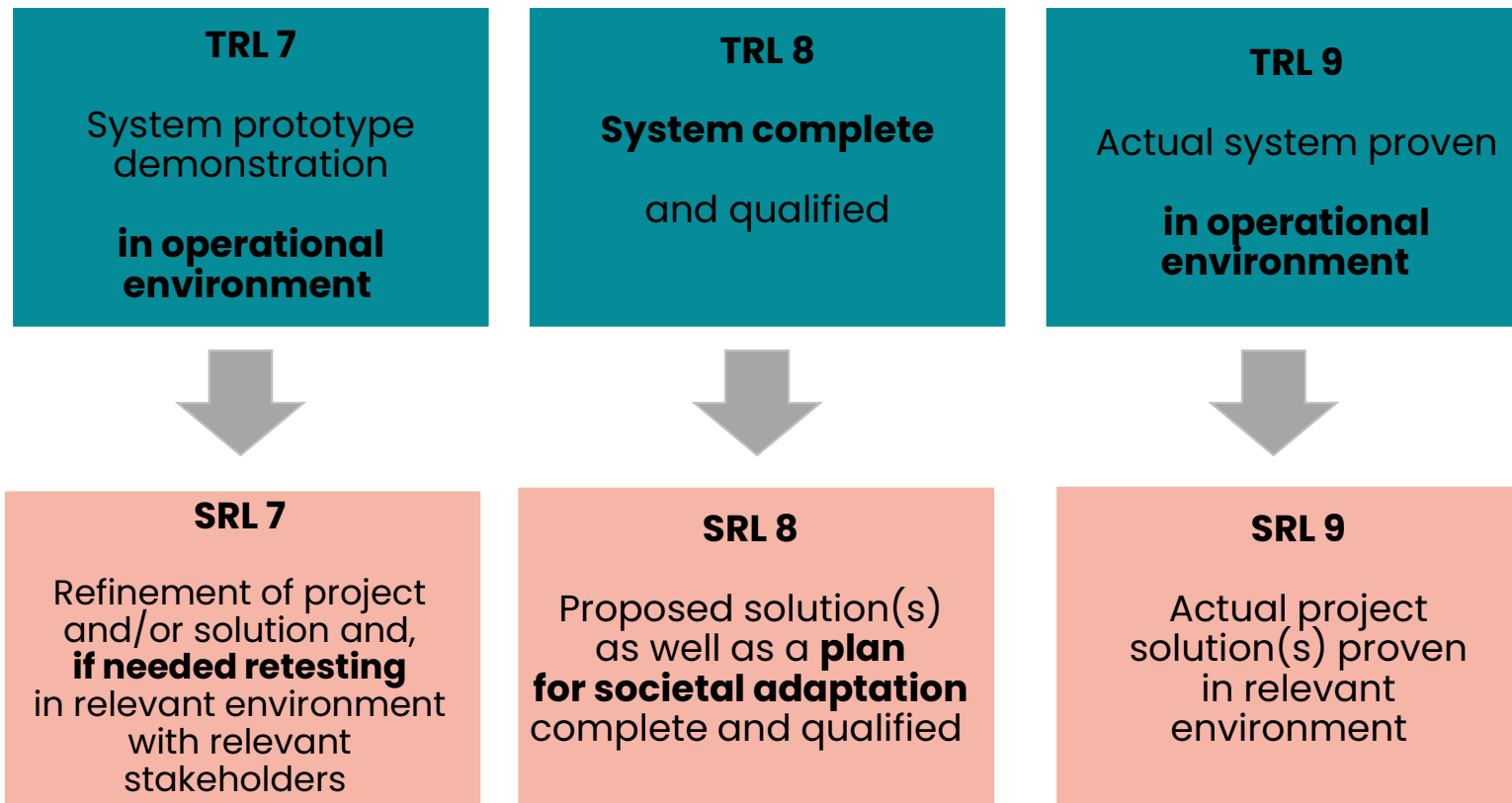
Societal Readiness Level 1-2-3

Technological Readiness Levels 4-5-6



Societal Readiness Level 4-5-6

Technological Readiness Levels 7-8-9



Societal Readiness Level 7-8-9

Understanding End-users

Understanding

**Needs
Problems**



Photo by [mauro mora](#) on [Unsplash](#)

Maslow's hierarchy of needs



Understanding End-users

Problems



Photo by [Naja Bertolt Jensen](#) on [Unsplash](#)

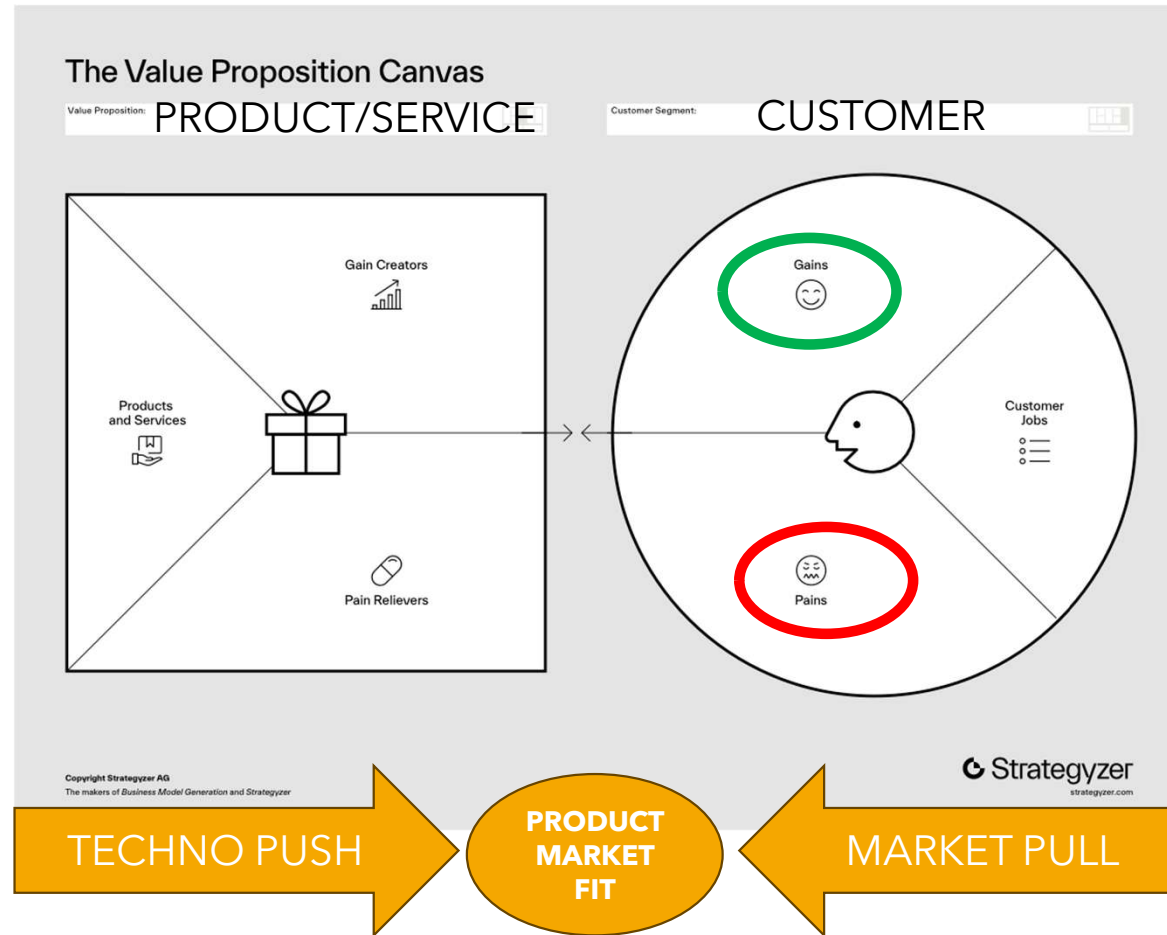
Why analyse end users?

We empathize **to understand our user behavior** and **to define social practices to change.**

To achieve this, we need **their trust.**

We gain trust by engaging with them or **observing them** “in situ” (meaning on-site), in **real-life settings**, in their environment, where they feel comfortable.

How to create value with users?



Persona



"A quotation that captures this user's personality"

Age: 1-100

Work: Job title

Family: Married, kids, etc.

Location: City

Personality



Environment



Motivations & Goals

- The motivations that guide the user
- Interests and personal preferences
- Values and activities that motivate the persona
- A task that needs to be completed
- A life goal to be reached
- An experience to be felt

Frustrations

- The challenges this user would like to avoid
- An obstacle that prevents this user from achieving their goals
- Problems with the available solutions

Bio

The bio should be a short paragraph to describe the user journey. It should include some of their story leading up to a current use case. It may be helpful to incorporate information listed across the template and add pertinent details that may have been left out.

Why this persona?

- What decisions do we need to make ?
- How will this persona help?
- How does this persona change our process?

Research

- What research or data informs our decisions and persona?

Success criteria

- How will we know our user or personas are serving their purpose?

MARILEE ADAMS, PhD

FOREWORD BY MARSHALL GOLDSMITH

4th
EDITION
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your
questions
change
your life

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COPIES SOLD

12 POWERFUL TOOLS
FOR LEADERSHIP, COACHING,
AND RESULTS

How to identify users depending on the phase

How might we ...

context (what?)

actor (for whom?)

problem (to be solved)

... ?

How might we help . . .



Photo by [Brooke Cagle](#) on [Unsplash](#)

Joelle

- Description of Persona?
- Jobs to be done?
- Her context? Literacy?
- Problems / Pains?
- Interests / Gains?

How might we . . .



I'd love to have solar panels on my roof (**WANT**)
to reduce my CO2 footprint (**NEED**).

Unfortunately, she doesn't have an engineering background or knows anybody that she can trust for reliable and transparent information.

Furthermore, she associates this transition with a large investment, she'll need to carefully plan her budget.

How might we . . .

help

Joelle

Reducing her CO2 footprint

???

Ensuring general consensus




**"I need more
motivation"**

"Where should I start?"

"Sounds expensive."

Understanding End users



"I want to be part of the Energy transition However, I don't have enough time to familiarize myself with the different possibilities."

"What would motivate you to go for Solar Energy?"

"What kind of technology have you considered regarding local energy production ?"

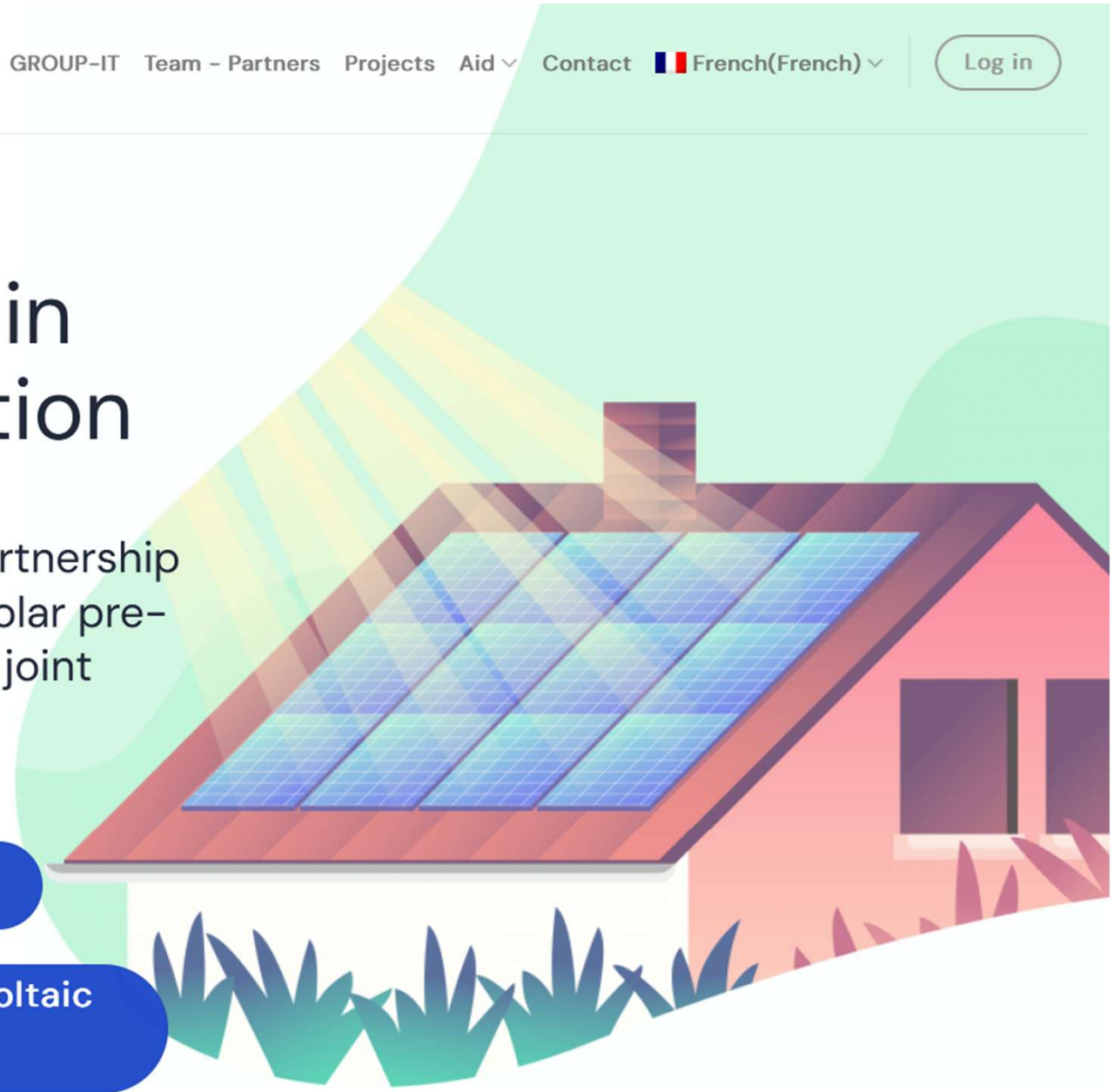
"What comes to mind when purchasing renewable Energy?"

Become an actor in the energy transition

Thanks to a project launched in partnership with your municipality, get a free solar pre-assessment and participate in our joint tender, all without commitment.

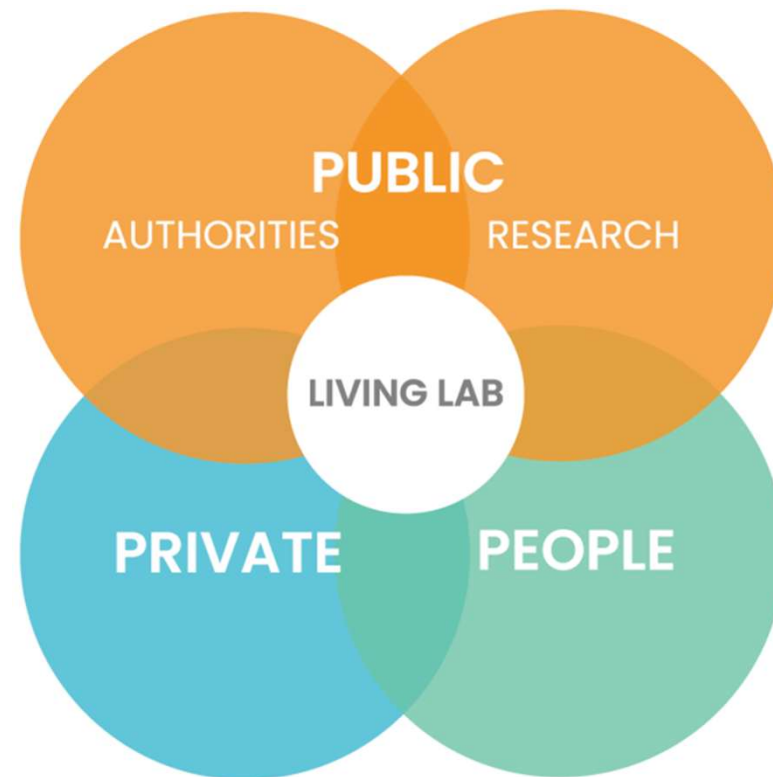
[Discover GROUP-IT and its process.](#)

[Help and information for a photovoltaic installation](#)



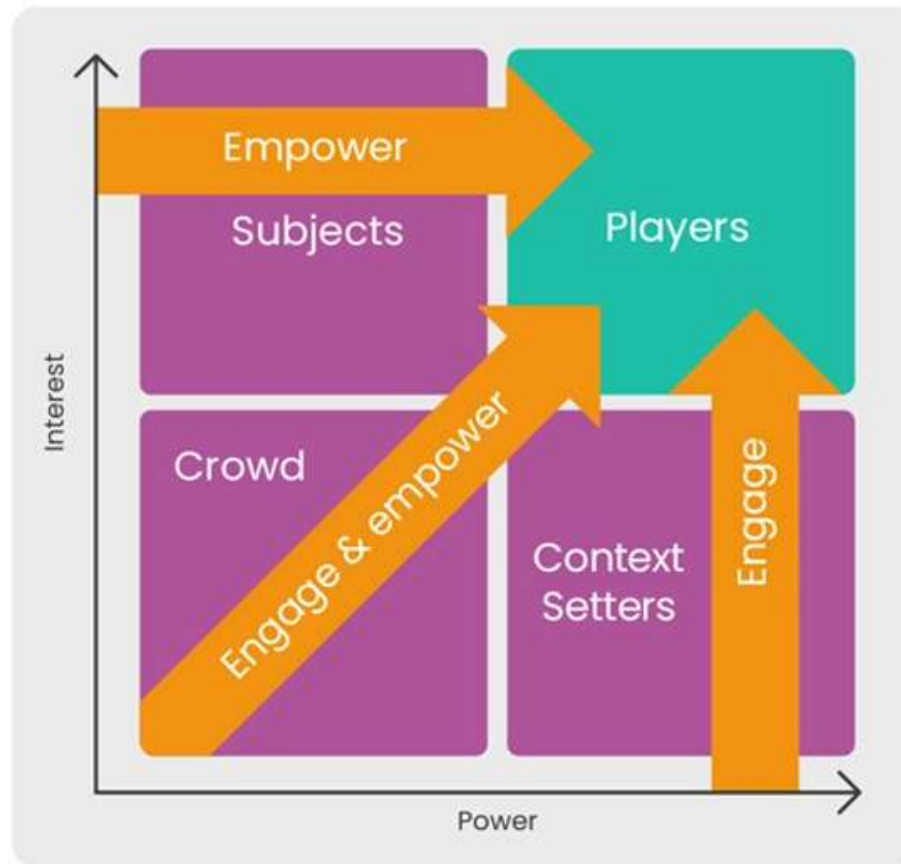
Multiple types of stakeholders

This model is called the
Quadruple Helix



Source:
Carayannis and Campbell, 2012

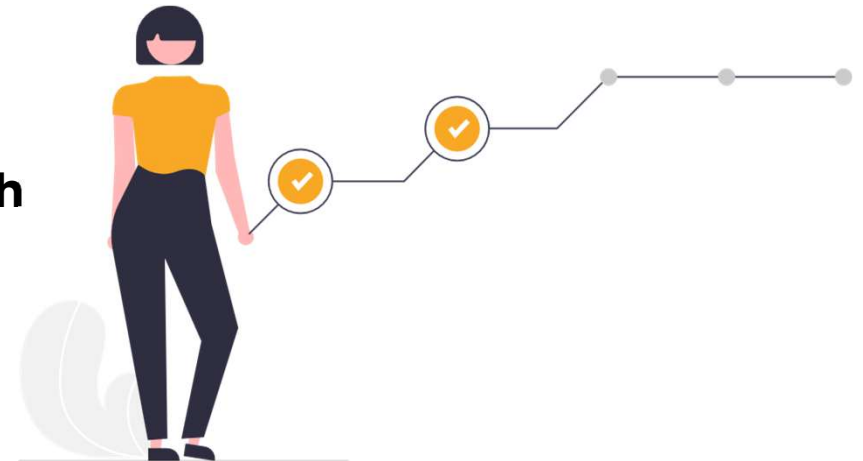
How to select, engage and empower?



Power-Interest Matrix,
(adapted from Eden & Ackermann, 1998)

How to find new stakeholders?

- **Identify project needs**
- **Use Stakeholders ecosystem mapping**
- **Develop your network**
- **Launch open calls for collaboration**
- **Collaborate with other Living Labs and Establish partnerships**
- **Provide clear incentives for stakeholder engagement**



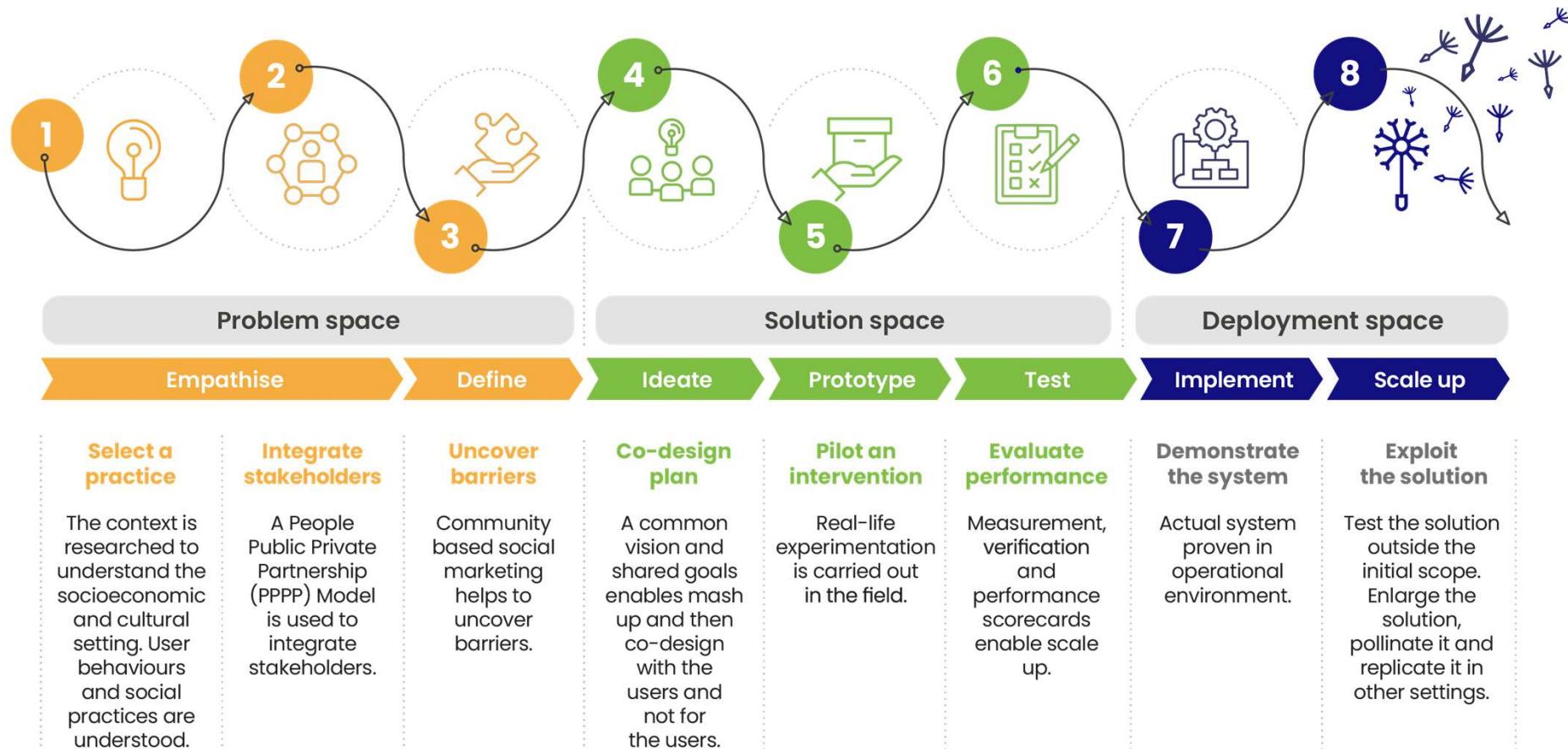
How to work with different stakeholders?

- **Establish open and transparent communication**
- **Manage expectations and ensure common understanding**
- **Apply participative processes involving different stakeholders**
- **Be prepared to adapt working methods and integrate changes**
- **Implement conflict resolution mechanisms**
- **Establish clear performance indicators and regular feedback processes**



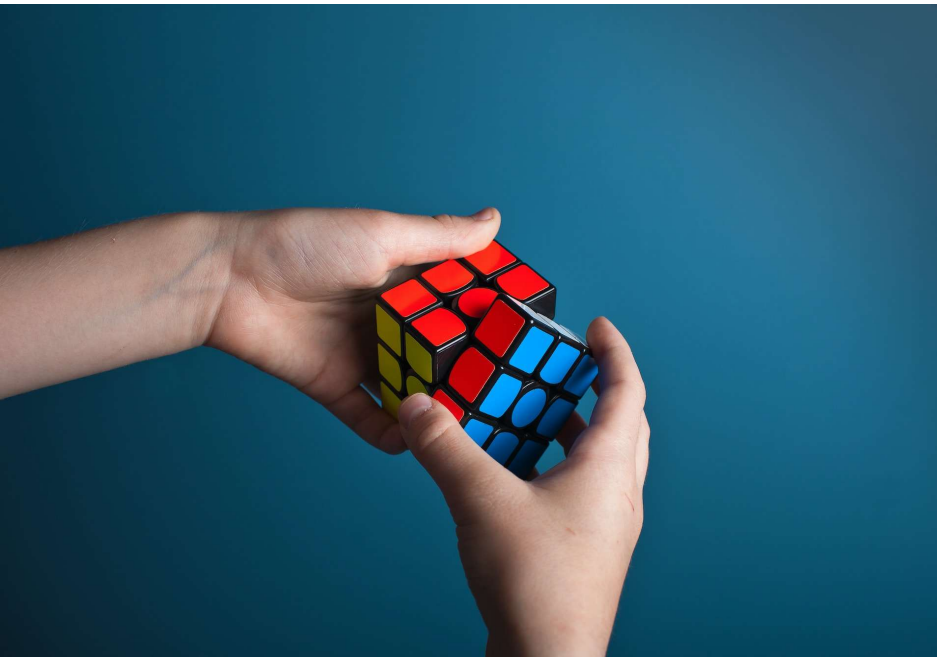
2. Structured way of validating with end-users

Living Lab Integrative Process



Step 1. Empathise & Define

Stakeholders' identification and problems formulation



Stakeholders' engagement

- **Expert interviews** – private and public organisations (to validate ideas / hypothesis)
- **Analysis of user profiles** + interviews/surveys to identify needs and validate ideas
- **Involvement of end users** in the conceptualisation of a new solution from the beginning of the process

Photo by [Olav Ahrens Røtne](#) on [Unsplash](#)

SRL 1 / SRL 2

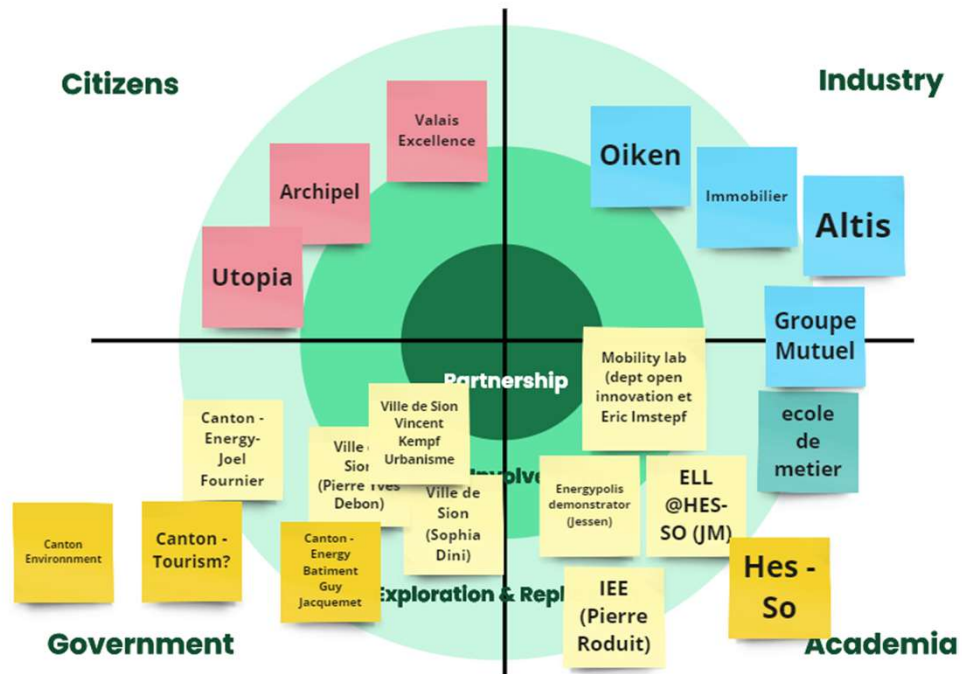
TRL 1 / TRL 2

Step 1. Empathise & Define

Stakeholders' identification and problems formulation

Example of stakeholder's identification by project

HELIX MODEL STAKEHOLDERS MAPPING



FLAIRE (Solutions for transition: Fair, flexible and socially resilient energy systems)



Understanding of Demand-Side Management (DSM) Solutions

FLAIRE aims to enhance understanding of DSM solutions and their role in decarbonizing and enhancing resilience in the Finnish energy system.

Assessment of Feasibility and Fairness

The project focuses on assessing the feasibility and fairness of customer-side DSM, particularly for less 'energy literate' households.

Economic Value of Flexibility Services and System-wide Impacts

Using modeling, FLAIRE estimates the economic value of flexibility services and evaluates their system-wide impacts on the energy system.

Quadruple helix stakeholders

Core Interaction Partner	Specific objectives and means of interaction
Project consortium	Interdisciplinary research
Relevant ministries and authorities (Environment, Employment & Economic Affairs & Employment, Energy Agency)	Policy relevance of research; inputs into KAISU & EIS via the Climate Assembly (CA) and transition arena & policy dialogues
Municipalities (Hinku-network & Lahti, Utajärvi)	Develop Virtual Power Plants (VPPs) & other Demand Side Management (DSM) solutions via experiments; input into Climate Plans
Properties & procurement (Senate Properties, Hansel)	Help develop VPPs and other smart DSM solutions via experiments
Finnish Innovation Fund Sitra)	Upscaling and mainstreaming DSM innovations; CA and transition arena organized in collaboration with Sitra
National energy advisor (Motiva)	Advising on DSM solutions; Down a Degree campaign evaluation
Households (Martha Association, Single-family Home Association)	Insights into household perspectives & joint dissemination activities
Citizens	Climate Assembly citizen panel
Energy sector (Energy Industries Association and member companies)	Assessing the scalability of DSM solutions in the energy system via user feedback, experimenting and transition arena

Step 2. Ideate

Co-design & Conceptualisation



Photo by [FORTYTWO](#) on [Unsplash](#)

Stakeholders' engagement

- Students mandates with universities
- Climathon / Hackathon
- Collaboration with R&D organisation
- Participative workshops

SRL 3

TRL 3

Step 2. Ideate

Co-design & Conceptualisation

Examples of Climathon Zurich 2023 challenges



Examples of participative workshop at the National Open Innovation Camp

Step 3. Prototype & Test

Pilot and intervention and evaluate performance



<https://openlab-project.eu/tartus-apartment-building-gets-a-test-touch-up-thanks-to-innovative-building-panels/>

**Example of Open Lab project –
Energy Positive Neighbourhoods,
Tartu**

Stakeholders' engagement

- Testing of prototypes with end users
- Co-design of technical prototypes with end users
- Show-case solution and inform users explaining how the technology works
- Co-design of solution/ functionalities with end-users
- Propose an experimentation platform for data management and data collection

SRL 4 - 5

TRL 4 - 5

Step 4. Implementation & Scale up

Demonstrate the system and exploit the solution



**Example of the NEST infrastructure
in Switzerland**

Real-life demonstration of the system

- Integration of the solution in a system
- Analysis of the performance in use
- Technical and social analysis of the integration

SRL 6 - 7 - 8 -
9

TRL 6 - 7 - 8 -
9

Why does implementation matter ?

- It transforms theoretical concepts and prototypes into practical applications that can be used **in real-world settings**.
- It **provides a testbed** for **refining innovation** based on actual use and feedback, leading to continuous improvement.
- Successful implementation is necessary for the **adoption and diffusion of innovation and Living Labs**, which can lead to widespread **benefits and societal progress**.

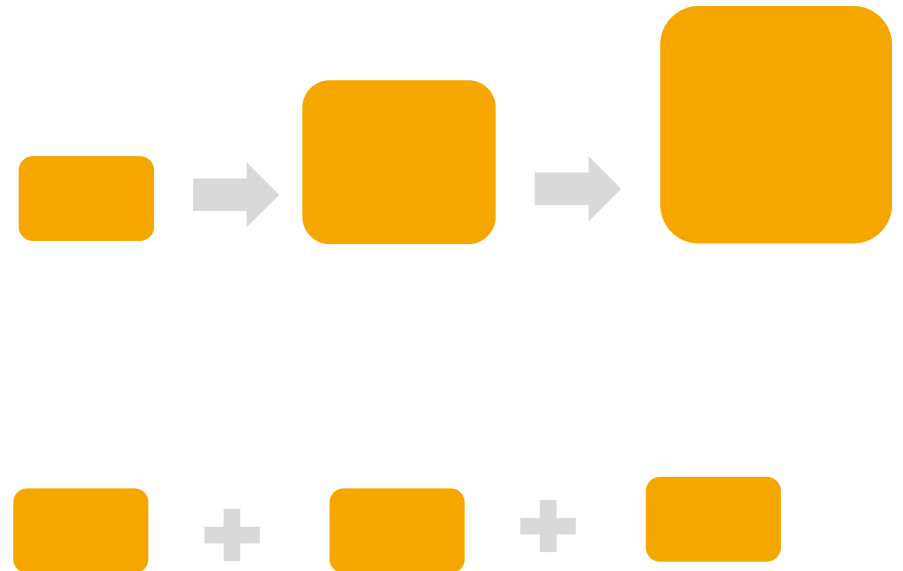


Image from [Energylivinglab.com](https://www.energylivinglab.com)

Scaling out & Scaling up

Manzini (2015) identify different practices:

- **Scaling out:** refers to expanding the size or scope of an initiative, often growing the capacity or increasing the resources to enhance the impact within the current operational context.
- **Scaling up:** involves replication or dissemination of an initiative across different geographic locations or contexts, adapting the core principles to diverse settings or populations.



KPIs to measure users engagement

Why measure engagement?

- Foster collaboration between citizens and a Living Lab
- Raise collective and individual awareness of proposed actions
- Increase consciousness towards energy and climate issues
- Foster a sense of ownership and responsibility within the community
- Address energy and climate transitions

KPIs examples

1. Number of Community Outreach Events (co-design workshops, public presentations, etc.)
2. Number of unique participants and their Satisfaction Level
3. Percentage of community members actively engaged in climate-related activities
4. Number of partnerships and collaborations established with local businesses, non-profits, and community organizations to promote climate awareness and action
5. Level of diversity of the community, including underrepresented groups, low-income residents, and vulnerable populations (social inclusiveness)
6. Level of engagement at climate-related content on social media platforms and websites – number of followers, reactions etc. (online community involvement)

3. Expert interview

Toñi Caro

- Senior Researcher at I2cat Foundation
- Author of *Transformative Governance for the Future – Navigating Profound Transitions*



4. Interactive activity

Q & A



Photo de [Jon Tyson](#) sur [Unsplash](#)

PERSONA



"A quotation that captures this user's personality"

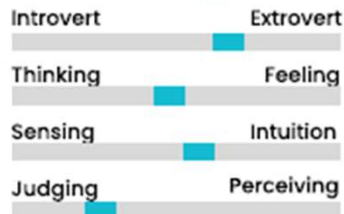
Age: 1-100

Work: Job title

Family: Married, kids, etc.

Location: City

Personality



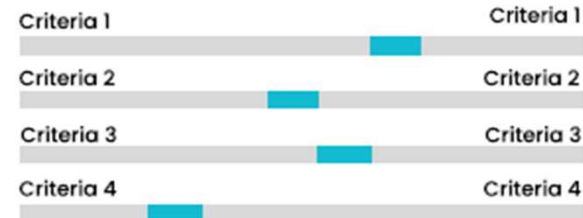
Trait 1

Trait 2

Trait 3

Trait 4

Environment



Motivations & Goals

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- How will this personal help?
- How does this persona change our process?

Research

- What research or data informs our decisions and persona?

Success criteria


- How will we know our user or personas are serving their purpose?

Interactive activity

Connect to the Miroboard
<https://shorturl.at/yFL29>

Persona

Your persona should be the decision-maker in a company likely to be interested in your solution/project.



PERSONA

Environment

- Criteria
- Criteria
- Criteria
- Criteria
- Criteria

Motivations & Goals

- The motivations that guide the user
- Interests and personal preferences
- Aspects of their life that influence the persona
- A role that needs to be completed
- A goal to be reached
- An aspiration to fulfill

Frustrations

- The challenges the user would like to avoid
- An obstacle that prevents the user from achieving their goals
- Problems with the available solutions

Bio

Why this persona?

Research

Success criteria

sweet

Fill in the different categories of your character by adding text in the editable areas and moving the sliders.

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