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

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

Co-funded by the European Union under project numbers 101077033, 101076349, Grant agreement n°101080029. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.
Welcome with Katerina Papapostolou (NTUA)
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
• 11:00 – 11:15: Welcome speech by moderator Katerina Papapostolou.

  ◦ 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

Ioanna Andreoulaki (NTUA)
ENERGATE, The Energy Efficiency Marketplace that accelerates Building Renovation
Table of content

• The ENERGATE Project: Overview
• The Challenge
• Research Question
• The ENERGATE Approach
• ENERGATE Platform Users
• ENERGATE Services
• Expected Impact
• Results
• Survey
The ENERGATE Project (1/3)

Enable easy, predictable and risk-weighted renovation investments

Smart energy marketplace for sustainable investments
January 2023 – June 2025
The ENERGATE Project (2/3)

Who we are
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

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

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

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

**Interests**
- Investment Security
- Sustainable Investment Opportunities
- Portfolio Diversification

**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
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
ENGERGATE Services (1/2)
Marketplace UI

WELCOME TO THE ENGERGATE MARKETPLACE

Are you looking to renovate, develop or invest in energy efficient buildings?
STANDARDISING BUILDING RENOVATIONS

GET STARTED

Choose a profile

Building Owner
Implementor
Financier

Main building information
Building Name:
Example: The Thompson Tower is a 40-story skyscraper located in downtown.
Its modern design features a sleek glass facade. Amenities include office

You have a new offer from an implementor!
D: Apartment
Building

Cluster Buildings
Green - 12,12.3
This is a building used for testing purposes...
Green - 11,11.4
This is a building used for testing purposes...
Green - 10,10.1
This is a building used for testing purposes...
Green - 8,8.3
This is a building used for testing purposes...
Green - 12,12.1
This is a building used for testing purposes...
Green - 11,11.3
This is a building used for testing purposes...
Green - 8,8.2
This is a building used for testing purposes...
Green - 8,8.1
This is a building used for testing purposes...

Cluster Buildings
Green - 12,12.2
This is a building used for testing purposes...
Green - 11,11.2
This is a building used for testing purposes...
Green - 9,9.1
This is a building used for testing purposes...
Green - 8,8.4
This is a building used for testing purposes...
Green - 9,9.5
This is a building used for testing purposes...
Green - 8,8.4
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Choose a profile

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Implementor
Financier

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Matching buildings with Implementors

Matching projects with Financiers

Aggregating projects

Assisting Public Bodies in exploring funding sources

ENERGATE Services (2/2)
Expected Impact (1/2)

- **5** Pilots
- **6** Countries
- UP TO **67** GWh/year
- UP TO **200** Users
- UP TO **180** Building Renovation Projects
- **40-50** Country experts
- UP TO **23** tCO₂eq/year
- UP TO **53** Million Euros
- Final energy savings
- Users
- GHG emissions saved
- Triggered investments
**Deployment & validation** phase to be done by indicative representatives from Demand & Supply side

- Energy Consulting, Design of cost optimal solutions for EE
- SME, expertise of asset and project management
- Turns energy-wasteful building into smarter (IoT, algorithms).
- Planning socioeconomic development of Riga, identification of projects
- Founded by Attica Finance & PPCR, access to infrastructures & buildings

**ENERGATE Pilots**

**Expected Impact (2/2)**

- **Fetch**: Formation of a standardised & well-structured data input interface
- **Process**: Formation of weighting factors, KPI, algorithms
- **Deliver**: Standardised project pipelines & feedback loops to measure impact

**Stakeholders**

**Suppliers**
- Group A
- Group B
- Commuty
- RPR, Greenesco
- EB, LDK, Greenesco

**Demand Side**
- Asset managers, private owners, building managers, social housing administrators, cooperatives
- ESCOs, aggregators, consultants, project developers

**Delivering Partners**
- Financial institutions, Energy companies, public or private funds
Explore our Results

ENERGATE Newsletter
issue December 2023

ENERGATE Factsheet on Financing Typologies for Building Renovation

ENERGATE Expert Talk at REHVA Brussels Summit

ENERGATE User Profiles

ENERGATE Regional Training Workshop in Madrid

Building Owners
- Use the platform to:
  - Contact you online easily
  - See how other similar buildings have improved their energy performance
  - Check for specifications and selection
  - Read client testimonials
  - Get help from our experts

Implementors
- Use the platform to:
  - Follow up on your work systematically
  - Get feedback on your work
  - Learn from other similar projects
  - Share your work with others
  - Get help from our experts

Financiers
- Use the platform to:
  - Follow the project and financial status
  - Know the project's financial strength
  - See how the project fits into the developer's strategy
  - Get information about the project's financial health
  - Find financial support

Public Authorities
- Use the platform to:
  - Follow the project's progress and financial status
  - Know the project's financial strength
  - See how the project fits into the developer's strategy
  - Get information about the project's financial health
  - Find financial support

Factsheet on ENERGATE Regional Training Workshop in Madrid

How are we financing building renovation?

They are perceived as a risk-free funding option because they are less speculative. Incentives can rely on and financing schemes can be customized.

Financing schemes for building renovation projects whose return on investment depends on achieved energy savings are also gaining momentum.
Explore our Videos

Building Owner

Implementor

Available in our YouTube Channel here

Financier

Public Bodies
THANK YOU

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National Technical University of Athens
Email: iandreoulaki@epu.ntua.gr
Session 1

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

WITH

Francisco Puente (ESCAN)

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

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

WEBINAR

MAY | 16 | 11-12:30 CET

16/05/2023

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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.
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.
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)
The InEExS Blockchain platform and smart services
PARTNERS

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

#InEEExS
https://ieecp.org/projects/ineexs/
fpuente@escansa.com

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Session 1

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

WITH

Kostas Panagopoulos (ED)

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

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

Challenges
Objectives and Expected Results

Digitisation and automation enablers

Data sovereignty
- Behavioural Model
- Recommendation engine
- Gamified mobile app
- Digital green-euro Neobanking app

Standardised Monitoring and Verification

Energy Smart Contracts

Blockchain

Data analytics

Digitisation

Business models
- Smart contracts
- Packages for market
- Performance guarranties

Boosting renovation wave
- Demonstrators
Objectives and Expected Results

Integrated EPC packages to raise overall EPC value proposition

### Digital Technologies

- **Poland**
  - Renovation Technologies
  - Water pumps
  - PVs
  - Sewage water heat recovery
  - HVAC

- **Latvia**
  - Renovation Technologies
  - HVAC

- **Portugal**
  - Renovation Technologies
  - Insulation
  - HVAC
  - PIPV

- **France, Spain, Greece**
  - Renovation Technologies
  - Insulation
  - HVAC
  - PIBV Windows
  - Insulation
  - HVAC
  - PV
  - Green roof

### Guaranties

<table>
<thead>
<tr>
<th>Guaranties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy reduction rate (%)</td>
</tr>
<tr>
<td>Indoor Environmental Quality (%)</td>
</tr>
<tr>
<td>Total CO2 emissions saved (tnCO2/year)</td>
</tr>
</tbody>
</table>
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
- GK
- +48
- ED
- CTIC
- CCO2
- NTUA
- SIN

### Latvia
- MESH
- LEIF
- DEE
- SIN
- ED
- CTIC
- CCO2
- NTUA

### Spain France Portugal
- OKT
- VEO
- JUST
- ED
- CCO2
- SIN
- NTUA
- GAR
- ENE
- COOP
- CTIC
- NTUA
- GOP

### Greece
- CRD
- TGT
- GSIS
- SIN
- ED
- CTIC
- CCO2
- NTUA

### Greece
- CRD
- TGT
- EEF
- SIN
- ED
- CTIC
- CCO2
- NTUA
Public Swimming Pool

The Goal
Inclusive and efficient pool management

The Team
Public Entity
Construction
Digitization
Companies

GKW
+48
ED/CTIC/
NTUA/CCO2/SIN

Poland
Public School Latvia

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

The Team
Public Entity Construction Digitization Companies

DEE LEIF / MESH
ED / CTIC /
NTUA / CO2 / SIN
The Goal

Sustainable Efficient and Comfortable homes, including poverty and prosumers homes
Public Building

Greece

The Goal
Sustainable and efficient workplace

The Team
Public Entity
Construction
Digitization
Companies
GSIS
TGT / CRD
ED/ CTIC/
NTUA/CCO2/SIN

Greece
The Goal

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

The Team

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

Greece
Objectives and Expected Results

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

- Other potential Customers: Households of all 3 types
- Value-in-Use: 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 motivation schemes: with Green Euros, crowdfunding, and/or public funding
  - Target actor: Households
  - Technological Service Providers: Partners providing TSCs
- Market Reach Services:
  - Access to Households (H) (and Energy poverty households, Financing (F), 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 (UST)
- 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
Innovations

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.

Innovative renovation packages and Tailored business models
Building industry technologies with performance improvements.

Gamified app for Building Performance Improvement
Visualization of the consumption and reporting for energy savings.

Smart contracts for EPC
Interaction of energy and non-energy actors.
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.
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

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.
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
Session 2: Panel Discussion

Katerina Papapostolou (NTUA)
Kostas Panagopoulos (EuroDyn)
Ioanna Andreoulaki (NTUA)
Francisco Puente (ESCAP)
THANK YOU!

For more info about the projects, please visit:

#InEExS

InEExS LIFE

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

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