InEExS
ENERGY SERVICES ON THE BLOCKCHAIN

FORTESIE

ENERGATE
ENERGY EFFICIENCY MARKETPLACE

From Tech to Transformation: Accelerating Building Energy Efficiency through ICT Solutions

MAY 16th | 11 - 12:30 (CEST)

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Welcome with Katerina Papapostolou (NTUA)

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Practical info

During the meeting:

- Please make sure your microphone is muted

How to ask questions?

- Use the chat function to ask questions during the sessions or raise your hand to be unmuted for verbal questions

Technical support

- Please address all technical questions via the chat function to Roberta D'Angiolella, IEECP

Note: *Today‘s presentation is being recorded and will be made available within two weeks*

Agenda

- **11:00 – 11:15: Welcome speech by moderator Katerina Papapostolou.**
- **11:15 – 11:45: Session 1 – Tools, services and business models for promoting Energy Efficiency solutions in buildings.**
  - The Energy Efficiency Marketplace that accelerates Building Renovation, Ioanna Andreoulaki (NTUA)
  - Innovative Energy Efficiency Service Models for Sector Integration via Blockchain, Fransisco Puente (ESCAN)
  - CBDC powered Smart Performance contracts for Efficiency, Sustainable, Inclusive, Energy use, Kostas Panagopoulos (EuroDyn)
- **12:00 – 12:25: Session 2 – Panel Discussion.**
- **12:25: Conclusions and wrap-up.**

Session 1

Tools, services and business models for promoting Energy Efficiency solutions in buildings

WITH



ENERGATE
ENERGY EFFICIENCY MARKETPLACE

Ioanna Andreoulaki (NTUA)

ENERGATE, The Energy Efficiency Marketplace that accelerates Building Renovation

ENERGATE Project Solutions

ENERGATE – InEExS - Fortesie JOINT WEBINAR

16 May 2024

Presenter: *Ioanna Andreoulaki (NTUA)*

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- The Challenge
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- The ENERGATE Approach
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- ENERGATE Services
- Expected Impact
- Results
- Survey

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The ENERGATE Project (1/3)

Smart energy marketplace for sustainable investments

January 2023 – June 2025

The ENERGATE vision

Enable easy, predictable and risk-weighted renovation investments



Project development of retrofitting actions



Access to sustainable finance for renovation projects



Business matchmaking in a user-friendly ICT-enabled platform

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The ENERGATE Project (2/3)

Who we are



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The ENERGATE Project (3/3)

Project Objectives

Project development

A large standardized project development facility for EE project sponsors and owners or private or public entities

Aggregation

An aggregation, due diligence, and cash flow enhancement process, where projects and measures shall be packaged and enhanced appropriately, to be offered to financiers

Feedback loops

Appropriate feedback loops that will measure the impact of the ENERGATE platform, i. e. by means of suitable M&V processes.

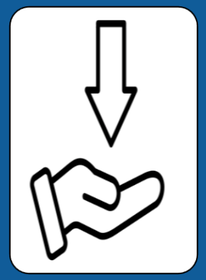
Business matchmaking

Providing added value services to all of its users, by enabling business matchmaking, quality assessments and user profiling and generally facilitate data and information exchange.

The Challenge

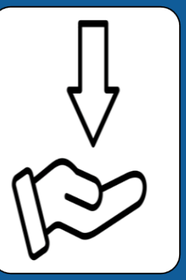
Building side VS Financial side

Needs



- Access to finance
- Technical expertise
- Simplified processes

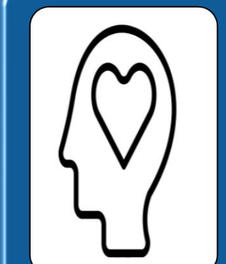
Needs



- Reliable data on EE projects
- Large financeable packages
- Project evaluation and risk assessment



Interests



- Energy and cost savings
- Property value enhancement
- Enhanced Comfort and Indoor Environment Quality

Interests



- Investment Security
- Sustainable Investment Opportunities
- Portfolio Diversification

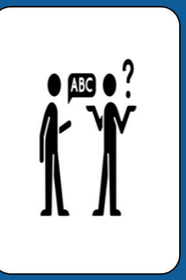


Barriers



- High upfront costs
- Complexity of procedures
- Lack of awareness and information

Barriers



- Perceived Risks
- Lack of Standardised Procedures
- Uncertain or weak economic environment

Research Question:
How can the challenges be faced?

To encourage investments in renovation projects, it is necessary to:



Provide the most suitable **technical support** for each building typology:

- ❖ Select the best renovation strategy
- ❖ Find experienced technical teams
- ❖ Follow-up on achieved results



Match available projects to **financial stakeholders** interested in sustainable investments:

- ❖ Effectively collect project-related information
- ❖ Properly declare financial and energy–related KPIs
- ❖ Aggregate similar projects

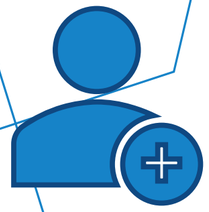


Optimise the process through **automated and standardised** procedures

- ❖ Create a common communication medium
- ❖ Provide a user – friendly environment
- ❖ Enhance based on feedback and validation

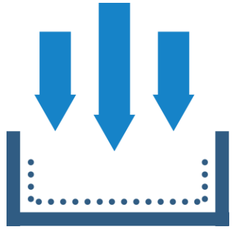
The ENERGATE Approach

Platform Stages



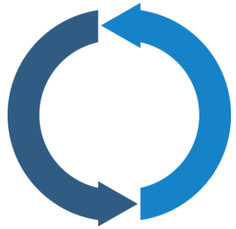
Zero

- User profile
- Registration
- Insertion of user-related data



Fetch

- Collection of structured information about projects
- Ensuring that key technical and commercial information is properly declared



Process

- Identification of similarities between projects and investors KPIs
- Project aggregation and bundling
- Matching opportunities with investors



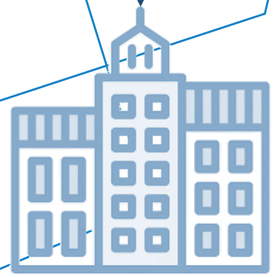
Deliver

- Follow up on projects
- Validation of M&V methodologies
- Definition of relevant KPIs and benchmarks

The ENERGATE Approach

Target Groups

Group A



Building Owner

- Building manager
- Property manager
- Asset manager
- Real estate agent etc.



Public Body

- Municipality
- Public procurement body
- City/ Region
- Commune etc.



Implementor

- Project developer
- ESCO
- Energy consultant
- Engineering company etc.

Group B



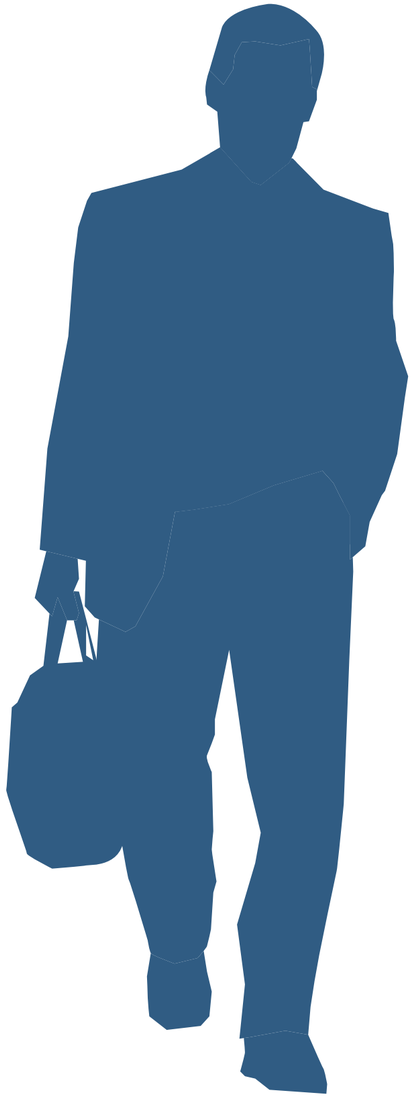
Financier

- Private financing body
- Public financing body
- Investor
- Financial institution etc.

ENERGATE Platform Users (1/4)

BUILDING OWNERS

(such as private owners, public authorities, building administrators, building managers, asset managers, property managers, and real estate developers)



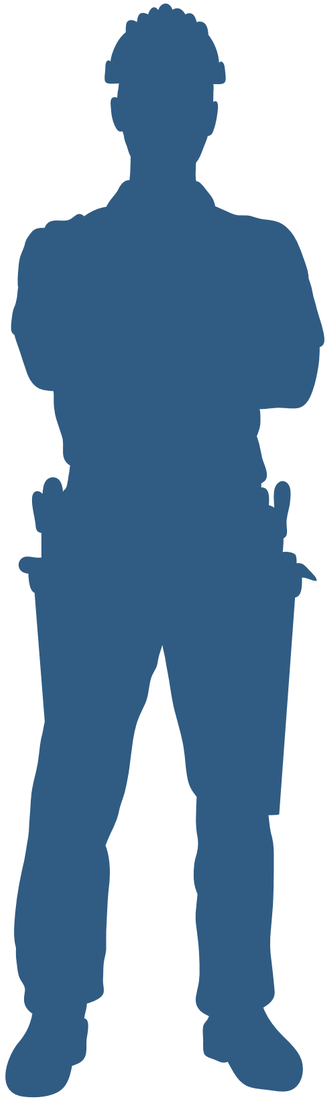
Use the platform to:

- Create a building profile
- See how other similar buildings have improved energy performance
- Search for renovation experts
- Select preferred type of financing
- Find financial support
- Have their building aggregated to attract more financiers

ENERGATE Platform Users (2/4)

IMPLEMENTORS

(such as project developers, ESCOs, energy consultants, architect & design companies, engineering companies, installers, and maintenance companies)



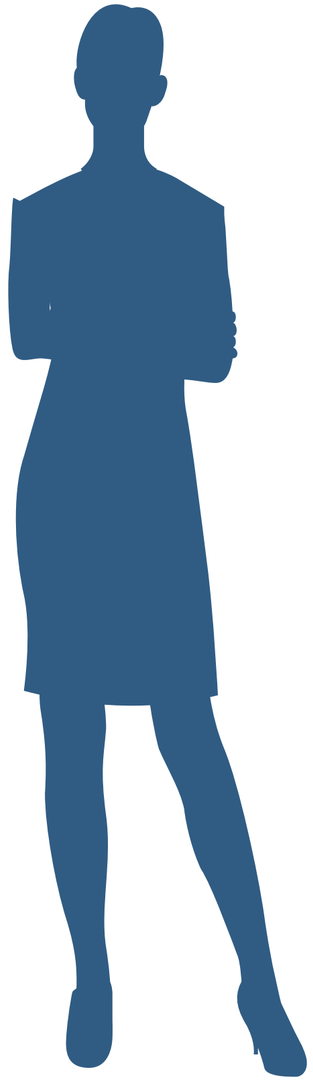
Use the platform to:

- Be matched with buildings that need renovation
- Access all the necessary building information
- Extract a well-structured offer with project details
- Insert a project from an external client
- Have their project aggregated with other similar projects
- Find financial support

ENERGATE Platform Users (3/4)

FINANCIERS

(such as public or private funds, investors, and financial institutions)



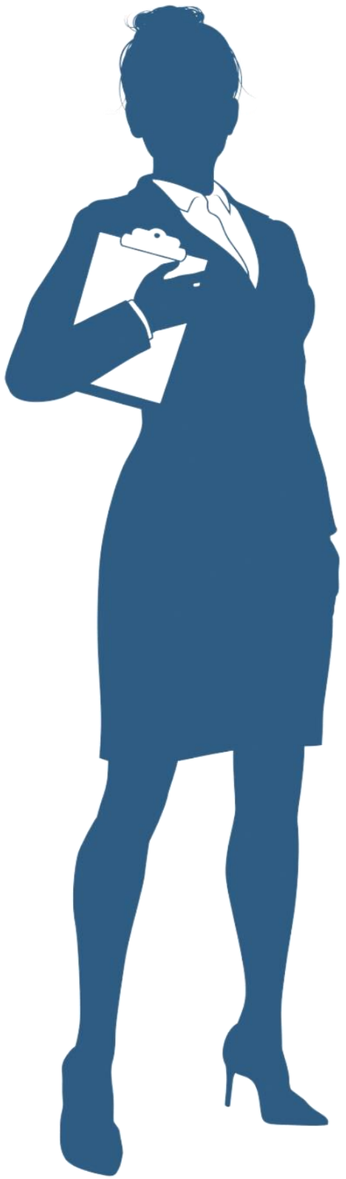
Use the platform to:

- Declare financial and non-financial criteria
- Be matched with projects
- See the projects ranked according to his declared criteria and preferences
- Access information about the projects
- Conduct Due Diligence processes
- Provide financial support

ENERGATE Platform Users (4/4)

PUBLIC BODIES

(such as municipalities, cities, regions, communities, public procurement bodies)



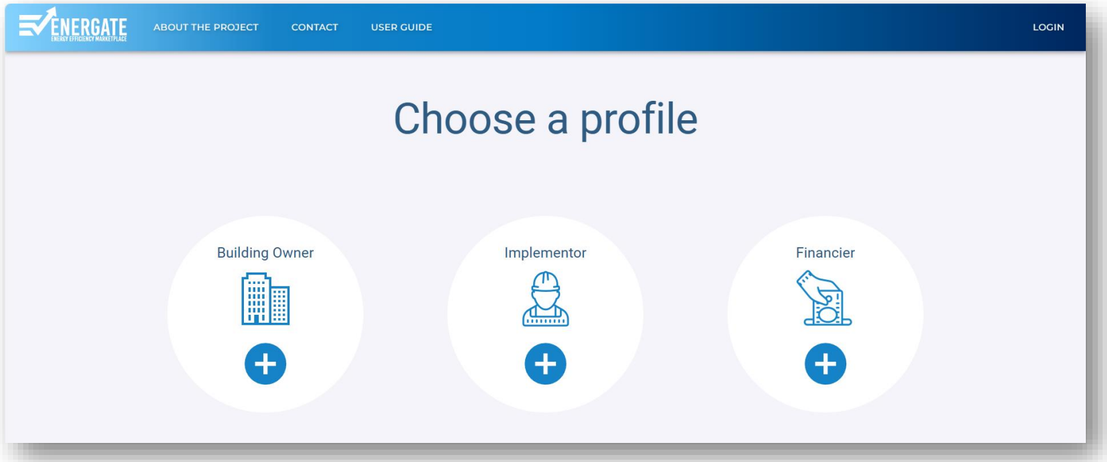
Use the platform to:

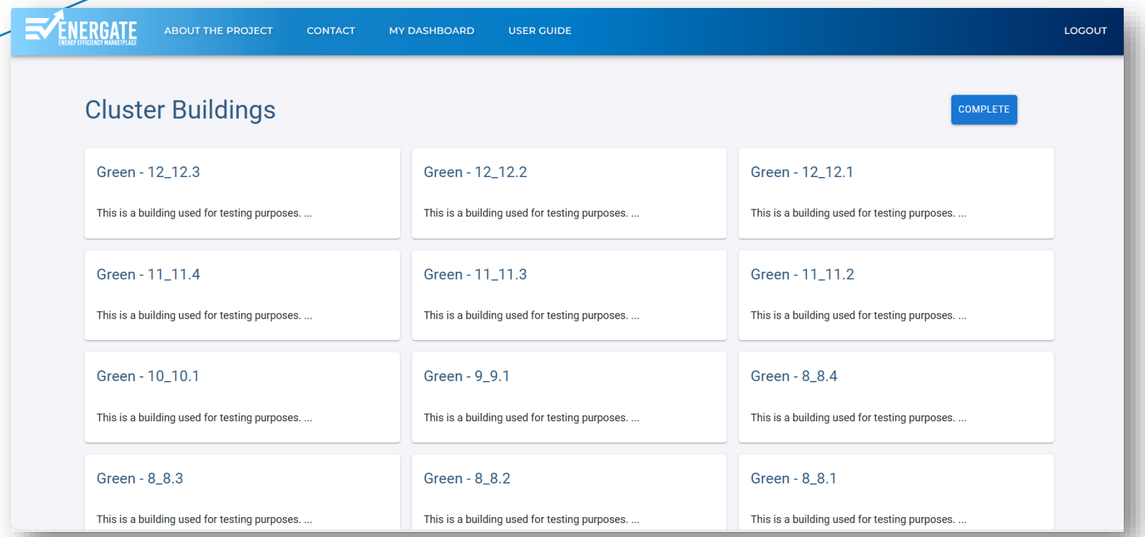
- Create a pre-announcement of your energy efficiency project
- Notify platform users that you are looking for technical and/or financial support
- Allow technical teams and fund providers to prepare financed solutions for your project
- See how other similar buildings have improved their energy performance
- Have your project aggregated with other public buildings to increase your chances of finding finance

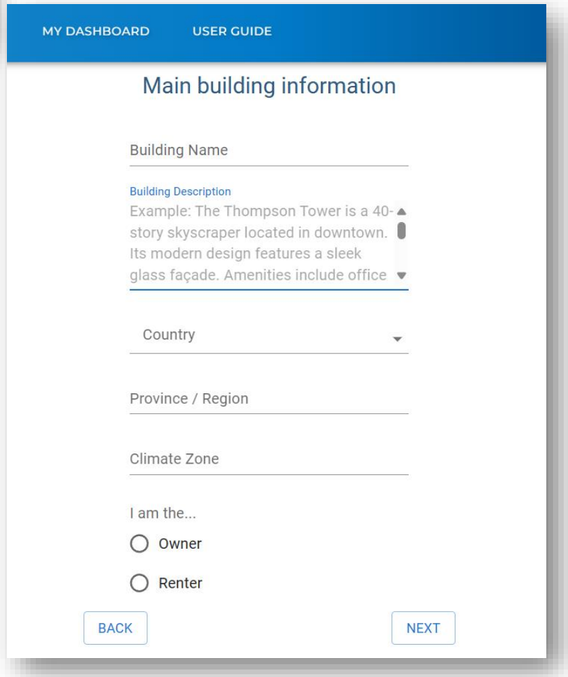
ENERGATE Services (1/2)

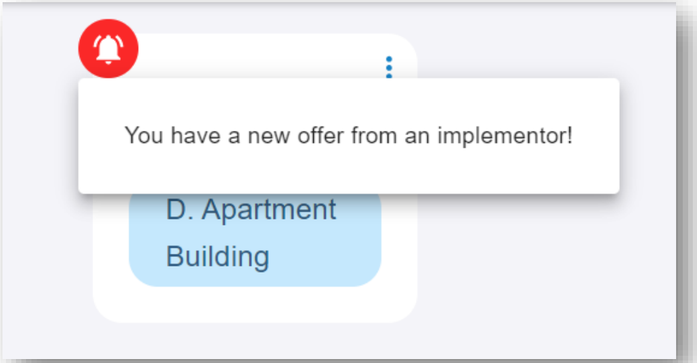
Marketplace UI



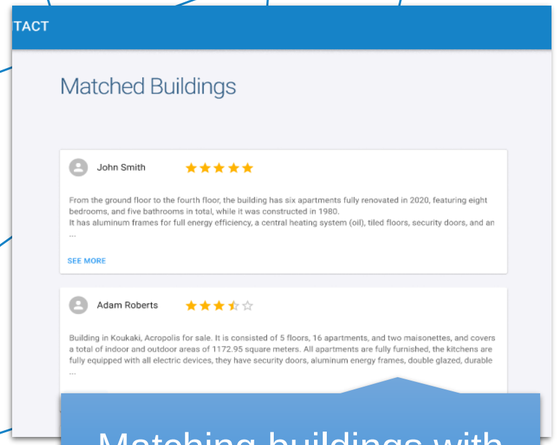




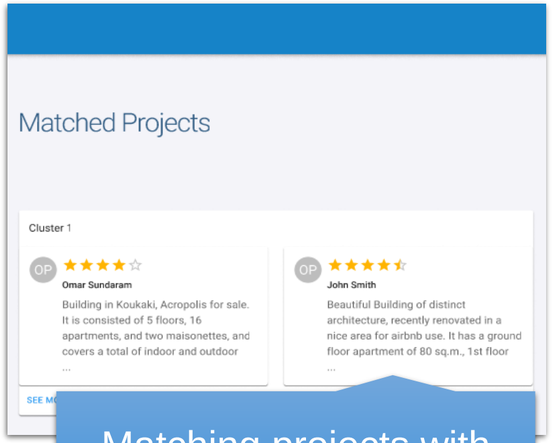




ENERGATE Services (2/2)



Matching buildings with Implementors



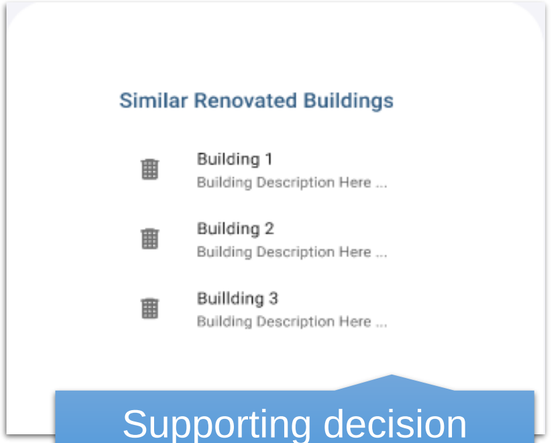
Matching projects with Financiers



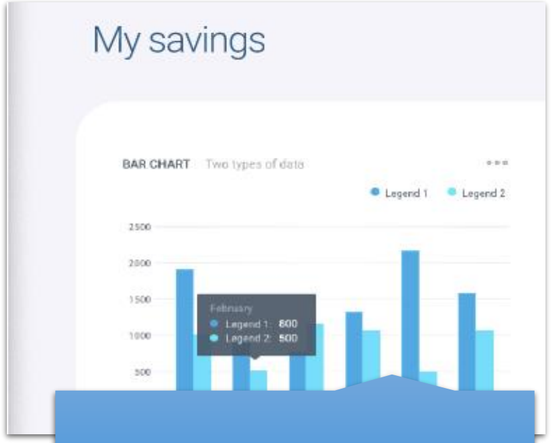
Aggregating projects



Assisting Public Bodies in exploring funding sources



Supporting decision making based on previous projects



Monitoring project results

Expected Impact (1/2)

5 Pilots

6 Countries

UP TO
67
GWh/year
Final energy savings

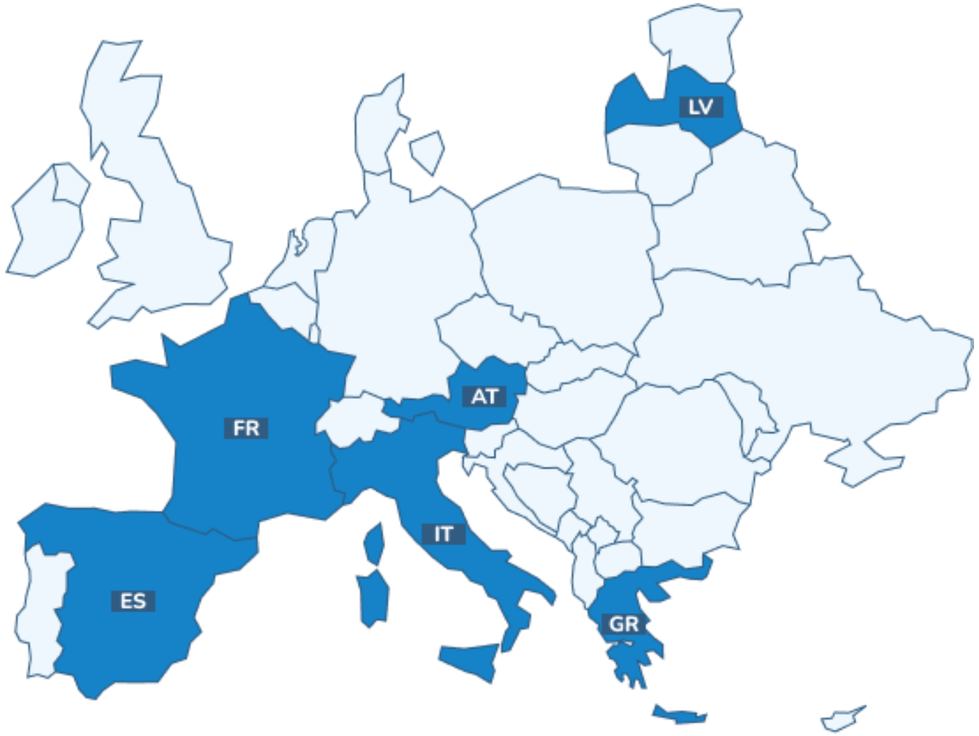
200 Users

UP TO
180
Building Renovation Projects

40-50 Country experts

UP TO
23
$tCO_2eq/year$
GHG emissions saved

UP TO
53
Million Euros
Triggered investments



Expected Impact (2/2)

ENERGATE Pilots

Deployment & validation phase to be done by indicative representatives from Demand & Supply side

LDK CONSULTANTS

Energy Consulting, Design of cost optimal solutions for EE

commuty

SME, expertise of asset and project management

enerbrain

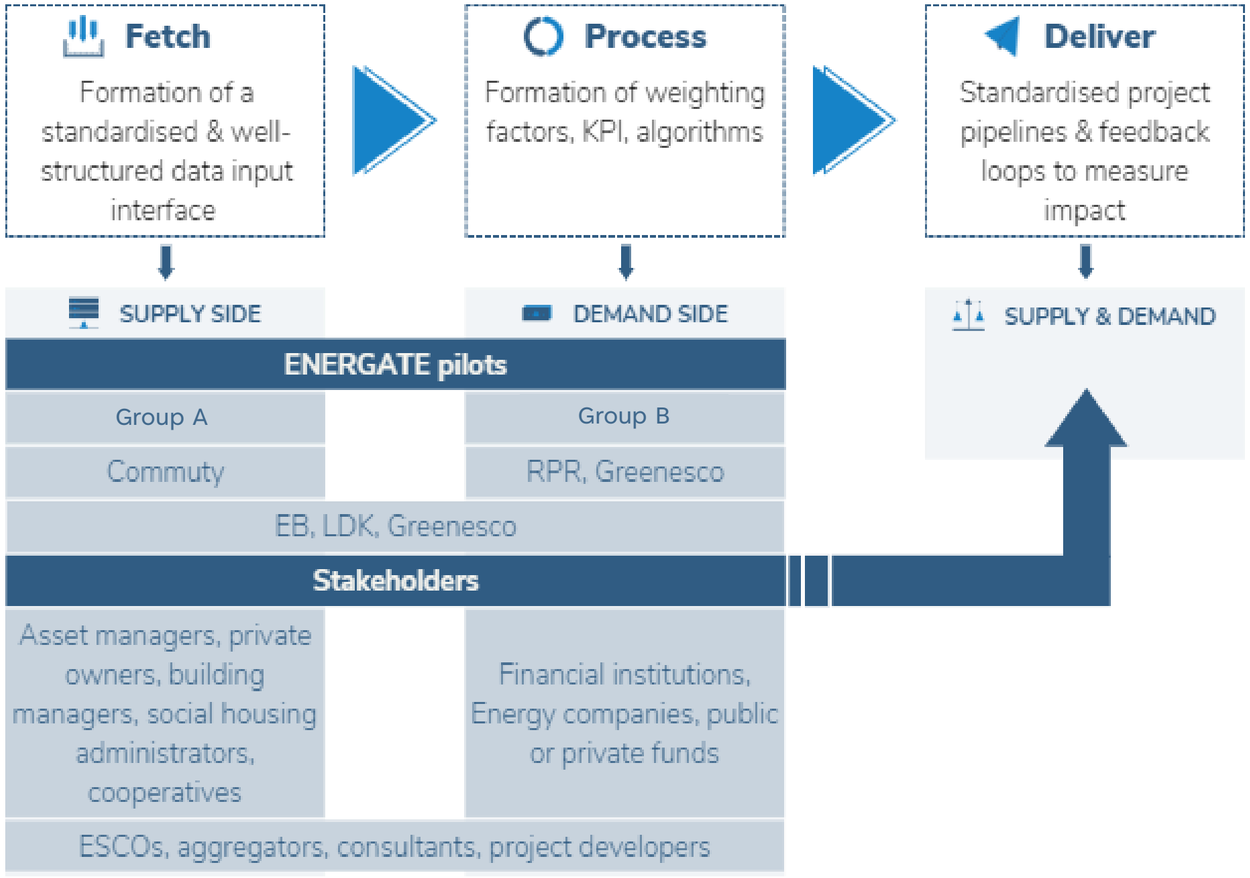
Turns energy-wasteful building into smarter (IoT, algorithms).

Riga Planning Region

Planning socioeconomic development of Riga, identification of projects

GREENESCO ENERGY SERVICES

Founded by Attica Finance & PPCR, access to infrastructures & buildings



Explore our Results



[ENERGATE Expert Talk at REHVA Brussels Summit]



[ENERGATE Newsletter issue December 2023]









[ENERGATE User Profiles]

[ENERGATE Factsheet on Financing Typologies for Building Renovation]



[Factsheet on ENERGATE Regional Training Workshop in Madrid]



Explore our Videos

Building Owner



Implementor



Available in our YouTube Channel here

Financier



Public Bodies



ENERGATE Consultation Survey



THANK YOU

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Session 1

Tools, services and business models for promoting Energy Efficiency solutions in buildings

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Francisco Puente (ESCAN)

Innovative Energy Efficiency Service Models for Sector Integration via Blockchain

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ENERGY SERVICES ON THE BLOCKCHAIN

InEExS – Innovative Energy (Efficiency) Service Models for Sector Integration via Blockchain



16/05/2023

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INEEXS - Objective



The core concept of INEEXS is the deployment of **smart energy services** using a common **blockchain** platform and tokenisation of energy data

Support the **cooperation** among market segments and actors working in this fields.

Support Obligated Parties of Energy Efficiency Directive (**EED) Article 7** with service offers that enable energy savings, system efficiency and include non-energy benefits.

InEExS
ENERGY SERVICES ON THE BLOCKCHAIN

INEEXS – Key tasks and activities



Design and roll out of new energy service business models that create benefits/revenue streams for utilities and Obligated Parties (EED Art7) as well as ESCOs and energy communities.



Pilot and test them in the field including energy efficiency, distributed energy resources (DERs), demand response/flexibility, electric mobility while including non-energy benefits such as comfort, health and safety.



Provide with **capacity building activities to EU market actors to replicate the business models** and adopt contractual schemes that overcome market barriers towards increased adoption of sustainable technologies and sector integration.

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The InEExS Blockchain platform and smart services

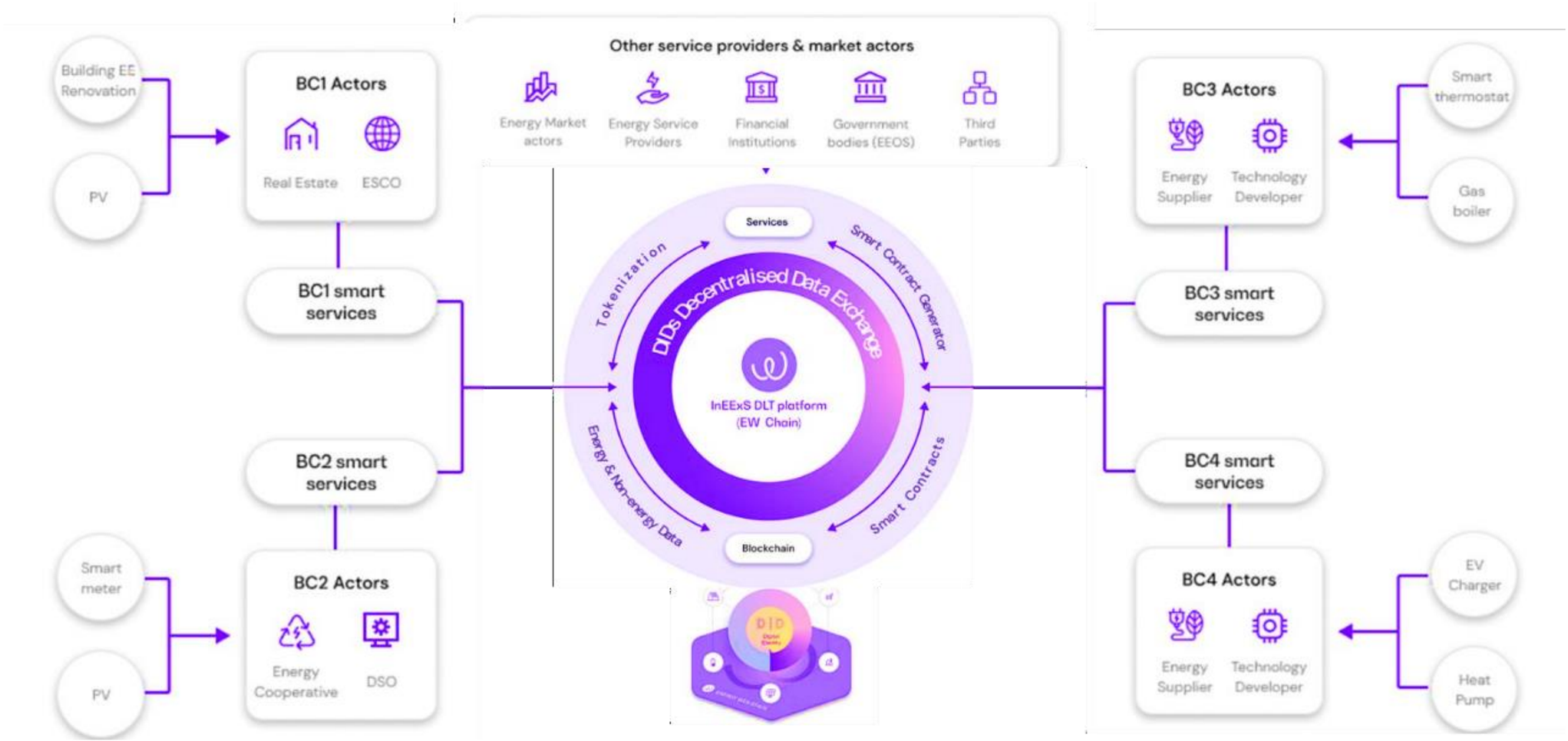
INEEXS will test the innovative services, models and contracts in different EU states:



1. Energy Performance Contracting with Pay4Performance guarantees in residential buildings (Berlin, Germany)
2. Improved self-consumption of distributed energy resources in Energy Cooperatives (Crevillent, Spain)
3. Energy efficiency and flexibility services for legacy natural gas boilers in residential buildings (5 Greek cities: Athens, Thessaloniki, Larisa, Trikala, Volos)
4. Smart energy management for EV chargers and electricity-based Heating, Ventilation and Air Conditioning (HVAC) appliances (Sweden)
5. Decentralized Energy Efficiency Power Plant (DEEPP) (conceptual)

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The InEExS Blockchain platform and smart services



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THANK YOU!

For more info, follow our hashtag, visit our website or contact us:

#InEExS

https://ieecp.org/projects/ineexs/

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Session 1

Tools, services and business models for promoting energy efficiency solutions in buildings

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Kostas Panagopoulos (ED)

CBDC powered Smart Performance contracts for Efficiency, Sustainable, Inclusive, Energy use

FORTESIE

Overview

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

Research & Development - European Dynamics

Kostas Panagopoulos

(kostas.panagopoulos@eurodyn.com)

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01 Project Info

02 Renovation Value chain

03 Challenges

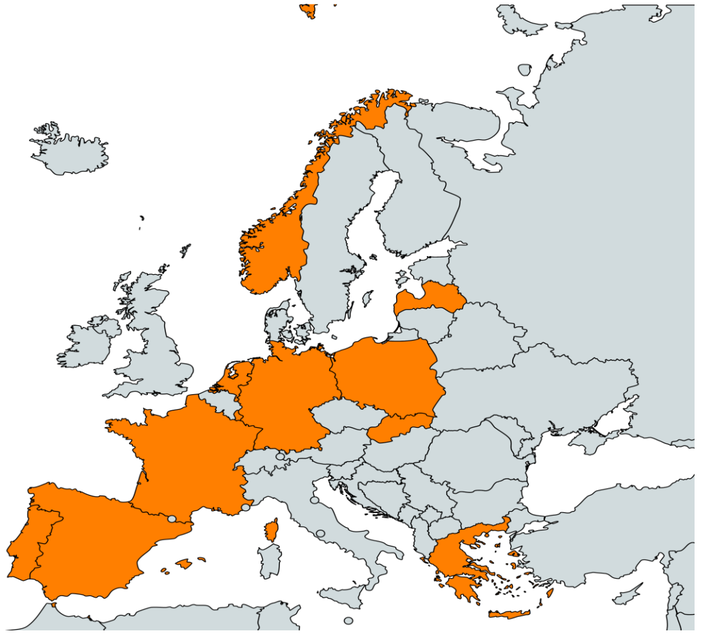
04 Objectives and expected results

05 Innovations

06 Reference Architecture

Project Info - Factsheet

FORTESIE



- **Programme:** Horizon Europe, Built4People Partnership
- **Grant Agreement** No. 101080029
- **EC Budget:** 9.5M €
- **EC Funding**: 7.3M€
- **Duration**: 36 months
- **Consortium**: 26 Partners
- **Coordinator**: European Dynamics Luxembourg SA (ED), Luxembourg

Renovation Value chain

ESCO/ ESCO associations	Construction/ renovation sector	Gov /Decision Makers	Energy Cooperatives	Investors/ Financiers	One-Stop-Shops	SSH	Digital Service Providers	Building Owners
MESH CRD OKT APES ECN VEO	TGT +48 JUST GAR	LEIF DEE GSIS GKW	COOP	GOP CCO2	ENE OKT GW	SIN IN CL LU H	ED EDGR NTU A CTIC CCO2 IEECP MES H	EEF GKW GSIS

Challenges

Renovation wave: Deep energy renovation rate should reach 3% per year, by 2030

Climate Change puts at stake life on earth

Lack of trust and uncertainty about energy performance improvements

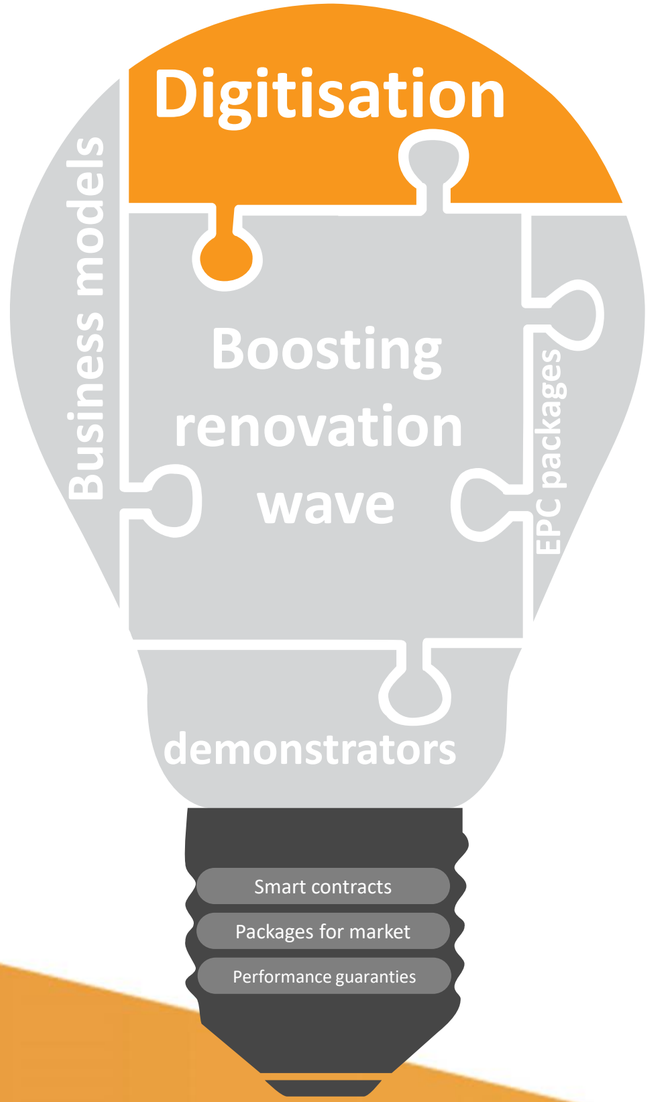
Monetary incentives to mobilise mass initiatives and construct a collective narrative are not largely explored

Lack of large public awareness eradicates skepticism and understanding of added value

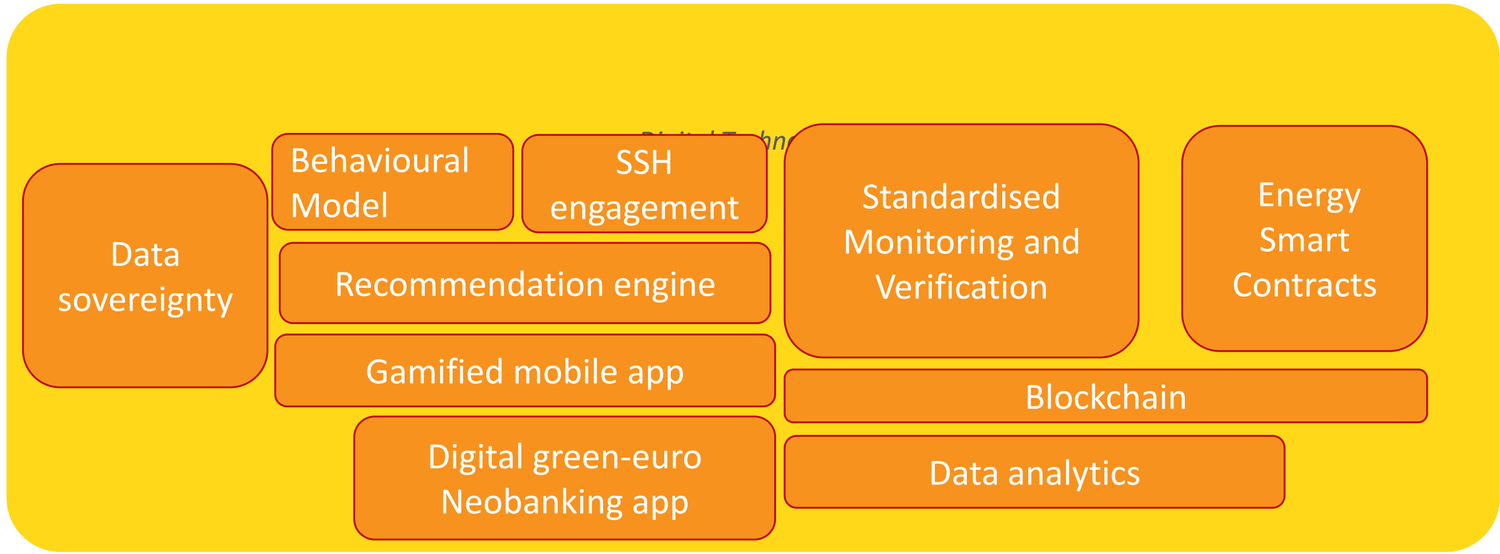
Large investments require novel financing schemes



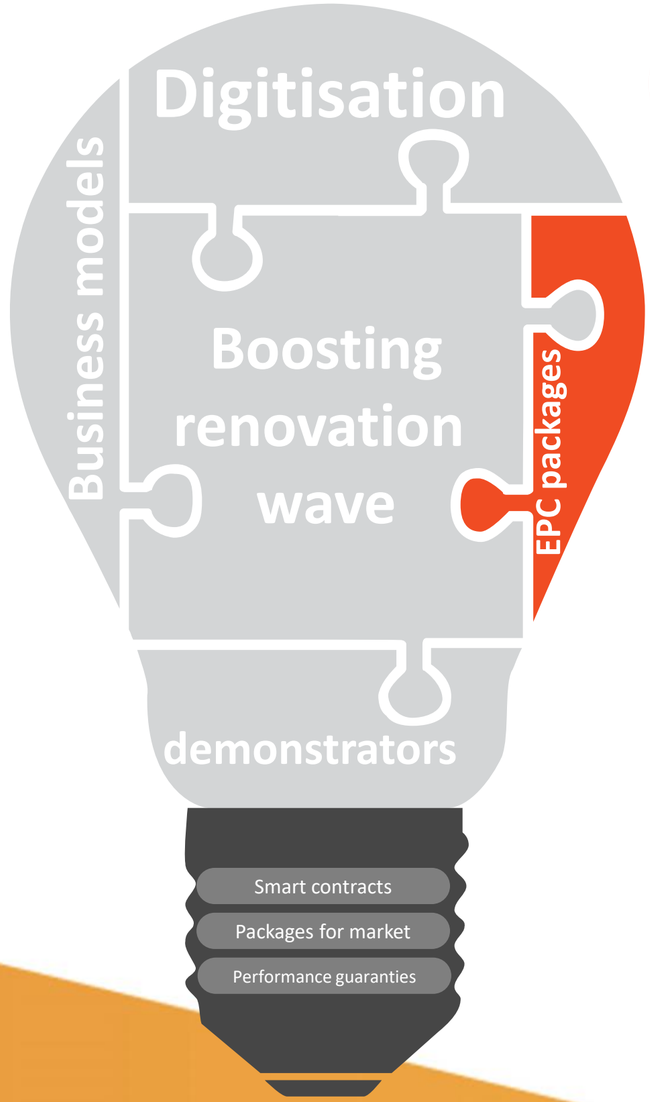
Objectives and Expected Results



Digitisatisation and automation enablers



Objectives and Expected Results



Integrated EPC packages to raise overall EPC value proposition

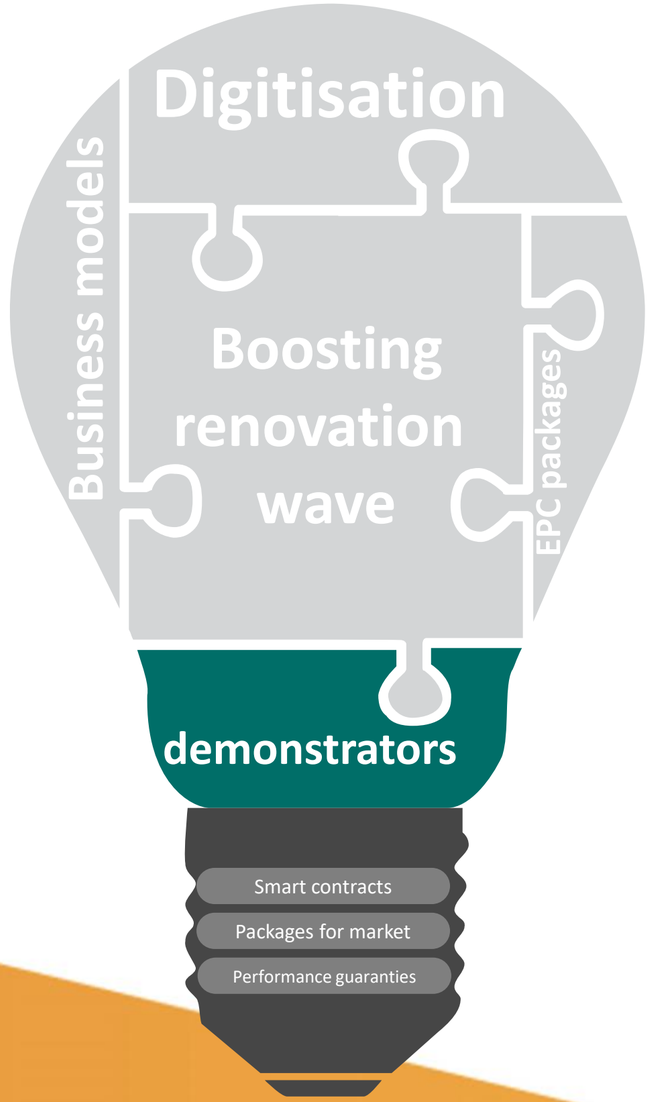
EPC packages

Poland	Latvia	Portugal France,Spain	Greece	Greece
Digital Technologies				
Renovation Technologies: **Water pumps PVs Sewage water heat recovery HVAC**	Renovation Technologies: **HVAC**	Renovation Technologies: **Insulation HVAC PIPV**	Renovation Technologies: **Insulation HVAC PV**	Renovation Technologies: **PIBV Windows Insulation HVAC PV Green roof**

Guaranties

- Energy reduction rate (%)
- Indoor Environmental Quality (%)
- Total CO2 emissions saved (tnCO2/ year)

Objectives and Expected Results



Real demonstrators targeting several different Stakeholders

1. SSH Engagement and inclusive methods
2. 3 target groups, 7 real life demonstrations in 6 countries
3. At least 10 ESIE and behavioural KPIs evaluated and improved

Poland	Latvia	Spain France Portugal	Greece	Greece
GK	+48	MESH	LEIF	OKT	GAR	CRD	TGT	CRD	TGT
ED	CTIC	DEE	SIN	VEO	ENE	GSIS	SIN	EEF	SIN
CCO2	NTUA	ED	CTIC	JUST	COOP	ED	CTIC	ED	CTIC
SIN		CCO2	NTUA	ED	CTIC	CCO2	NTUA	CCO2	NTUA
				CCO2	NTUA				
				SIN	GOP				

Public Swimming Pool

The Goal

Inclusive and efficient pool management





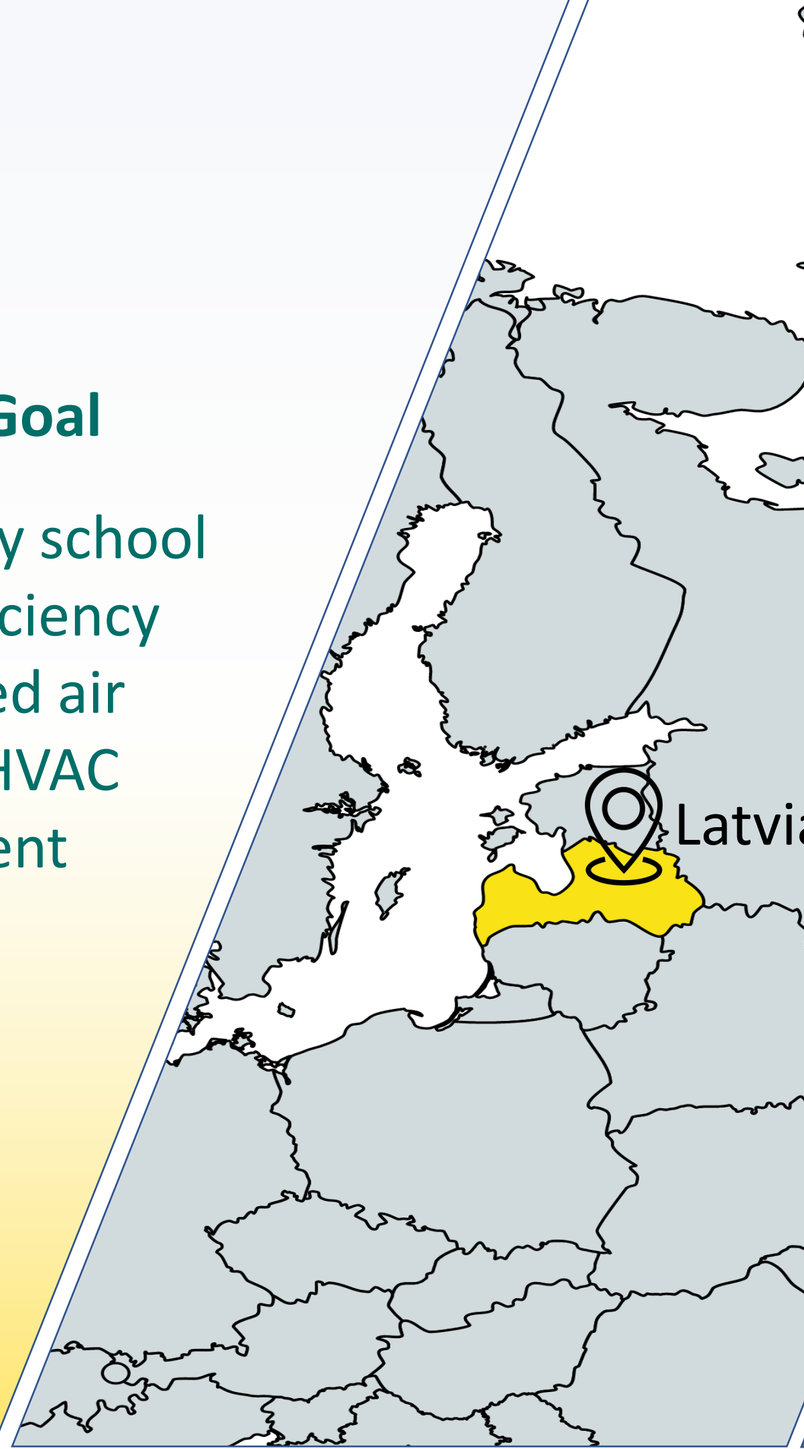
The Team

Public Entity	GKW
Construction	+48
Digitization	ED/ CTIC/
Companies	NTUA/CCO2/SIN

Public School

The Goal

An exemplary school for energy efficiency with improved air quality and HVAC management





The Team

Public Entity	DEE
Construction	LEIF / MESH
Digitization	ED/ CTIC/
Companies	NTUA/CCO2/SIN

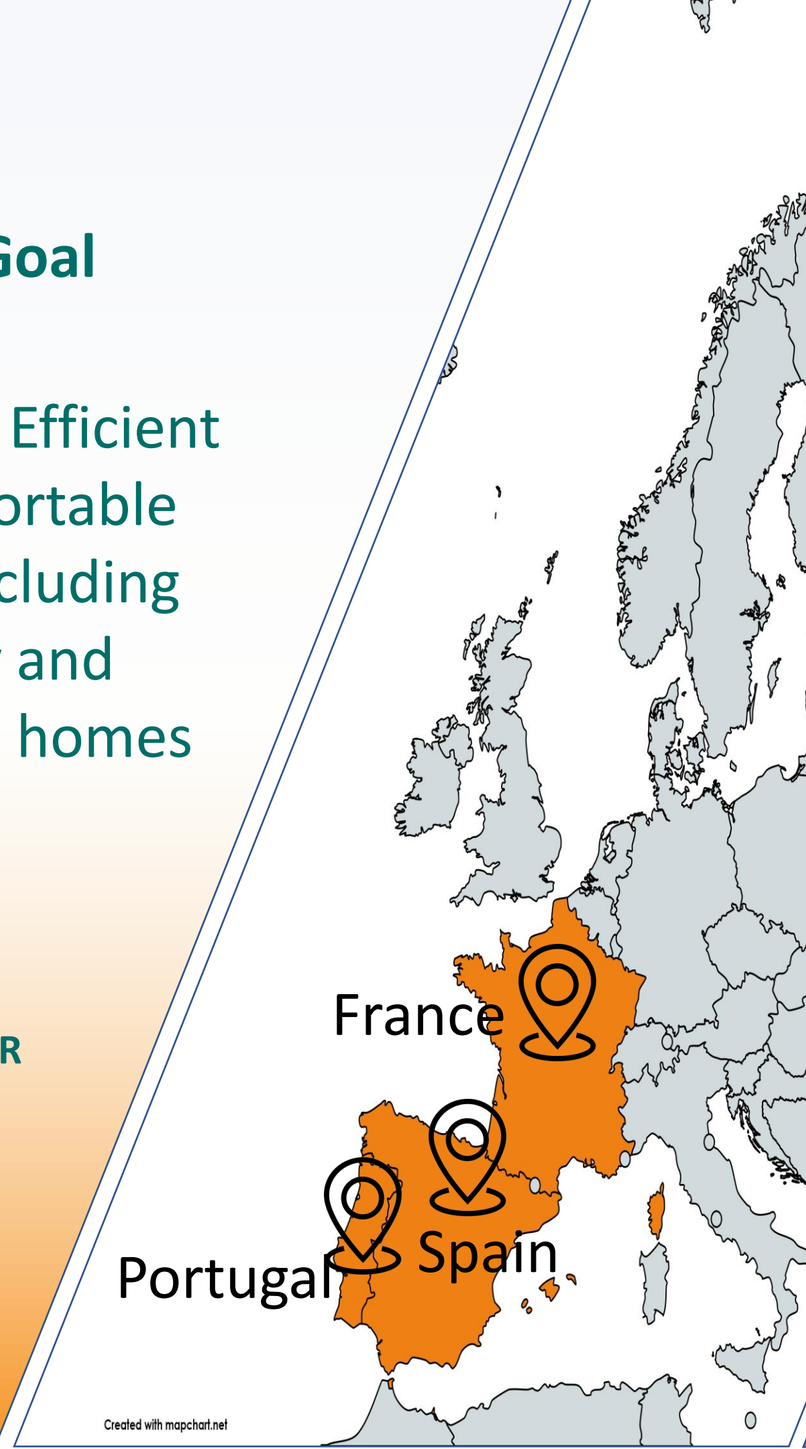
Households

The Goal

Sustainable Efficient and Comfortable homes, including poverty and prosumers homes

The Team

Construction	VEO/ OKT/GAR
Voluntary Construction	JUST
One-Stop-Shop	ENE
Cooperative	COOP
Financing Bale	GOP
Digitization	ED/ CTIC/
Companies	NTUA/CCO2/SIN

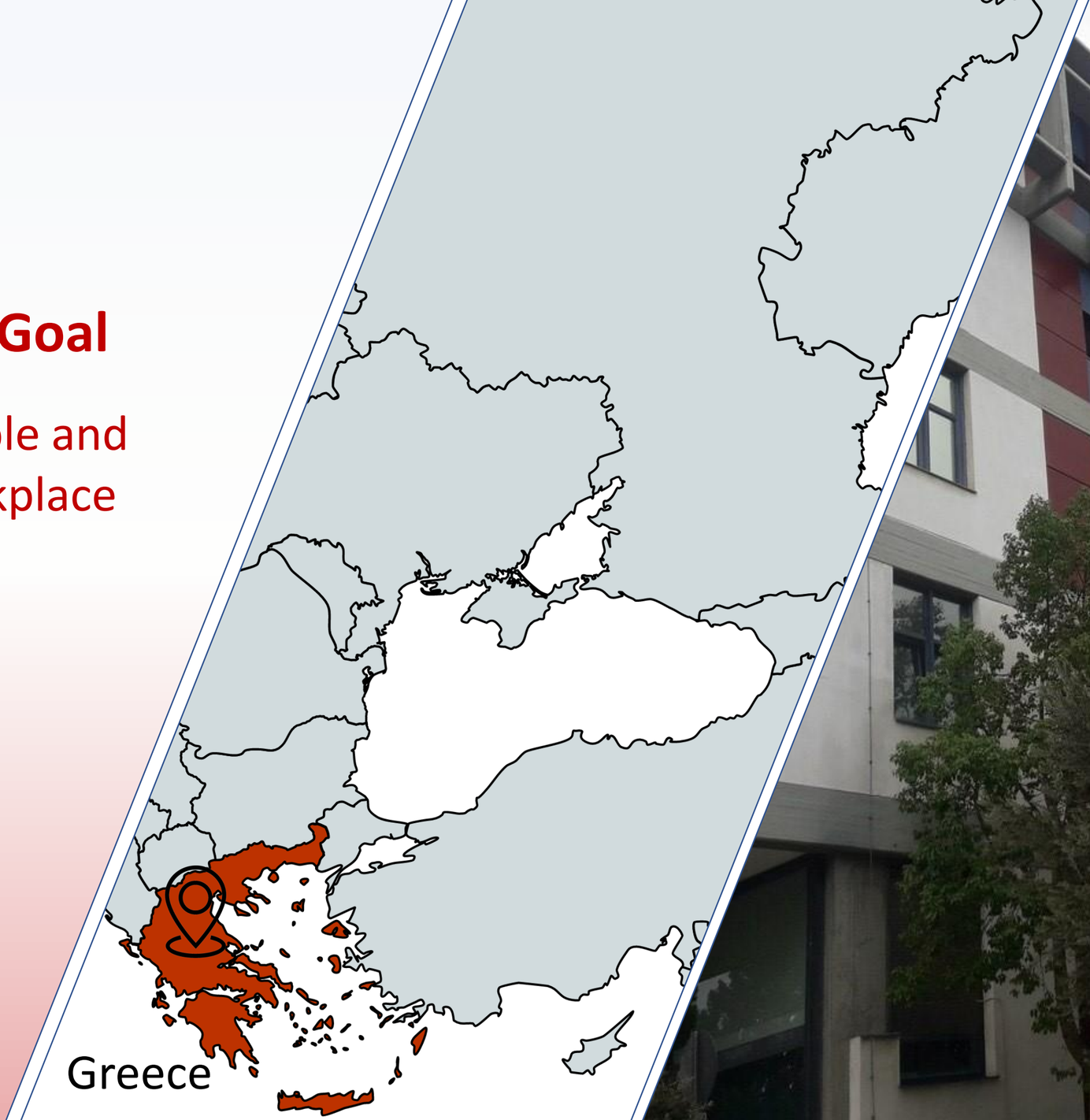




Public Building

The Goal

Sustainable and efficient workplace



The Team

Public Entity
Construction
Digitization
Companies

GSIS
TGT / CRD
ED/ CTIC/
NTUA/CCO2/SIN

Museum

The Goal

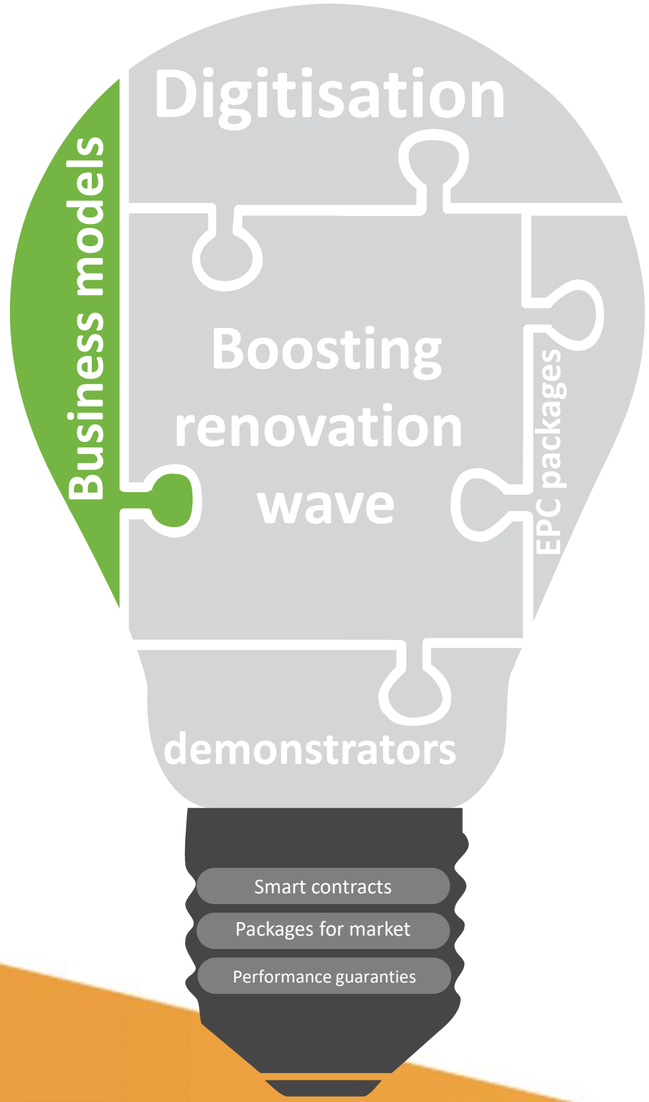
An exemplary museum for energy efficiency, with comfortable Green Roof.



The Team

Museum Entity	EEF
Construction	TGT / CRD
Digitization	ED/ CTIC/
Companies	NTUA/CCO2/SIN

Objectives and Expected Results



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

Value-in-Use

Other potential Customers
Households of all 3 types

Experience
Green, comfortable and sustainable homes

Integrated package description

Technological Service Components (TSC)
as described in the demonstration scenario
Renovation Technologies; Digitisation Technologies
Financing and motiviation schemes: with Green Euros, crowdfunding, and/or public funding

Technological Service Providers
Partners providing TSCs

Target actor
Households

Market Reach Services
Access to Households (H) (and Energy poverty households, Financing (IF), Compliance (M, U), New Revenue (U, M, R, C, OSS, E)

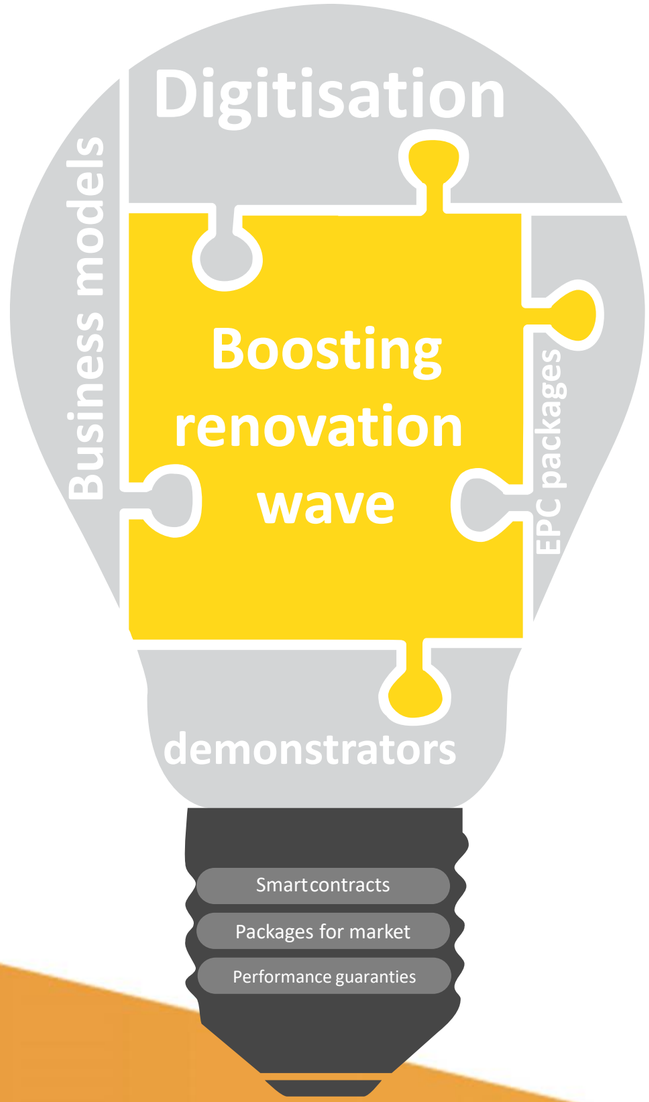
Market Reach Players
Investment Fund (IF) , Municipality (M), Utility (U), Retailers (R), ESCOs (E), One Stop Shops (OSS), Volunteer organisation (JUST)

Costs and Benefits

Costs
Compatible hardware and costs for technological components, deployment costs, financing costs

Incentives and Gains
Bill reduction, Building renovated, ESIE improved, Long terms resilience to extreme weather ; *Tangible rewards in Green Euro*
Green living, healthy and well being, and social benefits and collective narrative

Objectives and Expected Results



Boosting renovation wave with performance guaranties

Online network of One Shop Shop

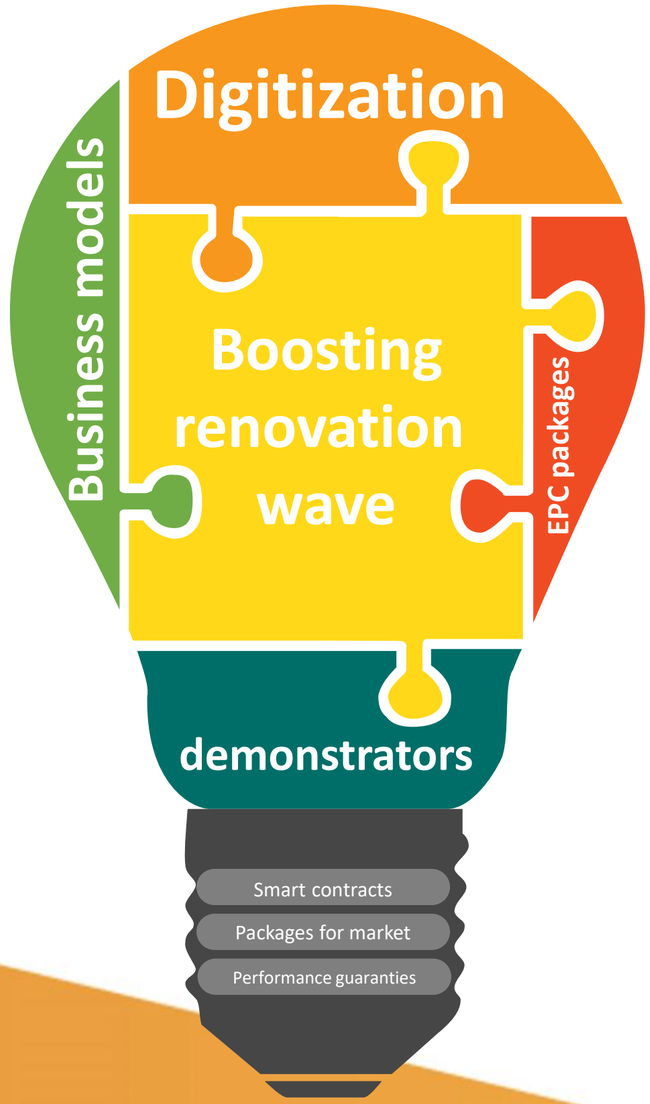
Replication

- value chains formation and offering optimization
- roadmaps and value chains in each partner country promote packages of all target groups
- roadmaps adopted by ESCO association

Financing incentives boost adoption

Dissemination channels

Overview of objectives



Digitization 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

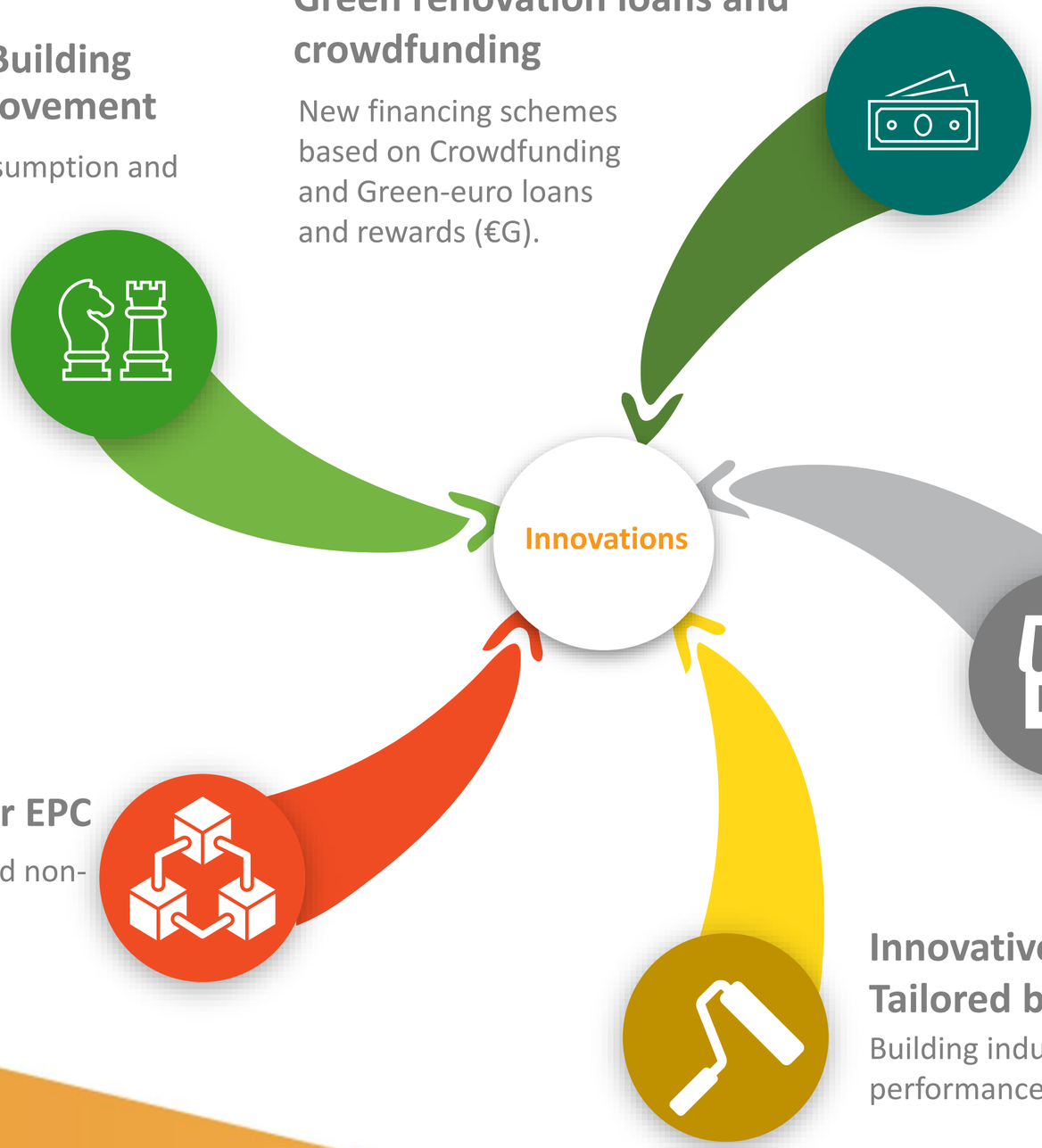
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Gamified app for Building Performance Improvement

Visualization of the consumption and reporting for energy savings.

Green renovation loans and crowdfunding

New financing schemes based on Crowdfunding and Green-euro loans and rewards (€G).



One-Stop-Shop

Online marketplace as an One-Stop-Shop for renovation, eliminating geographic barriers.

Smart contracts for EPC

Interaction of energy and non-energy actors.

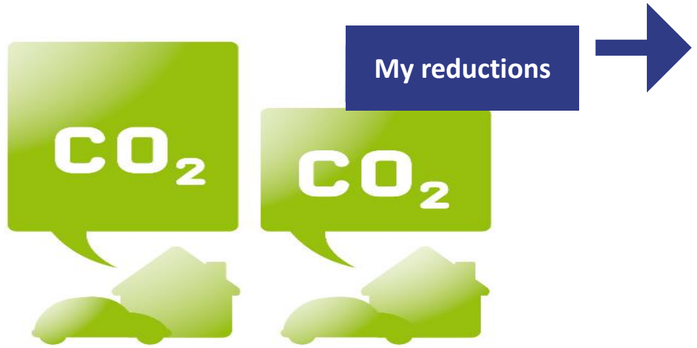
Innovative renovation packages and Tailored business models

Building industry technologies with performance improvements.

Innovations – Green renovation loans €G and crowdfunding

FORTESIE

1) Positive value of CO2 reductions with €Gs





- *One ton CO_2 abated = 44.60 €G*
- *By design total money supply is limited*
- *Real ex-post measures*

2) €Gs circulated with the neobank app



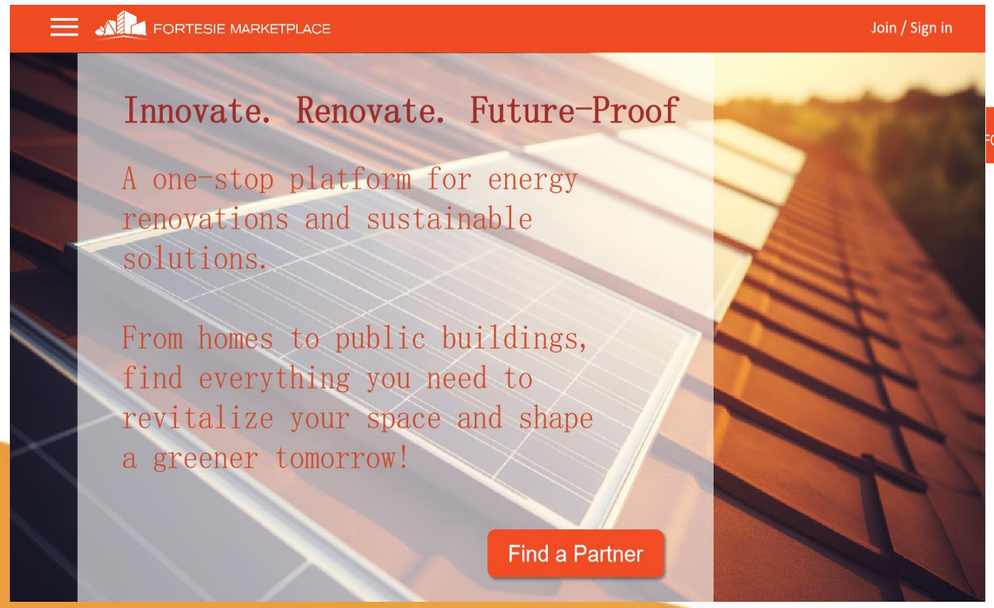
3) Innovative Crowdfunding to lend

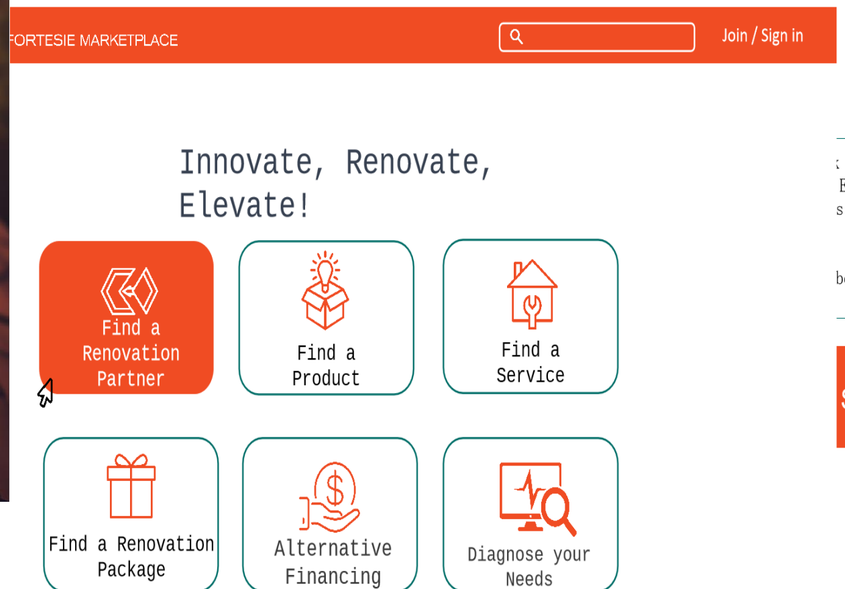
bottom-up approaches to finance and mobilise investments.

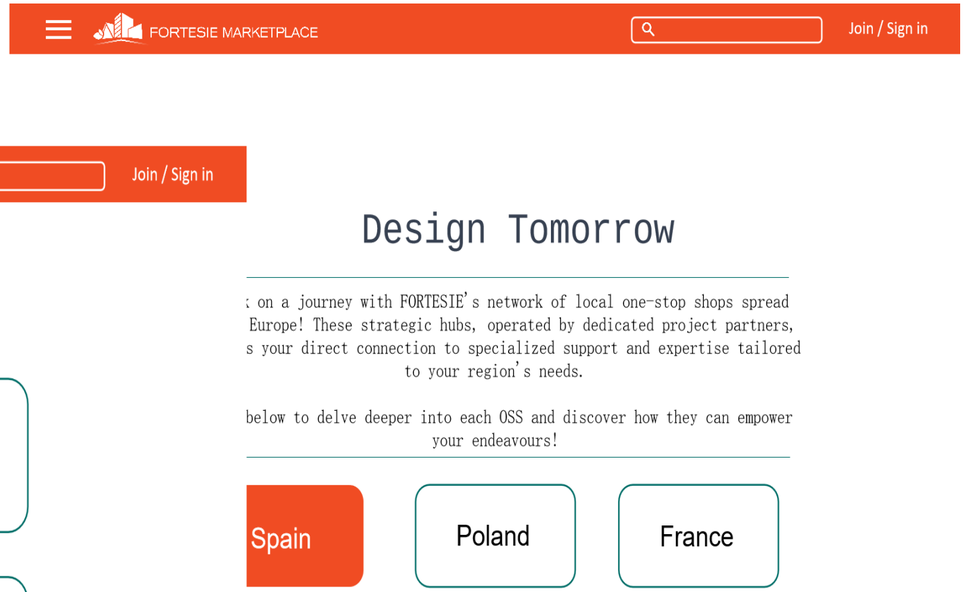
Innovations - One-Stop-Shop Marketplace

European One-Stop-Shop for renovations, eliminating geographic barriers.

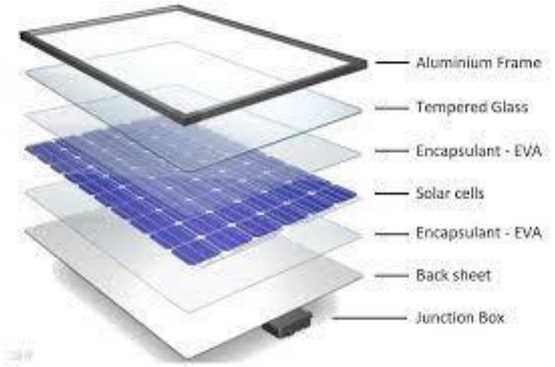
What: Central repository for best practices, resources and ecosystem making it easier for consumers and building owners to find renovation suppliers (consulting, digitisation, etc.).
Ecosystem: Local actors (ESCOs, Building Renovation Companies, Funding authorities), building owners, households







Innovations – Renovation packages and Tailored business models



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Key Performance Indicators	
ENERGY	Heating demand [kWh/m2]
	Cooling demand [kWh/m2]
	Ventilation consumption [kWh]
	Ceiling fan consumption [kWh]
	Estimate PV power production [kWh]
	Energy demand (H+C) saving respect to nonrenovated
	Overall energy reduction [%]
ENVIRONMENT	Yearly CO2 emissions due to Heating + Cooling [tCO2 year]
	CO2 reduction [%]
ECONOMIC ISSUES	Investment cost [€]
	Net Present Value (50 years) [€]
	Reduction of energy costs [%]
TIME FOR DEPLOYMENT	Duration of the building site [n. of months]

Portfolio of innovative building renovation technologies with performance improvements.

Renovation packages which combine state-of-the-art construction materials and technologies (prefabricated facades, BIPV, heat pumps, etc.) with digitisation solutions for contracting and executing performance guarantees.

Innovative collaborative business models and financing Schemes that boost ESIE investments.



Renovation Package: Green, comfortable and sustainable home		Green Roof
REQs		Tot Area
	Opaque part	Prefabricated facade thickness [cm]
		Final U-value wall [W/m²K]
	Window	Glazing Uvalue [W/m²K]
		Frame U-value [W/m²K]
		g-value [%]
	Shading system	Presence
		Control strategy
	Mechanical ventilation system	Type
	Smart ceiling fan	Control strategy
	Plug&Play Energy Hub	Presence

Innovations – Smart contracts for EPC

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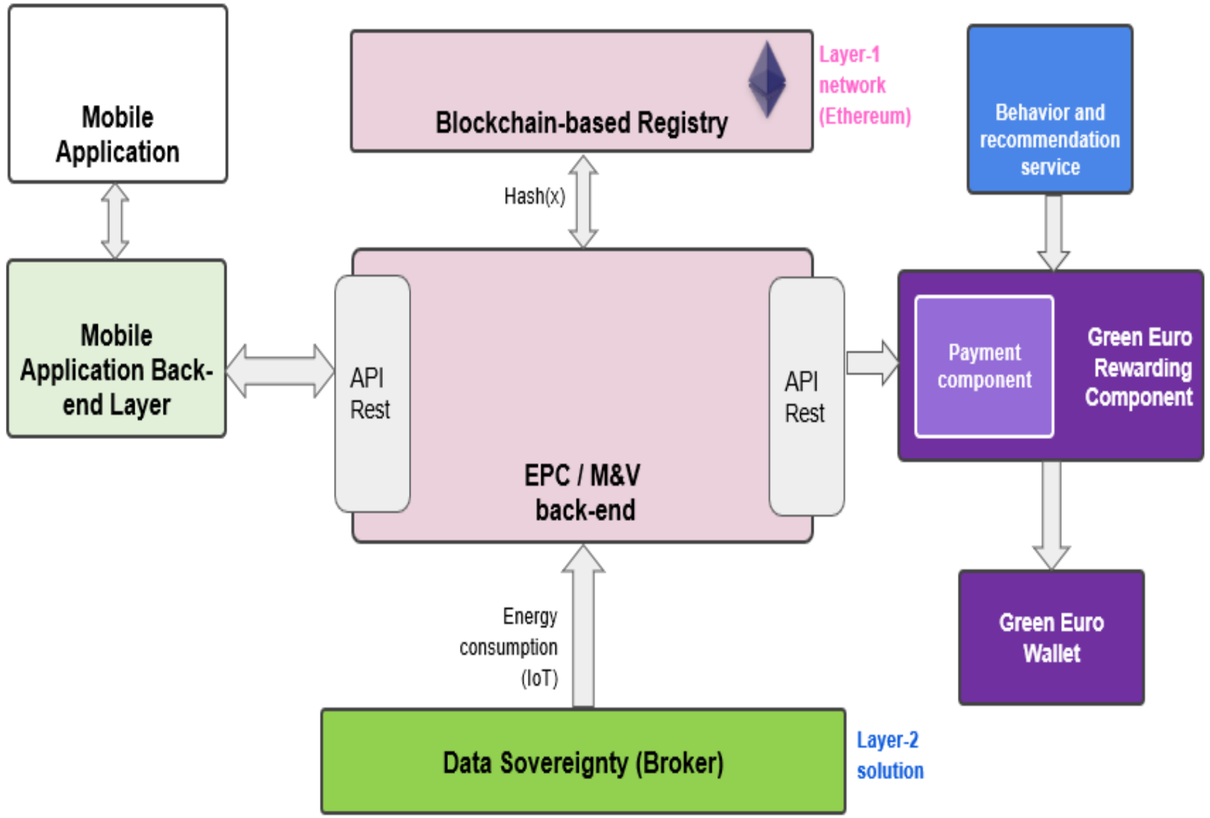
Electronic contracting of the EPC facilitates the Interaction, trust among energy and non-energy actors. Include:

Terms of the contract: Roles of investors and their contribution in the investment.

Guarantees agreed.

Periodic visualisation of the bonus/malus monthly for customers with the ESCOs rules.

Blockchain technology for trustworthy calculation of the achieved performance Improvements.



Innovations – Gamified app for Building Performance Improvement

Online Visualization of the consumption and reporting for energy savings.

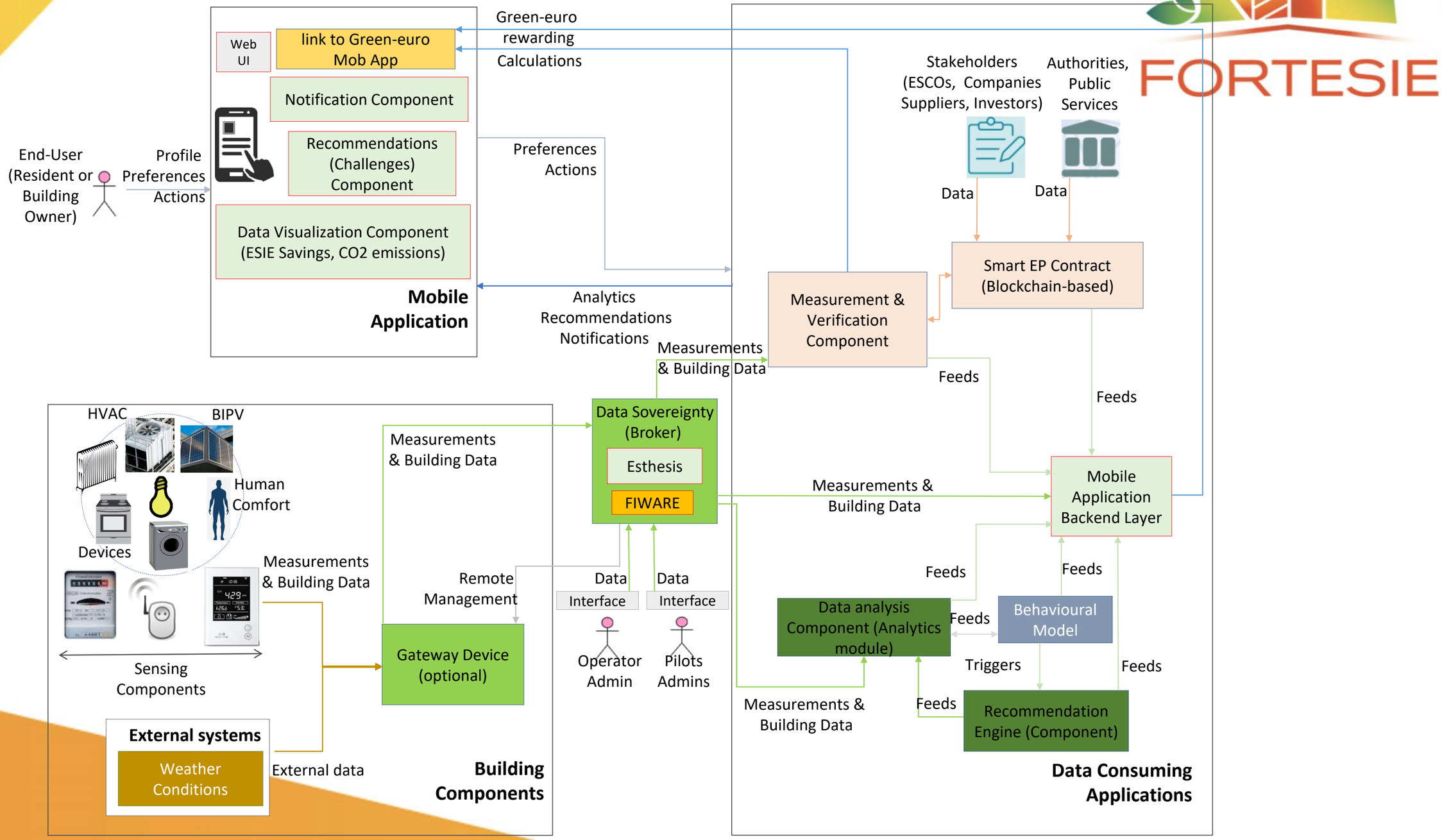
Challenges, Recommendations and Notifications Visualization

Badges as Rewardings

Tamagotchi concept for energy consumption

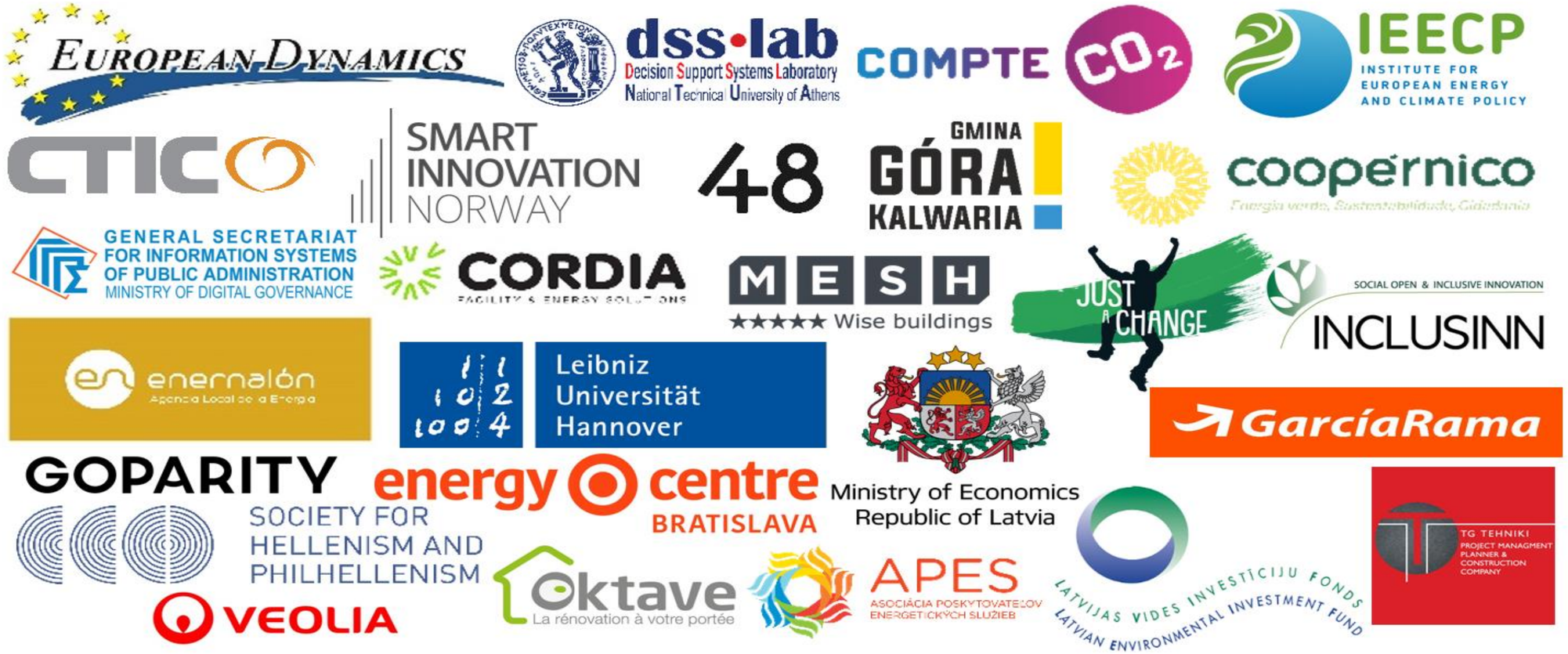


FORTESIE Reference Architecture



Who we are

FORTESIE



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Session 2: Panel Discussion



Katerina Papapostolou (NTUA)



Kostas Panagopoulos (EuroDyn)



Ioanna Andreoulaki (NTUA)



Francisco Puente (ESCAN)

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