SUSTAINABLE PLACES 2025

8-10 October 2025

Milano

Comune di Milano

R2M RESEARCH TO MARKET SOLUTION

TOPIC
WORKSHOP

Human-in-the-loop digitalisation for Europe's energy transition: From co-design in communities to scalable innovation systems

Smart Energy Cluster | CRETE VALLEY | enertef | dedalus | ENPOWER POWER IN OUR HANDS

www.sustainableplaces.eu

SUSTAINABLE PLACES 2025

Human-in-the-loop digitalisation for Europe's energy transition: From co-design in communities to scalable innovation systems

Day **2** Thurs. 09 Oct. 11.00 - 12.30 CEST

Smart Energy Cluster

CRETE VALLEY dedalus enertef ENPOWER POWER IN OUR HANDS

In-person Workshop

Projects

- CRETE VALLEY
- DEDALUS
- EnerTEF
- ENPOWER

SUSTAINABLE PLACES 2025

General Overview

01. Introduction

02. Workshop Objectives

03. Participants

04. The Smart Energy Cluster

Participants

Moderator
Chiara Fonio
Head of Social Innovation at
ICONS Innovation Strategies

PANELISTS

Diego Arnone
Engineering S.p.A

Julia Blanke
University of Cork

Christian Galletta
FEDARENE

Elissaios Sarmas
EPU NTUA

SUSTAINABLE PLACES 2025

Introduction

- Europe's energy transition needs **inclusive digitalization**
- Top-down platforms face **trust, legitimacy, and social acceptance** barriers
- **Human-in-the-loop** approaches align technology with citizens' participation
- Lessons from 4 EU-funded projects (**Crete Valley, DEDALUS, EnerTEF, ENPOWER**) show how to:
  - Empower citizens through **co-design & governance**.
  - Ensure **interoperability & flexibility** across carriers/sectors.
  - Build **scalable innovation ecosystems** connecting SMEs, communities, and industry.
- The workshop offers an **interactive platform** to explore **barriers, enablers, and scaling strategies**

SUSTAINABLE PLACES 2025

Workshop Objectives

- Identify **key barriers and enablers** for scaling human-in-the-loop digitalisation.
- Extract **actionable lessons** from real-world pilot experiences.
- Strengthen **connections among SMEs, startups, communities, policy-makers, and industry**.
- Explore **tools and strategies** that combine technical excellence with social legitimacy.

SUSTAINABLE PLACES 2025

InEExS
ENERGY SERVICES ON THE BLOCKCHAIN

THE SMART ENERGY CLUSTER

- **#SmartEnergyCluster is an initiative of the InEExS project**
- The core concept of the LIFE project InEExS is the deployment of integrated energy services across sectors and carriers, and the tokenisation of energy saving data in a public blockchain
- **Managed by IEECP and EPU NTUA**
- **It currently involves 34 EU (LIFE and Horizon 2020) projects**

Co-funded by the European Union under project ID101077033. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

IEECP INSTITUTE FOR EUROPEAN ENERGY AND CLIMATE POLICY

EPU N · T · U · A

#SmartEnergyCluster is a collaborative effort of more than 30 EU projects focused on merging different **energy services** and incorporating **non-energy benefits** whilst overcoming market fragmentation and fostering **cooperation**. This inclusive approach bridges gaps and creates a common ground for **business development** across different segments.

SUSTAINABLE PLACES 2025

EnerTEF

Dr. Elissaios Sarmas
NTUA

The EnerTEF Project

The Future of Energy Through AI Testing and Experimentation

Tagline

NTUA

National Technical University of Athens

Coordinator

HORIZON EUROPE, RIA – Research and Innovation Action

Funding

6.687.663,75€

Total Cost

5.526.007,50€

EU Contribution

10

Countries

Greece, Slovenia, Germany, France, Spain, Luxembourg, Italy, Netherlands, Portugal, Sweden

Countries

25

Participants

Consortium

HORIZON-CL5-2024-D3-01

Call / Grant

Common European-scale Energy Artificial Intelligence Federated Testing and Experimentation Facility

Title

1st Nov 2024 ⟶ 31 Oct 2027

36 Months

Lifetime

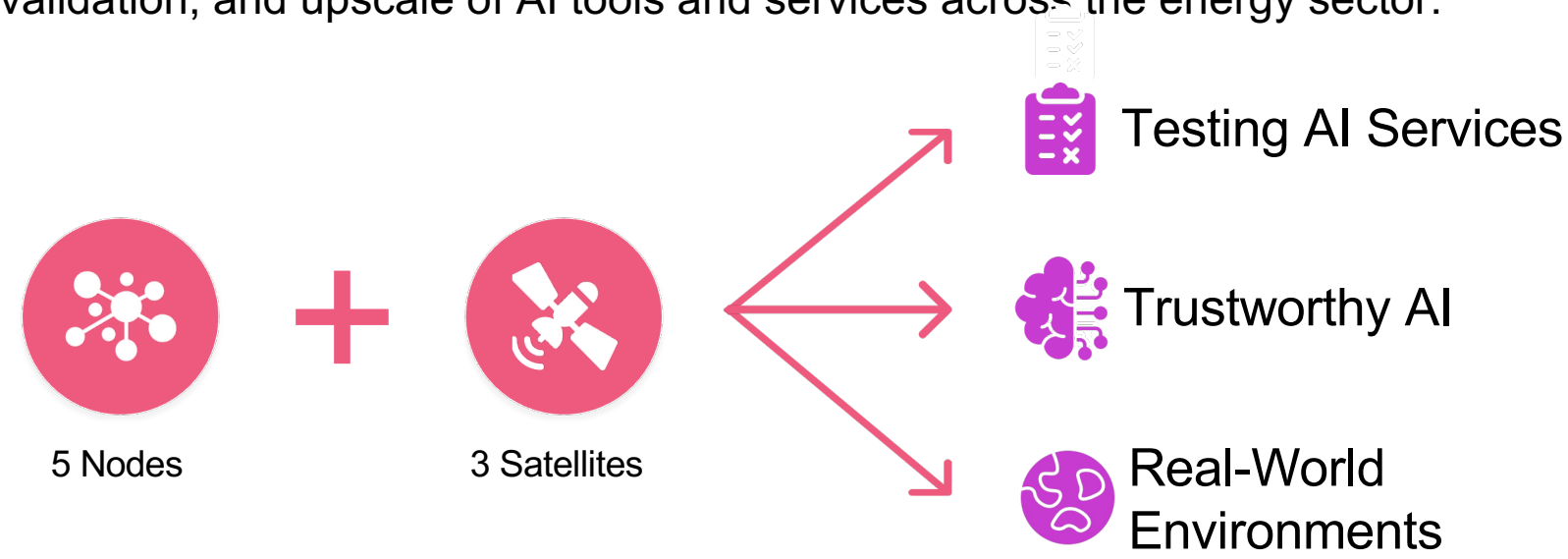
EnerTEF

EPU N · T · U · A

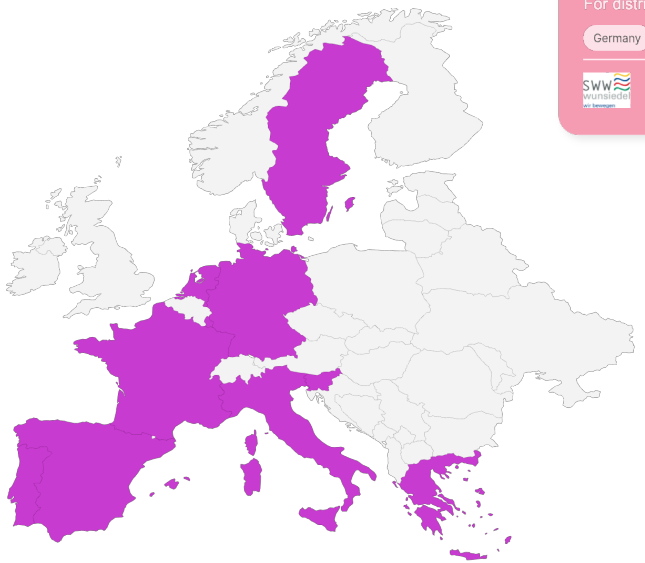
Co-funded by the European Union

Our Vision

Establish a Common European-scale Energy Artificial Intelligence (AI) Federated Testing and Experimentation Facility (TEF), facilitating extensive adaptation, validation, and upscale of AI tools and services across the energy sector.



8 Testing & Experimentation Facilities across Europe



TEF RES Node
For renewable energy systems operators

Portugal | Sweden | Greece

CorPower Ocean | rebase energy | INESCTEC | CEO | ΔEH | EPU N·T·U·A

TEF DSO Node
For distribution systems operators

Germany

SWW wunsiedel | gridhound | Es geht! | RWTH AACHEN UNIVERSITY

TEF TSO Node
For transmission systems operators

Slovenia

ELES | elektro sorenjska | COM SENSUS

TEF EV Node
For smart electric vehicle charging & storage in energy communities

Netherlands | Luxemburg | Italy

LIST | ENERGIEPARK | EMOTION | AUTEL

TEF Build Node
For energy efficiency in buildings

Greece

ΔEH | (e.o) CRETE | EPU N·T·U·A

TEF DHN Satellite
For district heating networks

Spain

VEOLIA

TEF H2 Satellite
For hydrogen systems

France

utbm

TEF IND Satellite
For energy efficient industrial processes

Greece

LMS

EnerTEF

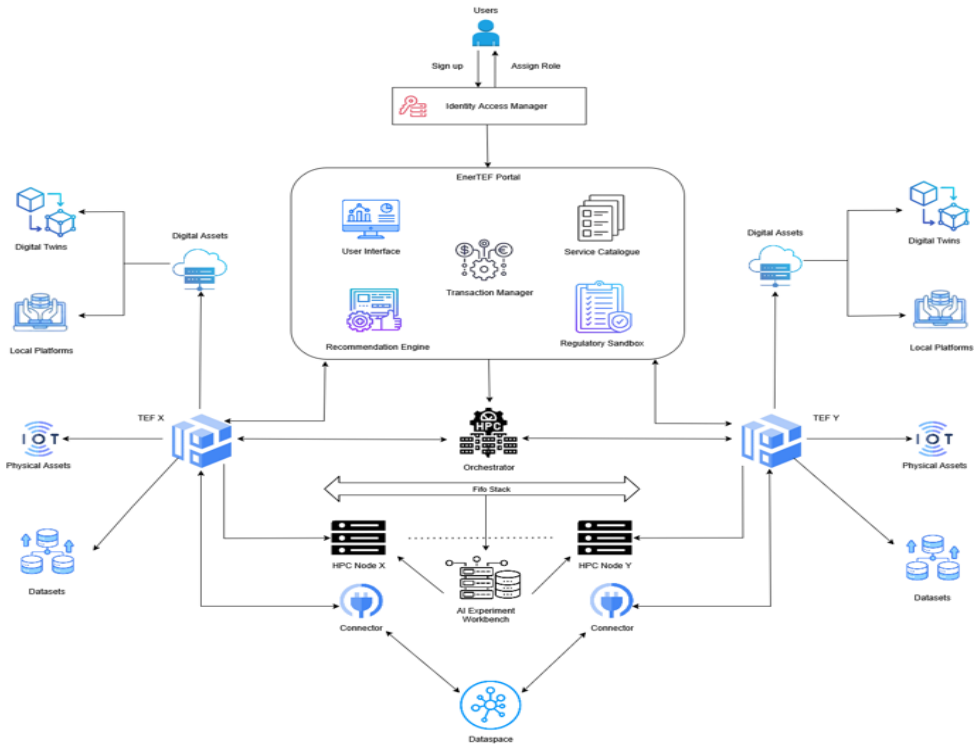
EPU N·T·U·A

Co-funded by the European Union

A Reference Architecture for Centralized Access to Testing & Experimentation Facilities

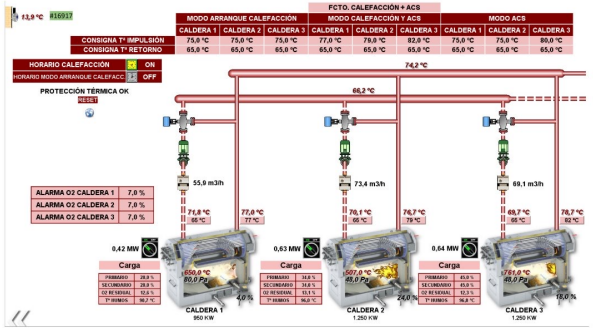
Centralized EnerTEF Portal

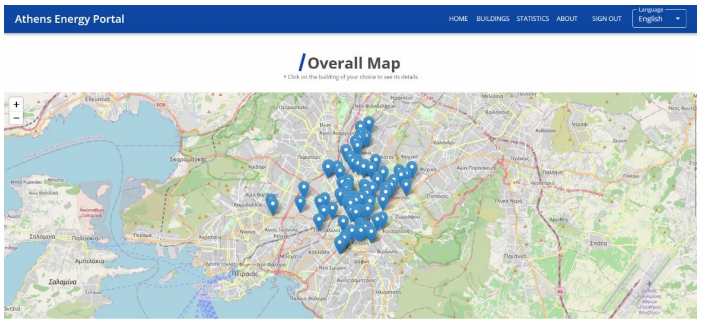
- ✓ Identity Access Manager
- ✓ Transaction Manager
- ✓ Services Catalogue
- ✓ Recommendation Engine
- ✓ Regulatory Sandbox
- ✓ HPC Orchestrator
- ✓ TEFs Integration

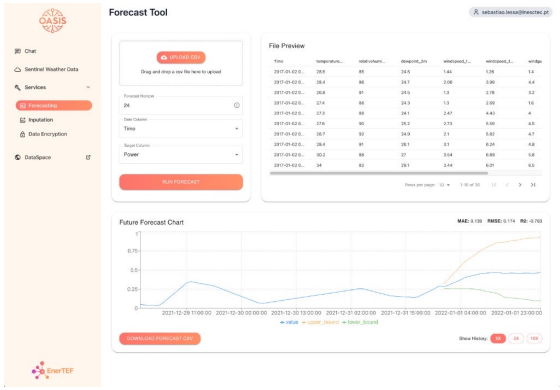


The EnerTEF Portal is in progress!

Federated TEF Nodes composed of Physical & Digital Assets: Asset Onboarding has started!







Digital Twins: Real-time optimization for District Heating and Cooling Network (DHCN)

Data Platforms: Real-time municipal buildings' consumption and PV production monitoring

AI/Data Services: Access to real sensors from RES and local AI/data services

EnerTEF

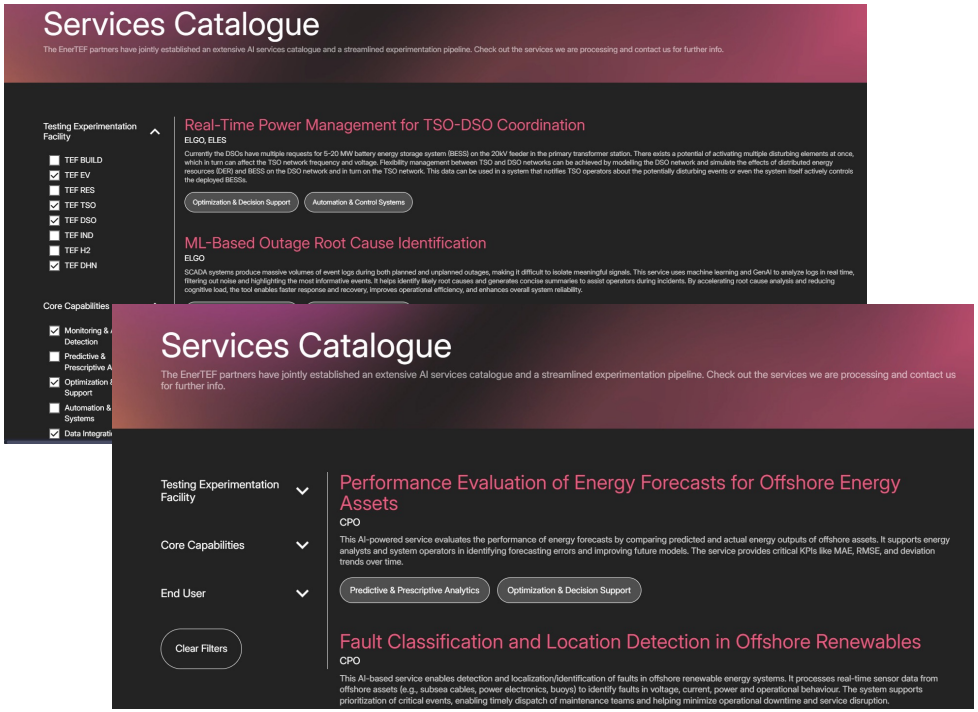
EPU N · T · U · A

Co-funded by the European Union

The AI Services Catalogue is ready for SMEs/Startups to explore

40 services - 5 nodes - 3 satellites

- AI-Driven Fault Detection and Classification in Transmission Grids
- Real-Time Power Management for TSO-DSO Coordination
- Battery & EV EMS Optimization for PV Self-Consumption
- Anomaly Detection for Preventive Maintenance in Offshore Renewables
- AI-Powered Wind Power Short-Term Forecasting
- AI-Driven Pumpback Optimization for Hydropower System



Available at: https://enertef.eu/services-catalogue

EnerTEF

EPU N · T · U · A

Co-funded by the European Union

SUSTAINABLE PLACES 2025

DEDALUS

Dr. Diego Arnone

Engineering S.p.A.

Project Identity

Bringing comfort and power connection for everyday living

Tagline

ENG

Engineering S.p.A.

Coordinator

HORIZON IA

Horizon Innovation Action

Funding

7.359.075,00 €

Total Cost

10

Countries

(Italy, Greece ,Spain, Turkey, Slovenia, Austria, Denmark, Belgium, Romania, Norway)

Countries

23

Participants

Consortium

HORIZON-CL5-2022-D4-01

Call / Grant

Data-driven Residential Energy Carrier-agnostic Demand Response Tools and Multi-value services

Title

5.999.801,25 €

EU Contribution

1st May 2023 ⟶ 30 Aprii 2026

36 Months

Lifetime

dedalus

eng

Funded by the European Union

Main Objectives

Using **SSH** for a better **engagement** of energy consumers in the residential DR

Extend ENERSHARE **Energy Data Space Interoperability and Trust layer**

Combine eDREAM, BRIGHT, MATRYCS and DigiBUILD **building-level data-driven models, algorithms and flexible assets** DTs with end-users' consumption and beyond consumption profiling models

Deliver **data-driven, value stacking cross-stakeholder/cross-commodity/cross-value chain DR algorithms, models, and ICT-based services**, for DR in energy-efficient residential buildings

Develop new **business models** from sharing economy, multi-carrier system-level perspective and with social innovation and non-financial benefits capture for DR

To enable effective consumer participation and support regulatory harmonisation for residential DR, ensuring efficient communication, dissemination, and alignment with EU initiatives.

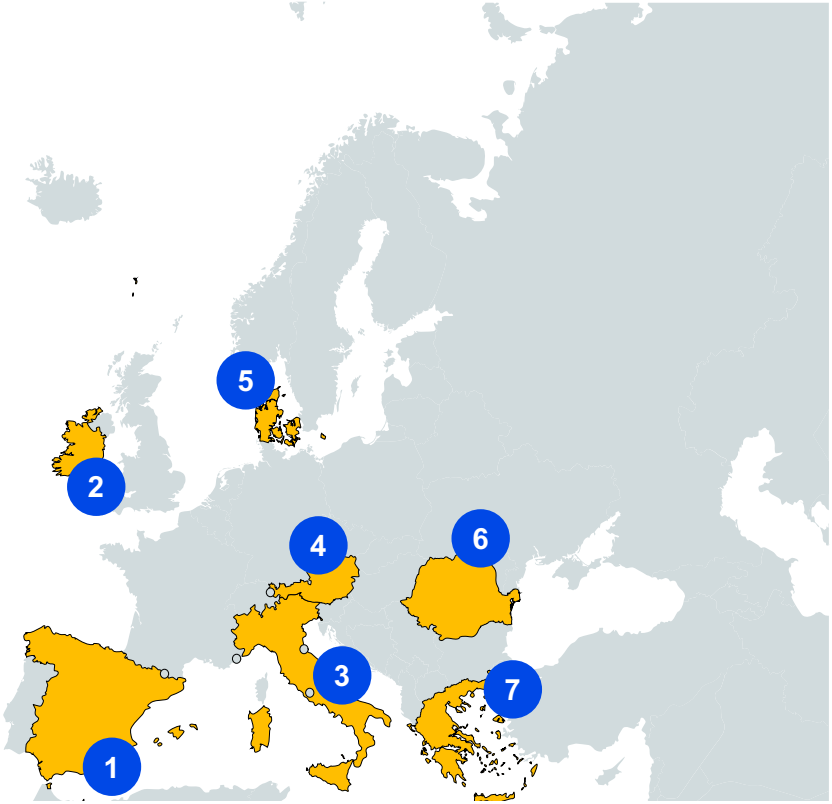
dedalus

eng

Funded by the European Union

7 Real pilots across Europe

1. **Spain** - District-level DR for increasing community-level self-consumption while providing flexibility to local DSO
2. **Ireland** -Decentralised Power2heat cross-commodity optimal heat vs electricity social housing flexibility aggregation
3. **Italy** -Trading off comfort with energy consumption in DR programs for elderly people living in serviced apartments
4. **Austria -** Flexibility pre-aggregation for building-level energy community
5. **Denmark** - Energy efficiency and DR optimal interactions between district heating and electricity networks in social housing
6. **Romania** – Blockchain solutions for DR Management and flexibility aggregation
7. **Greece** - Multi-value DR for multi-segments of residential energy (electricity and gas) consumers



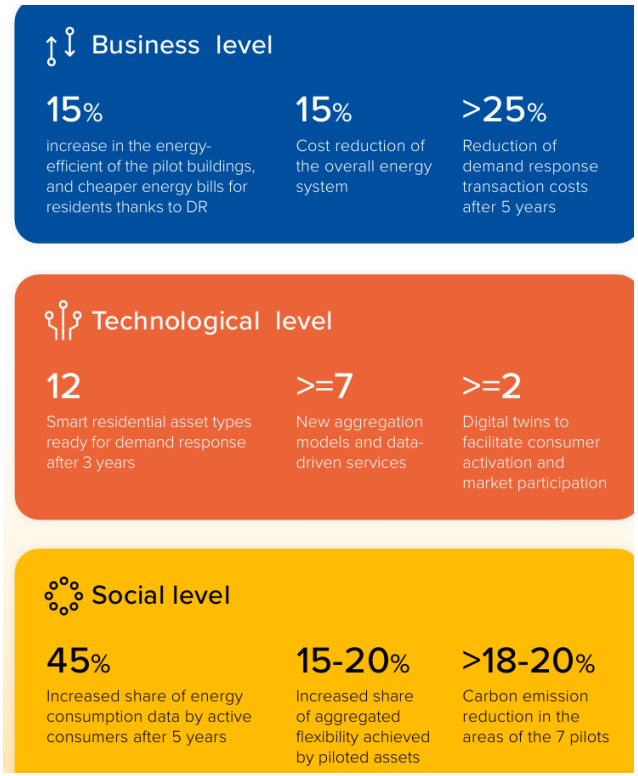
dedalus

eng

Funded by the European Union

Main Expected Outcomes

- **Technology enablers**, to turn smart energy appliances into DR-ready flexible assets
- **SSH-driven tools and techniques**, combining sharing economy, co-creation and design thinking to engage users at building level
- **Business layer**, for designing and validating building-centered DR business models



dedalus
eng
Funded by the European Union

DEDALUS's Overarching Project Goal

Goal: Deploy a social, technological, and business framework to design and demonstrate an SSH-driven, multi-value, energy carrier-agnostic Demand Response (DR) ecosystem.

Focus: Optimize and manage automated DR in residential buildings.

Social Arm: Structured through the Social Science Framework (SSF)

Key Insight Areas:

- Behavioral change theories
- Motivation and behavioral economics
- Foundational pillars: Individual Context, Goal Setting, and Motivation

Objective: Bridge theoretical frameworks and applications to foster end-user engagement in DR

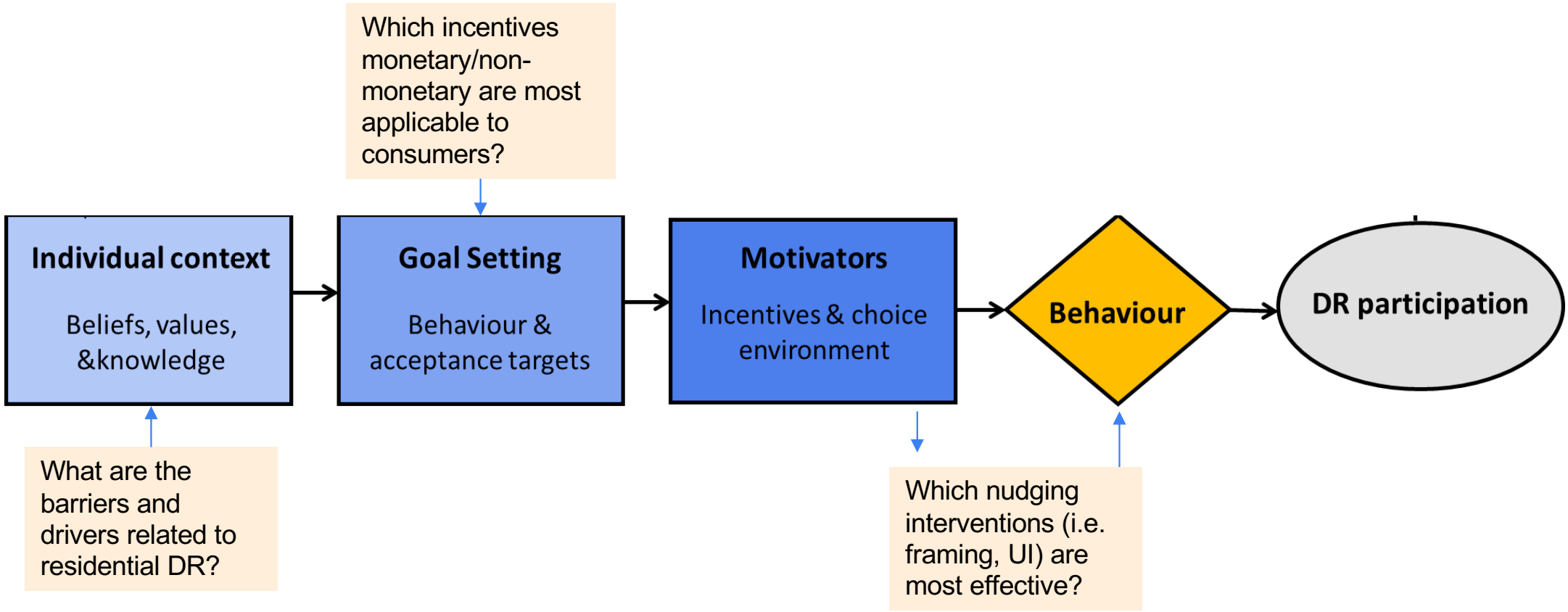
dedalus

eng

Funded by
the European Union

DEDALUS's Overarching Project Goal

Social Science Framework



dedalus
eng
Funded by the European Union

Questionnaire Segmentation

Pilot Persona profile example

Each bubble relates to a question category

dedalus
eng
Funded by the European Union

SUSTAINABLE PLACES 2025

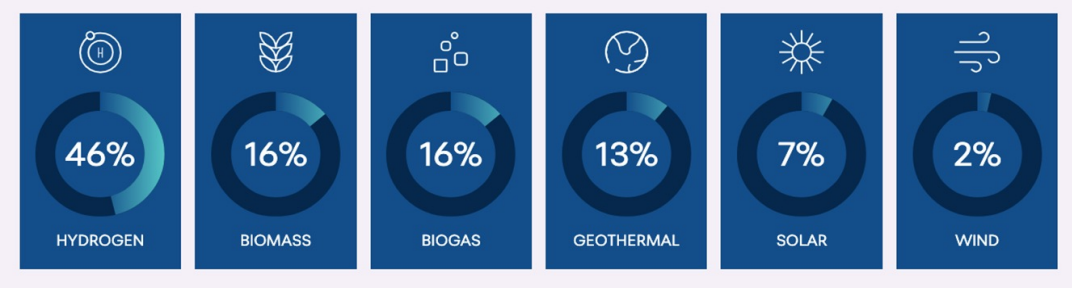
CRETE VALLEY

Dr. Christian Galletta
FEDARENE

Crete Valley in pills:

CRETE VALLEY is a project that will turn Crete into a as a pioneering **Renewable Energy Valley**, combining ICT technology, interoperable digital solutions, social innovation processes and economically viable business models,enabling the island to meet its energy needs through renewable sources.

- **41** partners
- **4** Community Energy Labs (CELs) and **4** Follower Communities
- **6** Renewable Energy Sources
- **320+** Facilities and households benefiting
- **5Y** duration
- **22,840 MWh**: annual energy produced



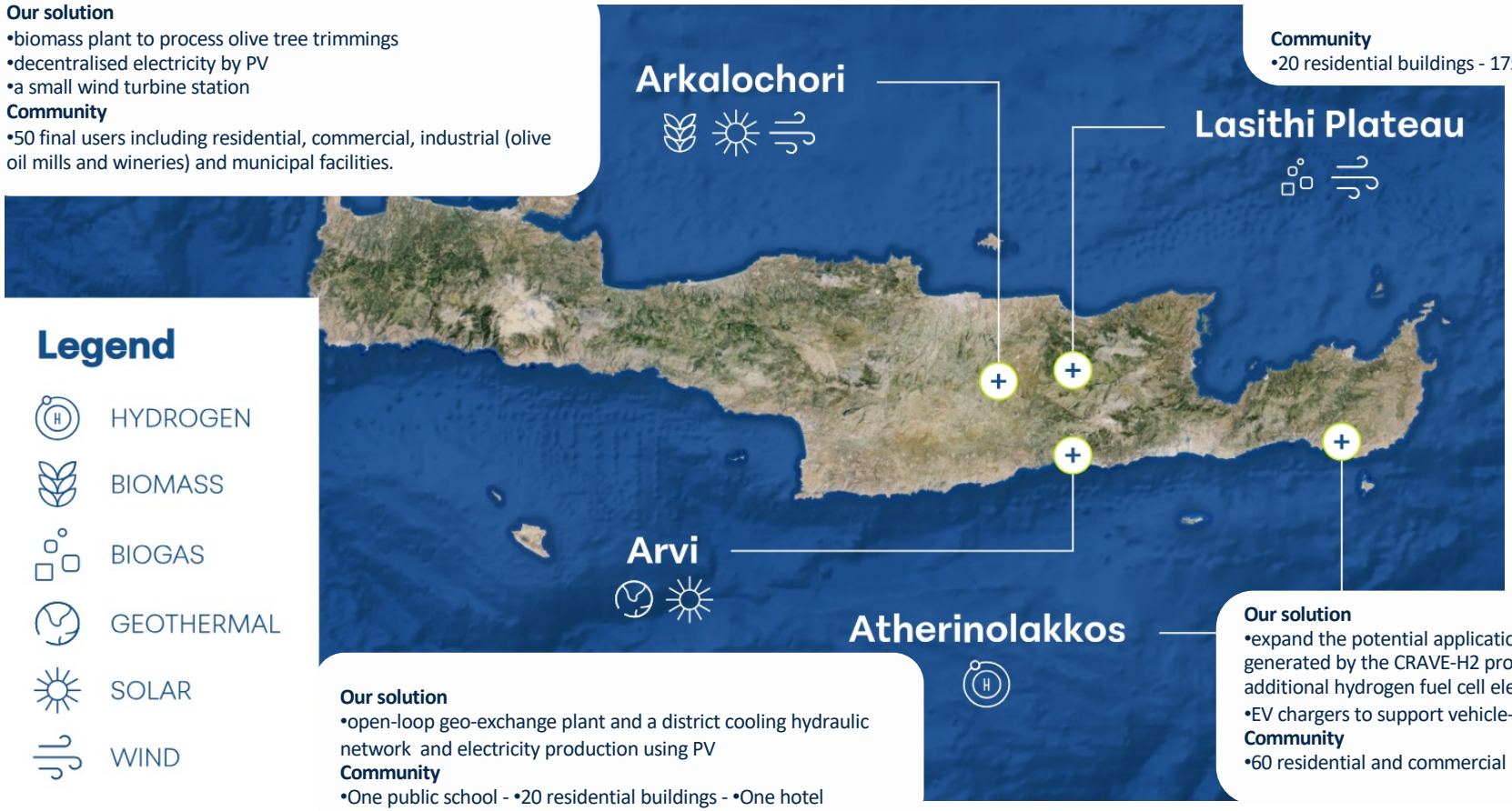
CRETE VALLEY

Community Energy Labs

Our solution
•biomass plant to process olive tree trimmings
•decentralised electricity by PV
•a small wind turbine station
Community
•50 final users including residential, commercial, industrial (olive oil mills and wineries) and municipal facilities.

Our solution
•biogas plant to process organic waste from households, used fats and vegetable oils, stock-farming manure
•50 small windmills

Community
•20 residential buildings - 175 households

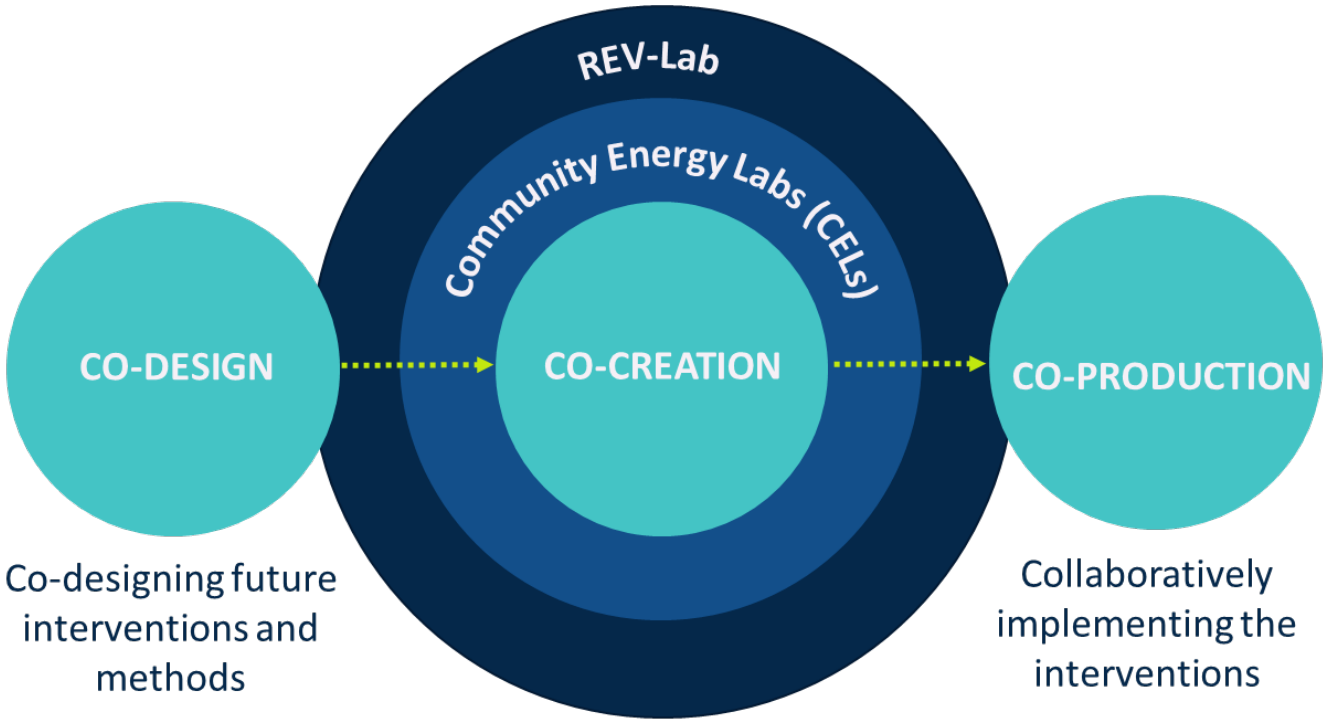


Our solution
•open-loop geo-exchange plant and a district cooling hydraulic network and electricity production using PV
Community
•One public school - •20 residential buildings - •One hotel

Our solution
•expand the potential applications of green hydrogen generated by the CRAVE-H2 project by securing additional hydrogen fuel cell electric buses
•EV chargers to support vehicle-to-grid (V2G) applications.
Community
•60 residential and commercial buildings

CRETE VALLEY

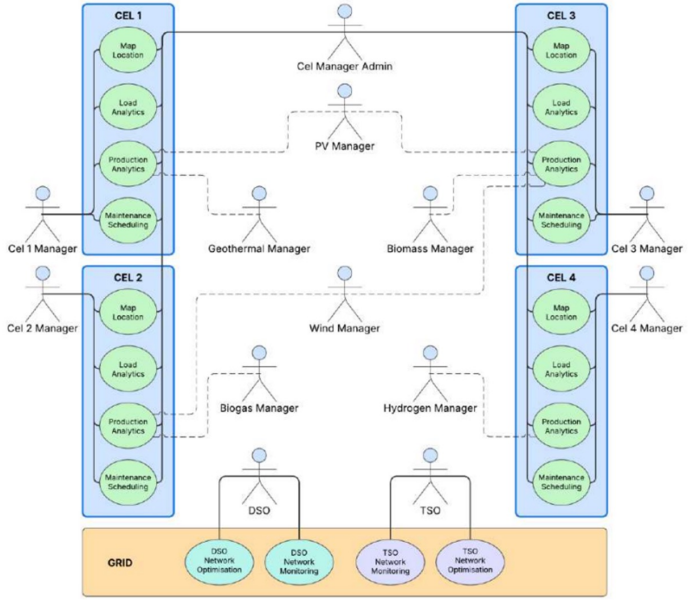
Social innovation embedded in the project

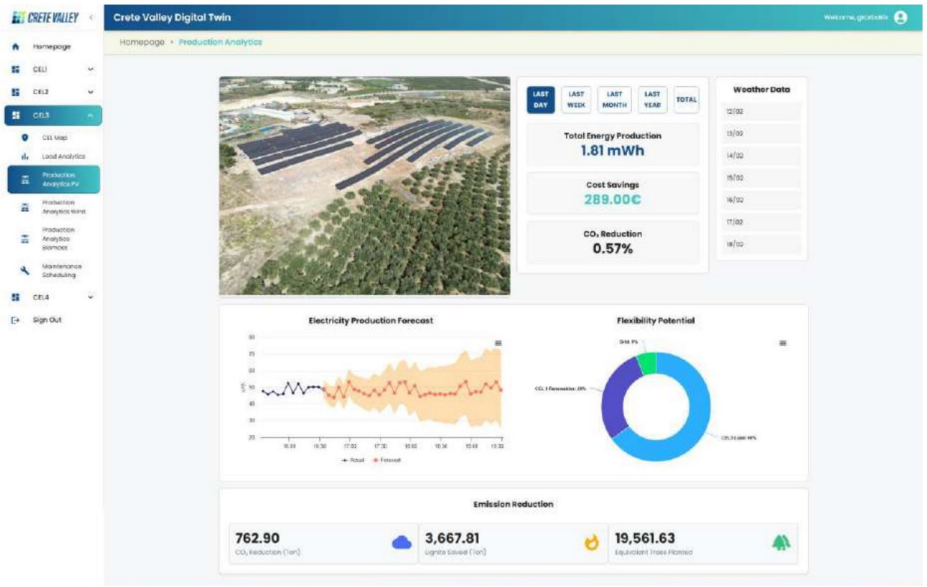


Digital innovations close the loop

System-of-systems Digital Twin
A unified digital environment integrating all individual systems to coordinate, manage, and operate the energy grids of the REV-Lab.

Data-driven services and apps
Energy management tools enabling consumers to make informed decisions and facilitating renewable energy consumption.





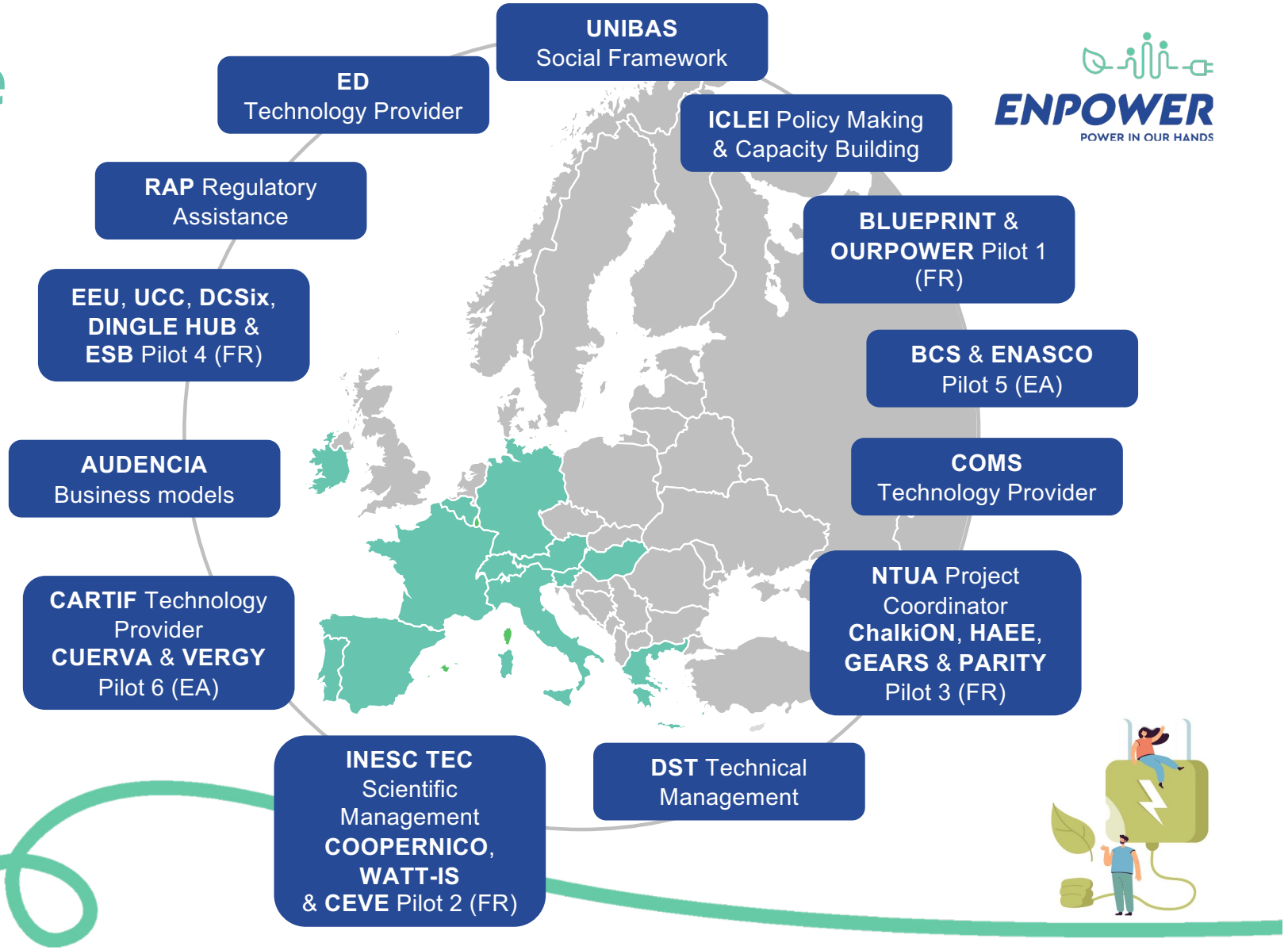
SUSTAINABLE PLACES 2025

ENPOWER

Dr. Julia Blanke
University of Cork, Ireland

Who we are

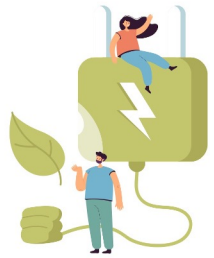
- **28 Partners**
- **13 Countries**
- **Sep 2023 – Aug 2026**
- **€7M**
- **Innovation Action**



ENPOWER VISION

The overall vision of ENPOWER is to design, develop and demonstrate SSH-driven methodologies, interactive and AI-based tools and services for energy activated citizens and data-driven energy-secure communities towards a consumer-centric energy system.

https://www.enpower-project.eu/

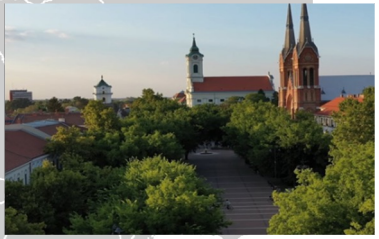


ENPOWER pilot sites

ENPOWER
POWER IN OUR HANDS

Ireland

Austria

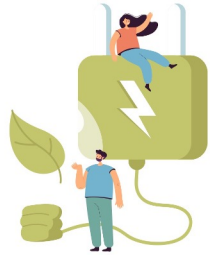


Hungary

Portugal

Spain

Greece



1 Consumer engagement and nudging

ENPOWER
POWER IN OUR HANDS

Tool	Objective
Citizen Renewable Platform - Engaged	To **help** community members adopt energy **efficiency technologies** and **practices**, making their lives easier and their businesses thrive.
Power Seller Nudging App	Provide **personalised energy production** advice and promote **behavioural changes** through nudging.

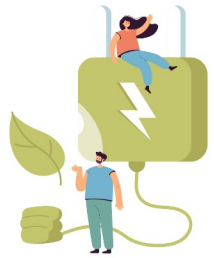
Expected Benefits

Community Engagement: Foster collaboration and participation among community members.

Energy consumption and **CO2 emissions** reduction.

Enhanced Energy Efficiency

Contributes to a more **responsive and sustainable** energy system



2 Flexibility management and consumption optimization

ENPOWER
POWER IN OUR HANDS

Tool	Objective
WIS4Households	Designing translated smart meter and consumer-related data into **actionable insights** and **targeted recommendations** to promote energy efficiency.
FLEXCOMM	Support both the energy community manager and individual citizens, to **increase self-consumption** of the energy community with **shifting flexible loads**.
EV LOADER Platform/App	Provide **recommendations** and **incentives** to optimise EV charging.
OpenDERMS	**Monitor**, **control**, and **manage DER** devices both individually and in groups to **facilitate DR**.

Expected Benefits

Empowerment of Consumers

Informed decision-making through data-driven insights.

Increase **Energy Efficiency and flexibility**

Reduction in electricity bills

Increase **Self-Consumption**

3 Energy community planning and management

ENPOWER
POWER IN OUR HANDS

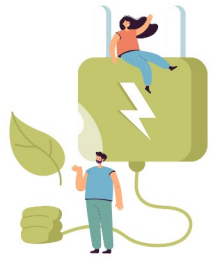
Tool	Objective
Energy community planning tool	Help users assess the **economic, environmental, and social benefits** of becoming a **prosumer** or **joining an energy community**, allowing them to compare individual and collective energy actions.
Energy Community Management Platform	To **enable** the operation of energy communities in line with the Clean Energy Package and Austrian legislation.
WIS4Communities	Facilitating the **management** of the energy community specifically in **energy sharing.**

Expected Benefits

Enable citizens to **take the initiative** on joining energy communities.

Scenarios evaluation with different types of Key Performance Indicators

Increase of local energy resources.



4 Energy trading and flexibility marketplaces

Tool	Objective
P2P Energy Trading Platform	Connection of **renewable energy power producers** with **energy consumers**, offering services such as accounting, billing, and contracting in compliance with Austrian legislation.
ENPOWER Marketplace	To facilitate the **exchange of flexibility services** at the **local** distribution level.

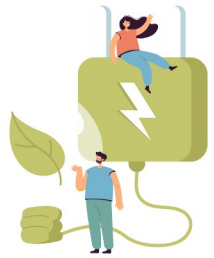
Expected Benefits

Community Engagement: Foster collaboration and participation among citizens

Increased Security of Supply

Enable local generation and consumption

Increase local **DERs flexibility**



SUSTAINABLE PLACES 2025

Introduction

Group discussion

4 main areas

1. **Understanding the Human-in-the-Loop**
2. **Building Trust and Social Acceptance**
3. **Connecting Across the Innovation Ecosystem**
4. **Shaping the Future**

First: let’s meet each other.

- Mentimeter INSERIRE QUI

Understanding the Human-in-the-Loop

What does “human-in-the-loop” mean in the context of the energy transition?

Instruction:
Discuss and note down key words or concepts that reflect how people, technology, and data interact in shaping climate-neutral built environments

Building Trust and Social Acceptance

Based on your project or organizational experience, discuss effective practices (“do’s”) and pitfalls to avoid (“don’ts”) to ensure trust and social acceptance.

Instruction:
Work together in your group to list concrete examples, key principles, or lessons learned that illustrate what builds — or weakens — trust in human-centred digitalisation processes.

Connecting the Dots Across the Innovation Ecosystem

How can we create robust innovation ecosystems that connect SMEs, startups, communities, and large industry players?

Instruction:
In your group, identify key enablers, barriers, and collaboration models that can strengthen these connections and accelerate innovation toward climate-neutral built environments.

Shaping the Future

Looking ahead, what future directions or enablers are needed to advance human-in-the-loop digitalisation for climate-neutral built environments?

Instruction:

Discuss what policies, skills, technologies, or forms of collaboration will be most important to turn today’s insights into long-term systemic change

Conclusions

- Wrap-up

- **Follow-up: A 1–2 page synthesis of key takeaways will be prepared and shared with participants who provided their contact details.**