Advanced Energy Performance Assessment towards Smart Living in Building and District Level

The SmartLivingEPC project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101069639.

SmartLivingEPC Project

Aggeliki Veliskaki, CERTH/ITI

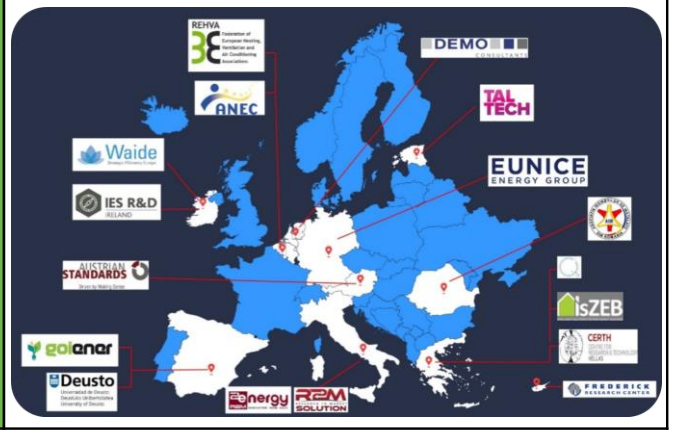
Project Coordinator:
Dr. Dimosthenis Ioannidis, CERTH/ITI

Buildings Clustering Meeting, 21-22 May, Brussels

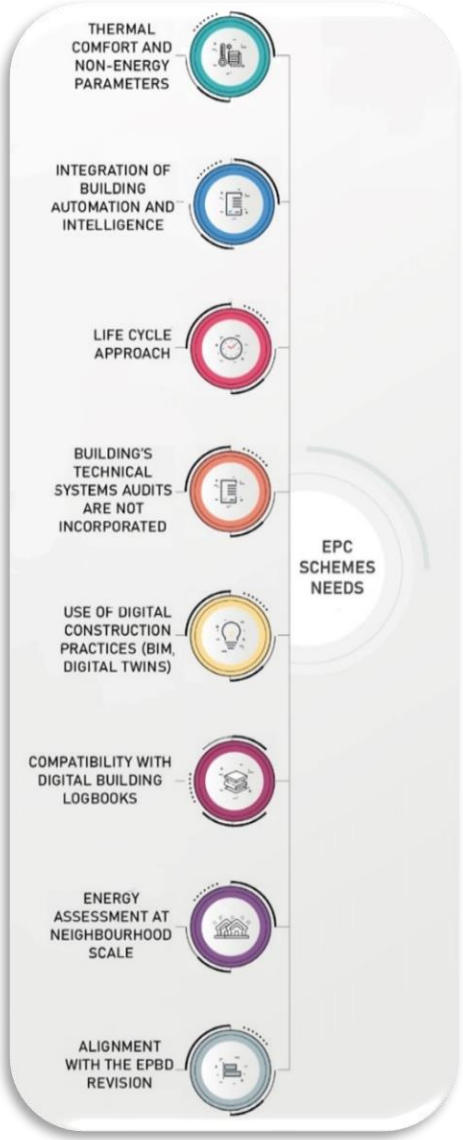
Smart living EPC

SmartLivingEPC - Project information & background

Grant Number	101069639
H2020 Call	HORIZON-CL5-2021-D4-01-01
Type of action	Advanced Energy Performance Assessment & Certification HORIZON Innovation Actions
Duration	36 months (Current month: 23)
Starting date	1 July 2022
Consortium	15 Partners and 2 affiliated entities From 12 Countries



Needs and Challenges



The ambition

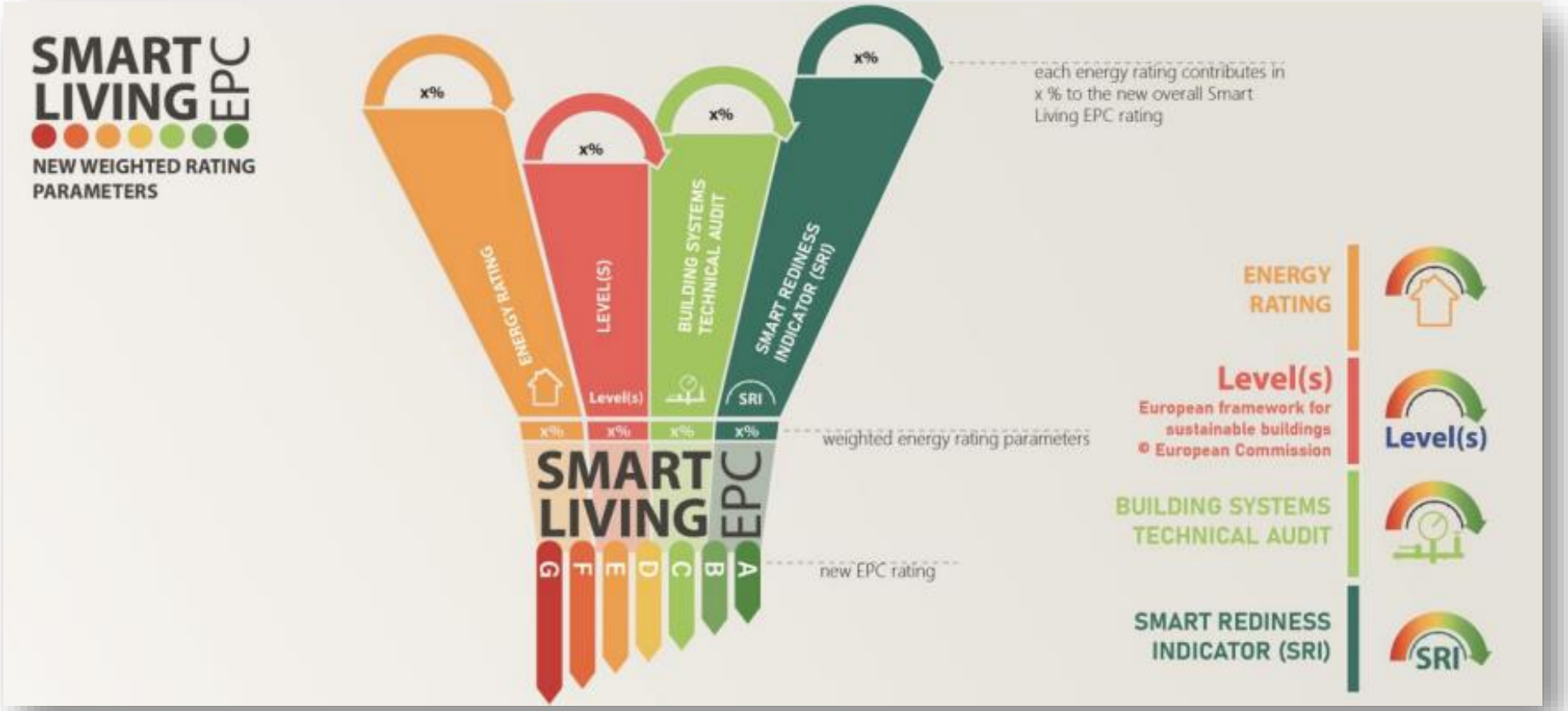
Use of **digitized tools** and retrieve assessment information from **BIM** literacy

Provide information on building operational behavior based on **life cycle performance**, **smartness**, and **technical system performance**

Expand to cover **water consumption**, **noise pollution**, and **acoustics**, and be compatible with **digital logbooks**

Certification on **2 Levels**:
- building level (**Building EPC**)
- building complex (**neighborhood scale**)

SmartLivingEPC – Approach, Impacts



Impacts

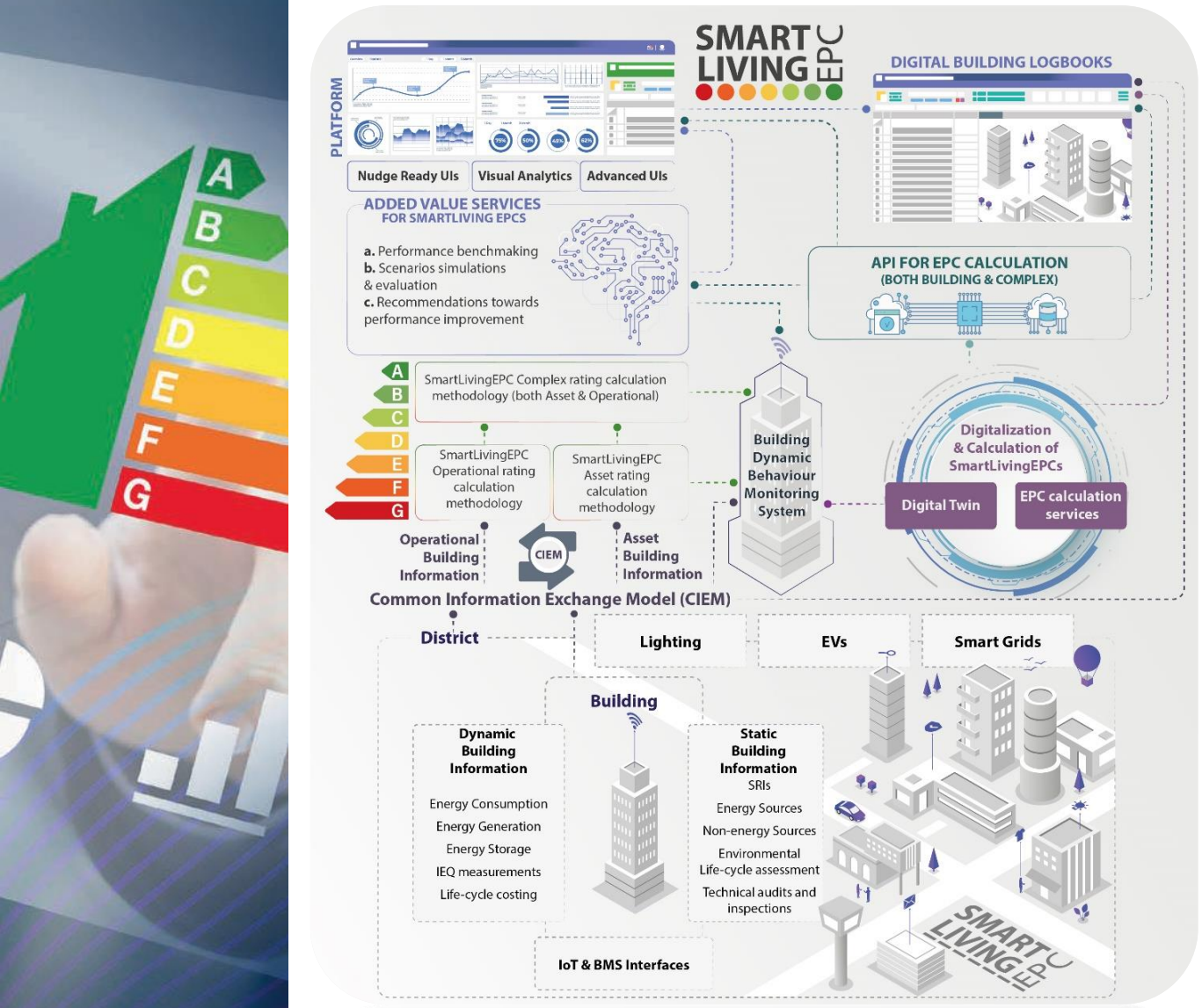
More **energy efficient** building stocks supported by an **accurate understanding** of buildings performance in Europe and of related **evolution**

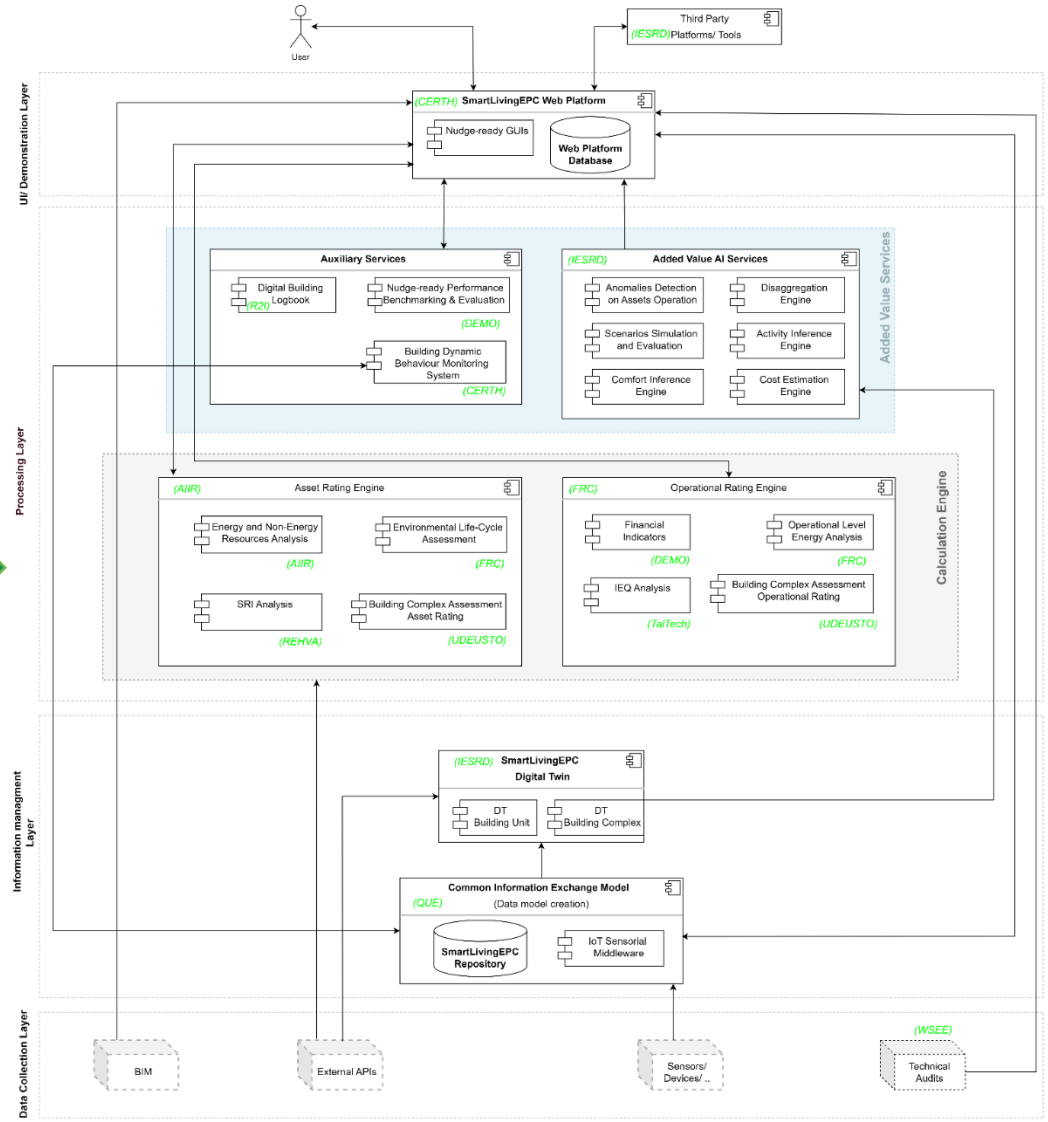
Building stocks that effectively combine **energy efficiency**, **renewable** energy sources and **digital** and **smart technologies** to support the **transformation** of the energy system towards climate **neutrality**

Higher buildings' performance with lower environmental impacts through increased rates of **holistic renovations**

Higher **quality**, more **affordable** built environment preserving **climate**, **environment** and **cultural heritage** and ensuring better **living conditions**

SmartLivingEPC – Framework Architecture





SmartLivingEPC – Main achievements [A]

WP1

- **EPC rating schemes explored** in 10 EU countries**, identifying methodologies, barriers, stakeholder requirements, and market needs** for energy efficiency, culminating in defining **specifications** for the SmartLivingEPC framework alongside **business scenarios** and **technical use cases.**

WP2/ WP3

- **The indicators** for assessing building **asset and operational** performance **identified** and calculated.
- Both **asset and operational rating calculation methodology developed** by combining all KPIs within a **single framework** & definition of API for calculating building indicators.

WP4

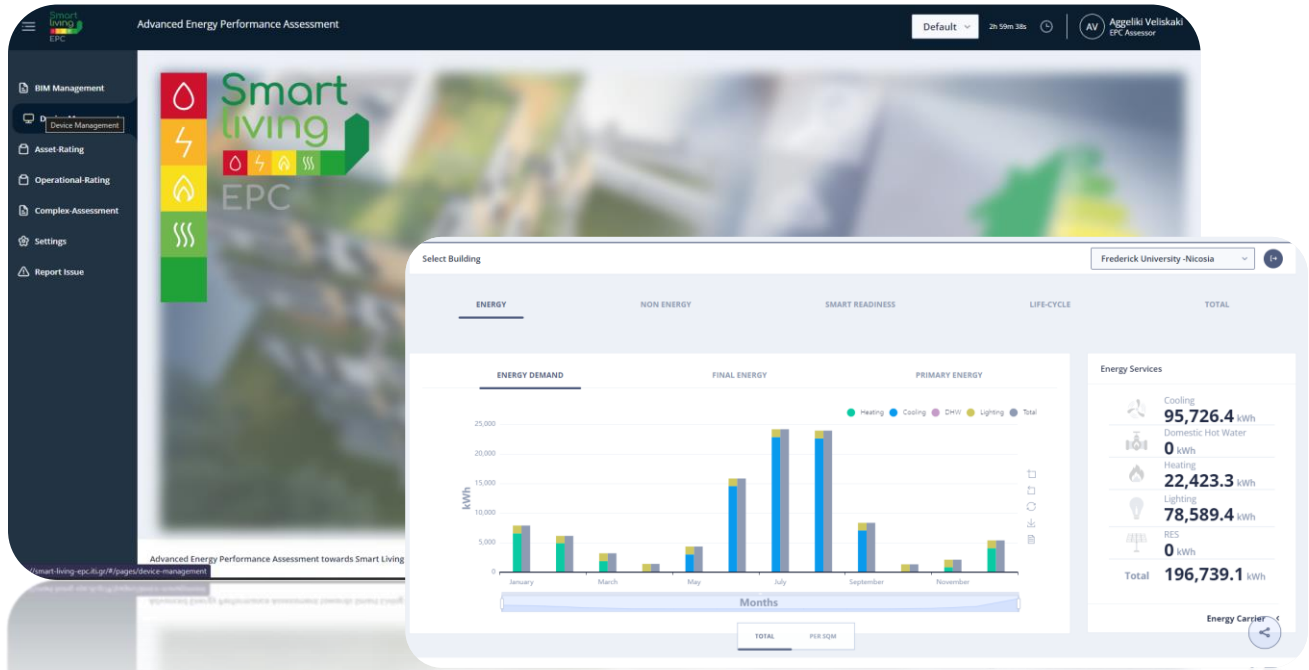
- **Common Information Exchange Model (CIEM)**: A first version of **CIEM 's Data Model & CIEM's architecture developed**
- **Building Dynamic Behaviour Monitoring: Occupancy estimation, profiling, and energy consumption forecasting models developed and tested** & An **alert system** with real time anomalies detection for building state insights **developed**
- **SmartLiving Digital Twin (DT)**: **DT architecture established** and BIM-based DT development explored through testing of pilot IFC files in ICL environment
- **Digital Logbooks (DBL) for EPCs:** SmartLivingEPC **DBL concept is under development** and experiments are implemented in parallel in the SmartLiving Web Platform
- **EPCs Calculation and APIs for 3rd Party Applications:** The **development of EPC calculations** is **on progress** and a **RETful APIs** for each individual calculation are under development

SmartLivingEPC – Main achievements [A]

WP5

- Definition of the functionality **of Added Values AI Tools** and **Benchmarking & Evaluation tool** and their data requirements
- **Definition and development of the initial version of the Web Platform** (Remarkable Progress on the integration of SLE components into the Web Platform)

https://smart-living epc.iti.gr/#/auth/login



WP6

- **Pilot preparation is completed and data collection is underway**

WP7

- Participation as sister project to the **Next Generation Energy Performance Certificates cluster** (Next Gen EPC cluster)
- Contribution to the development of a Next Gen EPC Policy Brief centralizing policy recommendations for the **Energy Performance of Building Directive Recast**
- Participation in **TC 371, Working Group 5 Energy Performance of Buildings — Operational rating Requirements for assessing Operational rating**

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Thank you for your attention!

https://www.smartlivingepc.eu/en/

https://www.linkedin.com/company/smartlivingepc/

https://twitter.com/SmartLivingEPC

https://www.youtube.com/channel/UC0SKa-20tiSabuwjtYDqRrQ

Smart living EPC

Andrei Vladimir Lițiu
Executive Director, EPB Center / Building Performance Adviser, REHVA
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Next Gen EPC cluster

Buildings Cluster Meeting

Tuesday, 21 May 2024, 13h30 CEST
Wednesday, 22 May 2024, 14h00 CEST

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Next Generation Energy Performance Certificates cluster

2019

2020

2021

2022

2023

Qual DeEPC

U-CERT
User-Centred Energy Performance Assessment and Certification

X-tendo

D2EPC

E-DYCE

ePANACEA
Smart European Energy Performance Assessment & Certification

EPC RECAST
ENERGY PERFORMANCE CERTIFICATE RECAST

crossCert
Next-generation of Energy Performance Assessment and Certification

EUB SuperHub

iBRoad2EPC

TIMEPAC
The new EPC for Europe

Smart living EPC

CHRONICLE

iEPB

Smarter EPC

tunES

EPBDwise

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Smart Readiness Indicator cluster

2022

SRI-ENACT
Co-creating Tools and Services for Smart Readiness Indicator Uptake

SRI2MARKET

SMART2
ENHANCING THE INTELLIGENCE OF BUILDINGS IN EUROPE

easy SRI

2023

iEPB

Smarter EPC

tunES

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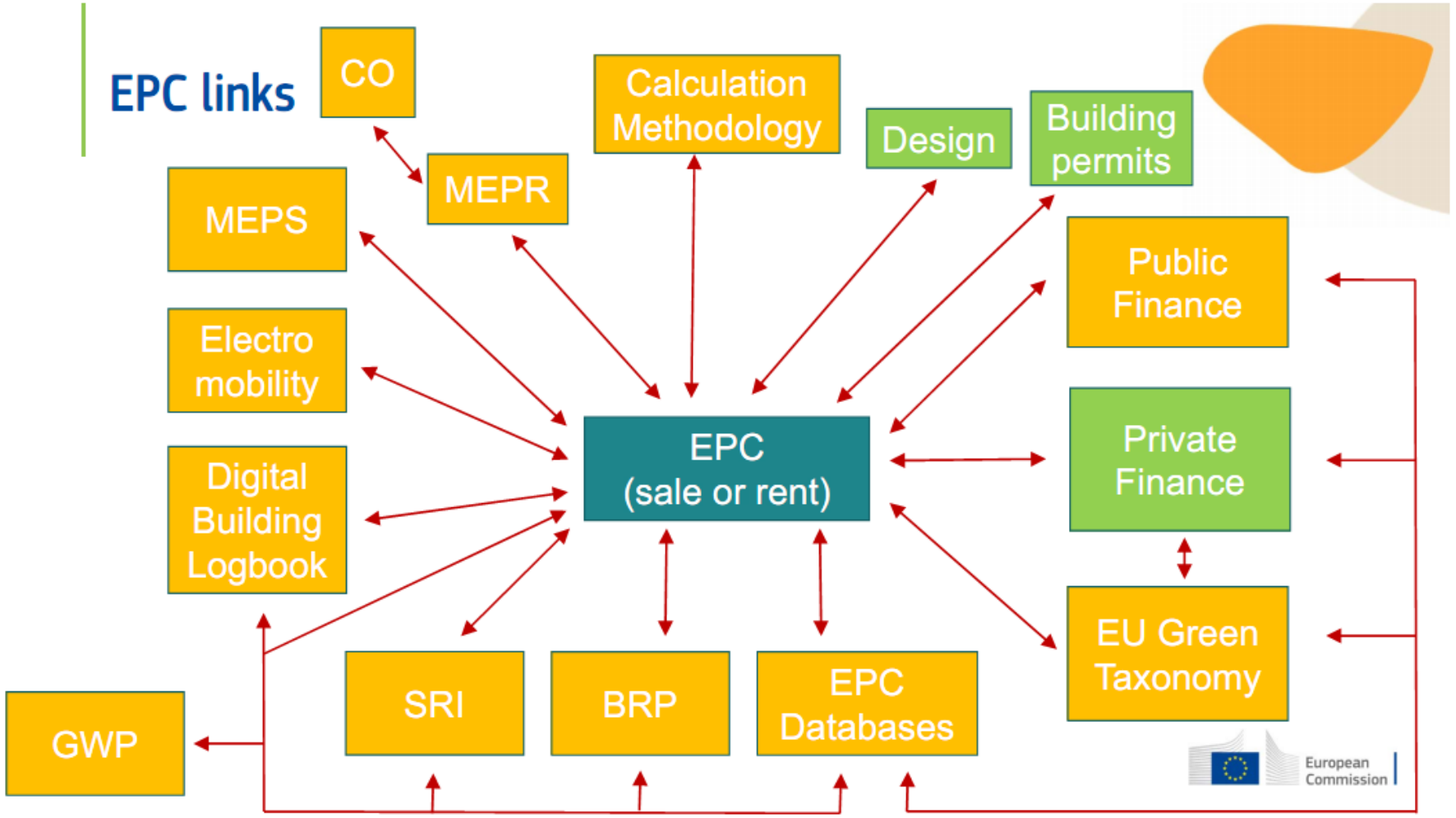
Energy Performance Certificates are linchpin



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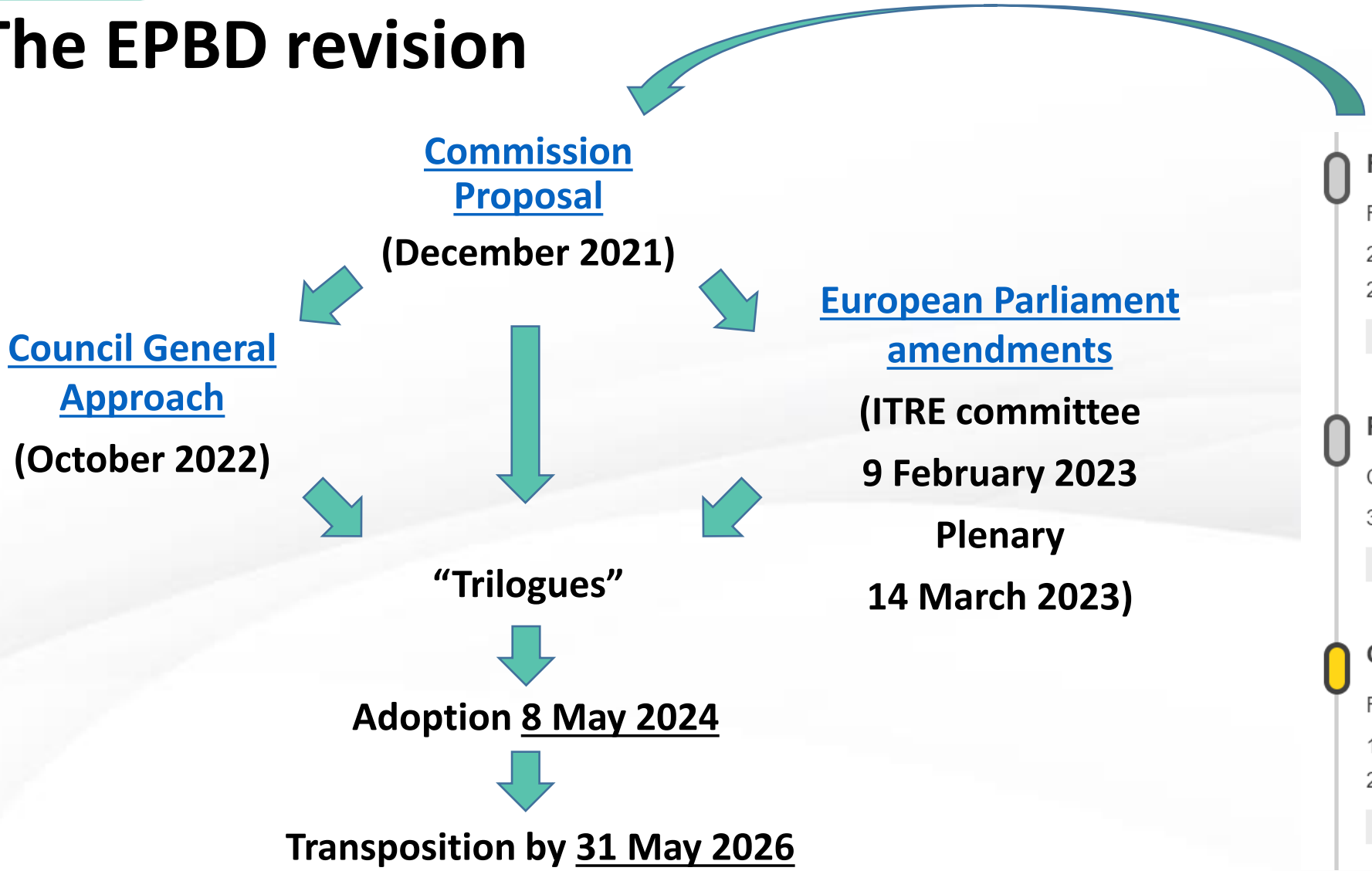
The EPBD revision



Roadmap

Feedback period

22 February 2021 - 22 March 2021

FEEDBACK: CLOSED

Public consultation

Consultation period

30 March 2021 - 22 June 2021

FEEDBACK: CLOSED

Commission adoption

Feedback period

15 December 2021 - 01 April 2022

FEEDBACK: CLOSED

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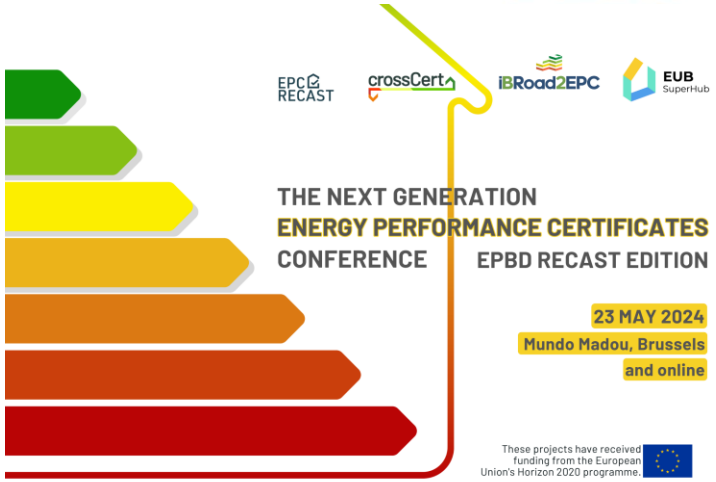
WHY cluster?

- ✓ For **making a meaningful, impactful and lasting contribution** to the evolution process of the European Building Performance Assessment, Certification and Management - both mandatory and voluntary - the Next Gen EPC cluster of projects strongly believes in **enabling and facilitating an open dialogue and structured exchange in between the sister initiatives**.
- ✓ The coordination efforts aimed at **collectively exploring synergies for successfully implementing the individual projects** and overall **maximizing the impact at cluster level**.
- ✓ This is especially relevant in terms of **communication, dissemination, exploitation and technical advocacy**, at both EU and national levels, and, **as much as possible, also in terms of technical activities**.
- ✓ The team members of all Next Gen EPC cluster of projects can **exploit together Key Exploitable Results (KERs) in a coordinated, coherent and converged approach at EU level**, increasing the market uptake and roll-out of the cluster results at both EU and national levels, while **supporting overall the transposition, implementation and monitoring of the EPBD related policy instruments**.

Annual Conference



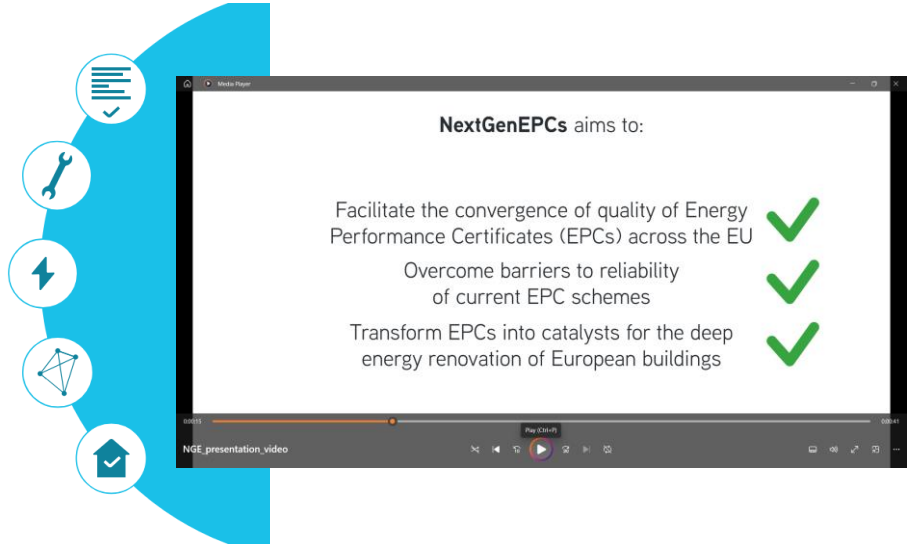
Horizon Results Booster

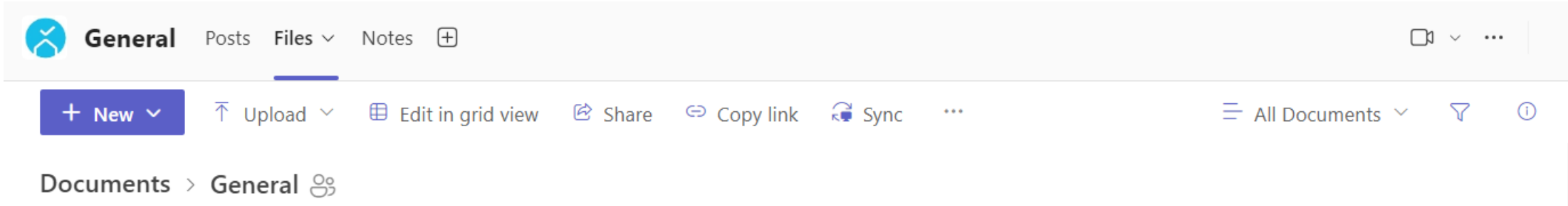
NextGenEPCs

Enhancing the evolution of Energy Performance Certificates

The Cluster focuses on the implementation and improvement of technologies and processes linked to EPCs, providing:

- Guidelines and recommendations for the development of people centred EPCs products and services
- A toolbox enabling public authorities to improve the current EPC scheme
- Smart Energy Performance Assessment Platform
- A transnational framework serving as an EU-wide digital building performance information hub
- Building Renovation Passports to complement EPCs in guiding upgrades to the building stock





Upcoming

Supporting the EPBD Recast transposition & implementation

The Commission published 2 recommendations in 2019, including guidelines for EU countries related to these rules.

- Commission recommendation on building renovation (EU) 2019/786
- Commission recommendation on building modernisation (EU) 2019/1019

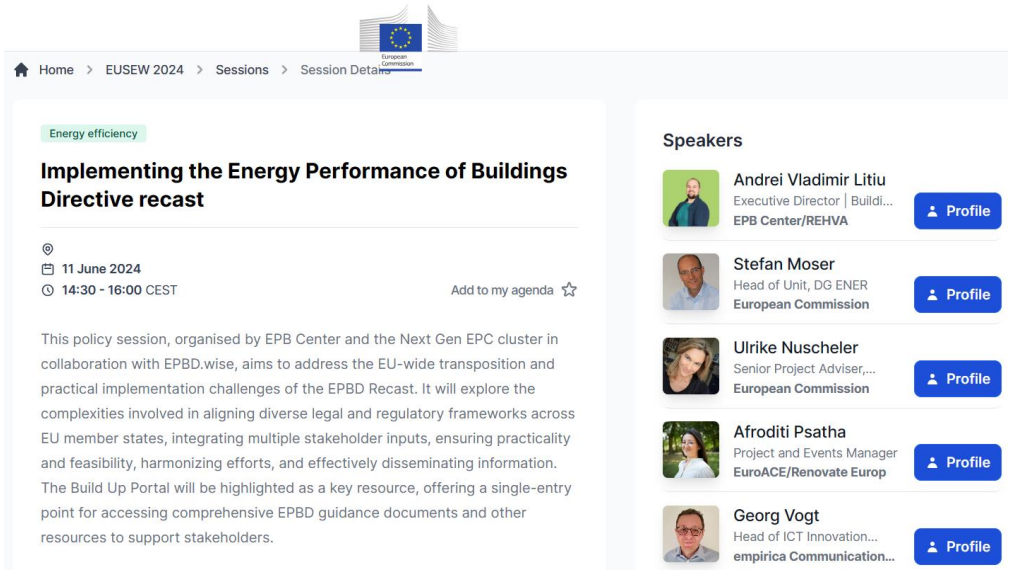
- Mapping (Executive Summary) on areas of interest / topics → DG ENER recommendations / guidance documents

- EPBD Recast framework (nothing against) or more ambitious!

- Very practical for implementation (how to be swiftly put in place / fit for consumption / condensed / specific)

- May – June – July – September 2024 contribution → December 2024 final draft → Early 2025 publication

- Build Up Portal dedicated section embedding also the Guidance Documents prepared by the EU stakeholders



Qual DeEPC · U-CERT User-Centred Energy Performance Assessment and Certification · X-tendo · D2EPC · E-DYCE · ePANACEA Smart European Energy Performance Assessment & Certification · EPC RECAST ENERGY PERFORMANCE CERTIFICATE RECAST · crossCert Next-generation of Energy Performance Assessment and Certification

EUB SuperHub · iBRoad2EPC · TIMEPAC The new EPC for Europe · CHRONICLE · Smart living EPC · iEPB · Smarter EPC · tunES · EPBDwise

Thank you without end!

✓Let's continue

✓**going farther together**

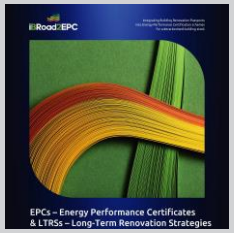
✓**as opposed to fast alone!**

NextGenEPCs

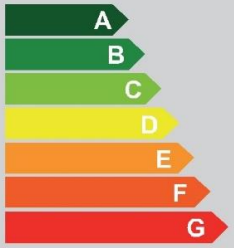
Follow our hashtag #NextGenEPCs

Join us on our mission to make the EPCs evolution a reality

Market positioning of iBRoad2EPC / Database structure



EPC



iBRoad2EPC

Building Renovation Passport

Effort:
2 - 4 hours — 1,5 - 2 days

Price:
50 - 250 Euro — 1000 - 3000 Euro

Coverage:
5 - 15% of the building stock — obligatory — voluntary — several thousand buildings

- iBRoad2EPC
  - Current building state
  - Basic – General text
  - Basic – Measures
    - Measure – Category
    - Measure – Title
    - Measure – Specification
    - Measure – Description
  - Basic – Note/recommendation
    - Note – Pre-measure
    - Note – Measure
    - Note – Description
  - Basic – Regulations/obligations
    - Regulations – Building type
    - Regulations – Validity date
    - Regulations – Year
    - Regulations – Step
    - Regulations – Description
  - Cost – General text
  - Cost – Information
    - Information – Building type
    - Information – Title
    - Information – Unit
  - Energy demand – General text
  - Energy demand – Information
    - Information – Building type
    - Information - Title
  - IEQ – General text
  - IEQ – Calculation and information from external spreadsheet
  - SRI – General text
  - SRI – Calculation and information from external spreadsheet
  - MEP – General text
  - MEP – Calculation and information from external spreadsheet
  - User influence – Title
  - User influence – Description
  - EPC colour scheme

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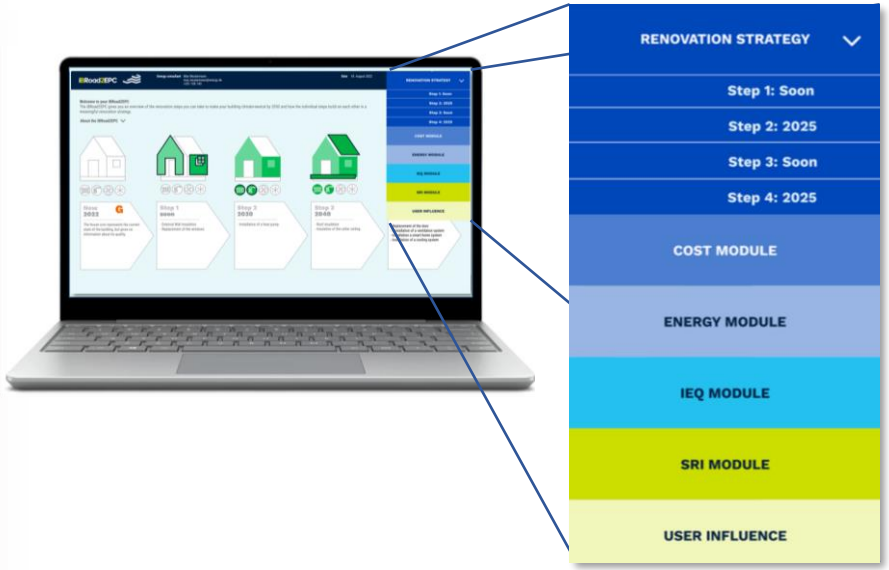
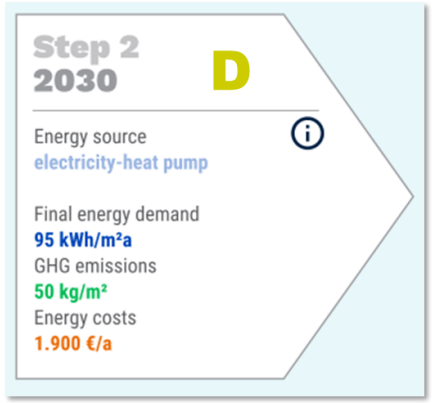
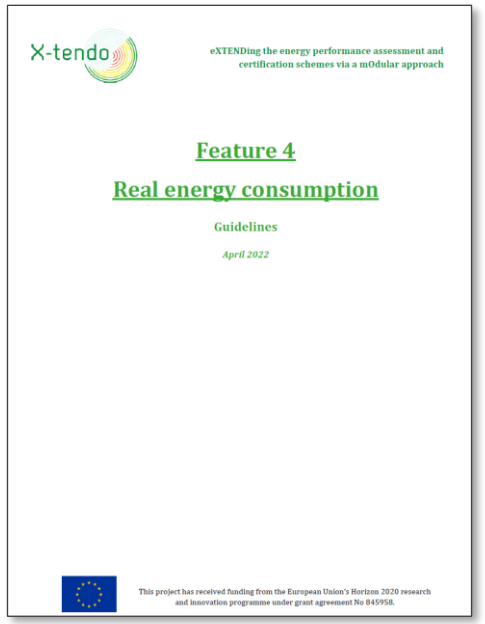
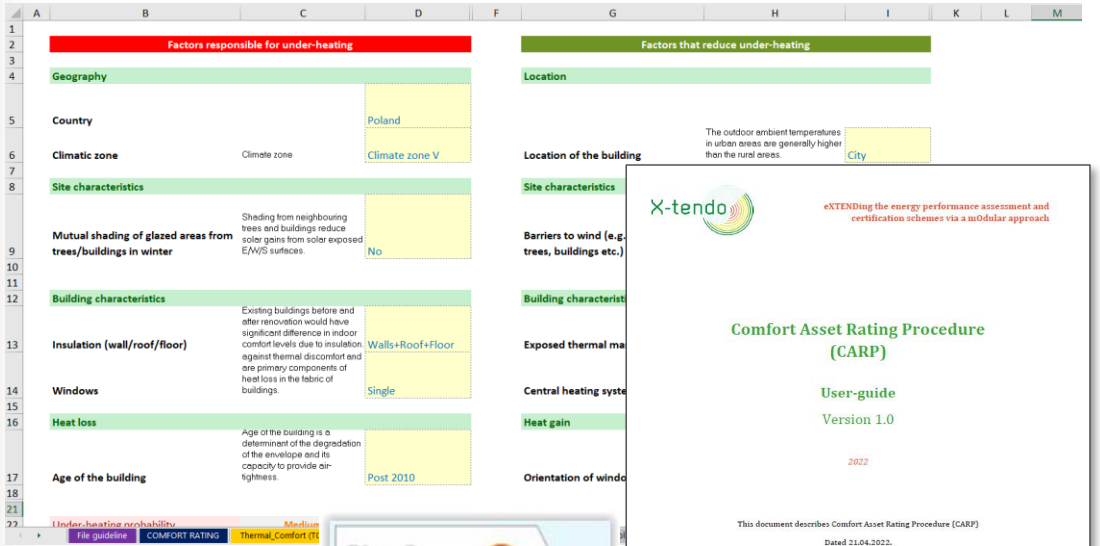
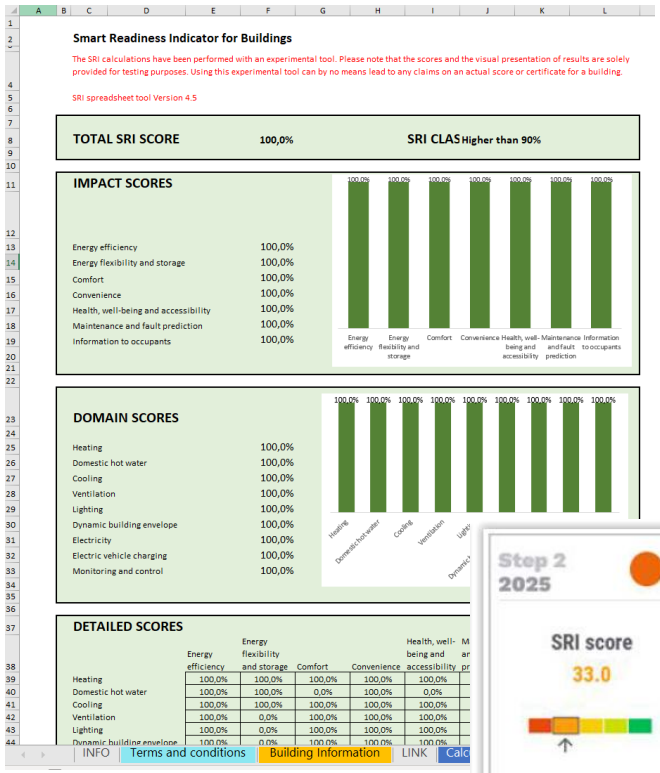
iBRoad2EPC modular/open approach

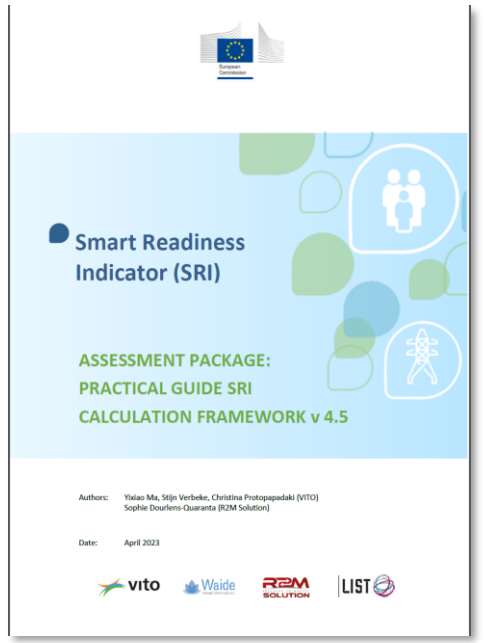












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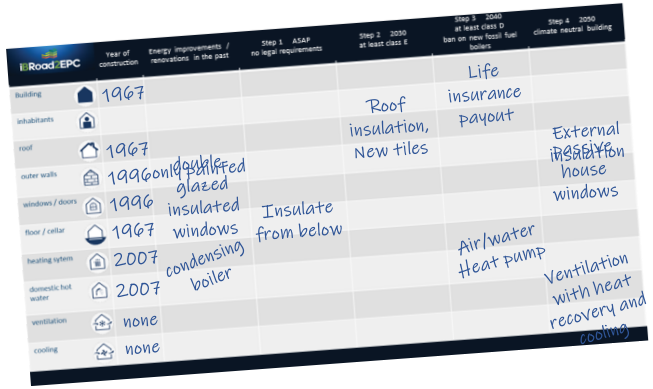
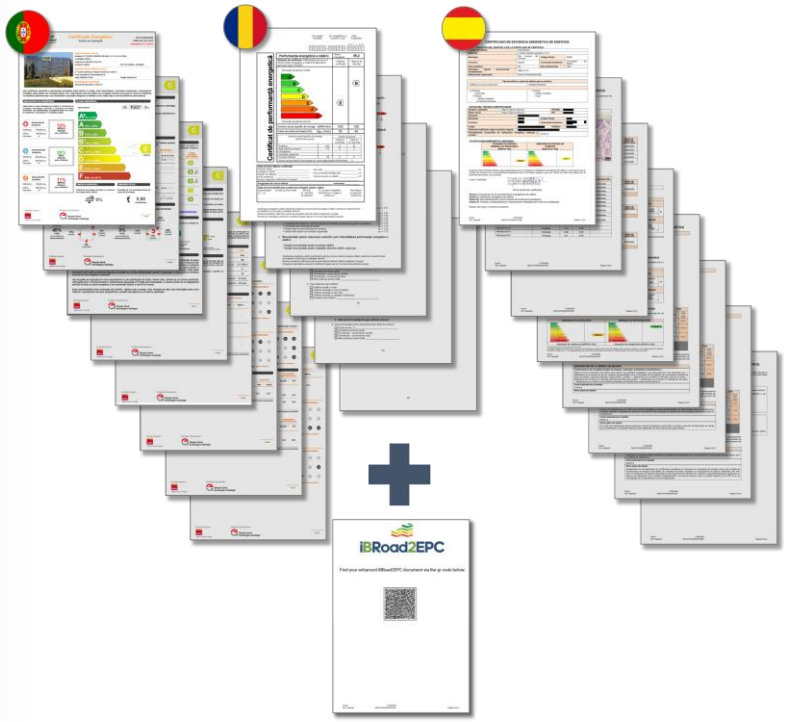
Issuing the iBRoad2EPC

- STEP 1: On-site Visit
- STEP 2: Calculation of the current Buildings State
- STEP 3: Definition of the Renovation Strategy
- STEP 4: Calculation of planned Building States
- STEP 5: Creation of iBRoad2EPC





Present building state
according to EPC

Step 1
Which renovation measures are pending?

Renovation steps
Support to meet all future requirements

Target state
Climate neutral building

House icons
Represent the quality of the envelop

Technology icons
Represent the quality of the technical equipment

Timing of renovation steps
According to climate targets

Brief description
of the renovation measures contained in the step

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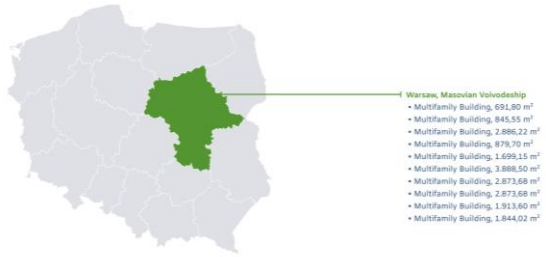
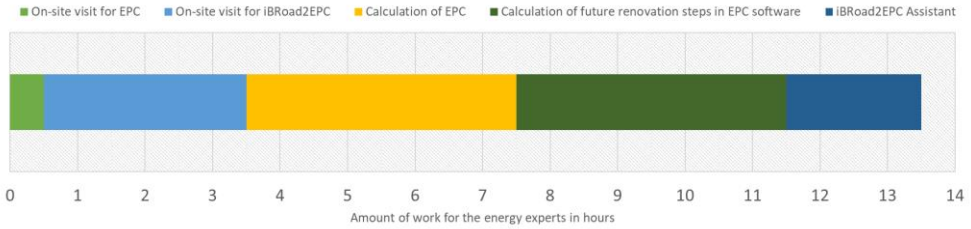
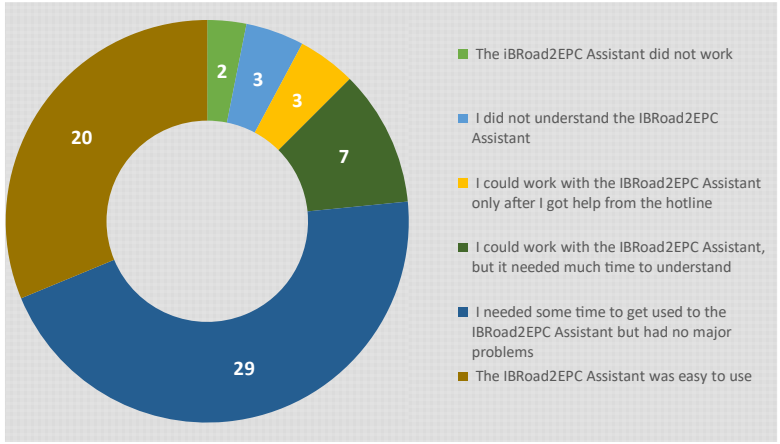
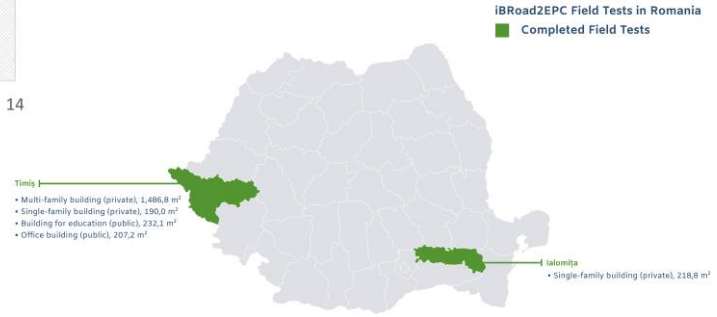
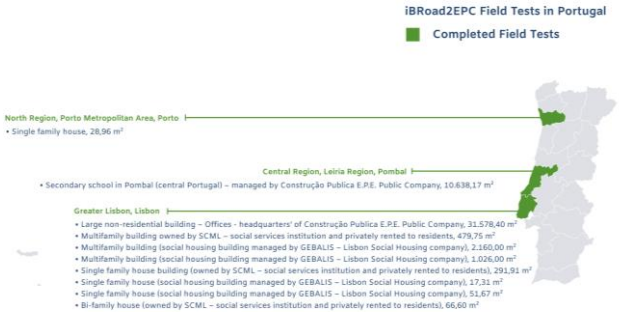
Pilot testing

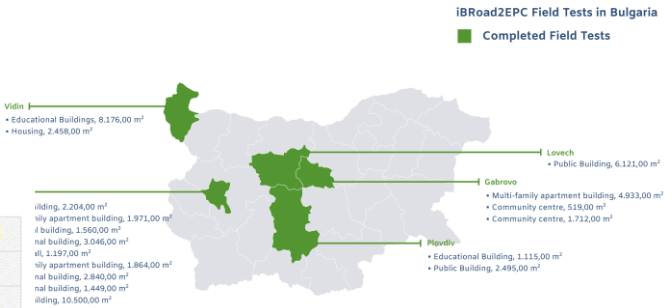


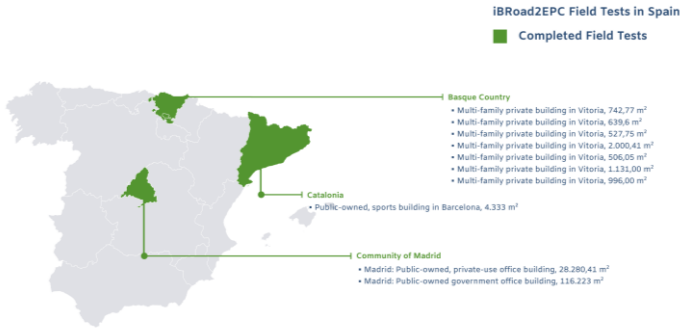


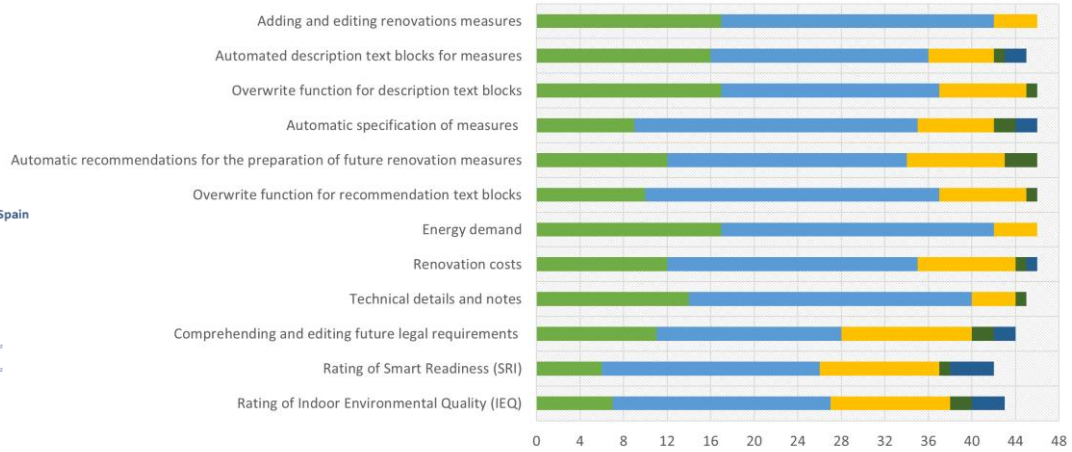


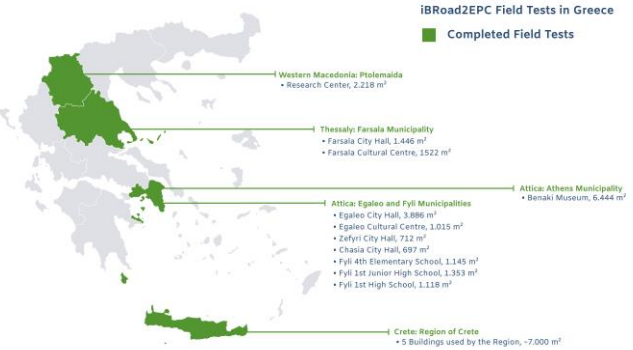


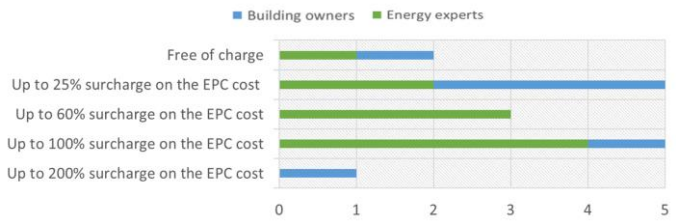












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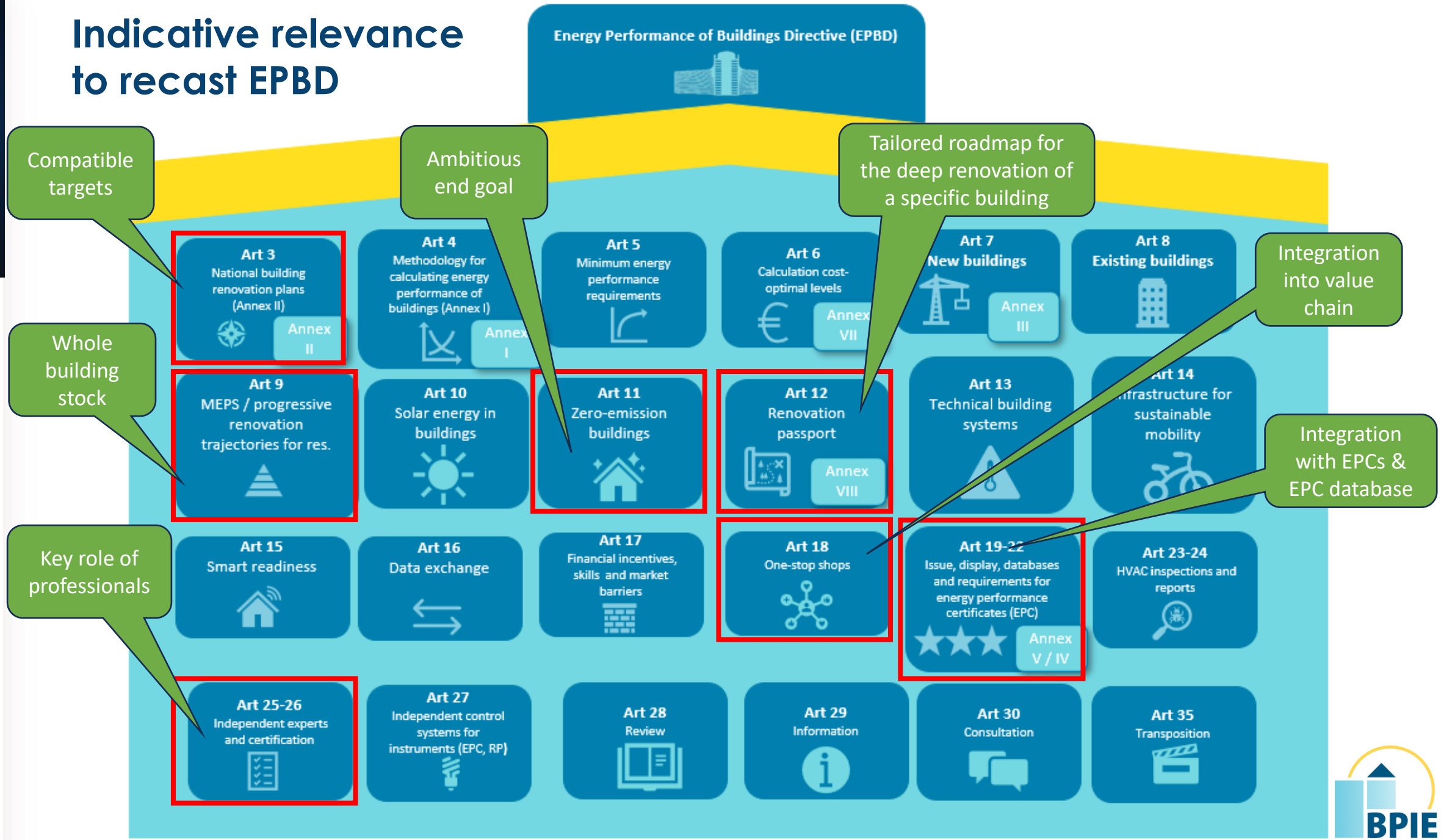
Indicative relevance to recast EPBD



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22/05/2024

Presentation of the EPBD.wise project

Buildings Clustering Meeting / Breakout Session Buildings Rating Instruments

HEAD OF BUILDINGS AND RESOURCES EFFICIENCY AT ADENE

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POLICY AND PROJECT OFFICER AT EUROACE

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EPBD.wise in a nutshell

→EPBD.wise provides **on-the-ground support to six countries** for the implementation of the EPBD *recast* (**Poland, Hungary, Romania, Bulgaria, Greece and Ukraine**).

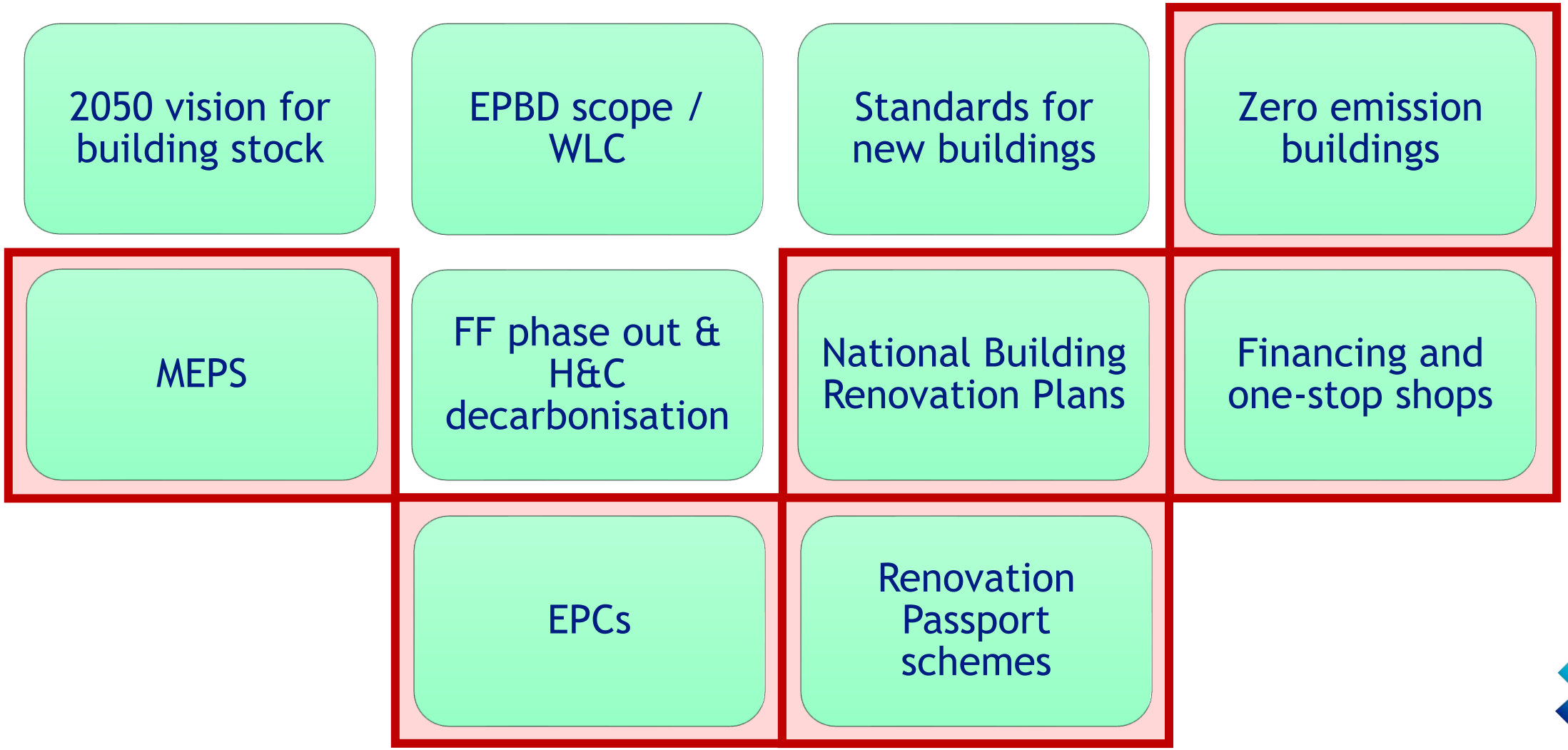
→EPBD.wise provides on-the-ground support for the implementation of **5 key elements of the EPBD**:

- **Minimum Energy Performance Standards**
- **National Building Renovation Plans**
- **Energy Performance Certificates**
- **Renovation Passports**
- **Zero Emission Buildings**

Goals of the project

- **Support Member States** in aligning new policies with EPBD and European, national, and regional targets
- Assist in ensuring **consistency among policies** affecting buildings to enhance their impact
- **Integrate monitoring and reporting** mechanisms into policy design for continuous evaluation
- Enhance understanding and **knowledge of building policy planning and design** among public administrations
- **Foster collaboration among implementing bodies** within and across Member States for effective EPBD implementation

Relevant sections from 2024 recast EPBD for EPCs+RPs



Challenges and synergies on EPCs + RPs

Challenges:

- ✓ **Awareness:** Building awareness about RPs and its role; training professionals for their issuance is crucial.
- ✓ **Cost and Affordability:** Balancing the cost of implementing RPs with existing EPC
- ✓ **Standardization and Transparency:** Currently, EPCs show high variation across member states, making comparisons difficult. Similarly, links between EPC databases and RPs are missing.
- ✓ **EPC Recommendations:** Most EPCs lack information on payback periods, cost-benefits, GWP, and indoor environmental quality (IEQ).

Synergies:

- ✓ **Role of EPC & RP:** Opportunity to define a clear role between EPC (support decision and information) and RP (support action)
- ✓ **Joint Issuance:** EPCs and RPs can be jointly issued, streamlining the process and potentially replacing EPC recommendations with the more detailed RP information.
- ✓ **Database Linkages:** Linking EPC databases with RPs can provide a more comprehensive overview of the national building stock for informed policy making.
- ✓ **Financial Incentives:** EPCs can be used to verify renovation improvements and link them to financial incentives while RP drive renovation.

Thank you for your time!

Funded by the European Union. 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 CINEA can be held responsible for them

OneClickRENO –

Buildings clustering meeting

21st-22nd May, Brussels

Instituto Valenciano de la Edificación (IVE)
Project coordination

Blanca Larraz

one click reno

May 2024

Co-funded by the European Union

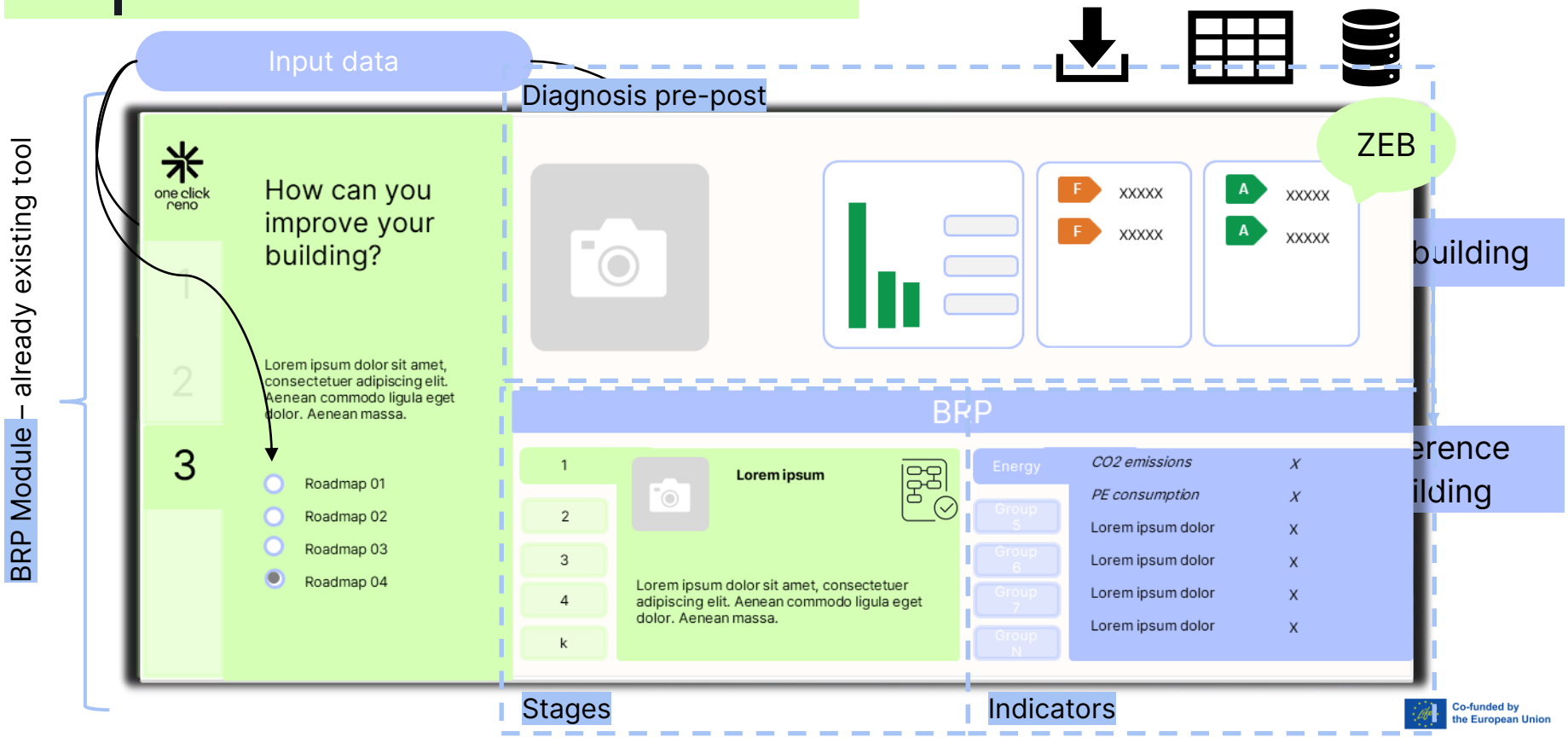
About the project

OneClickRENO objective: automatically generated and customizable BRPs

- GIS based web environment
- Existing tools
- Building location and user profile

Co-funded by the European Union

Expected outcomes



Co-funded by the European Union

Thank you

Co-funded by
the European Union

www.oneclickreno.eu

Co-funded by the European Union

energie sprong

giga regio factory

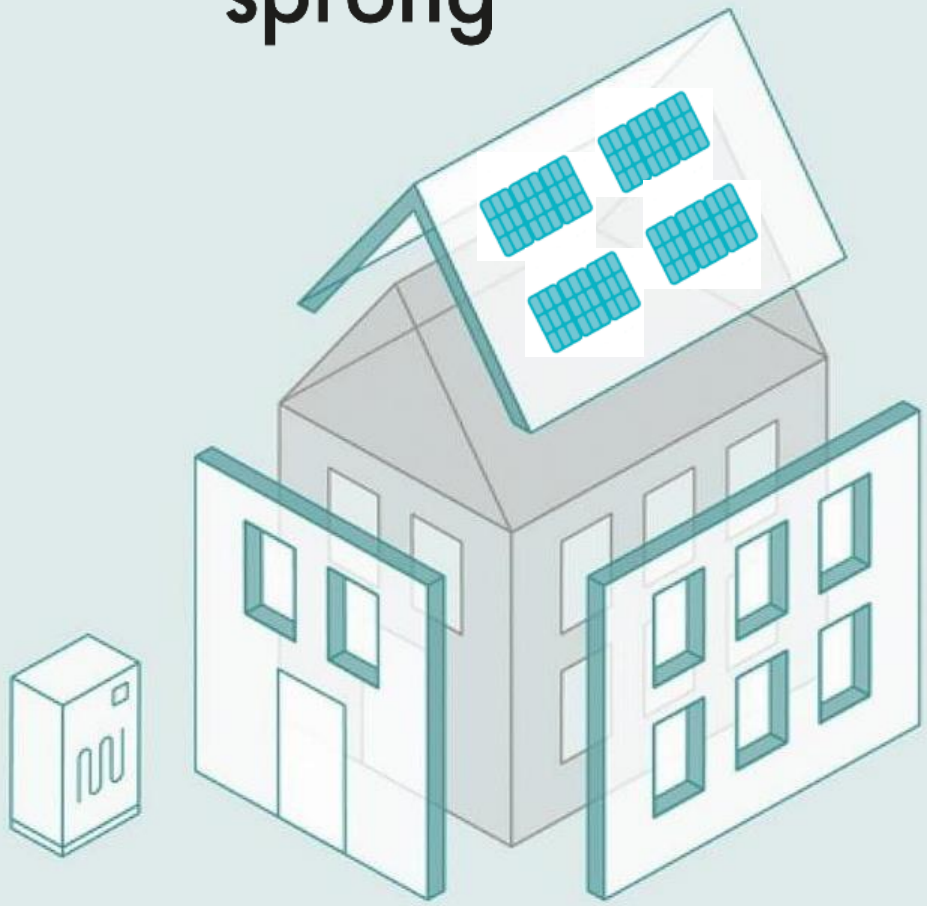
Project pitch

> CINEA Buildings Clustering Meeting 21-22 May

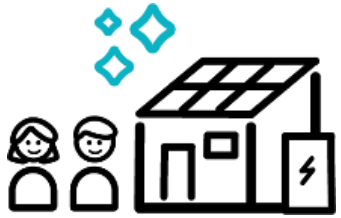
Co-funded by European Union

Energiesprong wants to solve the CO2 problem of our buildings by developing a mass-market for scalable nearly zero-energy solutions for existing buildings

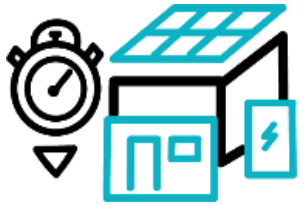
energie sprong



High likeability



Fast



SCALABLE

High quality

Affordable

➔ **We manage that with innovative design for serial refurbishment solutions as a complete product**


RPB Lot 4B
Opsial


Pilbot Bureau Construction

USH
Pays de la Loire
Association régionale Hlm
Atlantique Habitations
Bretagne Sud Habitat
cdc habitat
CISN
Résidences locatives
HABITAT44
Harmonie habitat
La Nantaise d'Habitations
Maine&Loire habitat
Mancelle d'habitation
Nantes Métropole Habitat
néotoa
Podeliha
Groupe ActionLogement
Saumur Habitat

Parc naturel régional Normandie-Maine
Parc naturel régional du Perche
Fougères
Mayenne
Laval
Le Mans
Sablé-sur-Sarthe
La Flèche
Tours
Chambray-les-Tours
Parc régional Loire-Touraine
Saint-Nazaire
Cholet
Thouars

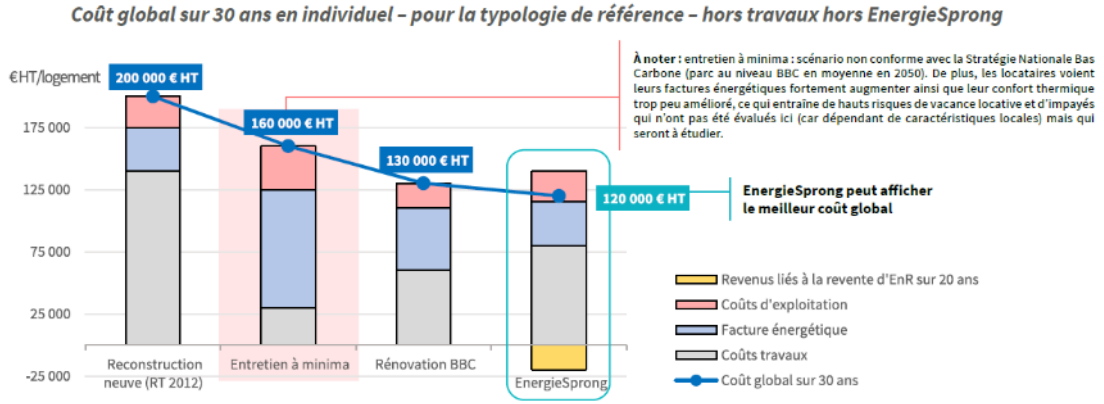
Now, from thousands to millions

giga
regio
factory

by energie
sprong

To scale up, we have to lower the costs, and it means better understanding buildings archetypes

Costs of operations — Linked to … — **Typologies of buildings**



Maison individuelle

3 typologies de maisons construites entre 1945 et 2000, représentant 60% des consommations énergétiques finales tous usages des maisons individuelles

	Maison isolée sur la parcelle	*Maison en bande*	*Maison semi-isolée*
Nombre et % sur le parc social construit entre 1945 et 2000	≈ 75 000 soit 17%	≈ 100 000 soit 22%	≈ 275 000 soit 61%
Nombre et % sur le parc résidentiel construit entre 1945 et 2000	≈ 7.5 M soit 75%	≈ 650 000 soit 6%	≈ 1.9 M soit 19%
Élévation	RDC ou R+1	R+1 généralement	RDC ou R+1
Toiture	Inclinée, double pente	Peu inclinée, double pente	Inclinée, double pente

Logement collectif

3 typologies de bâtiments construits entre 1945 et 2000, représentant 75% des consommations énergétiques finales tous usages des logements collectifs

	Petit collectif isolé sur la parcelle	*Petit collectif en bande*	*Grand collectif*
Nombre et % sur le parc social construit entre 1945 et 2000	≈ 200 000 soit 7%	≈ 150 000 soit 5%	≈ 2.5 M soit 88%
Nombre et % sur le parc résidentiel construit entre 1945 et 2000	≈ 800 000 soit 14%	≈ 600 000 soit 10%	≈ 4.4 M soit 76%

➔ **It is not only a question of volumes, the building archetypes are also important and better selecting them should help us to lower the costs**

To scale up, there is a potential for improvement in terms of culture and industrial capacity

Construction companies & contractors

Linked to …

Industrial capacities

The idea of catalog of solutions
(example : Future Factory)

Have to scale up if they want to meet demand

➔ Product development is the most important to lower costs and deliver serial deep renovation : doing off-site for single projects is not enough

ressorts energie sprong fr

giga regio factory

There is therefore a need to work better together to: plan to allow industrial development and thus reduce costs

Buildings owners issues

- **To know the solutions**
- To have **economically balanced** operations

➔ **Must plan their renovation strategies** and be able to aggregate homogeneous housing adapted to offsite renovation solutions, **for more efficient grouped approaches**

Integrators issues

Being asked to **do things faster and cheaper**: need for **new methods**

Solution providers issues

- **To know the existing building stock**
- **To have market visibility over time** to develop

➔ **Must scale up** and be able to catalog more easily their products and solutions according to the characteristics of the existing stock

Shared need for **COLLABORATIVE VISIBILITY**

Volume planned in time

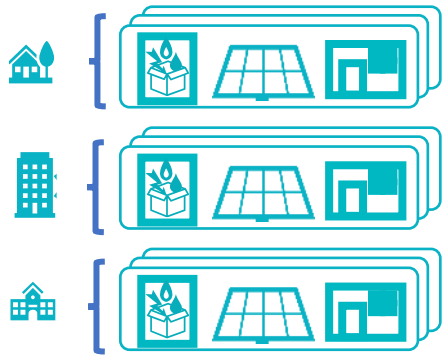
Adapted and scaled solutions

Cost reduction

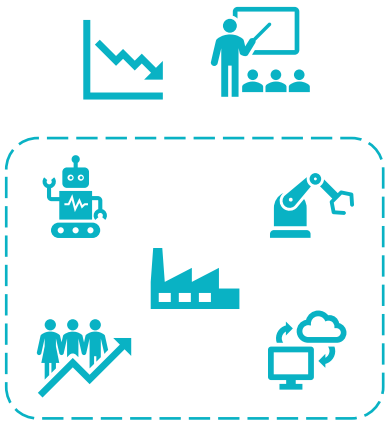
Life Giga Regio Factory's response: to facilitate this work by helping demand and supply side actors to scale up

1. Open-source tool for better aggregation strategies

2. Integration accelerator of industrial solutions



3. Kit Giga Factory for industrialisation



Enable more group purchases of renovation, more efficient, in several regions of Europe

➔ **Massify the demand to give volume and visibility**

Helping construction companies to industrialize and develop their solution catalogs

➔ **Accompany the evolution of the market**

Helping manufacturers and solution providers scale up to meet the massive demand

➔ **Develop industrial capacities**

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giga regio factory

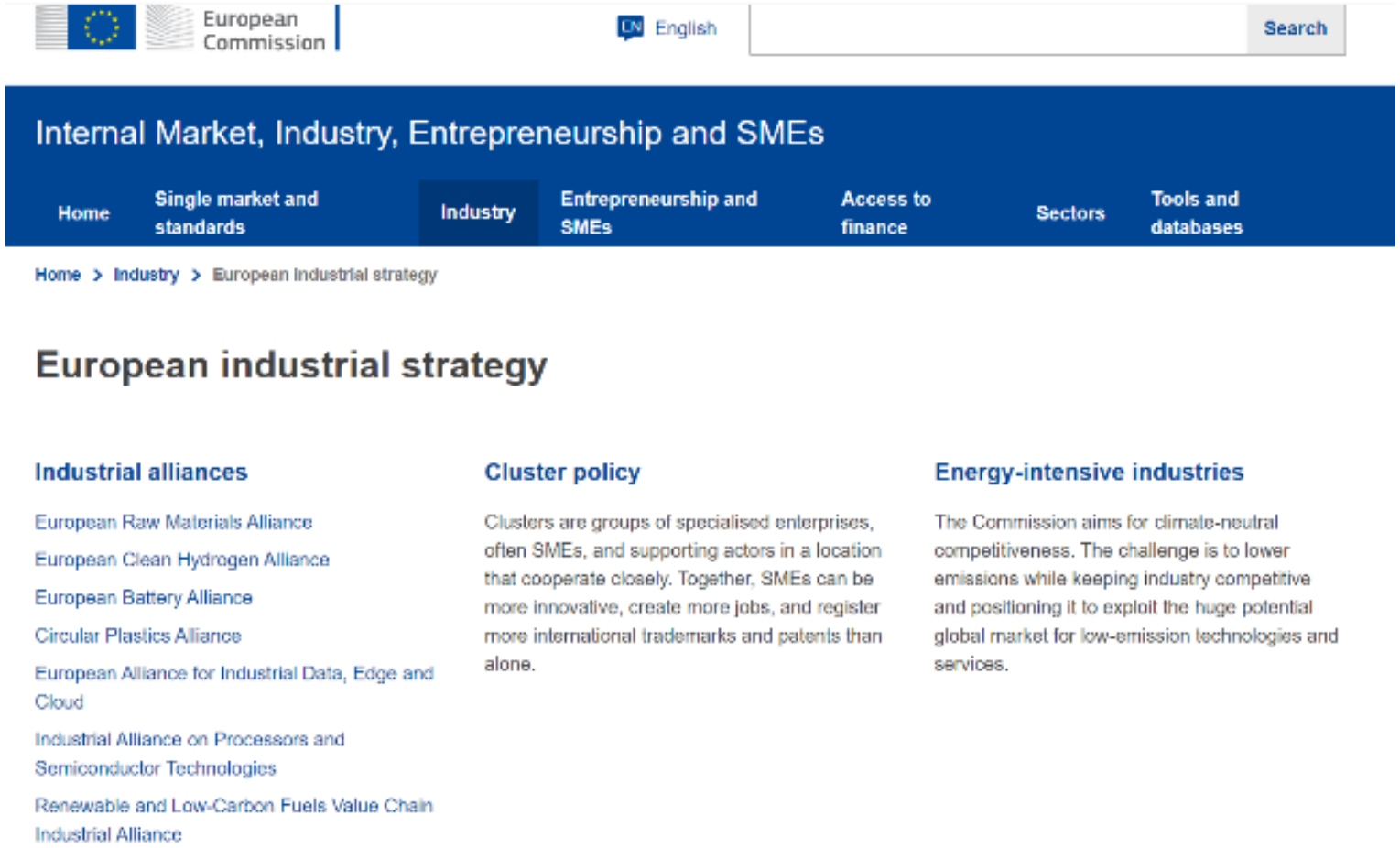
Giga Factory concept: dare to make nearly zero-energy renovation a desirable industry

Cars, batteries, materials, IT: OK!

But why not the renovation of buildings?

giga regio factory
by energie sprong

➔ **Create an image that considers renovation as an industry, just like other sectors**



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giga regio factory

To carry out this project, a consortium composed of 13 partners in France, Germany, Italy and Belgium

9 experts in consulting and social and environmental innovation

GreenFlex

HORS SITE
FORMER | INFORMER | ACCOMPAGNER

énergies demain

ressorts

POUGET Consultants

cstc.be
Recherche • Développe • Informe

GREEN WIN
FROM INNOVATION TO BUSINESS

greenInvest BERLIN

EDERA

4 beta testers: supply and demand side partners

est MÉTROPOLE HABITAT

AURA Hlm
Auvergne-Rhône-Alpes
Association régionale Hlm

BUILD

HOUSING EUROPE

This project aims to capitalize on the first industrialized zero-energy renovation operations carried out in France and in Europe, to support the change of scale

ressorts

energie sprong fr

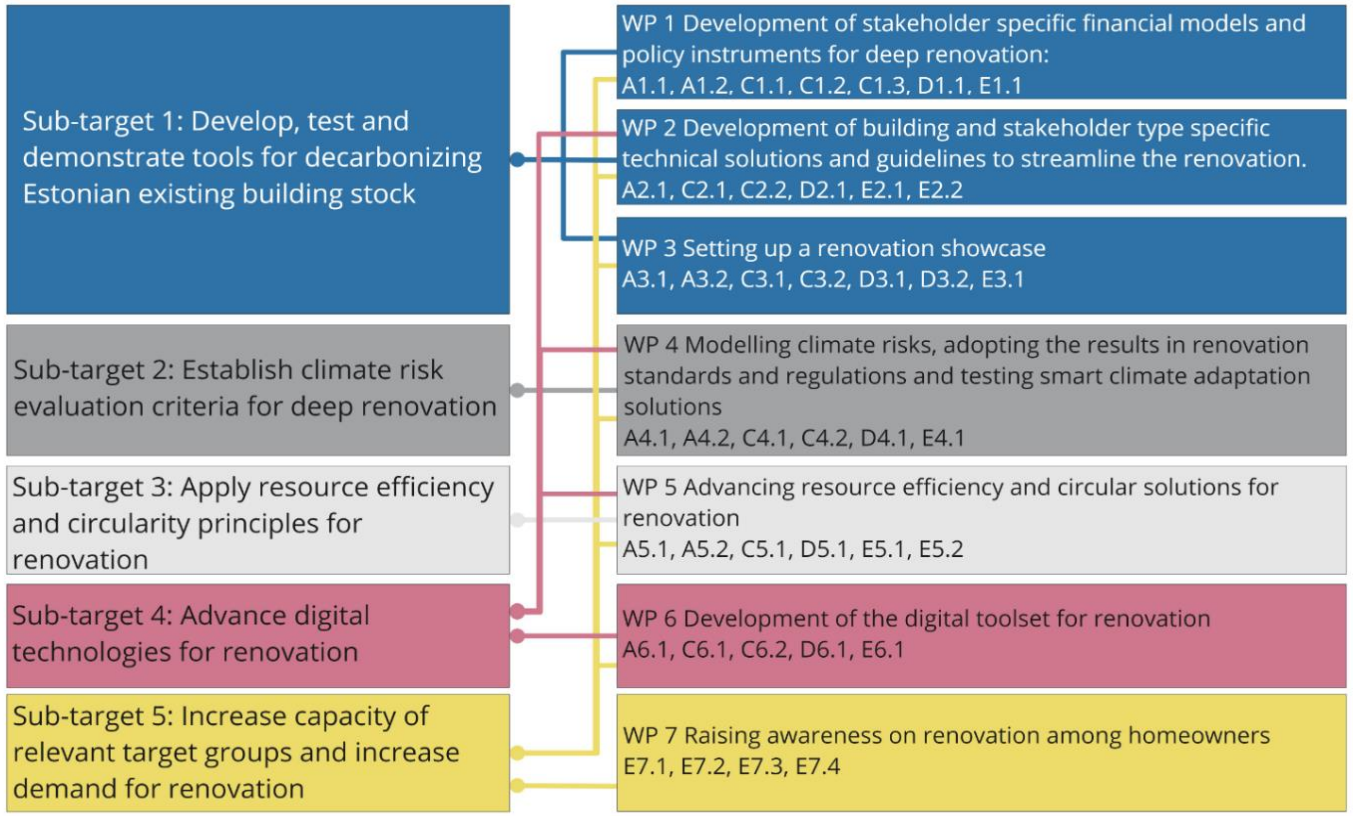
Life

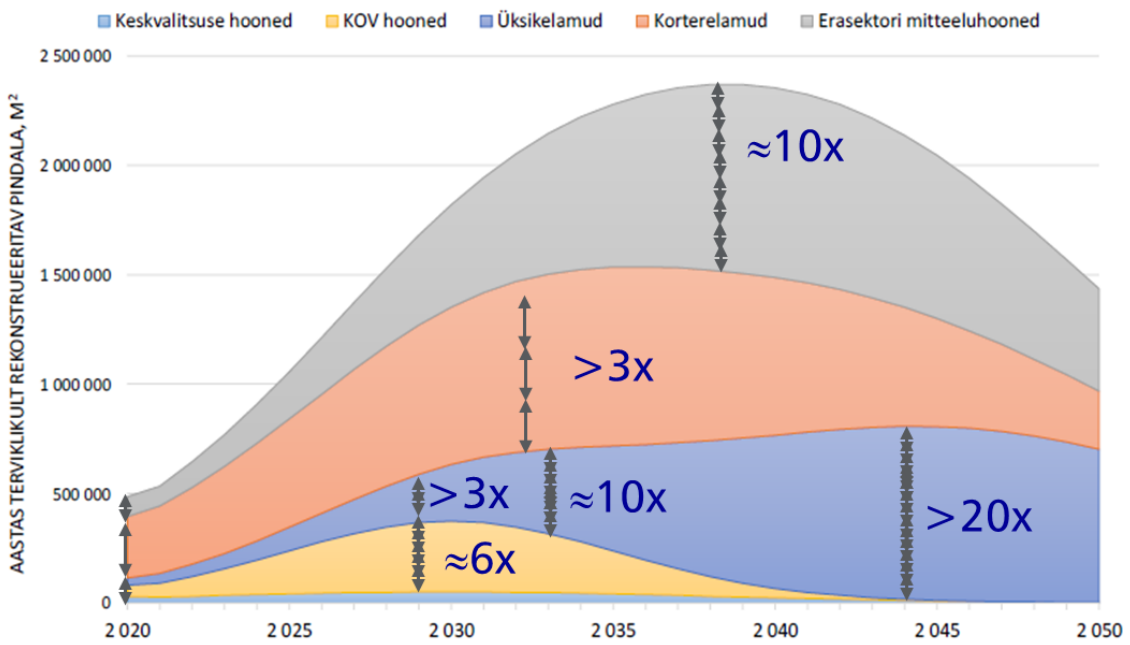
giga regio factory

LIFE IP BuildEST – renovation marathon in Estonia

www.kliimaministeerium.ee/buildest

2022-2028, 16,2 MEUR, 17 partners





Joonis 1. Kumulatiivne aastane rekonstrueerimise vajadus.

2003-2007
Loan: 8+%, short periods, insufficient funding
Grant: 10% (11 mln) – single works

2009-2014
Loan (KredEx): fixed~4%, 20y period, sufficient funding
Grant: 15, 25 and 35% (38 mln) – first deep renovation attempts (bad ventilation solution)

2015-2017
Loan: fixed ~2,5% 5y, 15-20y period, sufficient funding
Grant: 15, 25 and 40% (102 mln) – improved ventilation, more complexity, techincal consultants

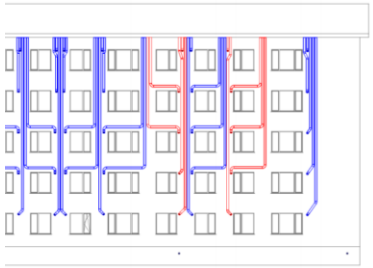
2018-2022
Loan: ~2,5% 20+y period, sufficient funding + KredEx loan for buildings with low value (bank not interested)
Grant (regional aspect): 30, 40 and 50% (ca 90 mln), different measures (partial, PV)
Pilotgrant for prefabrication: 50%, 19 buildings (ca 20 mln)

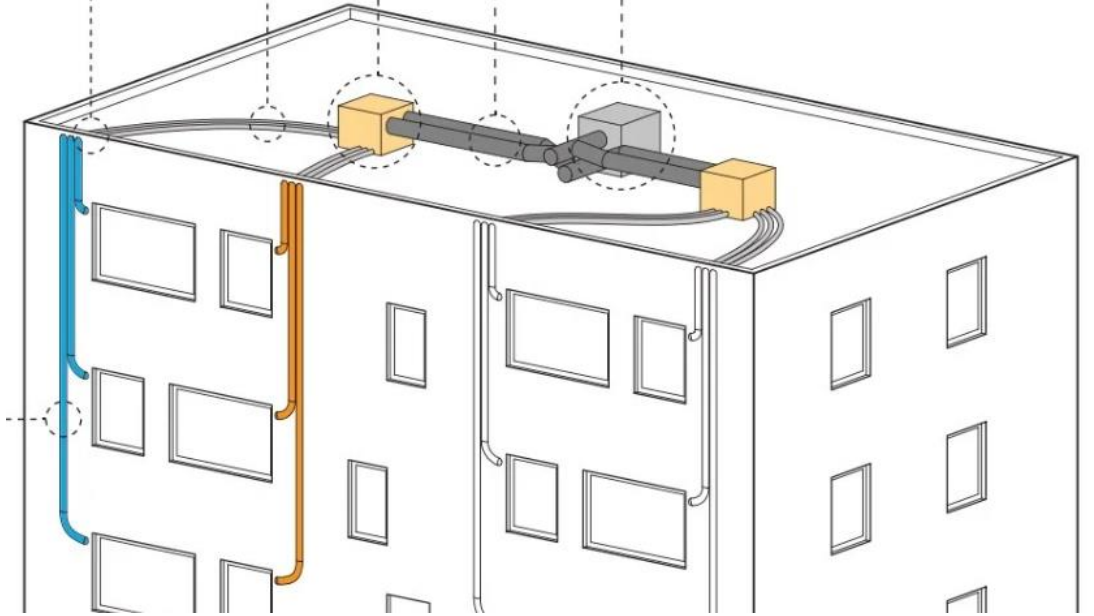
2023-2027
Loan: ~2,5% 25y period, sufficient funding + KredEx loan
Grant: 30 40 and 50% (330 mln) – even more regional aspect, more grant for prefabricated technology

Increased depth, quality, **ventilation** and energy savings, consultation, capacity building









Zehnder

Arcwood


DRIVE
MANITOU

Main project idea/purpose and implementation aspects, achievements/success stories

Dr.-Ing. Paris A. Fokaides, Euphyia Tech Ltd
paris@euphyia-tech.com

CINEA Cross-programme Buildings Clustering Meeting
21-22 May Brussels

Funded by the European Union

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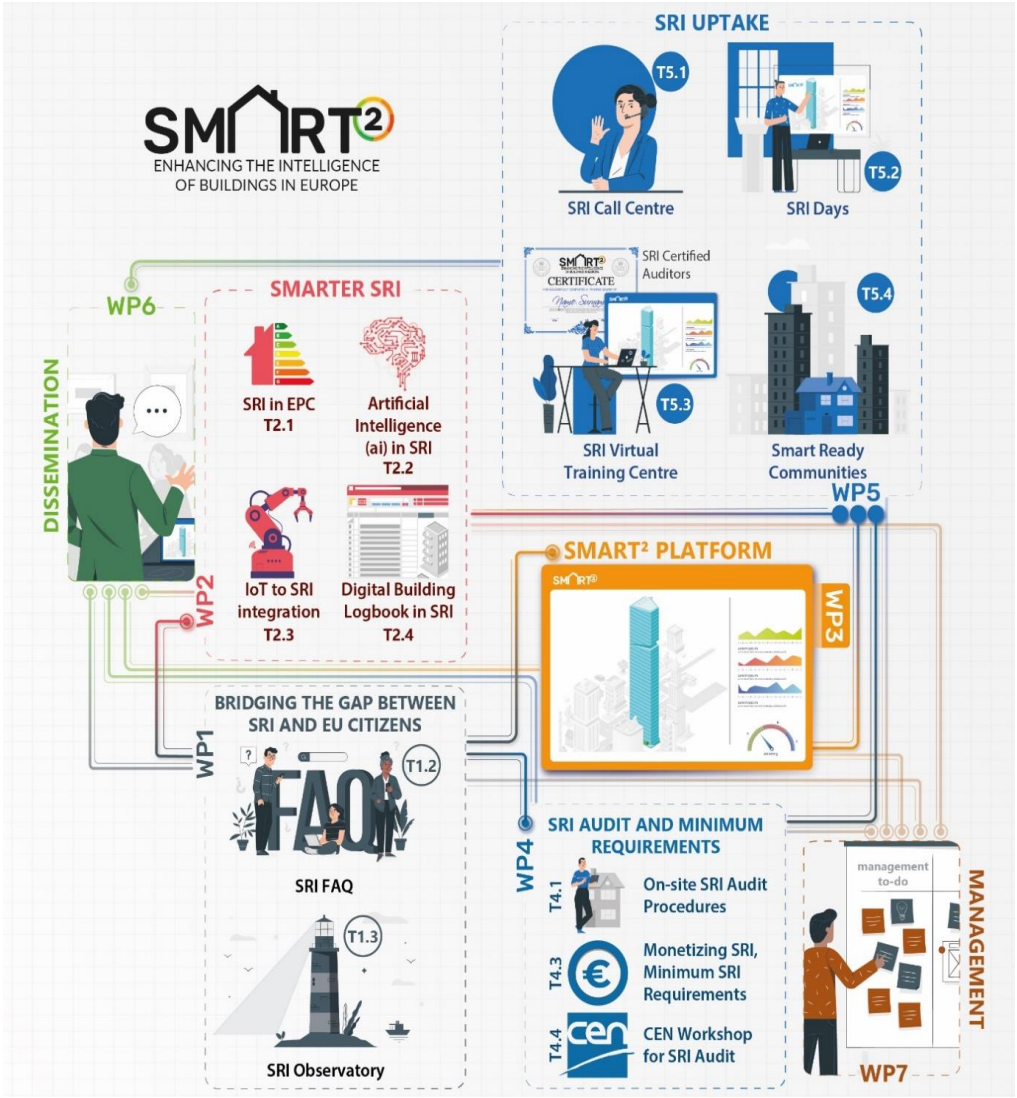
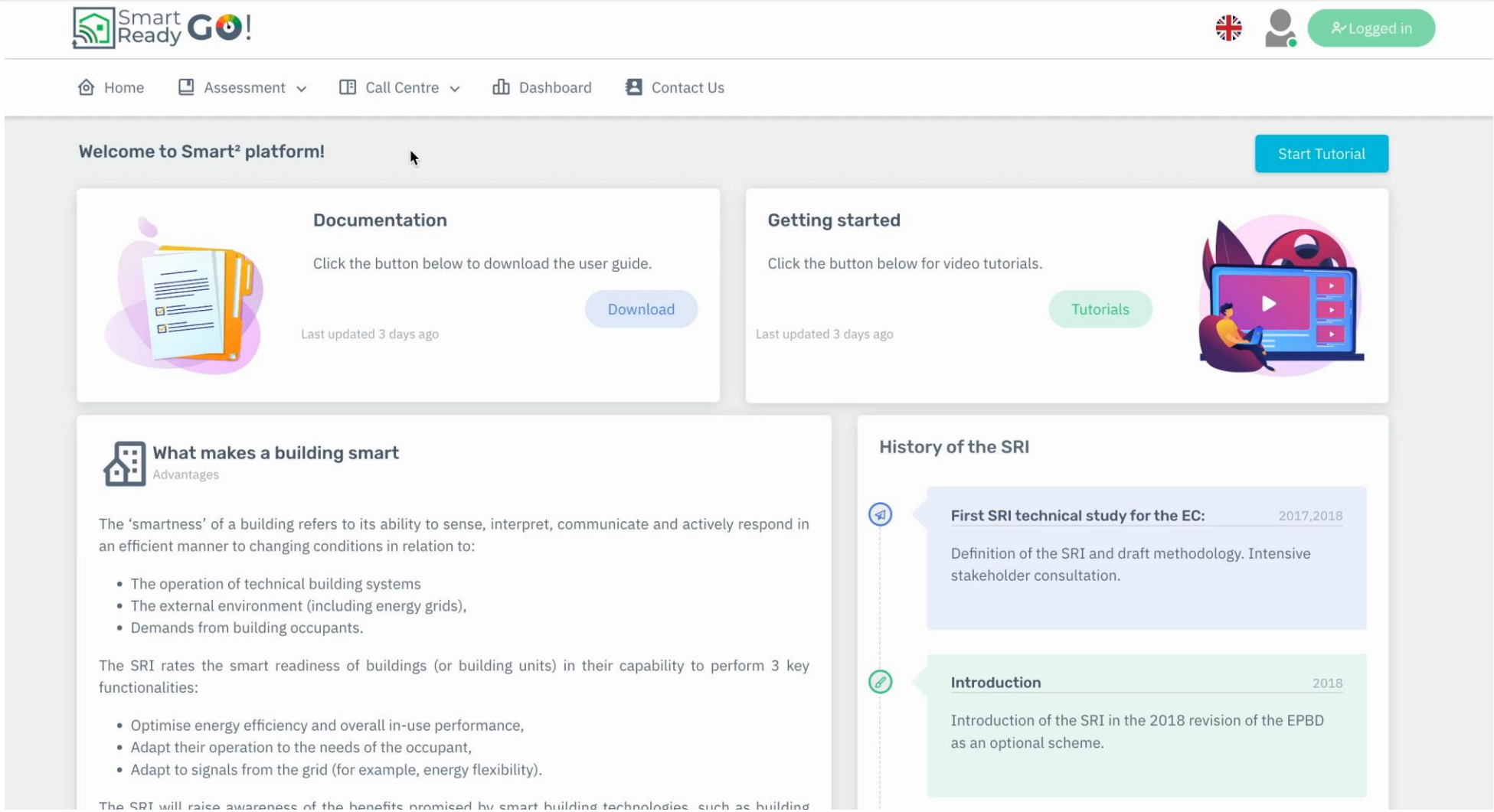
Smart Square Proposition

- The Smart Square project (https://www.smartsquare-project.eu/) provides innovative tools and solutions to promote SRI adoption across EU Member States, enhancing building intelligence.
- An open-access application, Smart-Ready-Go (www.smart-ready-go.eu), facilitates real-time SRI assessments of buildings using Method A, B, and a simplified method.
- The project launches additional activities like the SRI FAQ (https://sri-faq.eu/) and SRI Observatory (https://sriobservatory.eu/) to support demonstration and increase SRI uptake.
- Smart Square initiated a CEN Workshop aimed at defining best practices for conducting onsite SRI audits, ensuring standardized and effective processes.



Smart Ready Go! An open access tool for simplified SRI assessment

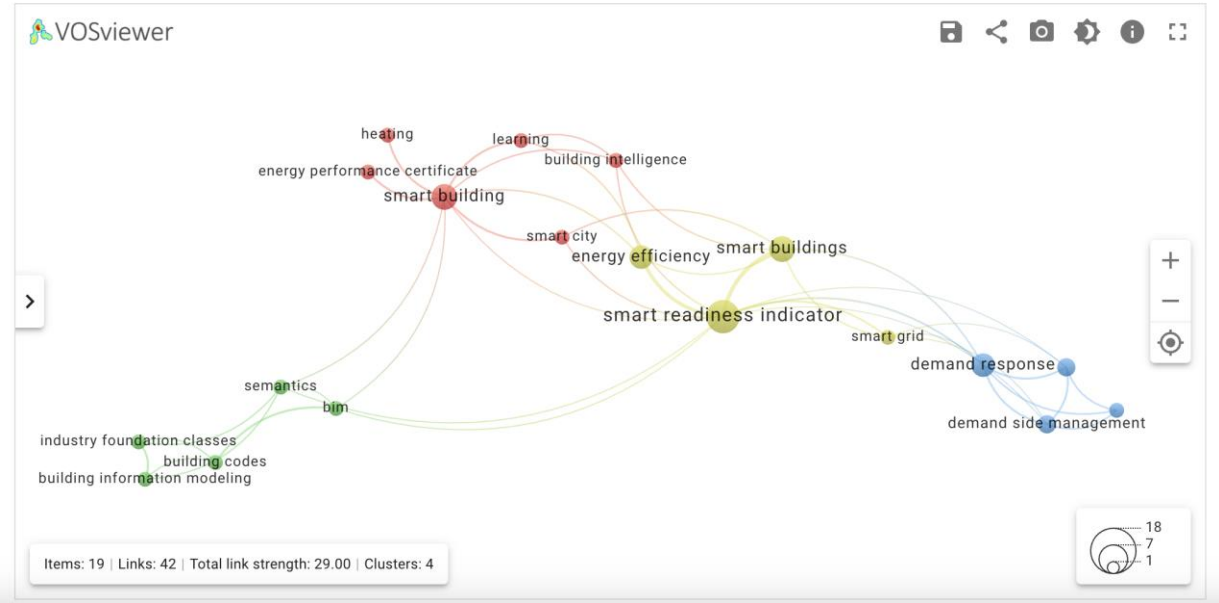


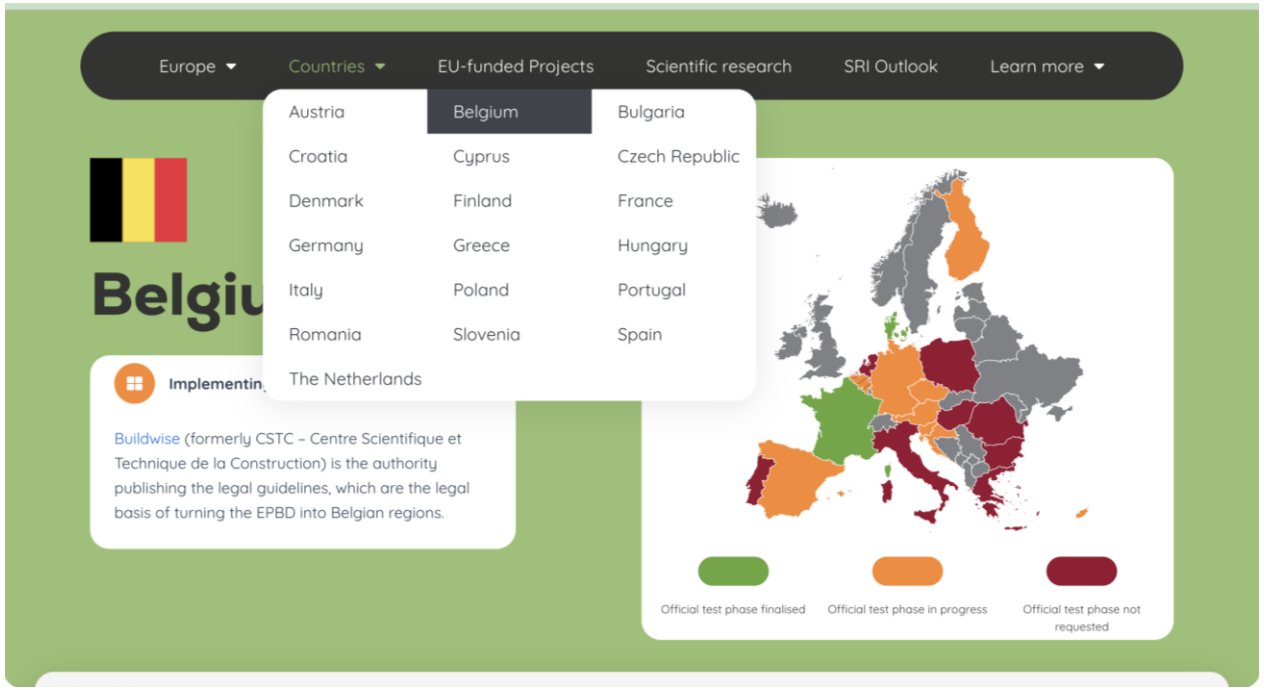
SRI Observatory! A hub for the SRI developments

SRI Observatory! A hub for the SRI developments

Building smartness research tracker

The approaches of scientific research on building smartness are diverse. However, the relevance of the Smart Readiness Indicator (SRI) in relation to smart buildings is remarkable. Other related research terms are depicted in the network graph below.

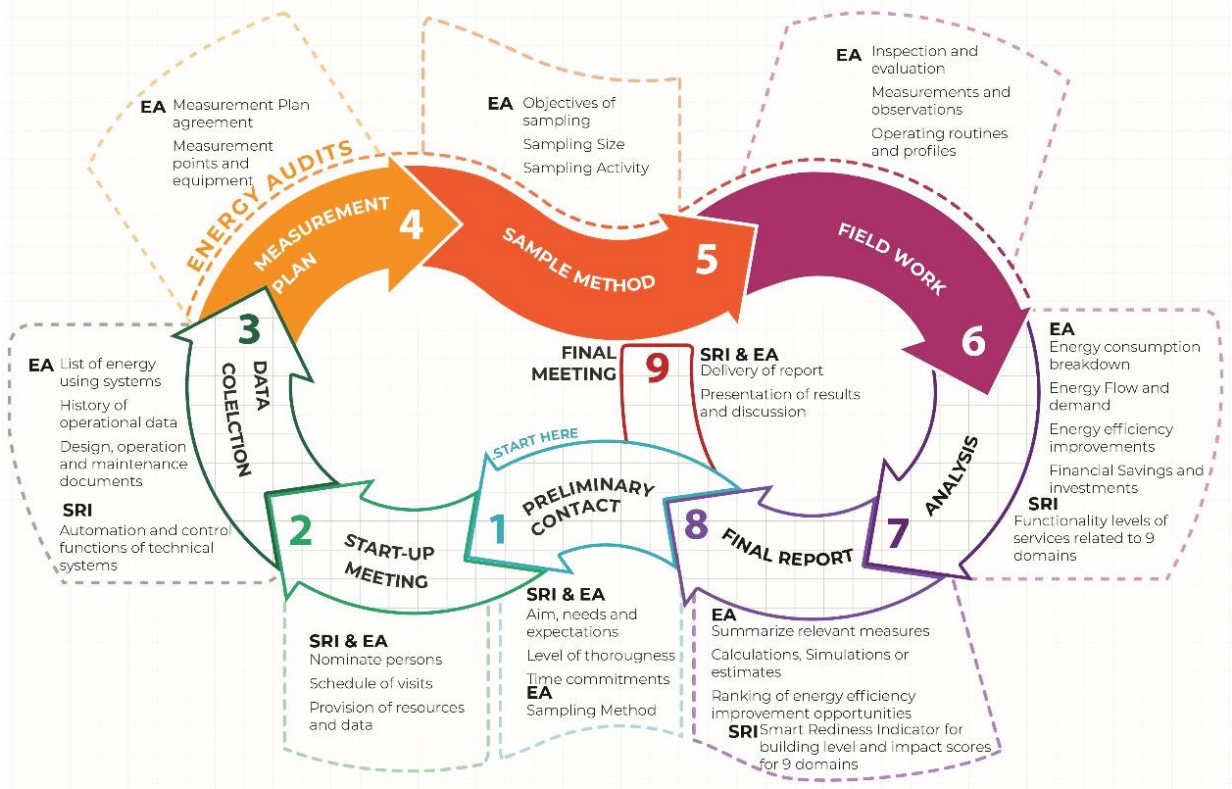




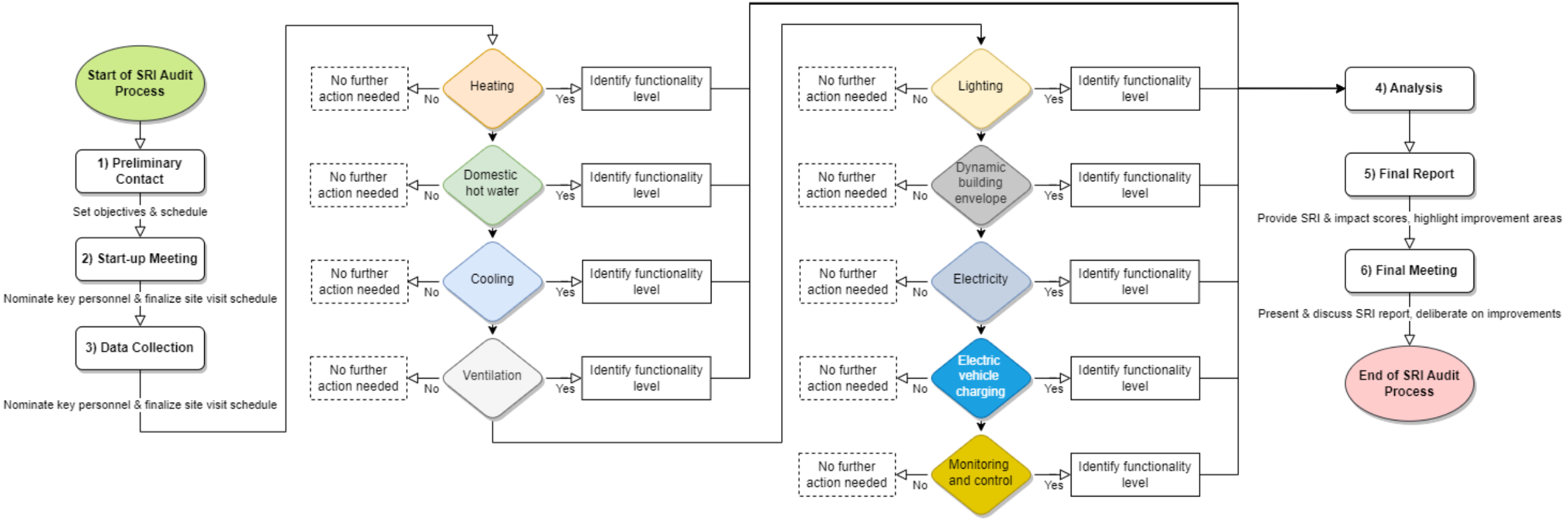
CEN Workshop for SRI On Site Audits

Step-by-Step Audit Procedure:

1. Preliminary Contact: Define audit objectives and scope.
2. Start-up Meeting: Nominate key personnel and finalize site visits.
3. Data Collection: Document automation and control functions.
4. Analysis: Assess functionality levels across nine SRI domains.
5. Final Report: Compile Smart Readiness Indicator and domain impact scores.
6. Final Meeting: Discuss report findings and potential improvements.



CEN Workshop for SRI On Site Audits



CEN Workshop for SRI On Site Audits

	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31
CEN/CENELEC Workshop	**Jan-24**	**Feb-24**	**Mar-24**	**Apr-24**	**May-24**	**Jun-24**	**Jul-24**	**Aug-24**	**Sep-24**	**Oct-24**	**Nov-24**	**Dec-24**	**Jan-25**	**Feb-25**	**Mar-25**	**Apr-25**
Initiation																
1. Proposal form submission and TC response																
2. Project plan development																
3. Open commenting period on draft project plan																
Operation																
4. Kick-off meeting																
5. CWA development																
6. Open commenting phase																
7. CWA finalised and approved by Workshop participants																
Publication																
8. CWA publication																
Dissemination																
Milestones	**B**		**K**		**V**	**M**	**V**	**V**	**M**	**V**		**A**			**P**	**D**

Main project idea/purpose and implementation aspects, achievements/success stories

Dr.-Ing. Paris A. Fokaides, Euphyia Tech Ltd
paris@euphyia-tech.com

CINEA Cross-programme Buildings Clustering Meeting
21-22 May Brussels

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CINEA Cross-programme Buildings Clustering Meeting

SRI2MARKET

Paving the way for the adoption of the SRI into national regulation and market

Prepared by Dimitrios Athanasiou & Filippos Anagnostopoulos
Institute for European Energy and Climate Policy

Brussels, 21-22 May 2024

Co-funded by the European Union. 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.

Project objectives

Setting up national campaigns

- Consulting national stakeholders
- Adapting the SRI calculation to national specificities
- Providing recommendations for policy makers and building owners
- Designing public funding schemes
- Exploring alternative paths to SRI certification

Developing a SRI assessment tool

- Enhancing the SRI calculation
- Running pilot cases to test the tool
- Training assessors
- Linking with Energy Performance Certificates

Support the targeted countries on introducing the SRI into their national regulation

Propose **public funding schemes** to finance SRI upgrades in buildings

Develop tools to guide SRI assessors and streamline building assessments

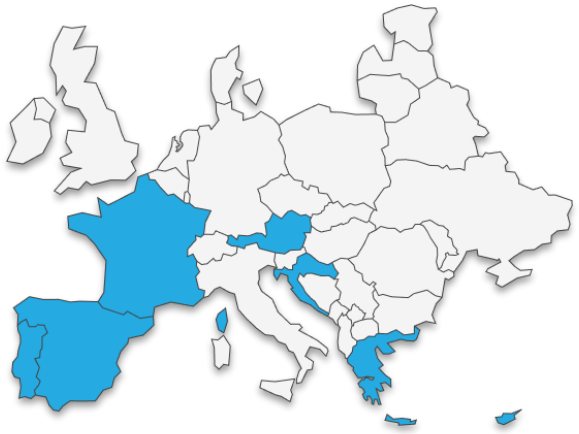
Provide **training** to EPC assessors on the SRI and the methodology of its calculation

Set up **SRI pilots** at national level identify best practices for SRI assessments

Provide **recommendations** to building owners and facility managers on cost-effective SRI upgrades

SRI2MARKET

Geographical coverage



EU countries	Partners
Austria	AEE INTEC, BOKU
Croatia	EIHP
Cyprus	CEA
France	R2M
Greece	UPRC, HEBES
Portugal	ADENE
Spain	CENER

Countries with ongoing test phases

AUSTRIA AND FRANCE

SRI2MARKET will learn from their tests and provide complementary support to their activities.

Countries with active interest in SRI

PORTUGAL AND SPAIN

SRI2MARKET will support with designing and implementing a testing phase, applying the lessons learnt from the first group.

Countries examining how to proceed

CROATIA, CYPRUS and GREECE

SRI2MARKET will engage national policy and market stakeholders to create interest in the SRI and the opportunities that emerge from it.

SRI2MARKET

Project outcomes

SRI assessment tool

The tool will provide a user-friendly interface for users to save their SRI assessments. The tool will also create dynamic scorecards according to pre-defined filters, and it will automatically compare SRI assessments of buildings situated in different countries.

E-learning platform

E-learning lessons on the SRI and its assessment methodology. The course will be structured in chapters and will rely on training materials such as videos and documents in every partner's national language.

SRI2MARKET

Project outputs and KPIs

SRI assessment tool: 3,000 users
SRI assessments: 1,200 total
Training on SRI methodology: 1,200 beginners, 600 experts
Use cases of cost-effective SRI upgrades: 30 total
Workshop for co-designing and evaluating business models:
20 representatives of ESCO and building EMS providers

Challenges and barriers

National specificities and priorities

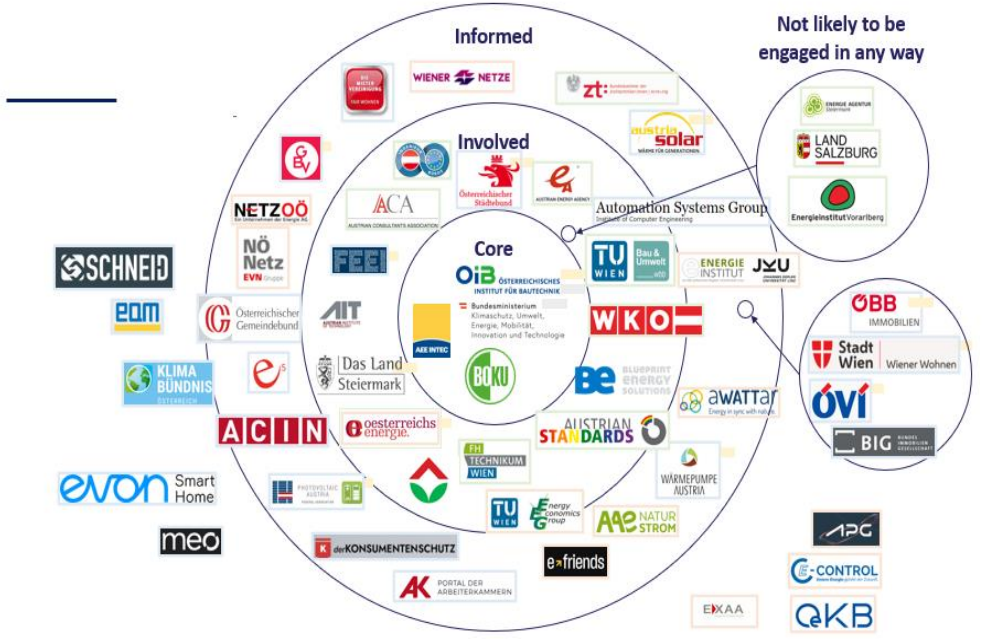
- Co-create with national authorities an SRI adoption roadmap fit to each participating country
- Assess in detail the boundary conditions of SRI implementation to prepare concrete roadmaps

Technical support

- Development of an SRI assessment tool
- e-learning material on the SRI
- Training of assessors (3 certification levels)
- Integration of EPC and SRI certification

Market & Stakeholder's engagement

- Setup of pilot campaigns at national level
- Map, identify and engage the relevant stakeholders in each national ecosystem (e.g. ->)



Success story: test phase in Spain and Croatia

CROATIA

The SRI test phase in Croatia is led by the Ministry of Physical Planning, Construction and State Assets and is supported by the Energy Institute Hrvoje Pozar (EIHP).

The decision for the test phase was influenced by the funding of the SRI2MARKET.

Projects involved: SRI2MARKET, SRI-ENACT

SPAIN

The SRI test phase in Spain is led by the Ministry for the Ecological Transition and the Demographic Challenge.

IDAE (Institute for Diversification and Energy Saving) is the public organization in charge of the EPC schemes, as well as the SRI instrument.

CENER and EFINOTATIC are technical partners of IDEA, and part of the group of developers chaired by IDAE to provide technical perspective and advice regarding the future evolution and development of the EPC in Spain.

Projects involved: SRI2MARKET, easySRI, SRI-ENACT

SRI2MARKET

Future developments and replication: interaction with the LIFE SRI Cluster & the SRI Platform

- **EasySRI** - Improving and demonstrating the potential of SRI
- **SRI2MARKET** - Paving the way for the adoption of the SRI into national regulation and market
- **SRI-ENACT** - Co-creating Tools and Services for Smart Readiness Indicator Uptake
- **Smart²** - Smart Tools for Smart Buildings: Enhancing the intelligence of buildings in Europe

SRI2MARKET

LIFE CET SRI projects **support Member States** to successfully plan the rollout of the SRI in their national regulation and markets.

The LIFE SRI cluster projects aim to collaboratively develop **complementary tools,** enhancing the effectiveness of SRI.

The projects strive to **support policy makers** by providing valuable insights and data, fostering informed **decision-making** in the realm of smart building assessments.

Our joint effort results in more efficient and effective outcomes, ensuring our results **complement rather than duplicate each other.**

Thank you!

Filippos Anagnostopoulos
IEECP

SRI2MARKET

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CLIMATE POSITIVE

ARV

CINEA Buildings Clustering Meeting
21-22 May, Brussels

Gloria Oddo
Project Officer, Architects' Council of Europe

CIRCULAR COMMUNITIES

KEY DATA

35 partners

8 countries

2022 - 2025

6 large scale demo projects

130 000 m2 renovation

25 000 m2 new construction

ARV is a Norwegian word meaning LEGACY or HERITAGE

CLIMATE POSITIVE CIRCULAR COMMUNITES

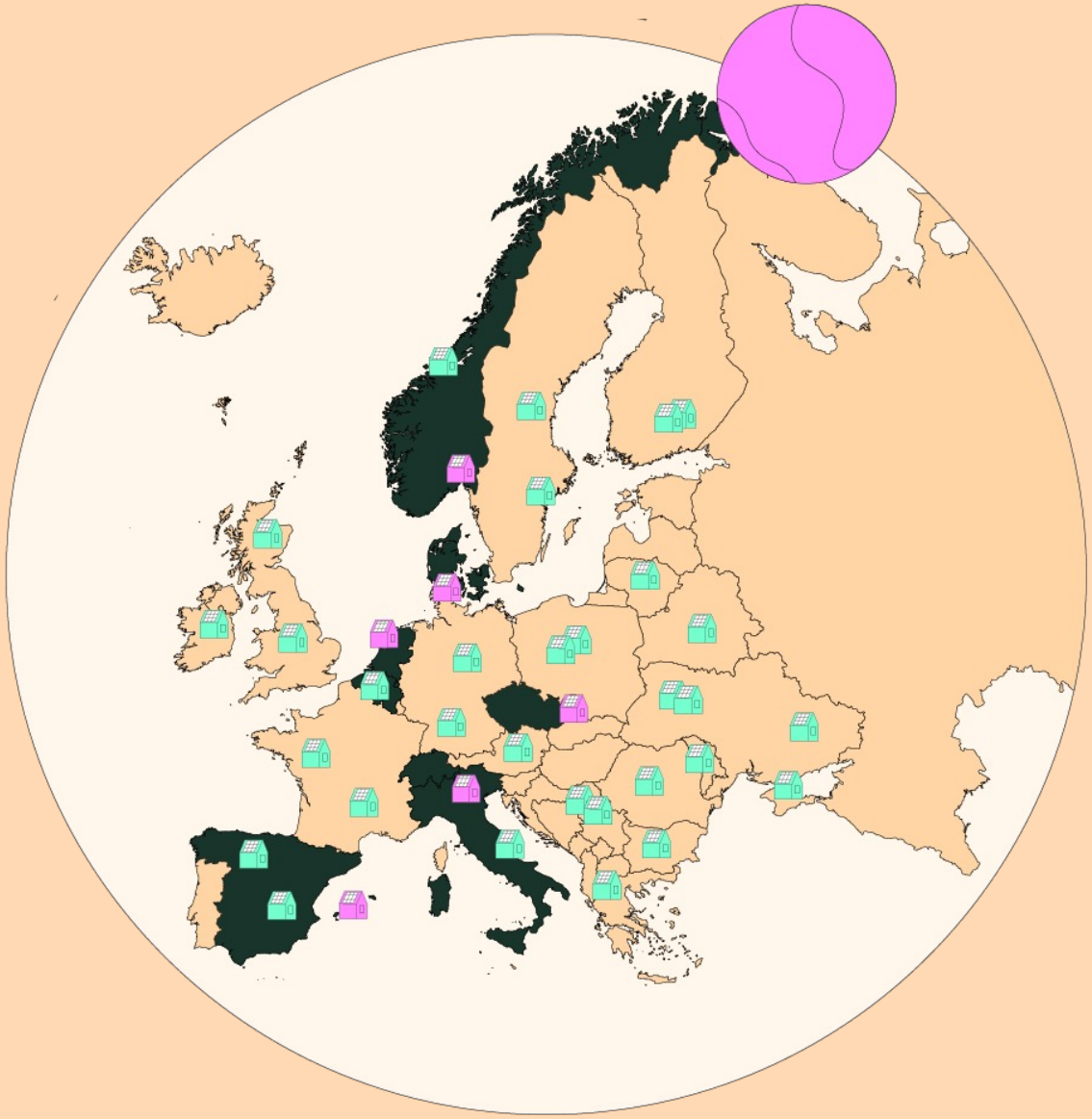
OUR VISION

To contribute to wide-scale implementation of **Climate Positive Circular Communities (CPCC)** where people can thrive and prosper for generations to come.

WHAT ARE CPCCS?

A Climate Positive Circular Community (CPCC) is an urban area which aims to achieve **net zero greenhouse gas emissions**, enables **energy flexibility**, and promotes a **circular economy** and **social sustainability**.

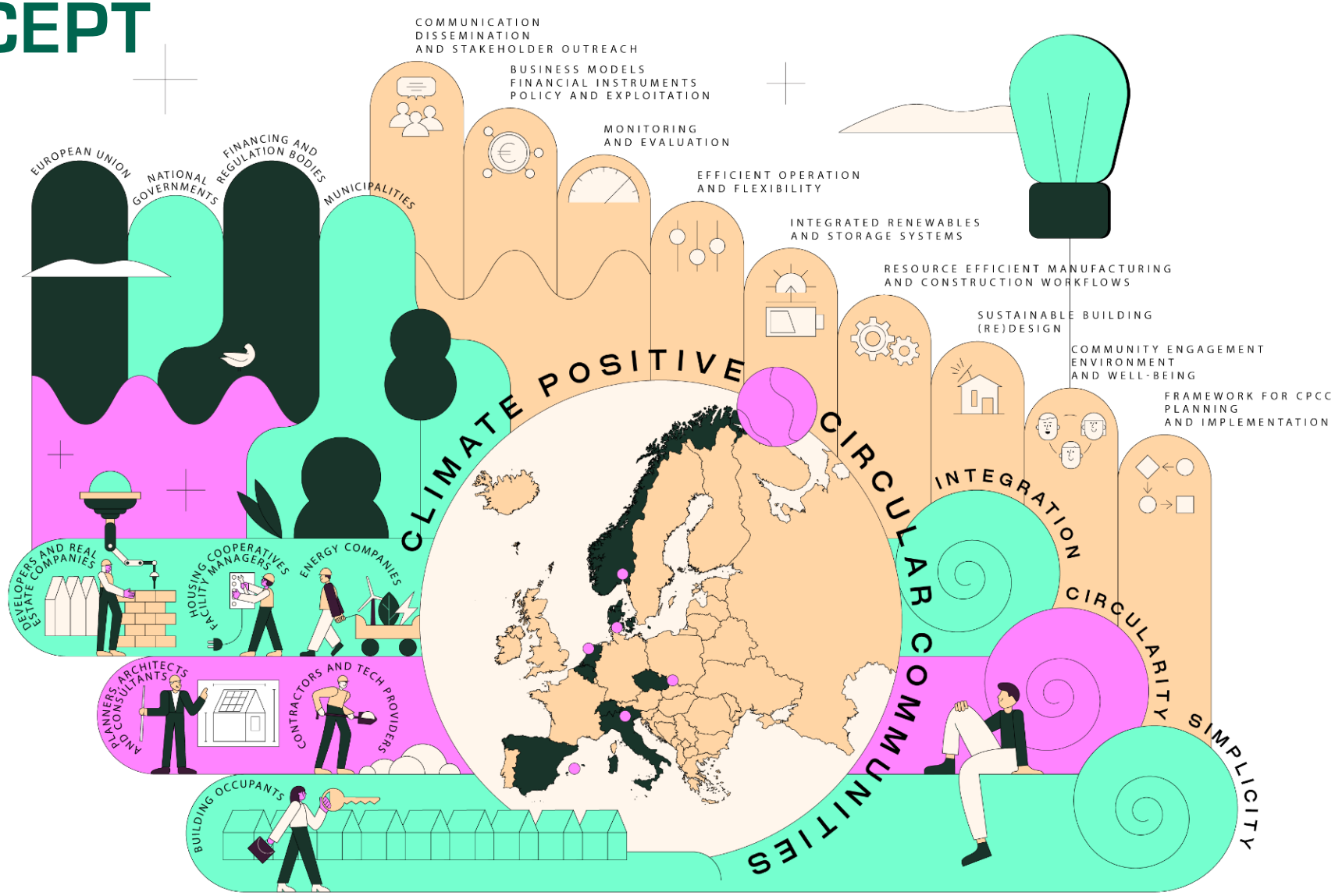
The CPCC concept focuses strongly on the interaction and integration between new and regenerated buildings, users, and energy systems, facilitated by ICT to provide attractive, resilient, and affordable solutions for citizens.



ARV

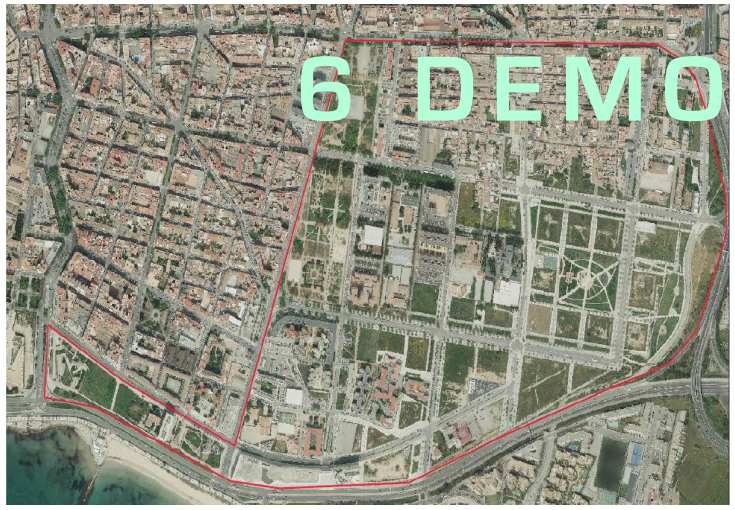
THE ARV CONCEPT

- 3 conceptual pillars
  - integration
  - circularity
  - simplicity
- 6 demo projects
- 9 focus areas



6 DEMO PROJECTS

Palma de Mallorca, Spain: Urban transformation of large city district into circular energy community



Trento, Italy: Renovation and new built area with innovative energy infrastructure

Utrecht, the Netherlands: Social renovation of residential blocks by industrialization

Karvina, Czechia: Living Lab for transformation from Coal district to PED and CPCC

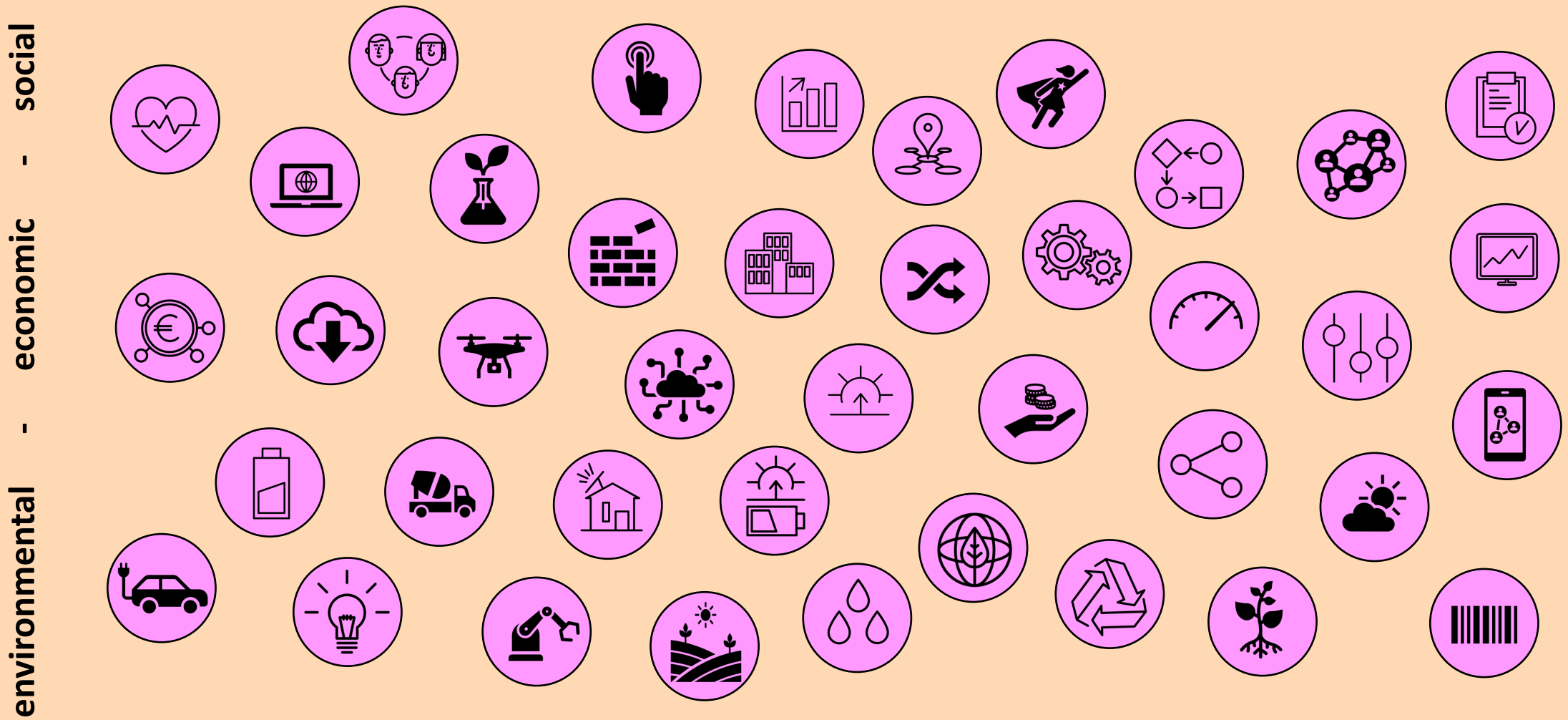
Sønderborg, Denmark: Smart and flexible homes embedded in district energy system

Oslo, Norway: School and cultural area as a lighthouse for CPCCs

KEY PERFORMANCE GOALS

	ENERGY	IEQ	NOISE & DUST	EMBODIED EMISSIONS	TIME	LIFE CYCLE COSTS	CONSTRUCTION COSTS
NEW BUILDINGS	**At least 50%** reduction in energy needs compared to current country building code. Positive energy level based on primary energy	High levels of indoor environment quality according to EU norms	According to the EU health, safety and environment standards	**At least 50% reduction** compared to local practice	**At least 30% reduction** compared to local practice	**At least 20% reduction** compared to local practice	**At least 30% reduction** compared to local practice
RENOVATION	**At least 50% reduction in energy needs** compared to pre-renovation levels. At least nZEB standard	**At least 30% improvement** compared to pre-retrofitting levels according to EN 16798-1:2019	**At least 30% reduction** in occupant disruption during retrofitting compared to current practice	**At least 50% reduction** compared to local practice	**At least 30% reduction** compared to local practice	**At least 20% reduction** compared to local practice	**At least 30% reduction** compared to local practice

MORE THAN 50 INNOVATIONS (SOON AVAILABLE ON OUR E-MARKETPLACE)



ARV

technical solutions - processes - methods and tools

Thank you!

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https://greendeal-arv.eu/

https://twitter.com/GreenDealARV

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101036723

iBECOME

Intelligent Building Energy Assets Control for Comfort, Energy and Flexibility Optimization

Presenter: Sara Momi, R2M Solution, on behalf of Dimitrios Ntimos, IES R&D, iBECOME coordinator

iBECOME Key Facts

Funded under:

H2020-EU.3.3.1. - Reducing energy consumption and carbon footprint by smart and sustainable use

Total budget **€ 4.9M** (requested EU funding of € 3.7M)

10 Partners – 4 Countries

48 months (June 2020 – May 2024)

Project demonstration in 4 sites

This project has received funding from the European Union's Horizon 2020 Programme under Grant Agreement no 894617

iBECOME intended to demonstrate a combination of novel technologies for

Reducing energy bills in a building or facility through energy savings and demand response **by**

leveraging IoT, data analytics and the efficient control of a building, **to**

1 improve occupant wellbeing and optimising comfort while

2 enabling additional services (e.g. EV charging optimisation, etc.)

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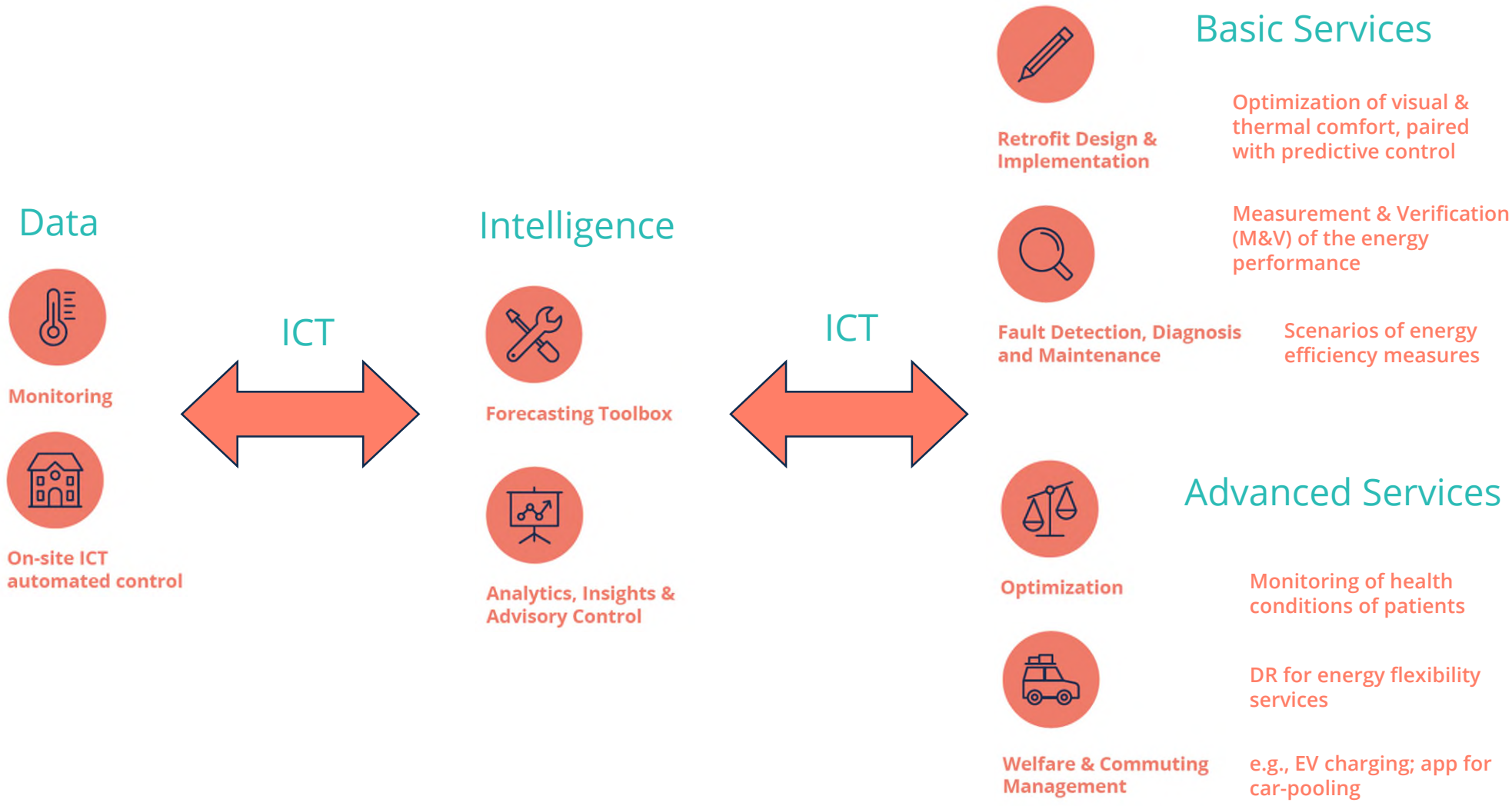
The iBECOME virtual Building Management System (Software-as-a-Service)



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Business Models:
2 types of Energy Performance Contracts

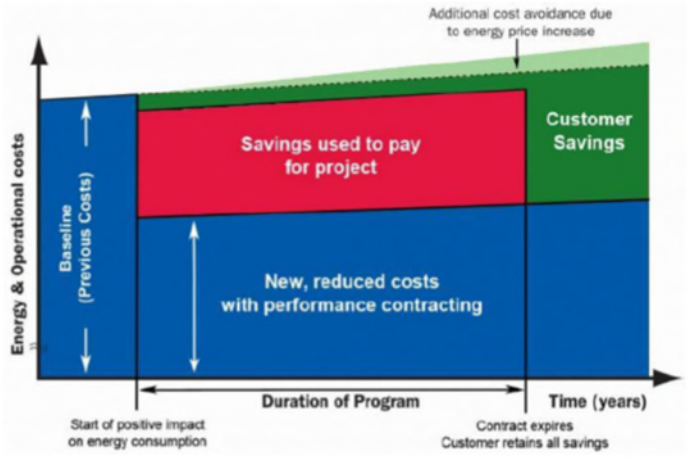
Agile EPC

Direct agreement between stakeholders
Deploy as SaaS
Revenue from operational energy savings

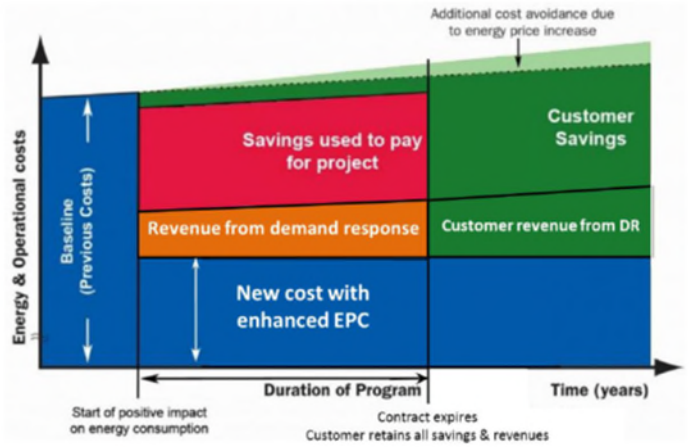
Enhanced EPC

Define the optimal retrofit
Commission the retrofit
+
Agile EPC = revenues from DR

Traditional



Enhanced



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iBECOME

Demonstration in 4 Pilots

Just vBMS installed, No BMS

vBMS combined with retrofits and BMS

Country Crest, Ireland

Food Processing Facility

Helix Building, Glasgow (UK)

Office

ASP Venzone (I)

Care Home

World Trade Center, Grenoble (FR)

Business Center

Success Story: The Helix Building, Glasgow, UK

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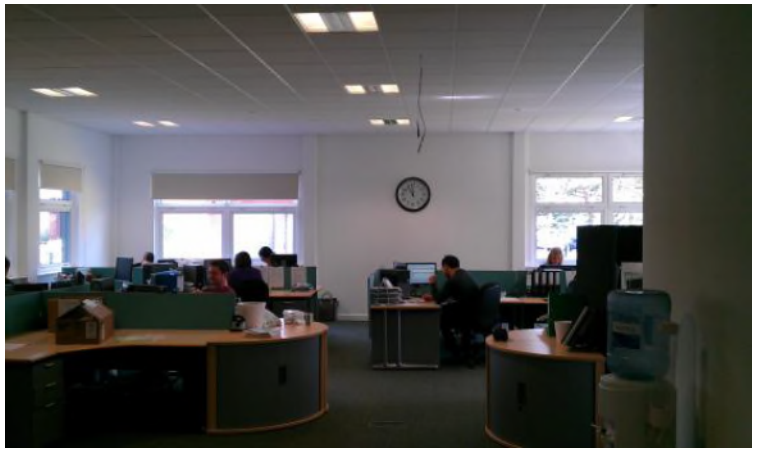
Audit/Survey – Issues



- No BMS, just IoT sensors/meters
- Heating is on a weekly schedule
- No local heating control
- Pre-heating not enough (very cold winter days)
- Meeting rooms either cold or overheated
- Air quality issues in meeting rooms

Facility/Energy Manager Workload

- Navigate daily-weekly to 4-5 apps
- Just energy bills to check energy use
- Receive complaints and adjust heating manually
- Use spreadsheets to track and report
- Maintenance needs & issues not noticed on time

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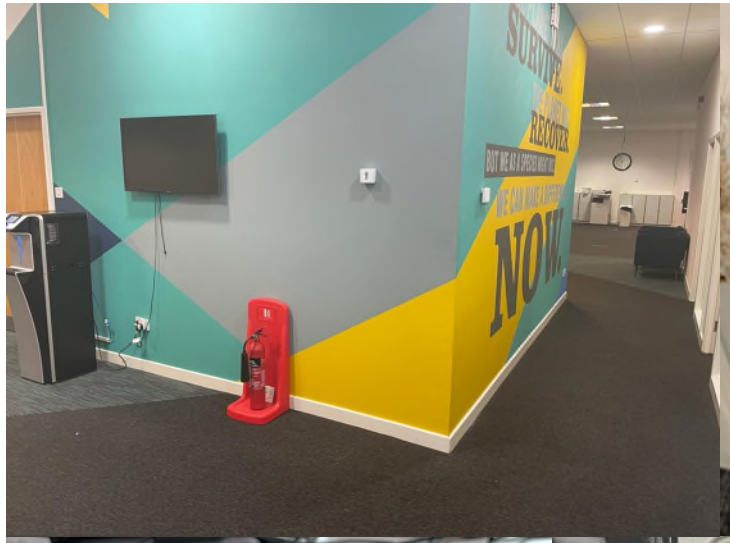
Solution: minimum hardware required



Off-the-shelve hardware from the market

- Portable WiFi space thermostat
- Smart TRV valves
- Window sensors
- Cloud access to Sensors & Heat/Electricity meters
- LED indicators

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Solution: with iBECOME vBMS

- All the live/historical sensor/meter data from all the hardware in one place
- Dashboard for the Energy/Facility manager
- Alerts for data gaps/anomalies
- CO2 alert in meeting rooms
- Calibrated energy model to calculate what-if scenarios and M&V
- ML Comfort predictions
- ML Heating Valves fault detection
- Battery degradation predictive maintenance
- Threefold Automatic control of heating
  - Occupancy based in meeting rooms
  - “Smart” pre-heating based on next day weather forecast
- Energy savings calculations using M&V
- What-if scenarios for decarbonisation

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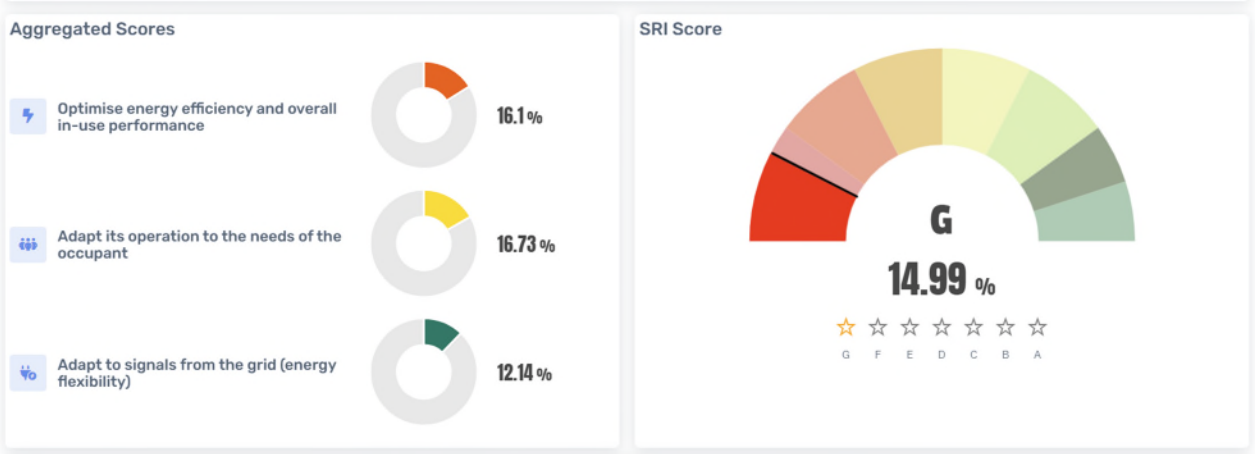
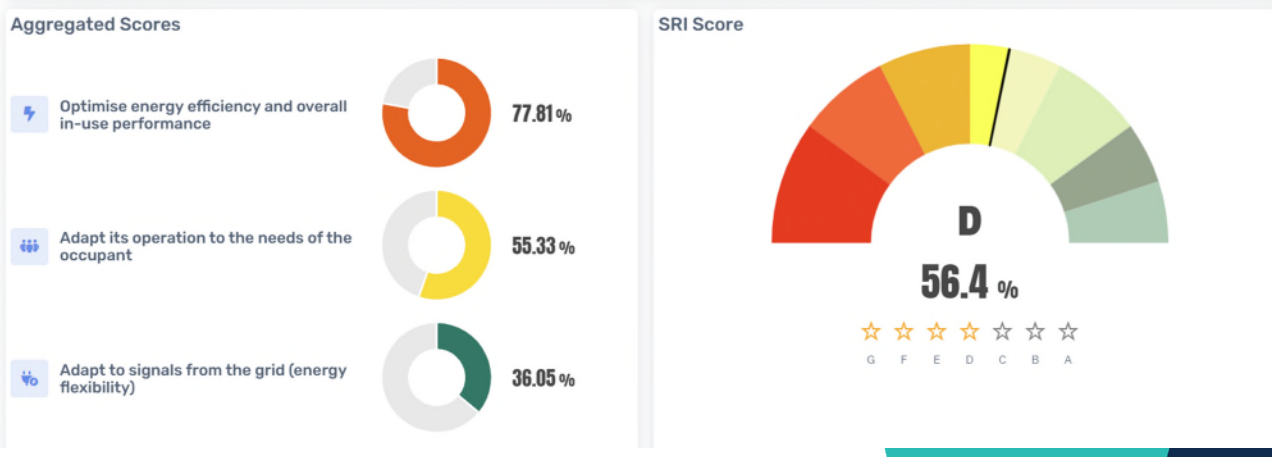
Helix Building: Smart Readiness Indicator before and after

Before iBECOME



After full iBECOME solution



Calculated using Smart Ready GO! https://www.smart-ready-go.com/

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Challenges and barriers

- COVID-19 caused big challenges: use of offices & air quality; delays in purchasing equipment; increase in prices of energy vectors
- Mechanical failures during installation of equipment = delays and increased costs
- Software deployment and interconnectivity between various components = delays
- Not so easy to fully assess energy & non-energy benefits of the iBECOME solution

Needs for future development

- Deploy all solutions for full winter/summer seasons, 2-3 full years and check outcomes
- Automated remote control (using Machine Learning) + energy modelling still very challenging, and costly for smaller buildings
- Need to replicate in > buildings & climates (focus on extreme weather phenomena
- Need to find a way to keep energy models calibrated for a long period of time

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Thank you!

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