Nebula
A Built4People Project

EBENTO

Energy efficiency Building Enhancement
through performance guarantee Tools

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EBENTO

Digital solutions, from planning to operation

Elena Leal
ETRA I+D

Alejandro Alonso
Valencia Clima i Energia

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Energy efficiency Building Enhancement through performance guarantee Tools

PROJECT OBJECTIVES

- **Development of a one-stop-shop** platform for all actors involved in the building and renovation sector
- **Focuses on citizens** as key players in the energy transition
- Increase the **involvement of public institutions and energy communities** by helping them to identify potential buildings for improvement.
- Explore the **best financing for users** by studying the type of support available.
- Include **new savings in EnPC** coming from user comfort, energy efficiency and demand response mechanisms creating new business models

B4P PARTNERSHIP CONTRIBUTION

Develop holistic solutions in a systemic approach → **EBENTO OSS platform**

Demonstrate clean energy transition potential → **Evaluation and monitoring tools**

Demonstrate affordability and cost-effectiveness → Integration of **Energy Performance Contract**

KPIs to which EBENTO project contributes

GO3	**Induce lasting behavioural change towards sustainable living**	12. # of private and public building owners with sustainable behaviour in their building stock	→ 50 building owners
SO5		17. Total floor area and # buildings (residential or non-residential) directly involved in the partnership's projects demonstration activities	→ TOTAL 130 residential houses & 1 public building: 24 (Valencia) + 80 (Tallinn) + 20 (Athens) + 7 (UK)
SO6		19. # building occupants and users involved in the partnership's projects demonstration activities	→ More than 200 participants

RESULTS AND INNOVATION

TOOLS

One Stop Shop

One-stop shop tool for the **management of energy efficiency contracts, simulation and monitoring of buildings**, with the aim of improving the dialogue between the actors involved in the renovation of buildings and the citizen.

Building performance contract module

- Working as a logbook where energy efficiency certificates and financial information for the different contracts will also be stored.
- **Decision support system**: generation of "standard" contracts.
- **Contract management** and control: EnPC life cycle and validating metrics.

Monitoring Module

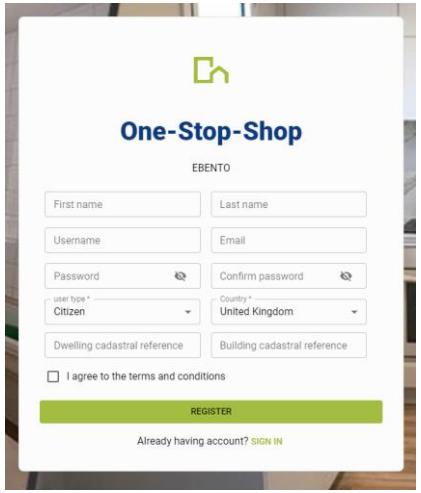
- **Monitoring** the state of the houses (energy, comfort…)
- List of **KPIs** that allow the evaluation of energy contracts
- Metrics of housing **behaviour for consumers**.

Simulation Module

- **Physical simulation:** Calculations based on BIM and specific energy simulation programs.
- **Economic simulation:** Profitability calculation coming by the physical simulation and actuations and simulation of the best performance contract to increase the benefits for the end user.

RESULTS AND INNOVATION

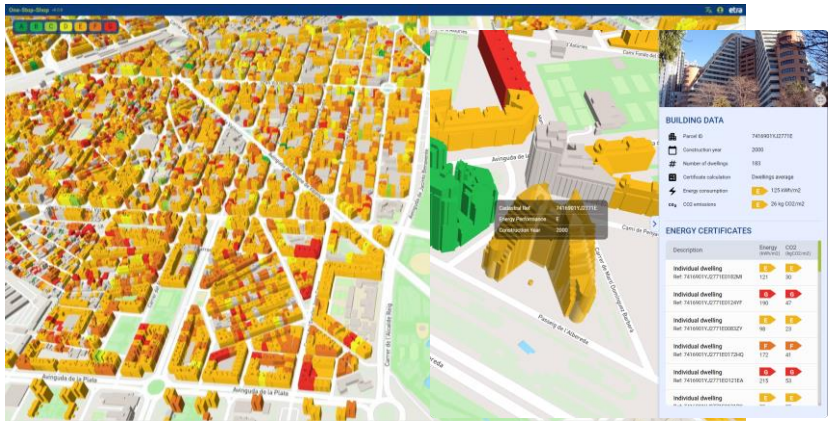
Unique platform with different roles



A unique platform for the **management of energy efficiency contracts, simulation and monitoring of buildings.**
Shows the information generated by EBENTO modules and allows users to interact with these modules and between them.

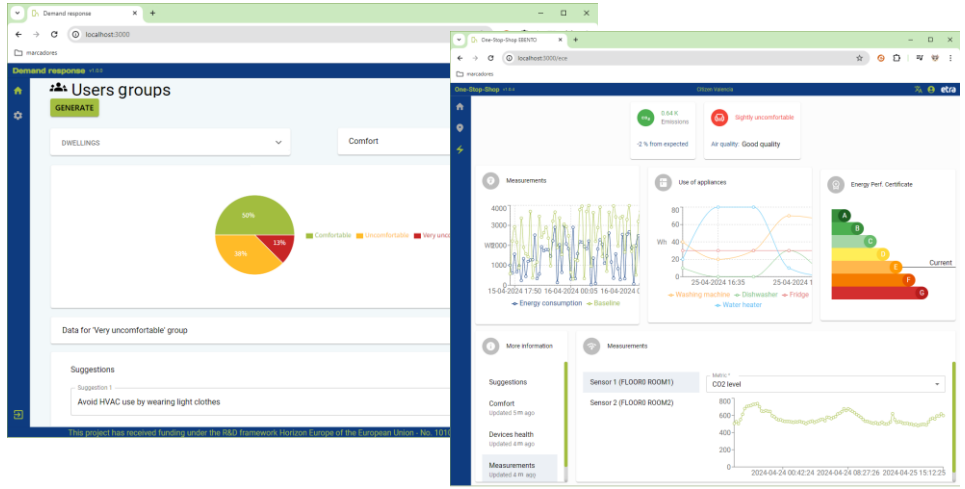
Main interface where the users of the platform (citizens, public administrations, constructors, ESCOs…) can review the status of the Energy Performance Certificates of building in different cities, to be able to define new strategies for enhance building.

Dynamic Map: EPC for buildings in cities

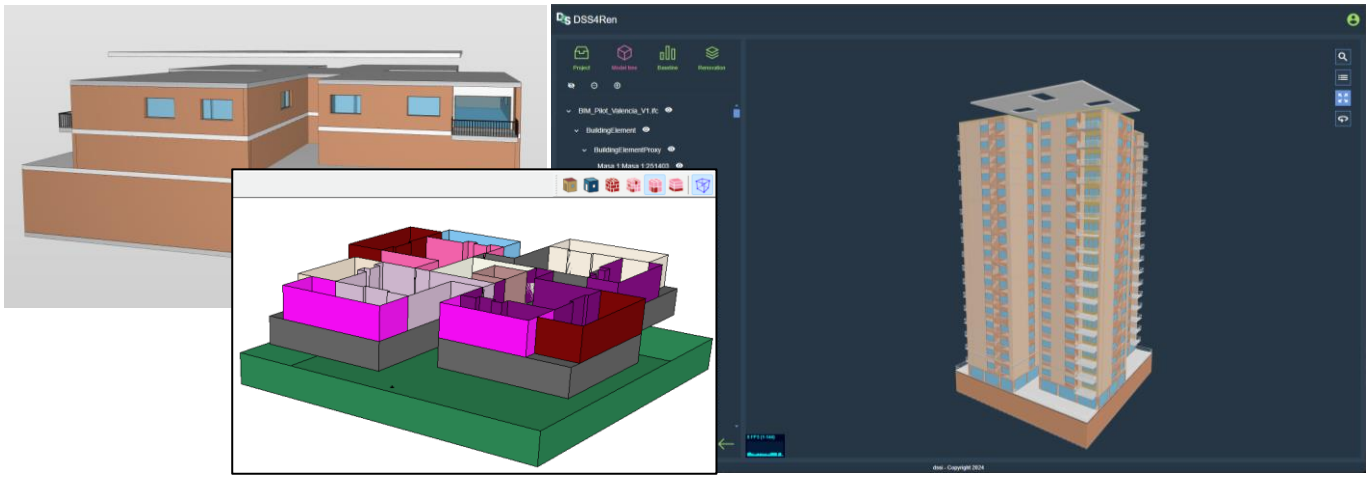


RESULTS AND INNOVATION

Monitoring (energy, comfort, CO2..) and user clustering



Energy and comfort simulation based on BIM in Energy+

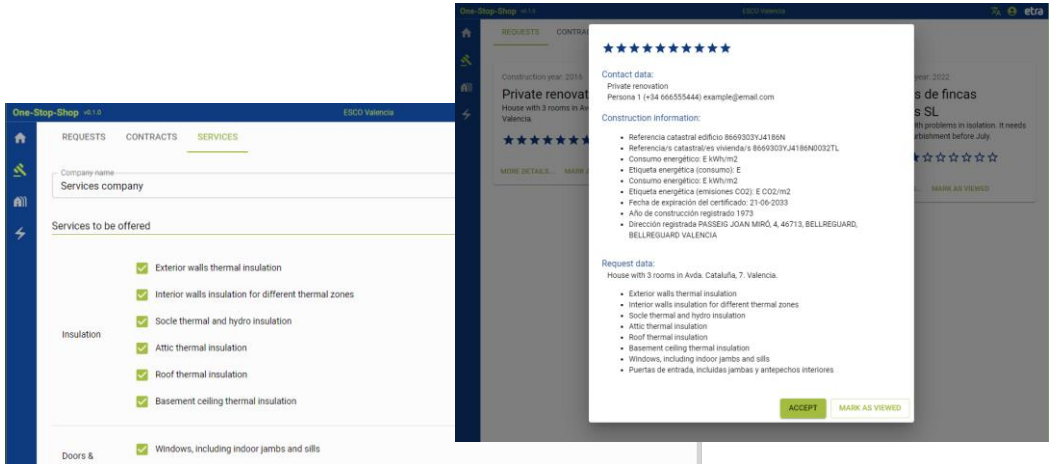


Monitoring energy consumption and comfort from users and buildings is needed for the verification of the EnPC.
The Monitoring module provide all the OSS users with the needed data to understand and better manage the contracts

For the definition of a EnPC the simulation of the possible options to enhance the building energy consumption is crucial. This is way the Simulation module provides a realistic results based on BIM to allow the contractors and citizens to select the best option for the contracts.

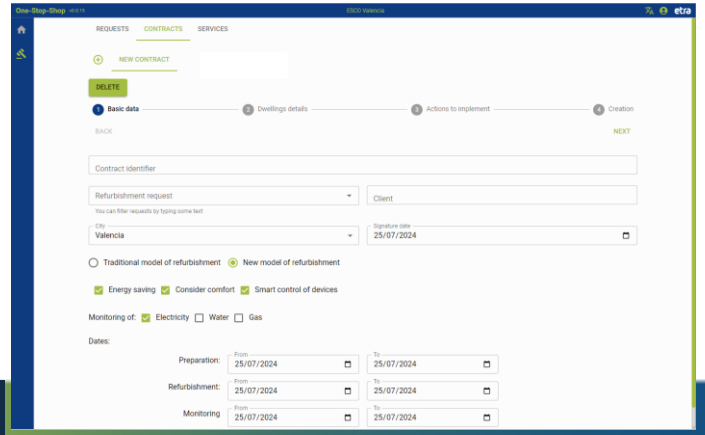
RESULTS AND INNOVATION

Common space for citizens and companies



One of the main barriers for the citizens to start the process of renovation and energy building enhancement is the lack of information about professionals able to make it possible. The EBENTO OSS allows both citizens and companies to make contact and start a relation for the house/building renovation

EnPC management, control and definition



EBENTO OSS offers the possibility to create standard and innovative Energy Performance Contracts directly though the EnPC decision support system. With this new models, integrated on the platform, the users involved on the renovation process will be able to check the information on the contract and validate the results during the whole contract duration

DEMONSTRATION SITES

Pilots

Different renovation and monitoring stages to enhance energy efficiency and comfort of users

- VALENCIA (Spain): Isolated two twin towers, **136 neighbours: 17 stories floors**, 4 dwellings per floor, one in each orientation. In which **24 houses** are fully monitored.
- TALLIN (Estonia): **Two buildings**, one focus on planning and 1st steps **preparation** for renovation and the second one focused on **actuations and commissioning** process.
- ATHENS (Greece): **20 resident buildings** with different consumption patterns.
- MANCHESTER (UK): Based on Levenshulme Area Based Retrofit Scheme (LABS) to reaches households **vulnerable to fuel poverty** and explores **new finance options for retrofit**

Valencia

Tallin

Greece

Manchester

CHALLENGES AND SYNERGIES -NEW EnPC FOR

EnPC model

Technical & financial aspects (relevant for the digital platform)

1. Design and installation of energy efficiency and RES measures
   - Renovation works specification
   - Contract and installation schedule
2. Performance Guarantee
   - Annual Guaranteed Energy Savings and Consumption
   - NEW: Demand Responsiveness and Flexibility
   - NEW: Guaranteed Quality and Comfort
3. Project implementation
4. Monitoring and energy savings calculation
5. Financial compensation
6. Notification and management of significant changes and delays

Legal & contractual aspects (outside OSS)

EnPC template fit-for-EBENTO OSS

- Define basic skeleton for all type of EnPCs
- Cover the most important elements
- Adding new parameter: COMFORT and DEMAND RESPONSE
- Focus on residential buildings

EBENTO OSS platform will suggest suitable solutions and useful tips for various elements of the contract, and it could also facilitate the management of the contract.

The legal decisions and the actual contract will be signed outside of the platform's environment.

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THANKS

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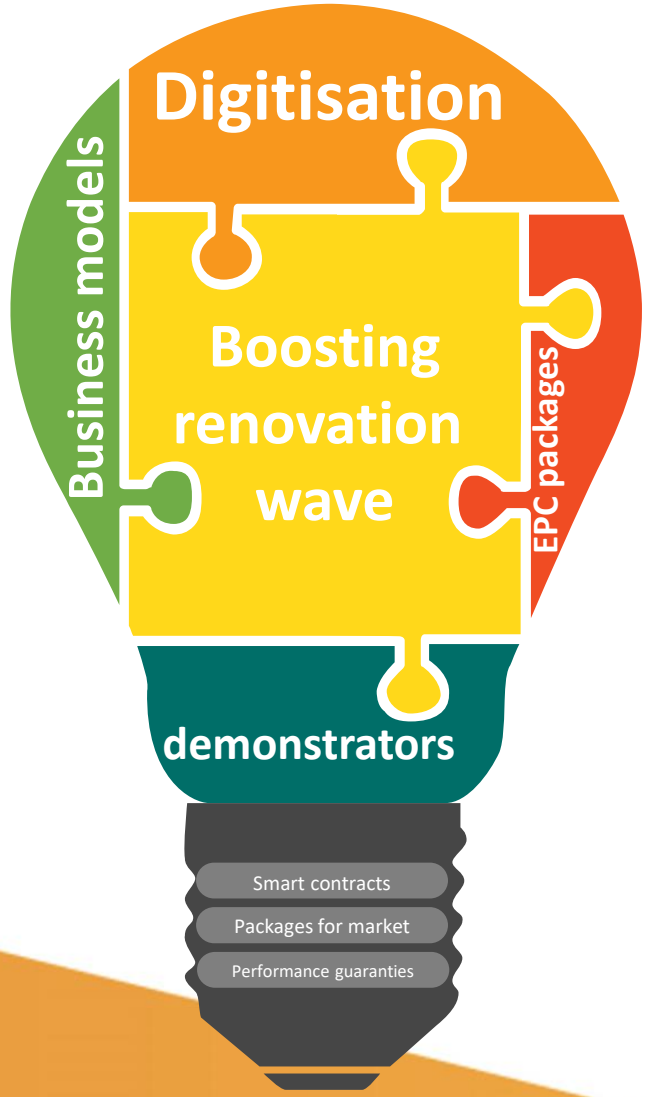
“Central Bank Digital Currency (CBDC) powered Smart PerFORmance contracTs for Efficiency, Sustainable, Inclusive, Energy use”

24 September 2024

SUSTAINABLE PLACES 2024

Overview of objectives



Digitisatisation and automation enablers

Real demonstrators targeting several different stakeholders

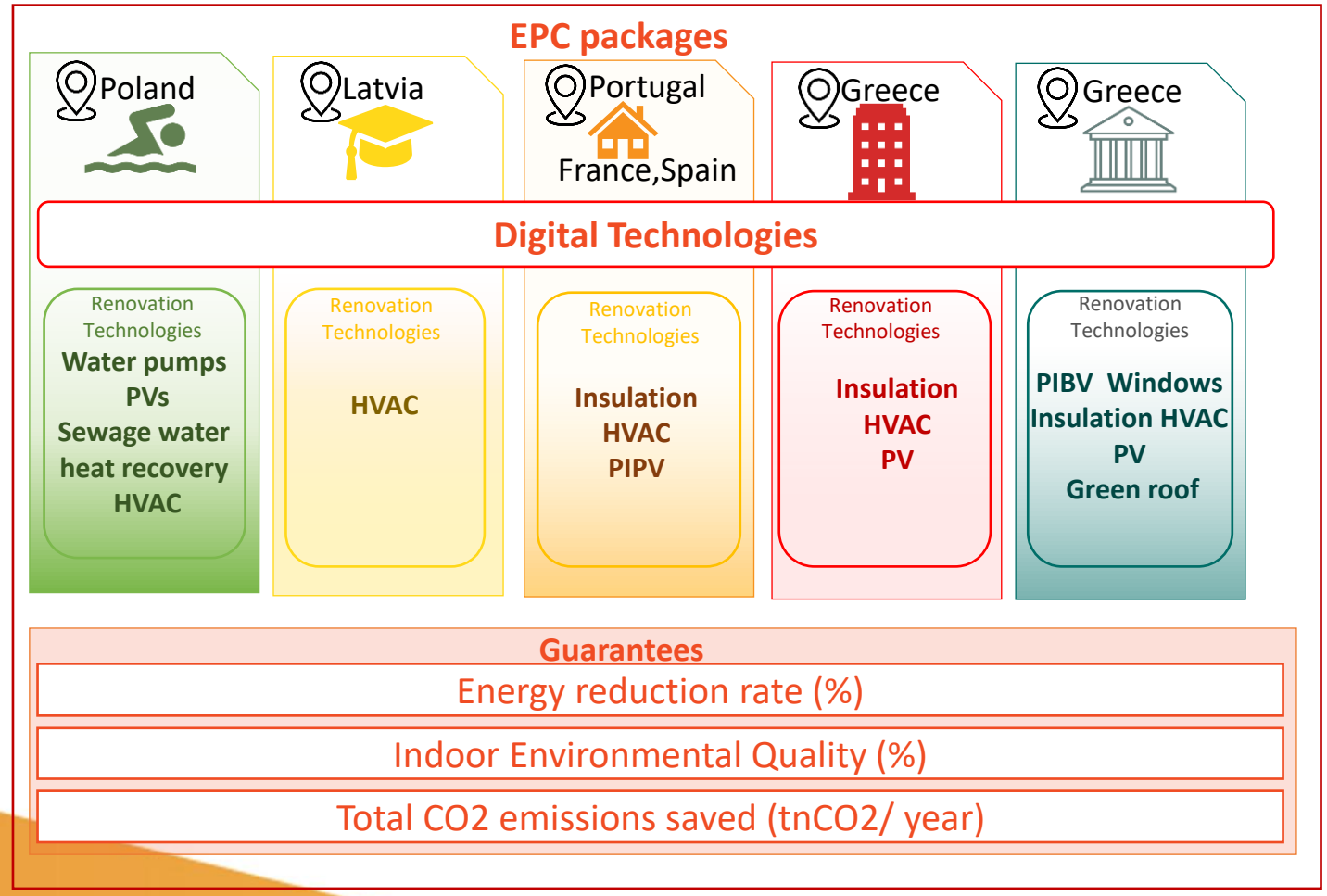
Integrated EPC packages to raise overall EPC value proposition

New business models for original and replicated packages serving, immediate market take up

Boosting renovation wave with performance guaranties

Objectives and Expected Results

Integrated EPC packages to raise overall EPC value proposition



B4P

FORTESIE

Objectives

A. Develop **holistic solutions** in a systemic approach

D. Demonstrate sector **decarbonization pathways**

KPIs

- # demonstrated innovative solutions and packages for sustainable construction and renovation <=7

-# building occupants and users involved in the partnership's projects demonstration activities = est.190 + 300 reach for information (school, poll)

- # Total floor area and # buildings (residential or non-residential) directly involved in the partnership's projects demonstration activities

- Energy savings (MWh) =Not measured yet

-# of private and public building owners with sustainable behaviour in their building stock est. 145

Challenges

FORTESIE

Collaborative Business Models
Diverse stakeholders interests->create scalable, replicable renovation solutions.

Renovation Complexity
Many suppliers cause delays -> Renovation marketplace to streamline collaboration and reduce delays.

Bureaucratic Delays
Public authority processes and bureaucratic hurdles significantly slow down energy renovations.

OSS Marketplace Adoption
Create traction and show value to local networks ->need many suppliers and dessimation to becuse useful and sustainable.

Key results/Innovations

FORTESIE

Comfort Price –Mobile App
-raise awareness of the cost of comfort
- users engagement and decision making.

Data sovereignty an Common Data model (on Fiware NGSI Agents
- Facilitating integration

Demonstrations-
Measured impact of renovation on building performance

One Stop Shop- European Renovation marketplace

Financing opportunities
- Alternative financing-green loans-green Euro
- Crowdfounding

Renovation packages
For replication

M&V and EPC in smart contracts (ESCOs)

Potential Synergies

Upcoming info on marketplace, blogs in website

Data sovereignty a Common Data model (on Fiware NGSI Agents

Share and replicate?

Financing opportunities
Alternative financing-green loans-green Euro + Crowdfounding

Share and replicate?

One Stop Shop- European Renovation marketplace

Thank You

Stay Connected

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https://zenodo.org/communities/fortesie_eu_project/

FORTESIE EU Project

This project has received funding from the European Union's Horizon Europe (HORIZON) Innovation programme under the grant agreement No 101080029. Content reflects only the authors' view and European Commission is not responsible for any use that may be made of the information it contains.

Who we are

FORTESIE

EUROPEAN DYNAMICS

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National Technical University of Athens

COMPTE CO2

IEECP
INSTITUTE FOR EUROPEAN ENERGY AND CLIMATE POLICY

CTIC

SMART INNOVATION NORWAY

48

GMINA GÓRA KALWARIA

coopernico

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MINISTRY OF DIGITAL GOVERNANCE

CORDIA
FACILITY & ENERGY SOLUTIONS

MESH
★★★★★ Wise buildings

JUST A CHANGE

SOCIAL OPEN & INCLUSIVE INNOVATION
INCLUSINN

enernalón
Agencia Local de la Energía

Leibniz Universität Hannover

GarcíaRama

GOPARITY

energy centre BRATISLAVA

Ministry of Economics
Republic of Latvia

SOCIETY FOR HELLENISM AND PHILHELLENISM

VEOLIA

Oktave
La rénovation à votre portée

APES
ASOCIÁCIA POSKYTOVATEĽOV ENERGETICKÝCH SLUŽIEB

LATVIJAS VIDES INVESTĪCIJU FONDS
LATVIAN ENVIRONMENTAL INVESTMENT FUND

TG TEHNIKI
PROJECT MANAGMENT PLANNER & CONSTRUCTION COMPANY

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Digital solutions, from planning to operation

Dr. Nikolaos Nikolopoulos, CERTH-CPERI

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B4P Clustering Event
11/11/2024
Breakout session - Room 1

VELIXIA
BUILDINGS AS ACTIVE UTILITY NODES

Smart Grid-Efficient Interactive Buildings

This project has received funding from the European Union's Horizon Europe Framework Programme for Research and Innovation under grant agreement no 101123238

EVELIXIA’s Key Objectives

EVE-KO#1	**Develop a platform for B2G/G2B services, turning Buildings into Active Utility Nodes (BAUNs).**
EVE-KO#2	Use Web3 and blockchain to enhance energy services' security and simplify human-to-building interfaces.
EVE-KO#3	Integrate heterogeneous data sources from multiple vendors and multiple sectors for seamless interoperability.
EVE-KO#4	**Provide cost-effective hardware to boost building energy efficiency, flexibility and sector coupling.**
EVE-KO#5	Assess B2G/G2B sustainability at seven pilot sites, focusing on economic, environmental, and social impact.
EVE-KO#6	Create business models for B2G/G2B services to drive adoption, attract investment and enable participation in untapped flexibility markets.
EVE-KO#7	**Foster an open innovation ecosystem for collaboration, behaviour change, and expanding EVELIXIA's reach.**

EVELIXIA's Contribution to B4P

B4P-SO#B
overall performance in the life-cycle perspective

14 B2G/G2B innovative services for data-driven planning, operation, and maintenance

B4P-SO#D
sector de-carbonization pathways

Energy consumption reduced by 13.5% & GHG emissions reduced by 17%

B4P-SO#C
energy efficiency, systems coupling flexibility, clean energy transition

RES self-consumption up to 100% & on-site RE generation by 11%

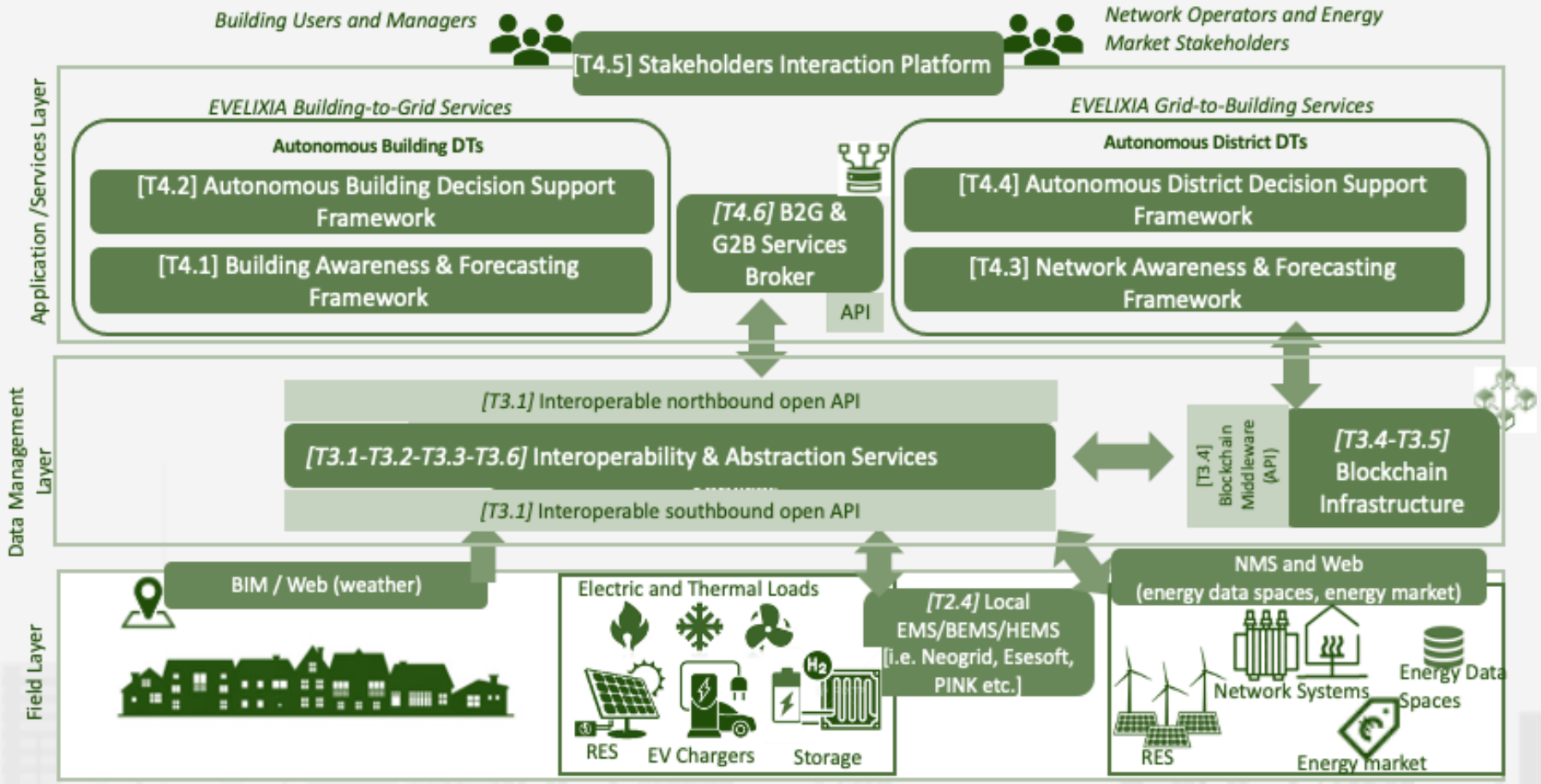
B4P-SO#F
affordability & cost-effectiveness

2 Innovative financing mechanisms & expected economic benefits >368K EUR/y

B4P-SO#A
co-development & knowledge sharing in a holistic approach

Stakeholders Interaction Platform
7 Scalability Roadmaps
7 BMs

EVELIXIA's Architecture



EVELIXIA's Innovations

KER: Key Exploitable Result**, S:** Software, **H:** Hardware

KER#1	**EVELIXIA platform (S)**
KER#2	Autonomous Building Digital Twin (S)
KER#3	Autonomous District Digital Twin (S)
KER#4	Stakeholders Interaction Platform (S)
KER#5	Interoperability and Abstraction Services (S)
KER#6	Geothermal Wall System (H)
KER#7	Window solar shading control using recycled PV cell (H)
KER#8	V2G EV Charger (H)
KER#9	Power-to-hydrogen-to-power compact system – MOSE (H)
KER#10	Hybrid long-term storage system (H)
KER#11	Decentralized DHW preparation solution "Ennerbox" (S/H)
KER#12	Building Aggregator Service (BAS) (S)
KER#13	ESesoft platform (S)

EVELIXIA's Demonstrations

PS#1 - AT

Residential/
Tertiary

7630 m²
142 ppl

80 ➡ **69**
kWh/m2/y

***SRI**(R): 25% ➡ 61%*
***SRI**(T): 13% ➡ 64%*

PS#2 - RO

Residential/
Tertiary

7630 m²
2700 ppl

308 ➡ **267**
kWh/m2/y

***SRI**(R): 18%➡53%*
***SRI**(T): 20% ➡ 55%*

PS#3 - FR

Industrial

4133m²
100 ppl

78 ➡ **55**
kWh/m2/y

***SRI**(I): 22% ➡ 72%*

PS#4 - DK

Residential

286229 m²
700 ppl

192 ➡ **154**
kWh/m2/y

***SRI**(R): 19%➡ 68%*

PS#5 - GR

Office/ Hospital

20984 m²
340 ppl

490 ➡ **390**
kWh/m2/y

***SRI**(O): 8% ➡ 71%*
***SRI**(H): 8% ➡ 67%*

PS#6 - ES

Residential/
Tertiary

16369 m²
6600 ppl

147 ➡ **144**
kWh/m2/y

***SRI**(R): 14%➡ 53%*
***SRI**(T): 12%➡ 56%*

PS#7 - FI

Residential

1883 m²
70 ppl

94 ➡ **85**
kWh/m2/y

***SRI**(R): 18%➡ 77%*

EVELIXIA's Challenges

Current key challenges so far lie with Platform Development and Tool Integration .

The Challenges arise from the phase-based architecture (e.g., design, operation), which needs to account for interdependencies among a series tools across phases.

Challenge #1 Data Availability: Lack of real-time data in some cased owed to several reasons, e.g. proprietary and non-interoperable sensors, GDPR, legislation limitations

Challenge #2 Interoperable Input/Output Interfaces: Ensure compatibility of data exchange across interconnected tools via APIs or other standardized formats.

Challenge #3 Fragmented regulatory frameworks across member states: Lack of cohesion often complicates the demonstration of B2G and G2B service operations, as businesses and governments must navigate varying legal standards, compliance requirements, and digital service protocols within the EU

EVELIXIA's Challenges

Current key challenges so far lie with Platform Development and Tool Integration .

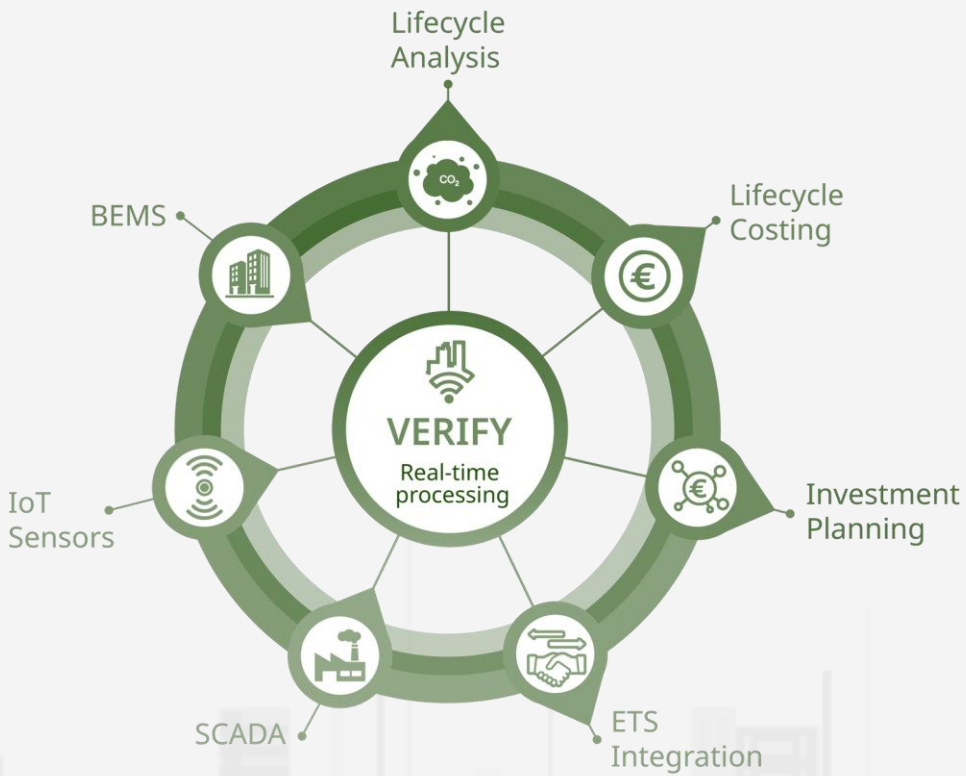
The Challenges arise from the phase-based architecture (e.g., design, operation), which needs to account for interdependencies among a series tools across phases.

Challenge #4 Seamless Tool Integration: Facilitate the integration of diverse tools within the same platform to ensure compatibility within the unified Toolboxes.

Challenge #5 Interoperable Input/Output Interfaces: Ensure compatibility of data exchange across interconnected tools via APIs or other standardized formats.

EVELIXIA's Potential Synergies

EVELIXIA's VERIFY



KEY FEATURES

Energy systems' lifecycle analysis and **costing** based on **real-time field production** and **consumption** data of energy components & **dynamic** changes in the energy, environmental and economic landscape

MARKET NICHE

Lack of digital tools suitable for monitoring **ETS2** implementation & usually they **do not perform LCC**

ADDED VALUE

Calculates KPIs on a building, plant, and / or district level (indicative list)

- Primary Energy Demand
- Global Warming Potential
- GHG emissions savings
- Fossil fuel consumption avoidance
- Project Cost and Financial analysis
- Systems' efficiency

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Smart Grid-Efficient Interactive Buildings

Thank You!

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ANNEX

VELIXIA

BUILDINGS AS ACTIVE UTILITY NODES

Smart Grid-Efficient Interactive Buildings

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WeForming

Buildings as Efficient Interoperable Formers of Clean Energy Ecosystems

Ângelo Casaleiro, R&D Nester

November 19, 2024, Belgium

Built4People 2nd Clustering Event

Funded by the European Union

The WeForming project has received funding from the European Union's Horizon Europe Programme under the Grant Agreement No. 101123556.

UK Research and Innovation

The UK participant is co-funded by UKRI.

WeForming Goals

WeForming will redefine buildings as active participants within the dynamic energy ecosystem transforming energy management through Intelligent Grid-Forming Buildings (iGFBs).

- Promote the adoption of Intelligent Grid-Forming Buildings (iGFBs) and Smart Cities
- Enhance the performance of buildings in terms of energy consumption and self-reliance
- Create new business models involving all the stakeholders in the energy-building value chain
- Shape a resilient and carbon-free energy ecosystem achieving EU's environmental and energy efficiency targets

WeForming Specific Objectives

- Transform passive buildings into iGFBs integrating a **real-time interoperability controller;**
- Design & implement the **WeForming Operational layer** to optimally manage multi-energy iGFBs & enable the coupling of iGFBs to form smart and active energy districts;
- Define & manage heterogeneous data models of iGFBs components and assets leveraging **data interoperability to design efficient Digital Twins** integrating them with BIM systems within the Operational Layer **to facilitate decision-making** processes in complex energy scenarios
- Design, develop and soundly link **BIM, gbXML , open building information exchange (oBIX),** and smart readiness indicators (SRI) in with the procedures and rules of operation of smart energy systems and markets
- Enable **digital interoperability of buildings** with their physical and digital energy ecosystem
- Promote a **participatory, dynamic and effective co-creation framework**
- Demonstrate, validate the WeForming solutions and frameworks in **6 Demonstrators**
- Unlock and promote innovative use cases and **business models for intelligent, efficient and grid-interactive buildings** in relevant sectors
- Enable feasible and sustainable integration potential of iGFBs into smart grids and smart cities
- Facilitate the **growth and capacity of iGFBs** and further market

B4P Specific Objectives and WeForming Contribution

Optimize and coordinate operation of multi-energy assets in buildings

- Advanced Building Management Systems (BMS) to coordinate control of energy carriers
- Predictive models for renewable technologies' behavior, demand, and building infrastructure
- Integration of smart grid technologies for real-time monitoring and control, optimizing energy synergy in buildings

Ensure seamless communication and data exchange among various platforms, systems, and tools

- Integration of building blocks for Data Spaces
- Standardized formats (SAREF, CIM, IEC) for data exchange
- Middleware layer for harmonized data profiles and service interoperability

C. Demonstrate clean energy transition potential

E. Demonstrate sustainable, circular business and value chain

Development and validation of sustainable and competitive business models involving stakeholders

- User-Centric platforms for optimal energy asset management
- Implement advanced algorithms for real-time interaction and optimal energy asset portfolio management
- Facilitate participation in centralized to fully distributed markets using digital technologies

Regulatory analysis, societal and environmental considerations, and effective promotion

- Develop a comprehensive regulatory blueprint considering technological integration aspects
- Policy recommendations for effective integration
- Address regulatory challenges for integrating building-level Distributed Energy Resources (DERs) into power systems

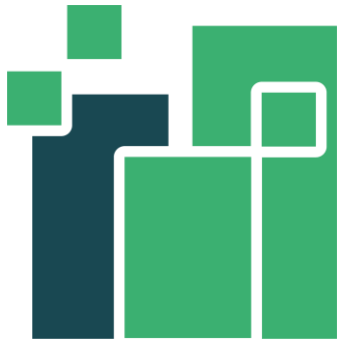
Contribution on Objectives and KPIs

		Contribution on Objective	KPI on Objective
GO1	 Generate holistic innovation in the built environment towards sustainability	**3. Contribution to the successful deployment of relevant EU instruments and frameworks**	Support the implementation framework for energy communities: • At least 3 of viable sharing and open economy and circular business models for communities • > 6 developed viable business models that enable building-to-grid integration • ≥ 4 business model assuming circularity
GO2	 Revitalise the sector through decarbonisation and sustainability transition	**5. Energy Savings** # buildings with on-site RES production # innovative services developed and demonstrated # building occupants and users involved in the partnership's projects demonstration activities # people trained across the whole value chain in the deployment of innovative sustainable tech. , system and methods	30 % for residential buildings > 50 residential building > 6 community based > 10 energy-related application, > 35 standard data services semantically harmonized* > 15 multi-energy or cross-sector data services semantically defined* > 2000 building users > 50 end-users engaged in each organized workshop. > 3 workshops including relevant iGFB actors applied in different building types > 4 investment studies (at least one study to provide cross-sector and circular economy applications).

Key Results and Innovations

First integrated technological release encompassing:

- Intelligent Grid Forming Building data space (data services and applications discovery)
- Implementation of multi-purpose (types of buildings) digital cloud operational platforms
- Open AI/ML energy applications to steer buildings'/community behavior and flexibility management
- 1st version of real-time controller
- Digital Twining service applied in 1 pilot case
- Interoperability actions to ensure harmonized semantics (BIM, gbXML, SAREF)
- Business Models for intelligent Grid Forming Buildings



Large-scale field demonstrators

Multi-energy grid-interactive district with a large fleet of electric vehicles

Shopping mall with internal power generation and energy storage systems

Grid-supporting renewable districts on a holiday island with seasonal demand variation

Interactive residential district with bidirectional power-to-heat and thermal storage capabilities

Grid-supporting rural renewable energy community

Energy market-driven multi-sector smart district

Challenges

- Need for intensive co-creation methodology for End-users' engagement;
- Intensive End-users' training to address Social and Behavioral Barriers;
- Regulatory framework, in particular on energy flexibility domain;
- Interoperability and governance aspects.

WeForming Collaboration Hub

A space for co-creation and knowledge sharing that serves as a dynamic forum for stakeholders across the EU.

Participating in the WeForming Collaboration Ecosystem offers:

- Influence policy decisions and strategic initiatives at the EU level, facilitating the integration of innovative building solutions into smart cities;
- Access to a centralized platform with valuable resources and information, further enhancing understanding and adoption of iGFBs;
- Shape the future of sustainable urban development through the creation of new business models.

Join us!

weforming.eu

@weforming

WeForming

Consortium

Comprising **30 partners** from **10 countries** with **European Dynamics as the coordinator**, the WeForming consortium brings together key players across different sectors strategically positioned to navigate the complexities of the dynamic energy landscape.

Thank you!

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Annexes – Support slides

Project ID

WeForming	Buildings as Efficient Interoperable Formers of Clean Energy Ecosystems
Project Number	101123556
Call	HORIZON-CL5-2022-D4-02
Type of Action	HORIZON Innovation Actions
Project starting date	1 October 2023
Project end date	1 October 2026
Project Duration	36 months
Website	weforming.eu

Funded by the European Union

The WeForming project has received funding from the European Union's Horizon Europe Programme under the Grant Agreement No. 101123556.

UK Research and Innovation

The UK participant is co-funded by UKRI.

The WeForming concept

Building Operational Pillar

- Building Operational Optimization
- Building to Grid integration
- Digital Twinning & BIM enhancement
- Energy-carrier co-optimization
- Market Participation & service provisioning
- Well-being (comfort, health) of occupants
- Advanced forecasting & Predictive Maintenance

Interoperability Assurance Pillar

- Building to energy stakeholders interaction
- Semantic Interoperability
- Service catalogue
- EDS-aligned
- Support data profiles standardization

New business models pillar

- Sustainable business models
- User engagement & acceptance SSH based approaches
- Co-creation methodologies
- Involvement of European Innovators

Smart-city Enabling Pillar

- Societal aspects
- Open & circular economy
- Environmental Considerations
- Regulatory Enablers

Large-Scale Field Demonstrators

LUXEMBOURG
multi-energy grid-interactive district with a large fleet of electric vehicles

PORTUGAL
shopping mall with internal power generation and energy storage systems

CROATIA
grid-supporting renewable districts on a holiday island with seasonal demand variation

BELGIUM
interactive residential district with bidirectional power-to-heat and thermal storage capabilities

SPAIN
grid-supporting rural renewable energy community

GERMANY
energy market-driven multi-sector smart district

WeForming Collaboration Ecosystem

- Webinars
- Co-creation
- Standardisation
- Capacity building
- Coffee talks
- Evaluation sessions
- News and events

A High-level use cases (HLUC) for iGFBs

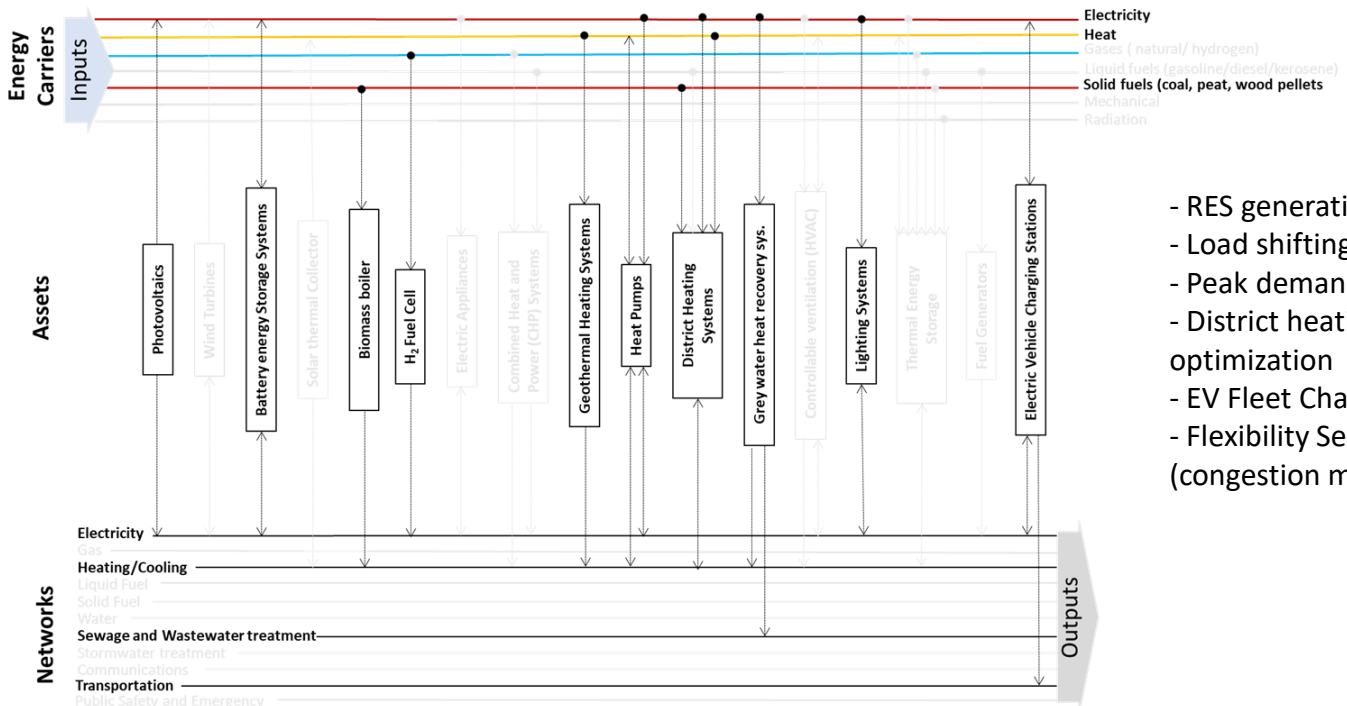
Multi-energy grid-interactive district with a large fleet of EVs

Residential district consisting in multi-user buildings including dwellings, offices and other commercial activities, and large scale private and public EV charging network

Objective: Process energy from multiple sources, regulate internal energy flows, and interact with networks operators to:

- Optimize the overall energy efficiency of district;
- Provide optimal flexibility service/products to the DSO;
- Optimize a large EV fleet charging infrastructure available in district.

- PV roof mounted & BIPV
- EV fleet charging infrastructure.
- Utility-scale Li-ion BESS
- AFC fuel cell
- Multi-port energy storage system
- EV charging
- Air-water heat-pumps
- Grey water heat recovery
- District heating system:
  Geothermal heat-pumps
  Biomass boiler



- RES generation optimization
- Load shifting
- Peak demand reduction
- District heating performance optimization
- EV Fleet Charging optimization
- Flexibility Services to the DSO (congestion mitigation, voltage control)

DATAWiSE
Intelligent and sustainable Building Management powered by cross-sectoral lifecycle

B4P event, CINEA, Brussels, 19/11/2024

Athina Tsanousa, Stefanos Vrochidis

CERTH/ITI

Co-funded by the European Union

MultiModal Data Fusion and Analytics Group

Information Technologies Institute

CERTH
CENTRE FOR RESEARCH & TECHNOLOGY HELLAS

DATAWiSE

Co-funded by the European Union

DATAWiSE

Objectives

- Collect and fuse Lifecycle data from multiple sources

- Develop and test intelligent building management tools

- Develop integrated services for energy efficiency and holistic management

- Provide holistic understanding of building operations.

- Test and evaluate the solutions in 3 large scale pilots

- Develop a dissemination plan and a business plan for commercial exploitation

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DATAWiSE

Contribution to B4P partnership

- **B4P Objectives**
  1. Develop holistic solutions in a systemic approach
  2. Demonstrate overall performance in the life-cycle perspective
  3. Demonstrate clean energy transition potential
- **KPIs**
  - Total floor area and # buildings directly involved in the demonstration activities: around 40 buildings, Max available area =51.878 m2
  - # and type of heritage buildings involved in/enhanced by the partnership's projects: 1 large heritage building (San Jose heritage building in Spain) currently hosting a private university and a hotel
  - # building occupants and users involved in the project's demonstration activities: Pilot 1: 500-900 users, Pilot 2: 3500 users, Pilot 3: min 80, Total: 4400
  - # living labs established and involved in the project: 6 planned co-creation sessions

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DATAWiSE

Key results and innovations

Lifecycle data

- Data Quality and Privacy Assessment Framework
- Protocol for Data Collection and Methods
- AI-based multimodal data fusion
- Data Integration and Harmonization Approach

Toolkits

- DBPM enhanced with a real-time digital twin and supported by BIM modelling
- LD^{2}S for the management of building assets and portfolios of buildings
- Data-Sharing Platform

Technical modules

- Generation, Demand Forecasting, and Optimization Algorithm
- Electrical and Thermal Flexibility Module
- Predictive Maintenance tool
- Explainable AI framework
- Adaptive Building Risk & Resilience Assessment Module
- Smart Sustainability & Comfort Balancing Module
- Smart Readiness Assessment tool
- Circular Lifecycle Assessment module

Dissemination

- Business Model and plan
- Board of Lighthouse Customers
- Policy recommendations and replication guidelines

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DATAWiSE

Demonstrations

Pilot 1: Riga Planning Region, Latvia (RPR)

Description:

- Three educational buildings, built in 1970-1982, renovated
- High demand in energy consumption and high costs

Pilot needs

- Optimize energy efficiency and occupants' comfort
- Educate users

Pilot 2: Heritage building San Jose, Burgos, Spain (CTC, VBE6D)

Description:

- Heritage building built in 20s, refurbished in 1964
- University and hotel with a sports center

Pilot needs

- Energy monitoring and optimization, crowd monitoring, Buildings' management

Pilot 3: Austrian Energy Communities, Stanz, Austria (BPE, OurPower, AEE)

Description:

- Community of residential and municipal buildings
- Energy transformation

Pilot needs

- Holistic model for sustainability and energy forecasting and generation
- Automated thermal and electrical management

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DATAWiSE

Demonstrations

Pilot 1, Latvia

Pilot 2, Spain

Pilot 3, Austria

Challenges

- Possible future technical challenges:
  - Collect data from educational buildings without violating privacy issues
  - Correctly identifying number of occupants to use as labels for tasks such as occupancy detection

Potential synergies

- Current:
- Cooperation with sister project Wilson
- Participation in Smart energy cluster
- Possible cooperation: EBENTO, EVELIXIA

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DATAWiSE

Thank you!

https://datawise-project.eu/#

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CENTRE FOR RESEARCH & TECHNOLOGY - HELLAS
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Nebula

A Built**4People** Project

WILSON

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the European Union

WILSON - Objectives

The **main objective of WILSON** is to enable **more efficient and sustainable data use** in the built environment by leveraging cutting-edge technologies and innovative management practices.

To do so, WILSON presents a **holistic, extensible, and decentralised approach to data management**, agnostic to and interoperable with existing proprietary BMS and Digital Twin (DT) systems. This is integrated together with a set of tools for both **energy and non-energy applications**, aiming to **increase availability** of performance indicators relevant to the built environment as well as supporting creation of new services and sustainable **financing schemes**.

To ensure integration and market uptake across the data lifecycle, WILSON will be **demonstrated in 4 different countries and mixed typologies**, showing its adaptability and performance in **real-case scenarios**.

SO1: To deliver a federated and data mesh-based solution that will operate and upgrade any existing building management system using data analytics and real-time digital twinning tools that enhance interoperability.

SO2: To optimise performance of buildings and portfolios by increasing availability of energy and environmental indicators, enhancing interoperability towards improved management strategies with a life-cycle approach.

SO3: To develop a set of DT-enabled tools for better planning and management of building assets and portfolios, focused both on energy and non-energy uses, which will create new business models, financing schemes and services

SO4: To carry out validation of WILSON solutions at TRL6, before a large-scale demonstration campaign up to TRL8 at four different countries, analysing replication and ensuring replicability of results

SO5: To involve market actors and stakeholders for open and dynamic discussion for knowledge sharing and drafting recommendations for policy makers on upcoming regulatory requirements.

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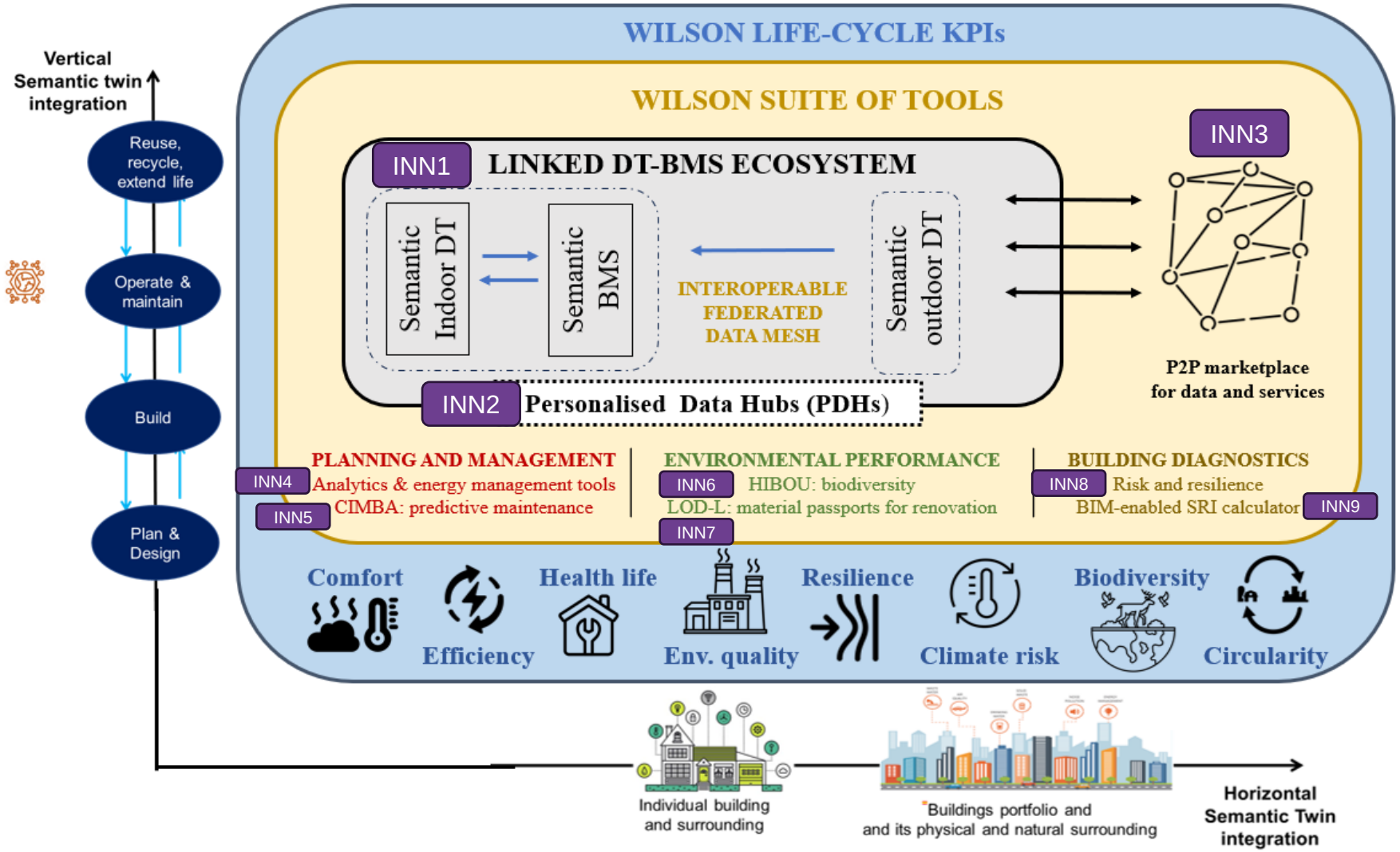
WILSON - Innovations and KERs



12 KEY EXPLOITABLE RESULTS

1. District DT: federation and data mesh
2. Personalised Buildings Data Hubs
3. P2P data and services marketplace
4. Semantics-aware energy management
5. CIMBA: predictive maintenance
6. HIBOU: biodiversity tool
7. LOD Lifter: sustainable renovation
8. Risk and resilience
9. BIM-enabled SRI calculator
10. Investment planning tool
11. New business models
12. Policy recommendations

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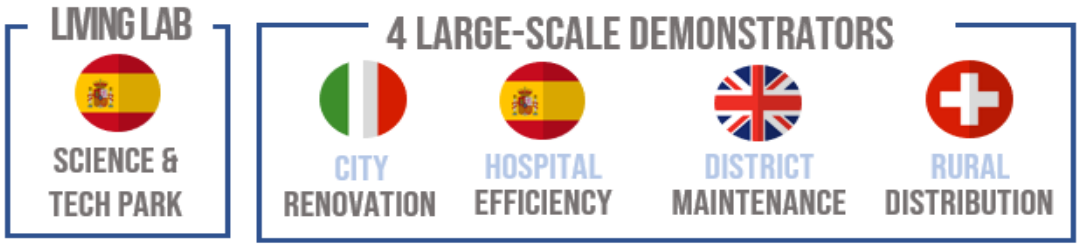
WILSON - Demonstrators



	Buildings	Type	Main focus and challenges	Area (m2)
Italy	Public district	City	Renovation, efficient design	39.000
Spain	Hospital	Coast	Energy efficiency, fragmentation	40.000
UK	Mixed	City	Multi-data sources, maintenance	97.000
Switzerland	Residential	Rural	Distribution, asset integration	14.000

↓ DEMO // USE CASE →				1) Decentralised multisource data management	2) Energy monitoring and optimisation	3) Data-driven network asset management	4) Predictive maintenance	5) Risk, resilience and biodiversity nexus	6) Renovation planning and design	7) Technoeconomic investment planning for property owners	8) Boost of green energy investments by market actors
LARGE-SCALE DEMOS	**Leader**	**Focus**	**Region**								
Italian demo (renovation, public owner)	ADDRINA-C	Renovation	Public	R	R	R		F	F	R	R
Spanish demo (hospital)	HMRIB PARQ	Efficiency	Coast	R	F		R	R	R	F	R
UK demo (multi-source data, city district)	HELIXUNEW	Multi-source data	City	F	R	R	F		R	R	R
Swiss demo (distribution, rural area)	SAK HSLU WATTX	Distribution	Rural	R	R	F	R	R		R	F
LIVING LAB	CIRCE			x	x	x	x	x	x	x	x

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Built4People – Specific objectives

1. **Specific Objective F: Demonstrate affordability and cost-effectiveness**
   - "[…] capacity of collecting and providing access to large sets of data through European wide-scale digital observatory […] as well as EU-wide open database"
   - "Eventually, a new generation of digital tools, systems and applications should support new services for the citizen and the city (transport, health, car parks, waste management), with an enlarged involvement of stakeholders and citizens in monitoring and maintenance of the built assets."

2. **Specific Objective E: Demonstrate sustainable, circular business and value chain**
   1. Digital innovation in procurement (micro-payments, blockchain based platforms, etc.)
   2. Models and digital tools (Big Data, AI, BIM)
   3. Developments of tools and data dictionary /data bank services
   4. Developments of BIM protocols and guidelines

3. **Specific Objective B: Demonstrate overall performance in the life-cycle perspective**
   1. Models and digital tools (Big Data, AI, BIM)
   2. Holistic data-based approach, interoperable tools (IoT, data analytics, risk assessment, long term prediction)

12 KEY EXPLOITABLE RESULTS

1. District DT: federation and data mesh
2. Personalised Buildings Data Hubs
3. P2P data and services marketplace
4. Semantics-aware energy management
5. CIMBA: predictive maintenance
6. HIBOU: biodiversity tool
7. LOD Lifter: sustainable renovation
8. Risk and resilience
9. BIM-enabled SRI calculator
10. Investment planning tool
11. New business models
12. Policy recommendations

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Built4People – KPIs

1. **# innovative products/services/processes linked to sustainability that are catalysed by the partnership and number of jobs created**
   - Not sure if applicable
2. **Contribution to the successful deployment of relevant EU instruments and frameworks**
   - European Data Space through IDSA
3. **Energy savings (MWh)**
   - Too early to calculate, Energy Management Toolset under development
4. **Share of reused/recycled materials used in construction (%)**
   - Check with pilots
5. **Share of buildings designed and constructed based on a life cycle approach.**
   - Check with pilots
6. **# buildings with on-site RES production**
   - TBD, demosites still under construction
7. **# of private and public building owners with sustainable behaviour in their building stock**
   - Not sure
8. **1 demonstrated innovative solutions and packages for sustainable construction and renovation**
   - LOD Lifter: semantic renovation for material passports
9. **4 demonstrated innovative solutions for the sustainability of the built environment value chain**
   - BIM-SRI, HIBOU, Risk ad resilience, CIMBA
10. **10 innovative services developed and demonstrated**
11. **1 living lab established and involved in the partnership's projects**
12. **More than 200 000 m^2 and more than 200 buildings (residential or non-residential) directly involved in the partnership's projects demonstration activities**
13. **3 heritage buildings (headquarters, cantina and warehouse of former military base) involved in/enhanced by the partnership's projects, in line with the safeguarding of the historical environment and architectural values of the building stock**
14. **# building occupants and users involved in the partnership's projects demonstration activities**
    - Check with pilots

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WILSON – Challenges and synergies

CHALLENGES

- **Characterization and engagement of the demosites partners**
  - Explain the importance of data: no data, no project!
- **Interoperability with European-wide systems and data spaces**
  - IDSA is going to be the European standard?
  - It makes sense to have a reference data spaces for the EU?
- **Lack of information**
  - We are a data-based project!!
  - Common EU repositories?
- **Engagement of stakeholders for the new business models**
  - Business models focused on data, hard to explain and take to real environment

SYNERGIES

- **Testing interoperability with other project platforms**
  - Searching common data spaces: IDSA, GAIA-X...
- **Workshops/events to share business models based on data and project results**
  - Are this business models interesting for stakeholders? Who is demanding them?
  - KPIs and result comparison with tother project developments
- **Dissemination events of common interest**
  - Data management
  - Life-cycle tools in building environment
  - Interoperability
- **Already 11 European projects contacted as sister projects**

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Nebula
A Built4People Project

THANK YOU!
QUESTIONS?

circe Creating together

Newcastle University

CSTB le futur en construction

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

RINA

Que technologies

PINEARQ

wattx

AGENZIA DEL DEMANIO

Hospital del Mar Barcelona

Broadoak

INTERNATIONAL DATA SPACES ASSOCIATION

GND

intract

HSLU Lucerne University of Applied Sciences and Arts

sak

Funded by the European Union

Dynamic Decarbonisation Pathways Framework Integrating Technological, Social, and Policy Innovations for Sustainable Renovations in the Built Environment

Filippos Anagnostopoulos
IEECP

Co-funded by the European Union

Grant Agreement No: 101147781

DeCO2 envisions a circular and sustainable decarbonised future for the European built environment

17
PARTNERS

7 EU
COUNTRIES

48
MONTHS

3
DEMOS

€7 M
FUNDING

DeCO2 Project scope and objectives

The project aims to improve the energy efficiency, circularity and sustainability of the built environment.

O1: Implement circular and technological innovations towards the decarbonization of the built environment, integrating new eco-friendly and recyclable material, cutting-edge digital manufacturing techniques and novel data-driven pathways across the value chain in three large-scale demonstrators.

O2: Foster social innovation by people-centred and inclusive participatory process activities for the development, implementation and post-occupancy assessment of sustainable renovation solutions.

O3: Promote policy innovation by providing practical guidelines to public authorities and policy makers on how to implement decarbonisation pathways, highlighting the challenges and enabling conditions to overcome them.

O4: Demonstrate the effectiveness and viability of innovative digital solutions, low disruptive construction and retrofitting processes on three physical demo cases.

O5: Access the **scalability and replicability of the demonstrated built environment decarbonization pathways for wider adoption**, by deploying innovative solutions across three Living Labs.

DeCO2 Project contribution to the 7 B4P objectives

A. Develop holistic solutions in a systemic approach
The Dynamic Decarbonization Pathways Framework integrates technology, policy, and social innovations using digital twins and collaborative design methods to address the built environment's full lifecycle.

B. Demonstrate overall performance in the life-cycle perspective
Life Cycle Assessment tools will assess environmental impacts in Living Labs in Limerick, Graz, and Valencia validating lifecycle improvements in energy and material efficiency for real-world application.

C. Demonstrate clean energy transition potential
Digital twins and energy efficiency technologies accelerate the shift to clean energy, supporting scalable renewable integration and optimising real-time building energy use.

D. Demonstrate sector decarbonization pathways
Sector-specific decarbonisation is demonstrated in urban Living Labs through tailored solutions, supported by policy-aligned innovation roadmaps and real-world decarbonisation strategies.

E. Demonstrate sustainable, circular business and value chain
The project promotes circularity (e.g. through Product-as-a-Service models) and engages value chain actors, aiming for reduced resource use and waste across sustainable renovations and products.

F. Demonstrate affordability and cost-effectiveness
Cost-benefit analyses within Living Labs and standardisation efforts ensure affordability, making scalable energy solutions more viable for widespread adoption.

G. Demonstrate no trade-offs on economy, comfort, health, functions, cultural heritage
Heritage-sensitive renovations in Graz maintain cultural integrity, while technology integration improves indoor health, comfort, and efficiency without compromising essential building functions.

DeCO2 Project contribution to the B4P partnership

KPIs by project's end

- **10 innovative solutions for the sustainability of the built environment value chain,** using circular materials and techniques will be demonstrated in demo cases: circular & bio-based prefabricated systems, ceramic robotic recycling, 3D printing with recycled materials, bio-based insulation materials and plant-based adhesives, SLA and FDM 3D printing of bio-based prefabricated products.
- **7 innovative services/technologies** developed and demonstrated in demo cases: material passports & traceability solutions, BIM-based building digital twins, toolbox of circular information access technologies, regulatory sandboxes, building scanning/analysis & material database, GOM 3D scanning survey methodology of existing building elements, and a dynamic ecosystem incubator to leverage stakeholders and resources.
- **3 Living Labs** (LLs) established within the built environment to create more sustainable, resilient, and people-centred renovation solutions: Limerick, Graz, and Valencia
- **Over 100 stakeholders** engaged in co-creation process, **over 100 households** engaged towards sustainability and **200 AEC professionals** (architectural, engineering and construction) trained and informed through workshops, webinars, regulatory sandboxes and LLs.

DeCO2 Project key results

- Increased number of options for built-environment **decarbonization pathways towards zero-emission buildings** considering the whole value chain at local or regional level.
- Increased **engagement and participation of the whole value chain in local and regional innovation clusters.**
- **Reduced time from first demonstration to market** of sustainable renovation solutions.
- **Increased awareness and improved access at a local or regional level** to information on construction products for reuse and circular businesses.
- Creation of **new business opportunities with reduced risk for investment in the circular economy.**

DeCO2 Project innovations

Technological innovations

- New design techniques allowing for **deconstruction** and optimization of secondary **material reuse**, **3D printing** with recycled/excavated materials.
- New products and components for construction works made of **bio-based materials** (e.g., use of plant-based adhesives).
- **Material passport** and traceability.
- Construction **database** with LCA indicators construction price bank, evolution of the prices of materials and BIM catalogue of constructive elements.

Social innovation

- Living Labs (LLs) as a real-world testbed where fast-tracking sustainable renovation solutions are implemented, evaluated, and showcased, while also informing replication strategies, influencing policies, and fostering community engagement and learning.

Policy innovation

- **Reduce time to market** through the adoption of **regulatory sandboxes** and innovation testing and certification, ensuring compliance with industry standards and enabling a faster path to market.

Demo 1: Limerick City, Ireland (TUS)

- Bio-based fully recyclable composites
- Mycelium and breathable adhesives to sequester carbon
- Green roof testing integrating various waste products and green vegetation
- Circular and cost-effective way for scalability
- Practical retrofitting and circular guidelines for the construction industry and building owners (TUS & Fraunhofer IBP)

Demo 2: Castelló Municipal Library, Valencia, Spain (IVE)

- A circular ecosystem involving two buildings: a historical library in the city of Castellón under renovation as a material supplier, and an experimental building to be constructed on the UPV campus.
- Library for controlled dismantling
- Digital Twin
- Material Passport library
- Innovative recycled construction products
- Mosaic floor and 3D-printed walls made from ceramic
- Regulatory sandbox

Demo 3: Graz-St. Peter, Austria (UGR)

- Terrassenhaussiedlung (THS) in Graz, Austria represents participatory residential architecture of post-war modernism
- A multifaceted system with roof gardens and terraces provides 530 private owned apartments within four buildings situated around a car-free courtyard
- 4 buildings in exposed concrete construction 8-14 storeys
- 530 apartments of various sizes
- Multiple planted roof gardens and terraces
- Car-free inner courtyard with an underground car park
- Policy, regulatory and community-based piloting scenarios will be carried out

DeCO2 Project challenges/good practices

Challenges

- Lesser representation of Graz pilot (Terrassenhaussiedlung) residents, due to PIC validation challenges with EC’s services
- Valencia flood impact being evaluated for delays

Good practices

- Engagement with University College of London's Building Passport Alignment Project
- Possibility to apply parallel and external research to the demo cases and integrate insights into the framework DeCo2

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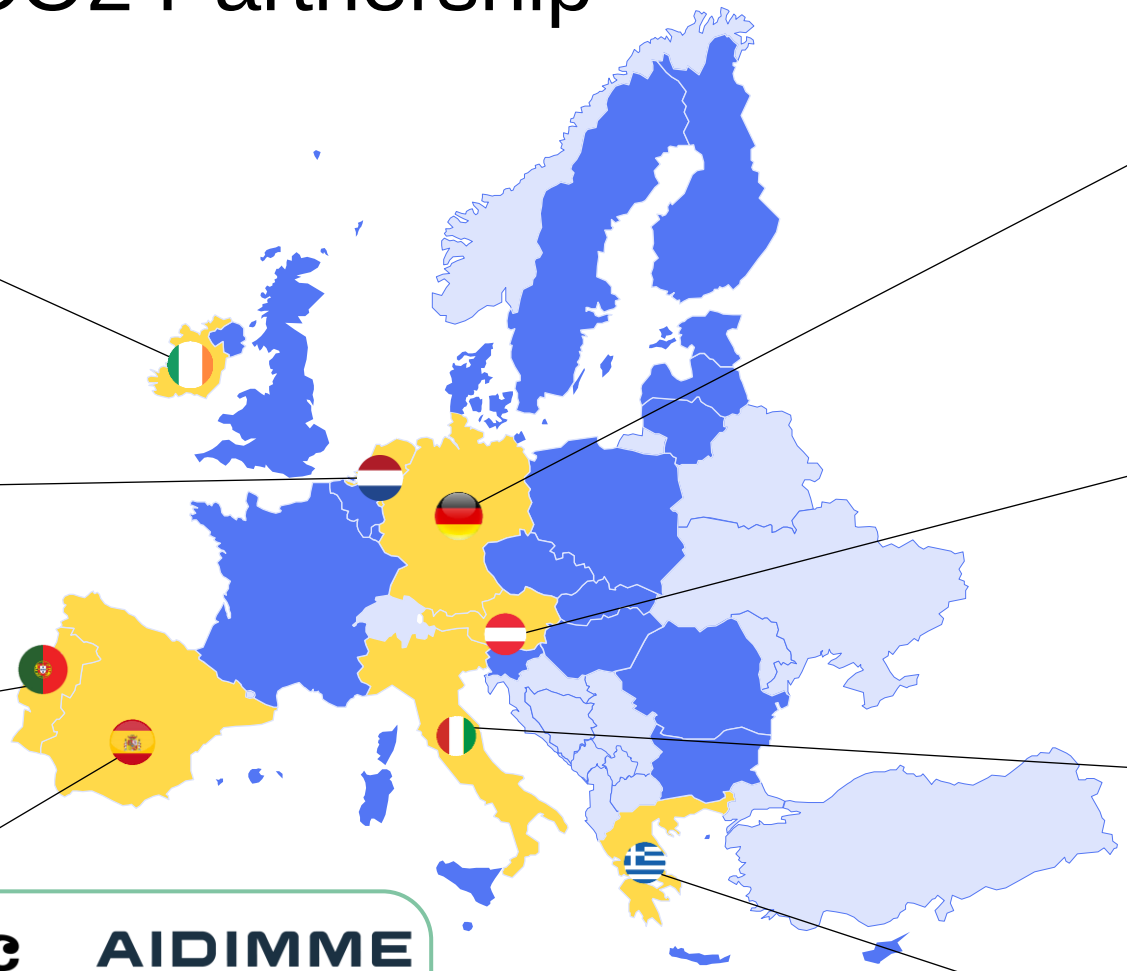
DeCO2 potential synergies

EBENTO enhances energy efficiency in buildings by developing an integrated one-stop-shop platform for all actors involved in building and renovation sector, to better coordinate and manage Energy Performance Contracting, bringing together the needs from all actors involved in enhancing the building stock. (Partner: IEECP)

FORTESIE will design, demonstrate, and validate innovative renovation packages in the building industry, to accelerate the renovation wave in Europe. The renovation packages will include innovative digital technologies for measurement and verification of building performance improvements and attractive financing schemes. (Partner: IEECP)

BUS-GoCircular develops a “Train the Trainers” programme, that addresses application of the Circular Economy interventions in the construction value chain framework and the Circular Construction Skills qualification framework. (Partner: TUS)

DeCO2 Partnership



TUS
Bord Oideachais & Oiliúna
LUIMNIGH & AN CHLÁIR
LIMERICK & CLARE
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Technology Institute

IVE
Instituto Valenciano de la Edificación

CoCircular

Ajuntament de Castelló

3L

Fraunhofer IBP

IG TERRASSENHAUS

Wegener Center

UNI GRAZ

wasp

pwc

Thank you

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IEECP – Institute for European Energy and Climate Policy

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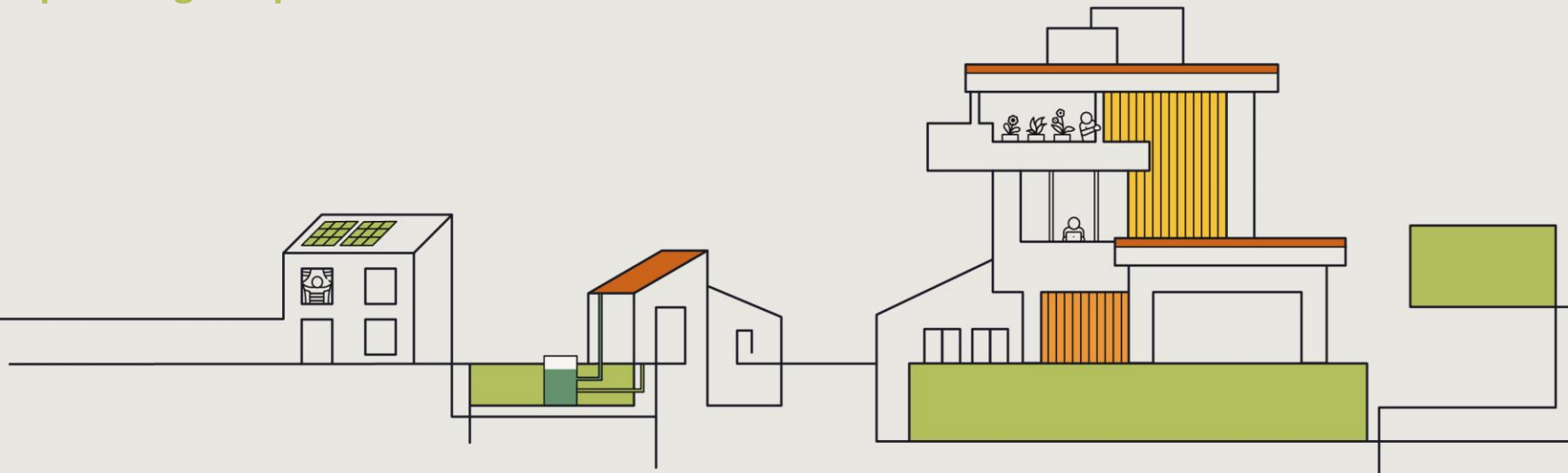
SIRCULAR

B4P clustering event

Digital solutions, from planning to operation



Marina Focarile

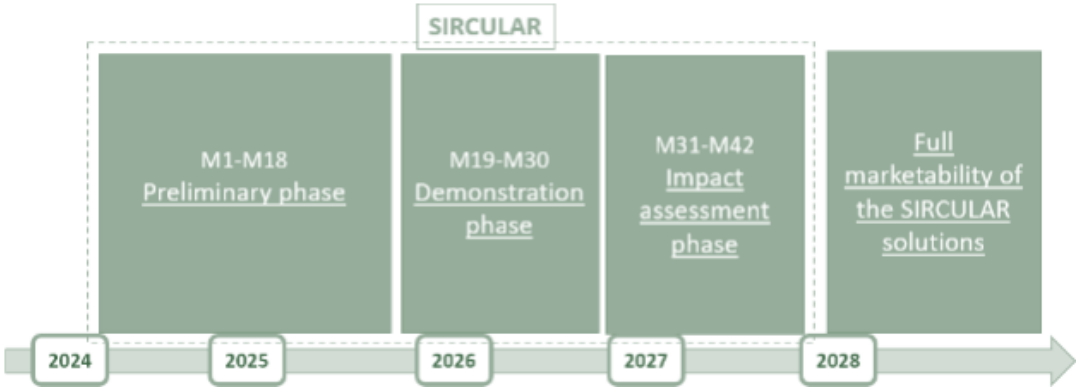
19 November 2024

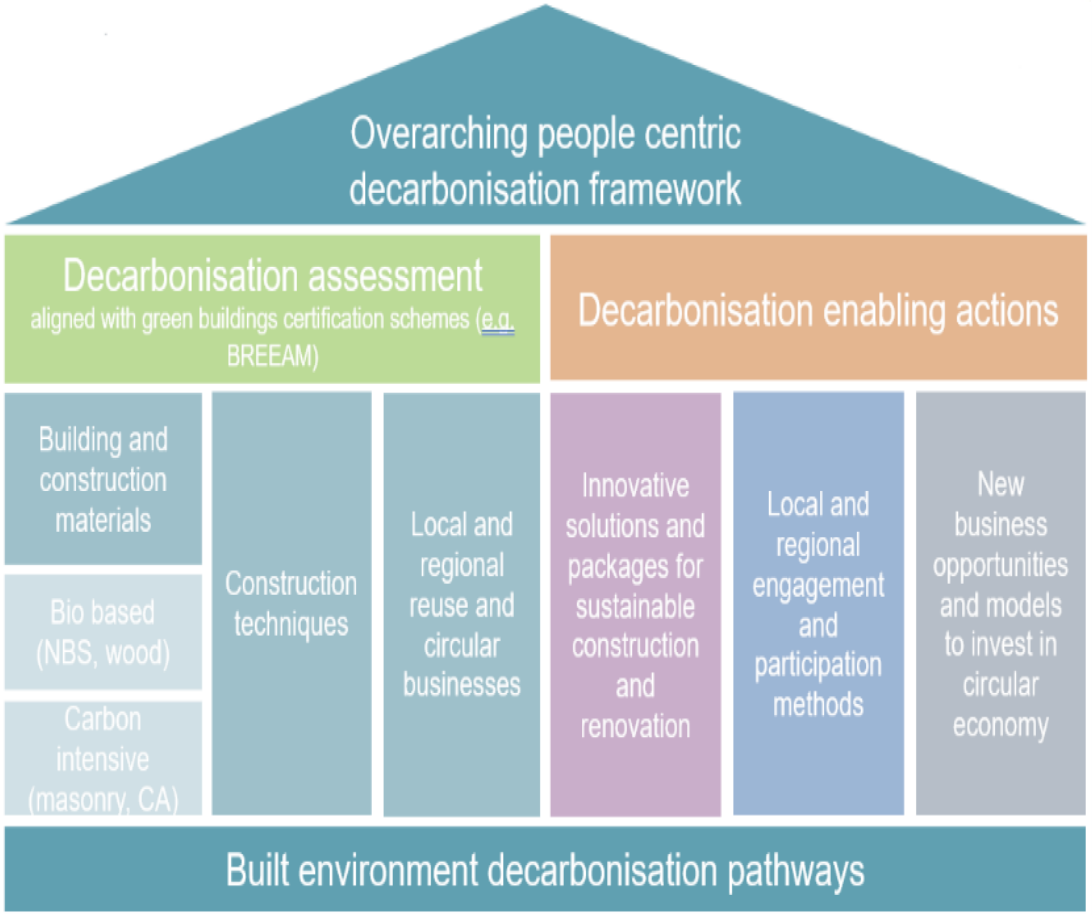
Co-funded by the European Union

SIRCULAR has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101147412. Views and opinions expressed are those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.

Project’s objectives

The overall objective is to develop **digital tools**, **technological solutions** and **non-technical services** for the *decarbonisation of the built environment*, delivering an efficient methodology for the evaluation of the circularity of a considered building and a set of evidence based KPIs.





Contribution to the B4P partnership

E. Demonstrate sustainable, circular business and value chain

D. Demonstrate sector decarbonization pathways

A. Develop holistic solutions in a systemic approach

IF1: increased circularity of the construction sector ⇩ Circularity Index up to 75%	IF2: reduction of carbon emissions ⇩ 20% of reduction	IF3: foster the uptake of decarbonisation solutions ⇩ At least 2 buildings intrested by decarbonisation intrevention	IF4: improve rate and depth of renovation ⇩ At least 2 buildings intrested by decarbonisation intrevention
IF5: reduction of CDW ⇩ 45-60% of CDW	IF6: more investment coming to circular economy sector ⇩ More than 20 companies working in sircular economy engaged	IF7: increased efficiency of the value chain ⇩ More than 30 stakeholders engaged	IF11: enhanced living conditions ⇩ 46-60% increased thermal comfort

SIRCULAR key results and innovations

SIRCULAR platform

5 SIRCULAR tools (software)

- Sircularity assessment index tool
- Marketplace
- Higrothermal simulation tool
- Comfort evaluation tool
- Design and construction phase gap toolbox

4 SIRCULAR technologies (hardware)

- Prefabricated offsite circular deep renovation solution
- Low-carbon precast insulated concrete façade panels with recycled material
- Innovative prefabricated circular renovation components
- Preliminary design studies on timber reuse

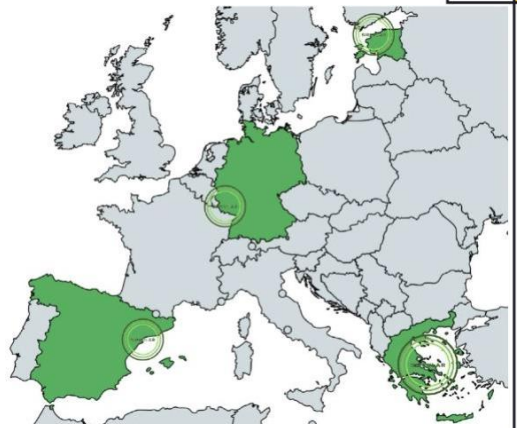
2 SIRCULAR non-technological services

- Risk reduction for investment in circular businesses
- Non-standard relationship

SIRCULAR demonstrators

4 Regional Clusters:

- 2 lighthouse demos (Estonia and Spain) - renovation
- 2 follower demos (Germany and Greece) - renovation



ESTONIA:

- Deep energy renovation (from EPC “D” to “A”)
- Reuse of existing materials and components
- Prefabricated components
- Design for demounting and waste management
- Integrated value chain approach

SPAIN:

- New renovation solutions
- Reuse of deconstruction materials
- High level of community engagement
- Policy recommendations
- Significant reduction of carbon emissions

GREECE:

- Selection of 4 typologically relevant schools for creating highly-replicable decarbonization pathways
- Comprehensive renovation plan

GERMANY:

- Renovation of a typical university building with poor energy performance
- High replication potential
- Developed solution fully prefarbricated
- Circular construction to enable multiple life cycles

Challenges

1. Integration of Circular Economy Principles	Challenge: *Embedding circular practices into traditional construction* processes can be complex due to existing industry norms, supply chain structures, and material limitations.
	Solution: *Extensive collaboration with stakeholders and demonstration projects* to showcase successful integration**.**
2. Technological Scalability and Maturity	Challenge: *Advancing technologies from lower TRLs to higher ones* and scaling them for real-world application can be difficult. Technologies need to be proven *reliable and efficient* under operational conditions.
	Solution: *Continuous testing and refinement of innovations* in pilot projects to ensure they meet performance expectations.
3. Stakeholder Engagement	Challenge: Engaging a *wide range of stakeholders* (e.g., industry partners, policymakers, local authorities, and end-users) is essential for widespread adoption but can be challenging due to different interests and priorities.
	Solution: Establishing *clear communication channels and collaborative workshops* to align objectives and foster commitment.
4. Regulatory and Policy Barriers	Challenge: Projects must *comply with existing regulations*, which can sometimes lag behind innovative approaches. Obtaining permits and ensuring that the project aligns with local, national, and EU regulations can be time-consuming.
	Solution*: Working closely with regulatory bodies* and participating *in policy discussions* to align project outcomes with current and future standards.
5. Sustainability vs. Cost-Effectiveness	Challenge: Balancing the *cost of sustainable and circular solutions with economic feasibility* is often a challenge, especially in large-scale implementations.
	Solution: Conducting detailed *cost-benefit analyses* and seeking additional funding sources or incentives to support sustainable initiatives.

Synergies

Energy Efficiency and Optimization: innovative technologies and frameworks to enhance energy efficiency, optimize energy usage, and create flexible energy systems in buildings. This involves active user engagement and technologies that allow buildings to act as dynamic parts of the energy grid.

Sustainability and Circular Economy: target the decarbonization and circularity of the building sector, with an emphasis on integrating economic, social, and policy innovation. Supporting sustainable renovation practices and co-creation activities that include a broad range of actors.

User-Centric and Collaborative Approaches: emphasize the importance of involving end-users, stakeholders, and communities in the development and application of building solutions. Many projects focus on making information accessible to non-experts, promoting social innovation, and supporting decision-making processes for energy investments

Standardized Frameworks and Business Models: Many projects focus on creating reusable, open-source architectures and standardized business models to ensure scalability and adaptation across different sectors and regions.

SIRCULAR

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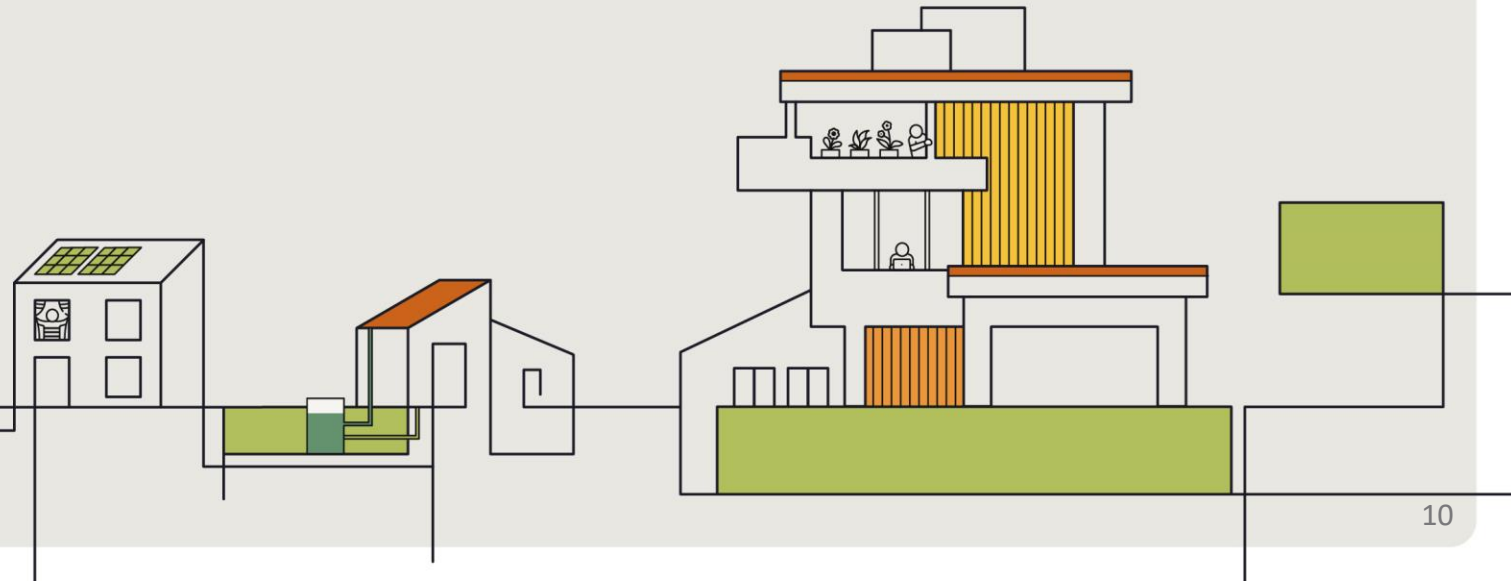

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STAR*track

A Built4People Project

B4P clustering event 19/11/2024

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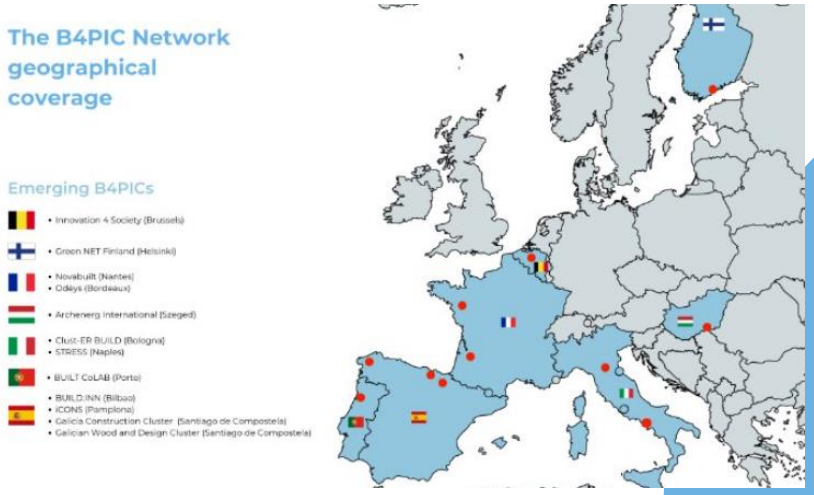
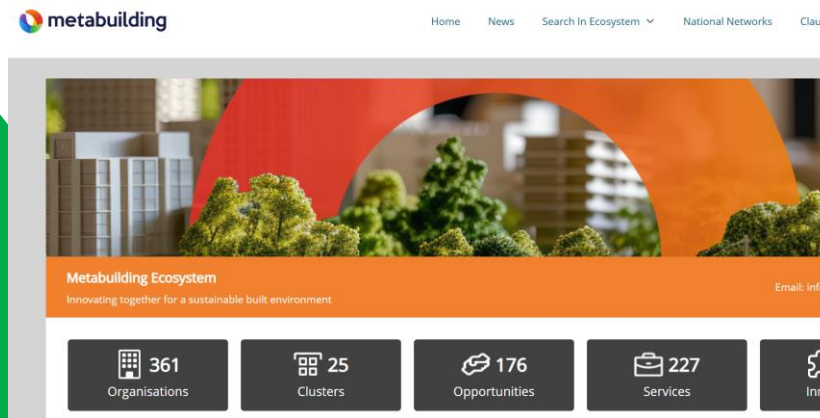
STAR*track objectives

STAR*track
A Built4People Project



EXPANSION
Participate & collaborate

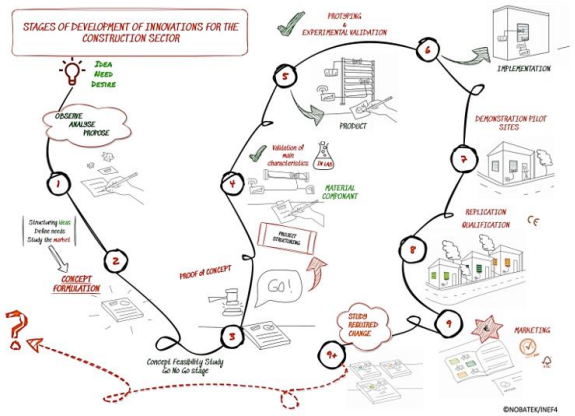
FACILITATION
Engage & enable



IMPACT
Invest & scale-up

EMPOWERING
Be efficient & competitive

Metabuilding Labs TRL scale adapted to the construction sector



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Contribution to B4P partnership

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A Built4People Project

A. Develop **holistic solutions** in a systemic approach

4. # training programmes developed for the sustainable built environment
3. Contribution to the successful deployment of relevant EU instruments and frameworks

B. Demonstrate **overall performance in the life-cycle** perspective

2. # innovative products/services/processes linked to sustainability that are catalysed by the partnership and number of jobs created
16. # living labs established and involved in the partnership's projects
12. # of private and public building owners with sustainable behaviour in their building stock
13. # demonstrated innovative solutions and packages for sustainable construction and renovation

E. Demonstrate **sustainable, circular** business and value chain

1. R&I investment in the sustainable built environment area catalysed by the partnership
10. # of workers trained on working methods and tools in the fields covering the B4P objectives

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Expected key results ~~and innovations~~

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#1: A comprehensive methodology for the reliable assessment of maturity of the B4PIC network

metabuilding

#2: A consolidated network of B4P innovation clusters

B4PIC
Networking EU innovators for a better built environment
Metacluster

#4: Visibility for project results from HEu Cluster 5

#7: A training module and tools on innovation processes

#8: A set of guidelines and digital tools/services to facilitate private and public

#9: An EU Financers' Forum connected to the B4P Partnership

#10: Advocacy toolkits for B4PICs

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Link to Open Innovation Testbeds and access to demonstration sites > you can join/participate

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metabuilding labs

EU WIDE NETWORK OF TESTING FACILITIES & INNOVATION SERVICES FOR NEW BUILDING ENVELOPE TECHNOLOGIES & PRODUCTS

MEZeroE

iCLIMABUILT

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Join and become active in the B4PIC of your region

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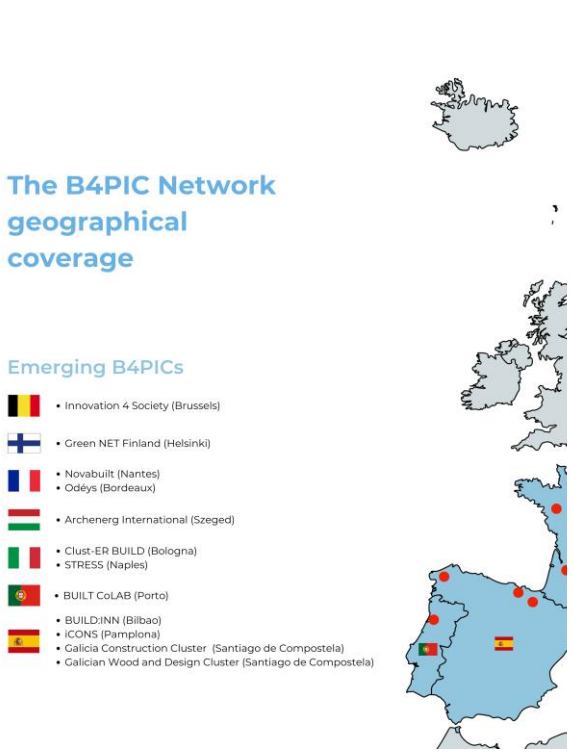

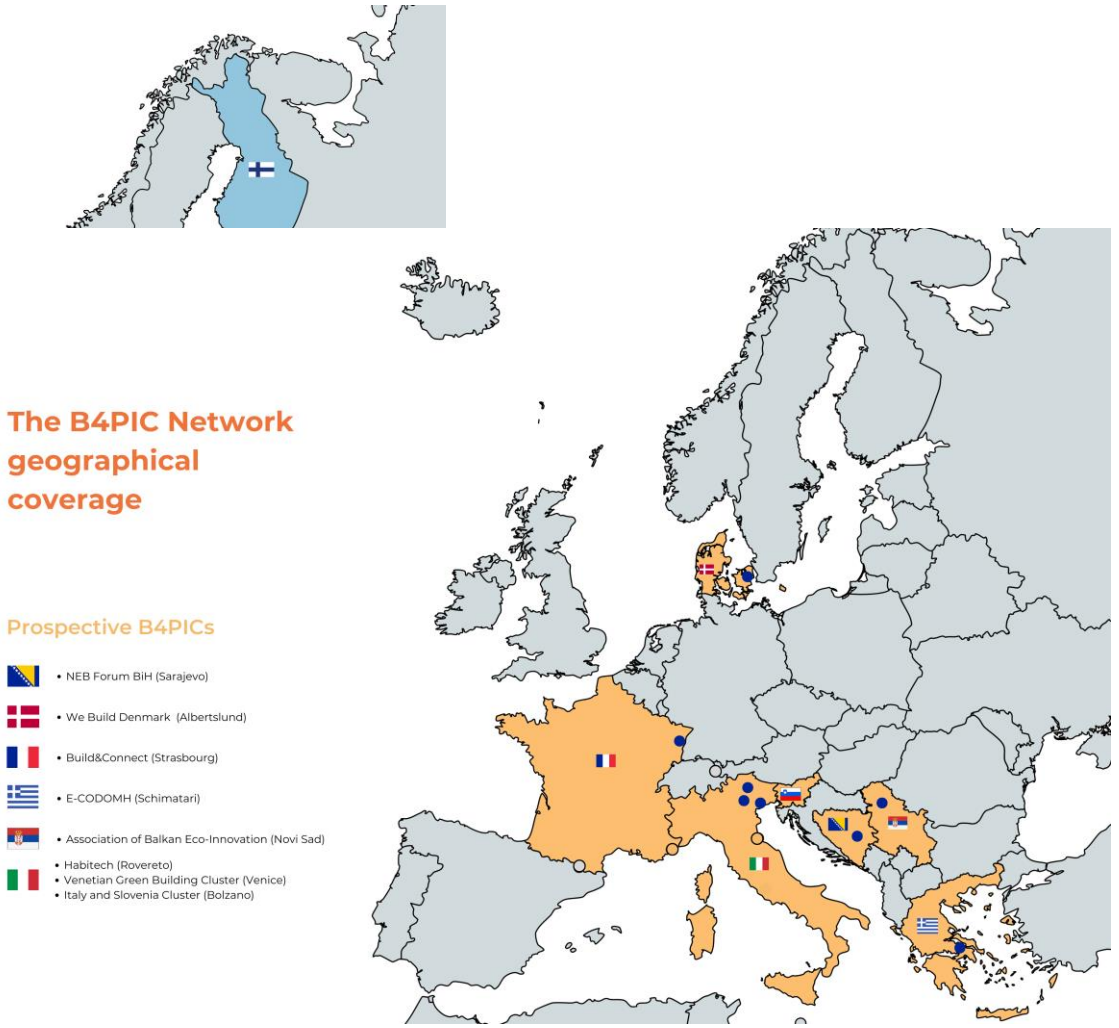

New call for Expression of Interest coming in 2025

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Visibility for EU projects and their results

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metabuilding

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Project

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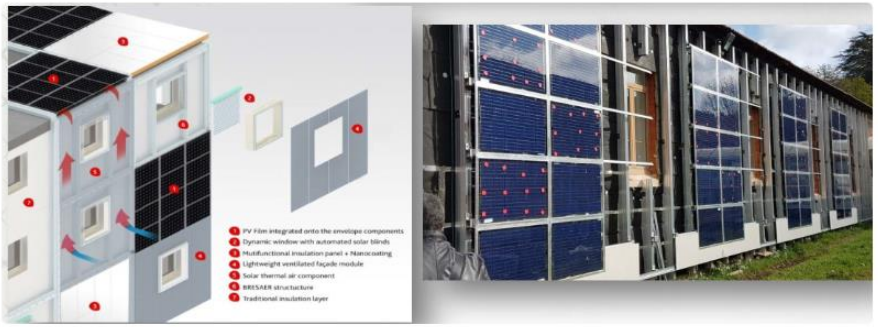

Start date: 01/02/2015
End date: 31/07/2019
Field of work: Envelop solutions for renovation
Related capabilities: 0
Associated innovations:
Associated organisation:
Source of fund: H2020
Website: http://www.bresaer.eu

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Search innovations

Innovation development status
Under development
Innovation type
Search with keywords
Organisation
Reset fields
Search

Total: 54

AGV sensor fusion
SmartUniversal
Under development

ASPIC sensitivity analysis module for EnergyPlus
NOBATEK/INEF4
Under development

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