

Smart Buildings & Data

Project pitches and panel session



MATRYCS



interconnect





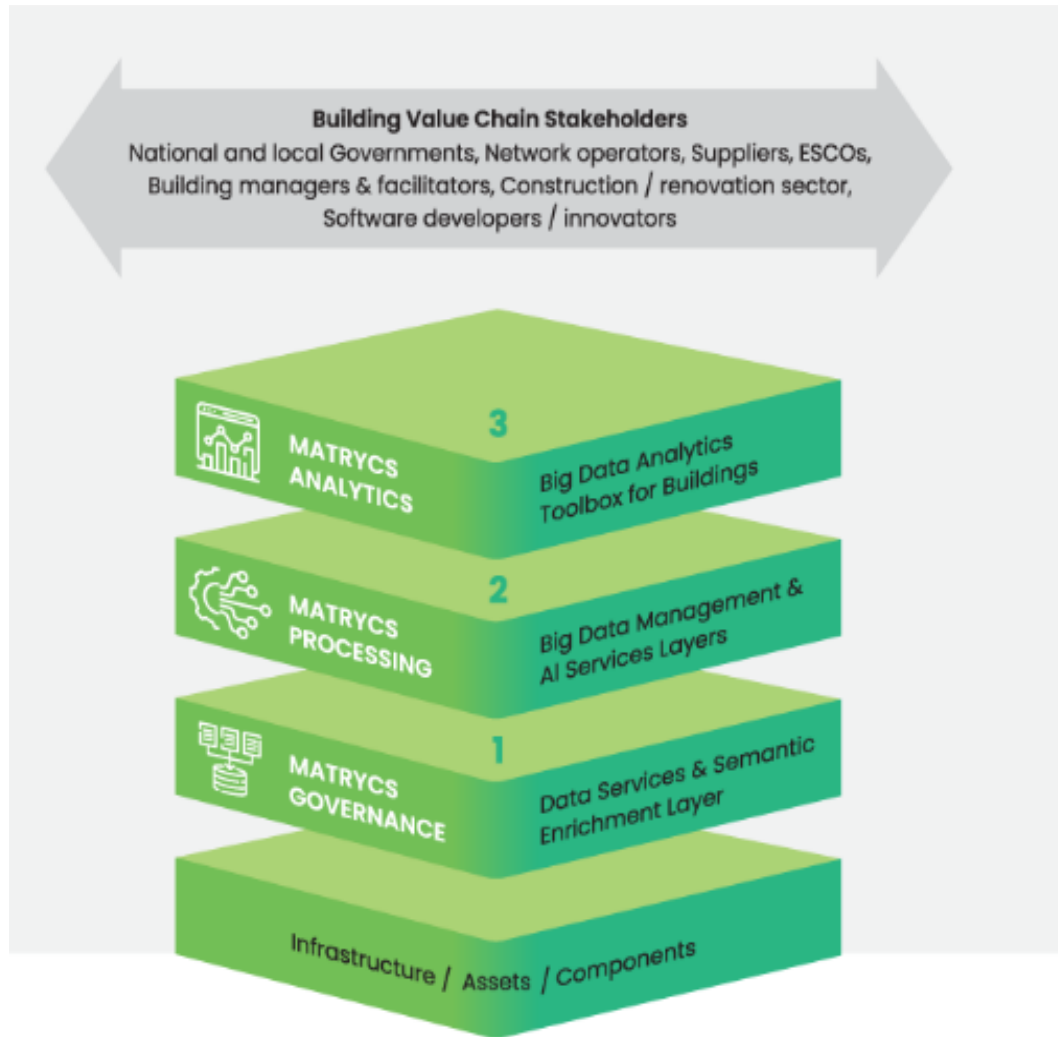
MATRYCS

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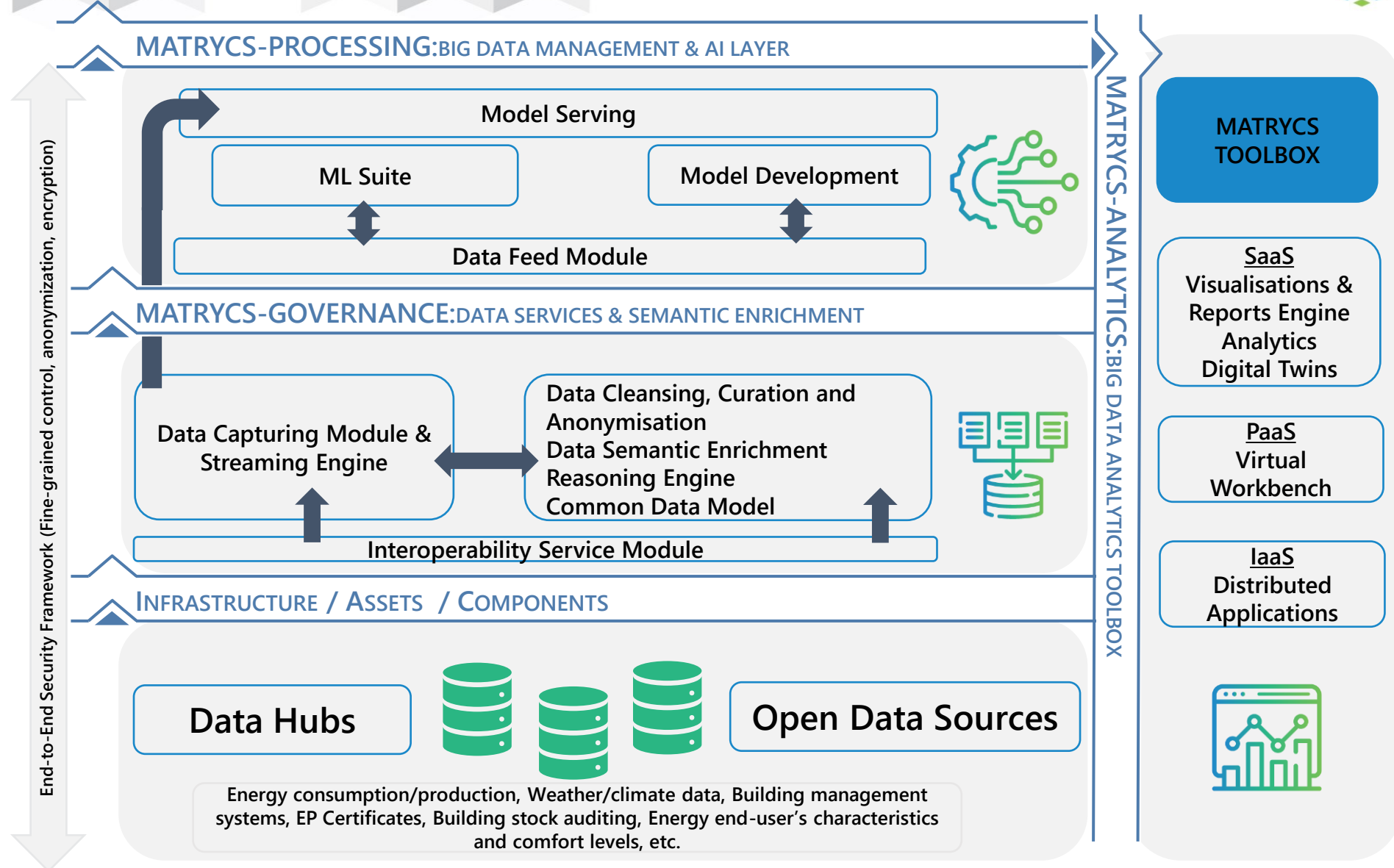
SmartBuilt4EU Final Conference

Roman Mendle (ICLEI)

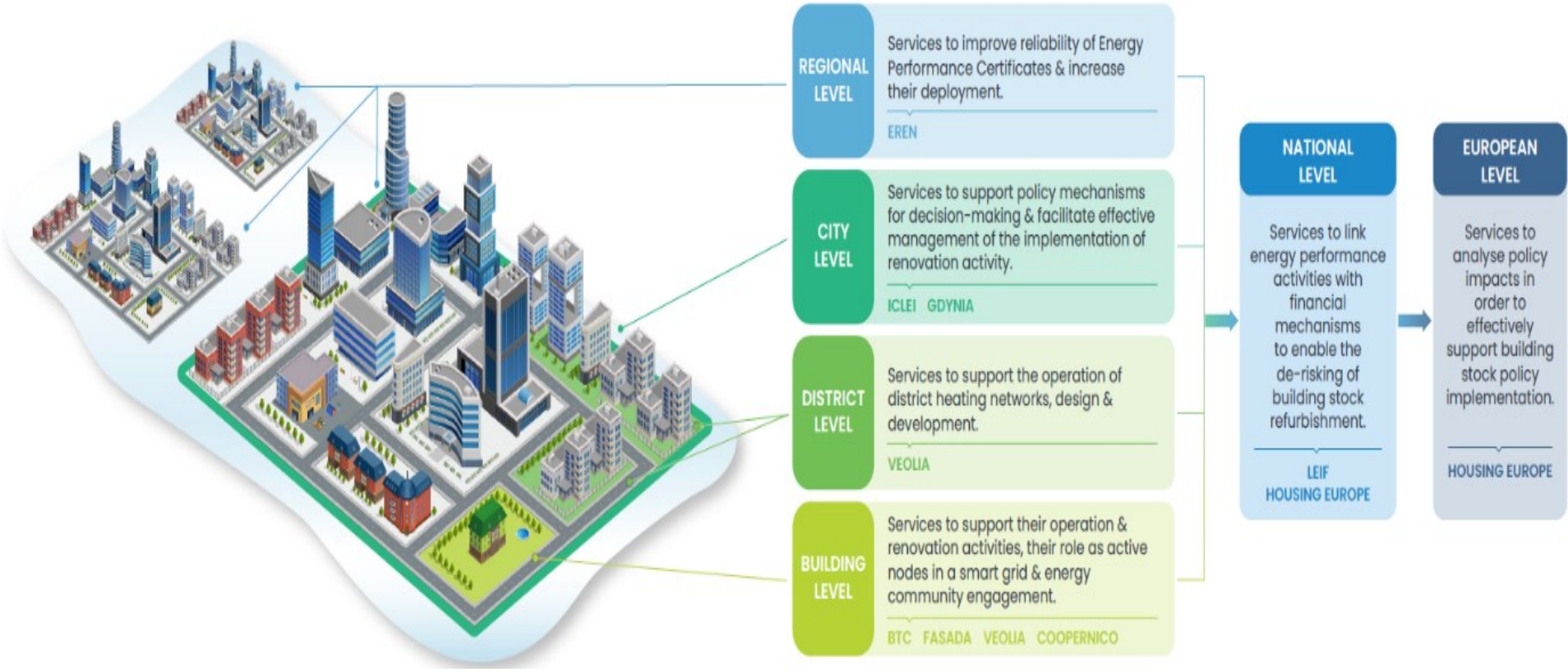




- **Holistic, state-of-the-art AI-powered framework** for decision-support models, data analytics and visualisations in real-life applications.
- Building energy management will be elevated to a new level through **improved data processing, analysis and aggregation.**
- MATRYCS envisions to become the greatest **energy marketplace of big data and services in the building sector.**



Large Scale Pilots




BDA Process

The Big Data Alliance is based on a cyclical stakeholder process to connect and utilize open data sets.




Added-value stakeholder mapping and inclusion



Asset aggregation: data access and capacity


User and decision maker needs assessment


Partnerships for access, analysis and applications


Ideation and co-creation of solutions


Advocacy, marketing and dissemination of results


Link to other initiatives

Join us on bda.matrycs.eu !





MATRYCS

Modular Big Data Applications for
Holistic Energy Services in Buildings


Thank you!

Roman Mendle, ICLEI


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 www.matrycs.eu


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The MATRYCS project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no.101000158



D²EPC

D²EPC: Next-generation Dynamic Digital EPCs for Enhanced Quality and User Awareness

Grant Number	892984
H2020 Call	LC-SC3-EE-5-2018-2019-2020
Type of action	Next-generation of Energy Performance Assessment & Certification



Objectives

Expected Impact

1

Introduce and establish the concept of next generation dynamic Energy Performance Certificates



- Empower the regular calculation and issuance of an operational certificate
- EU-wide deployment

2

Enhanced multi-parameter assessment (energy, SRI, LCA, LCC, IEQ)



- Facilitate the understanding of buildings' energy performance
- Improve user-friendliness of EPCs

3

BIM-based Digital Twins coupled with a state-of-the-art IoT ecosystem



- Enrich building documentation practices
- Integration of actual operational data from buildings into the EPCs

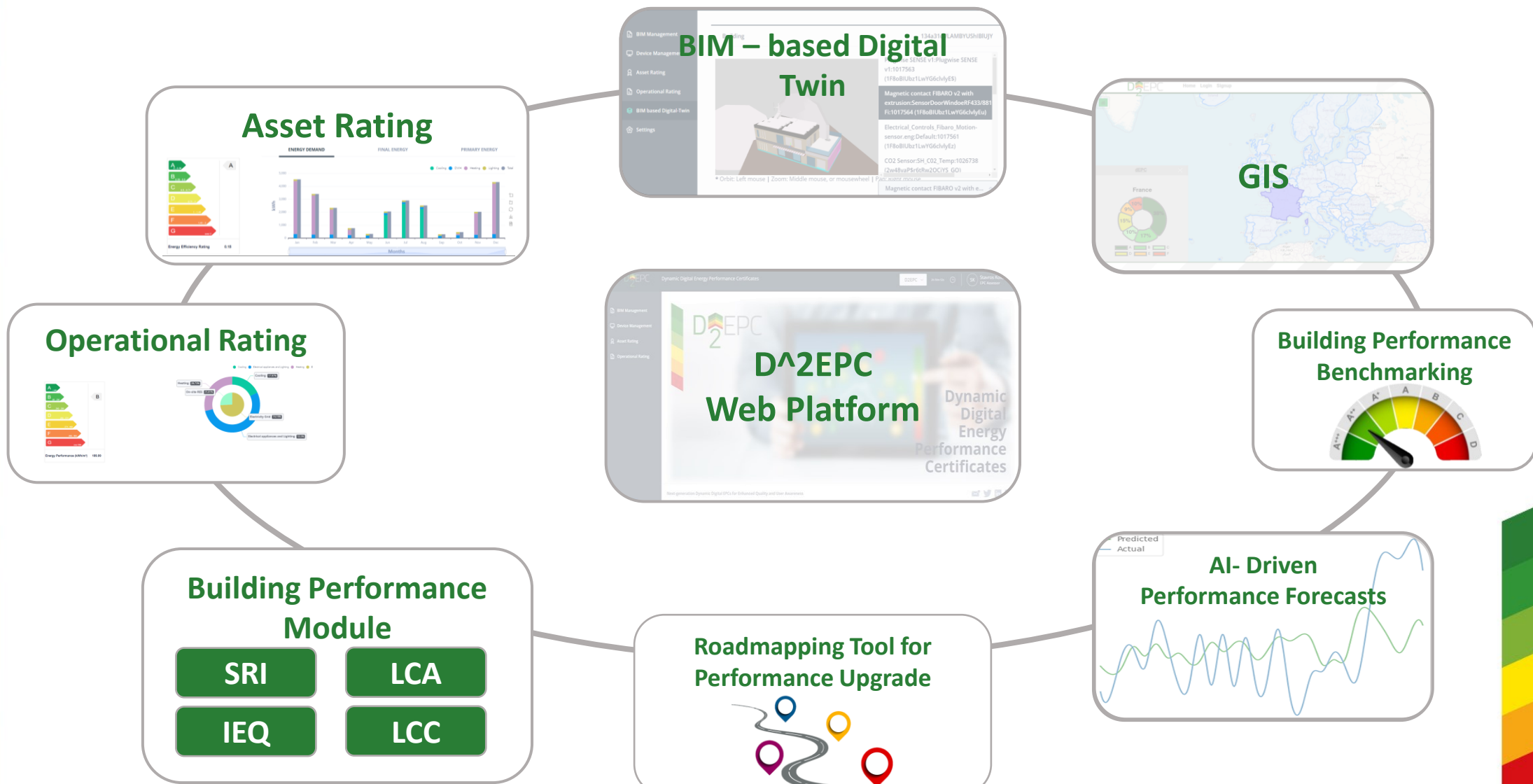
4

Improved AI-driven assessment recommendations



- Promote energy efficiency & optimal comfort
- Facilitate decision making and planning
- Foster energy saving consciousness

The D²EPC ecosystem



Lessons learnt and good practices

- BIM can minimize the EPC issuance time, but it has limited functionalities
 - IFC4 is considered adequate only for the definition of the 1st information layer of SRI
- EN ISO 52000 does not include sufficient information for building automation and control, needed for the extraction of SRI indicators.
- The EPC community should focus on **data interoperability** and **stakeholders' privacy** to scaling-up the broad acceptance of dynamic EPCs

Next steps

- D^2EPC participates in:
 - CEN/ TC 371/ WG 7: “Operational Rating of energy performance of buildings”
 - CEN/ TC 442/ WG9: “Digital Twins in AECOO sector”
- Project finalization on 08/2023



DigiBUILD

The DigiBUILD project

John Kapetanakis

Leader of DigiBUILD Communication & Dissemination Activities



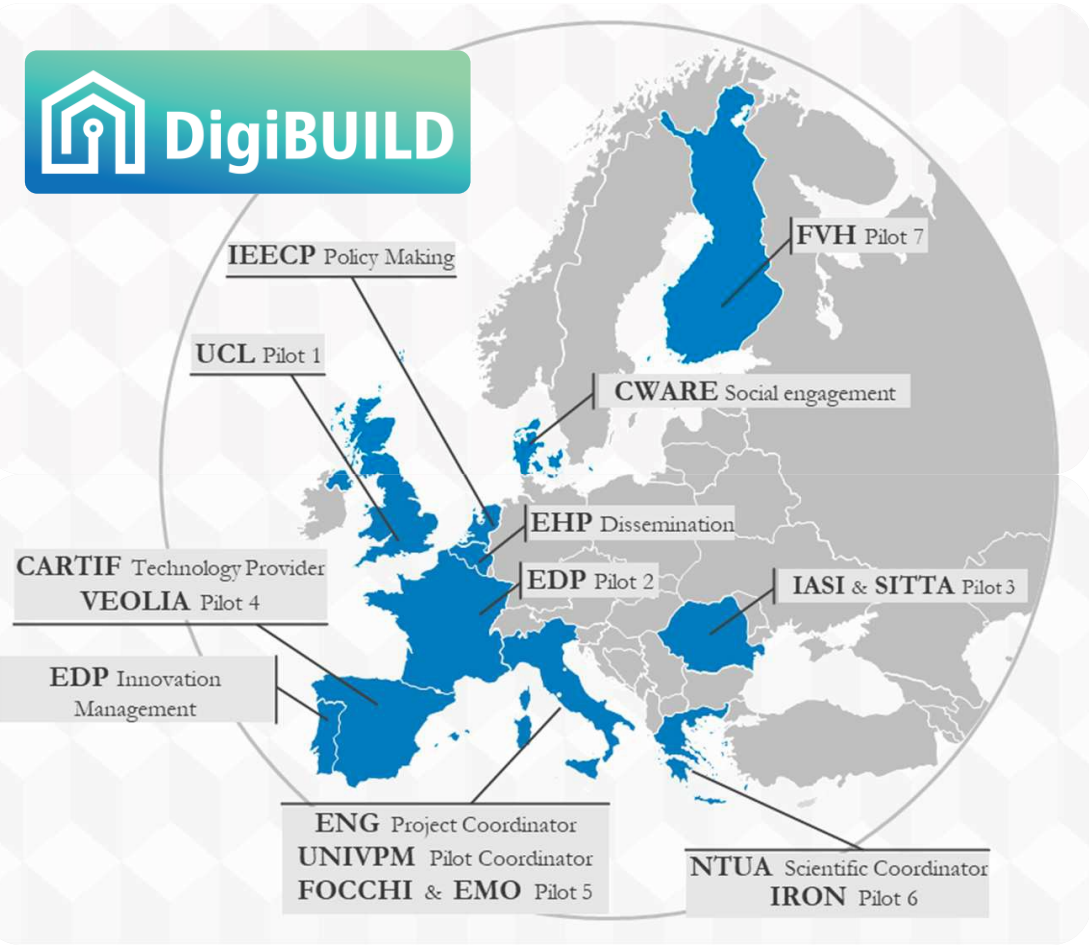
**EUROHEAT
& POWER**

SmartBuilt4EU Final Conference
23/03/2023



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Identity Card

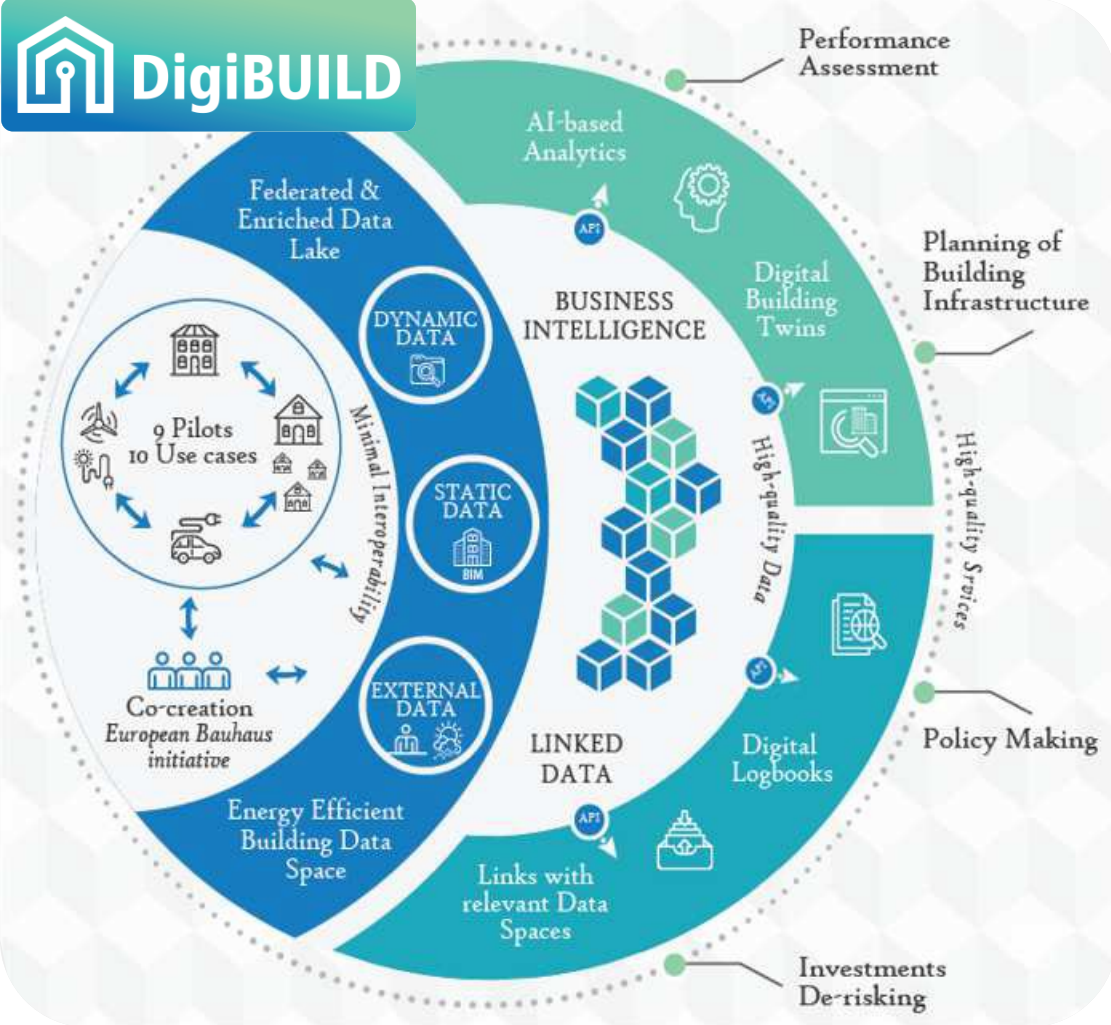


High-Quality Data-Driven Services for a Digital Built Environment towards a Climate-Neutral Building Stock

Call: HORIZON-CL5-2021-D4-01-03
 «**Advanced data-driven monitoring of building stock energy performance**»
 Consortium: **17** partners from **11** Countries
 Duration: June **2022** – May **2025**
 Budget: **€5.525.782**



Vision and approach



- **DigiBUILD** will be aligned with the European Strategy for data and contribute to the development of an **Energy Efficient Building Data Space**
- **Co-creation methodologies** (according to the European Bauhaus initiative) will be applied
- **Gather and manage data** in a proper and adaptable way (namely not to mobilise thousands of data but only the necessary data), in order to drive more robust, improved and consistent **monitoring of building stock energy performance**

Objectives



1. To introduce an innovative stakeholder inclusion framework for **co-creating and co-design** use cases



2. To increase the data quality by creating a **federated Data Lake** with enriched dynamic data and embedded Building Business Intelligence



3. To establish the grounds for an **Energy Efficient Building Data Space**



4. To increase **interoperability** by leveraging standards-based Data Models



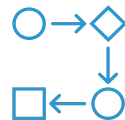
5. To deploy **AI-based data analytic services** for high-quality data-driven energy management, energy-efficient buildings and comfort



6. To deploy system-level reusable, interoperable **Digital Building Twins** for better-informed planning and investment decision-making



7. To demonstrate and validate the DigiBUILD applicability, effectiveness and value for the performance monitoring among **real-life pilots**



8. To develop and validate sharing-economy **business models**, as well as to make data accessible to everyone with data democratisation



Pilot Cluster 1
Buildings' Performance



Pilot Cluster 2
Buildings vs. Infrastructure optimal management



Pilot Cluster 3
Policy & Finance

Expected Outcomes

1. More robust, improved and consistent **monitoring of performance** (energy and other relevant aspects) of buildings across the European sectors and through the whole value chain

2. **Better-informed planning** of building infrastructure and better-informed **investment decision-making** for designing future buildings and building processes

3. Successfully tested **smart energy services** on the basis of advanced, high-quality building stock performance data

4. Significant and measurable **increase in the use of open**, real-time and **reliable building data** from multiple sources

5. Development of accurate **methods that facilitate collection of data** from the building stock

6. Availability of **big-data** analysis facilities **for real-life scale research**, simulation & policy-making

7. More **effective implementation of EU policies** driving the transition to a green, digital and sustainable economy, and enhancing the quality of the built environment

interconnect

interoperable solutions
connecting smart homes,
buildings and grids





H2020 InterConnect project pitch

Laura Daniele (TNO)

H2020 SmartBuilt4EU Final Event

Brussels, 23 March 2023

interconnect

interoperable solutions
connecting smart homes,
buildings and grids



H2020 InterConnect Large Scale Pilot <https://interconnectproject.eu/>

35M EURO funding

Duration 4.5 years
(October 2019- March 2024)

Develop and demonstrate advanced solutions for connecting and converging digital homes and buildings with the electricity sector

Validation in seven connected large-scale test-sites in Portugal, Belgium, Germany, Netherlands, Italy, Greece and France

50+ European partners
(R&D, consultancy, manufacturers, associations, IoT/ICT providers, DSOs, end-users)



FINANCING



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant agreement No 857237

Digitising and transforming European industry and services: digital innovation hubs and platforms (H2020-DT-2018-2020)
TOPIC ID: DT-ICT-10-2018-19 Interoperable and smart homes and grids
Programme: Horizon 2020 Framework Programme
Work programme part: Information and Communication Technologies
Work programme year: H2020-2018-2020



Main Objectives & Expected Impact

Large-scale cross-domain semantic interoperability

Large-scale pilots leading to market driven development

Based on open standards (SAREF framework of ontologies specified by ETSI SmartM2M)

Marketplace of integrated digital platforms bridging the gap between smart buildings and energy grid

Decentralised & distributed (without centrally hosted facilitator)

User centric energy flexibility services

Who has the opportunity to take advantage of these solutions?

- Energy users in buildings
- Manufacturers
- Distribution grid operators
- Energy retailers



Key Results & Value Proposition

Result 1: Semantic Interoperability Framework (SIF)

SIF components:

- Ontologies (SAREF)
- Knowledge Engine
- Service Adapters
- Service Store
- P2P marketplace enablers

Significantly improved process, easily appreciated advantages to customer, deployed in 7 large scale pilots (50 integrators), to be commercially exploited after project, TTM 1-3yr

Result 2: Distribution System Operator Interface (DSOi)

- based on SIF
- acting on the grid edge to ease the data exchange between DSOs and market entities
- enabling demand side flexibility services, open data sharing and enhanced network observability

New product, innovative, easily appreciated advantages to customer, new market, little competition on market, TTM 5-10yr

Result 3: Standardization success story

SAREF ontologies as pillar of semantic interoperability:

- start from ETSI, back to ETSI within the project timespan (4.5 years)
- common strategy (progress in ETSI SmartM2M TC & endorsement by CEN/CENELEC TC 205 WG19)

New version of SAREF4ENER (ETSI TS 103 410-1). Broader stakeholders basis (EEBUS and KNX). High chance of adoption



Lessons learnt & Good Practices

Semantic interoperability at large-scale, cross-domain, at high TRL is possible

Paradigm shift for traditional developers required, but possible

Guide stakeholders to clearly specify their use cases and services

Open protocols and open APIs are key to interoperability using ontologies

Steep learning curve, learn by example helps

Test with subset of early adopters, then extend to a broader group

Ontology development: trade-off between number of use cases and semantic coverage

User-friendly software tools for non-ontology experts is needed for market uptake

Early and continuous involvement of stakeholders is essential to guarantee adoption



Nuno Mateus – Project Coordinator

**Smart buildings in Europe: SmartBuil4EU Final
Conference**



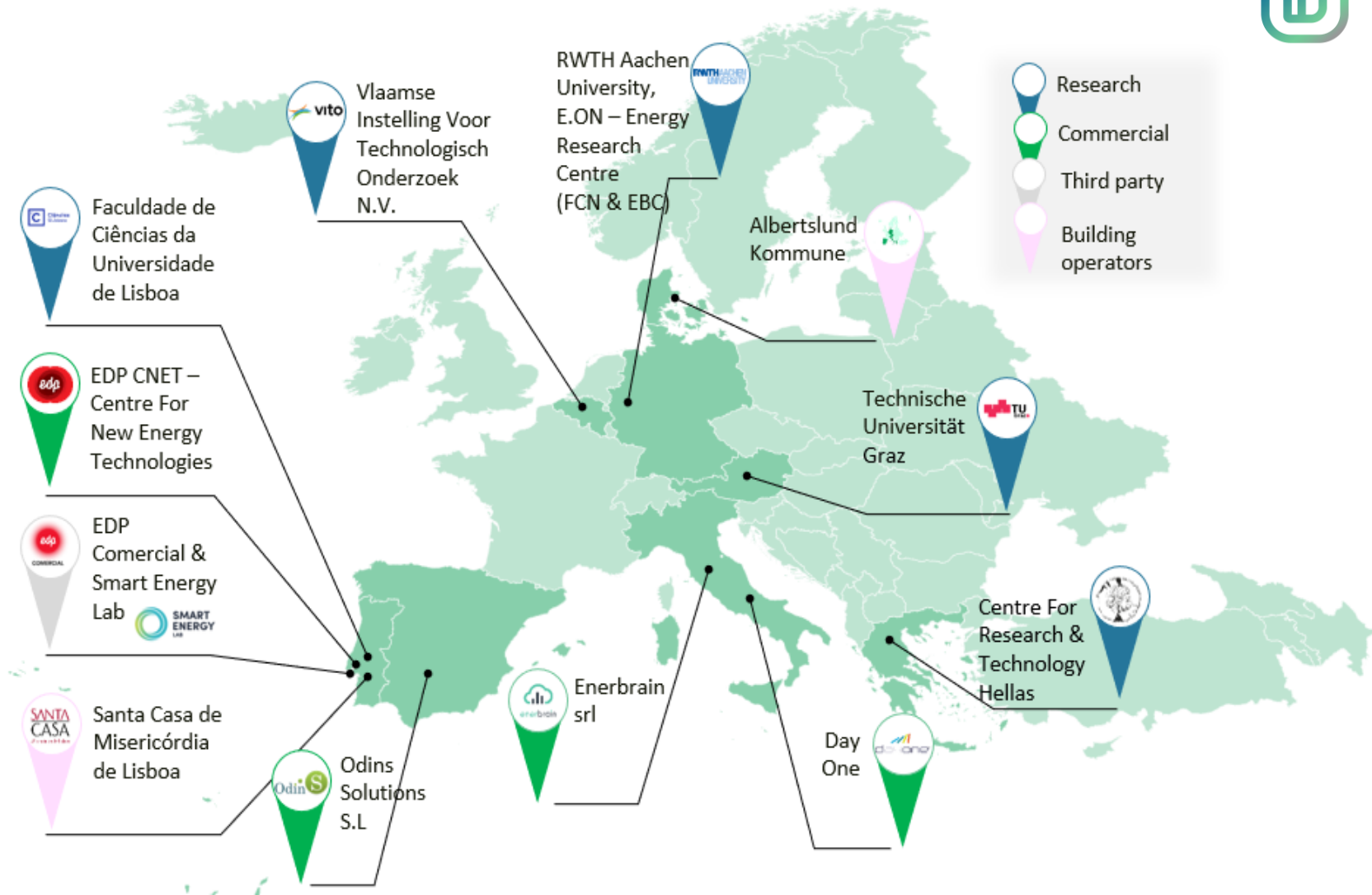
This project has received funding from the European Union's Horizon 2020 research and innovation program under Grant agreement no. 101023666.

23/03/2023

Key Facts

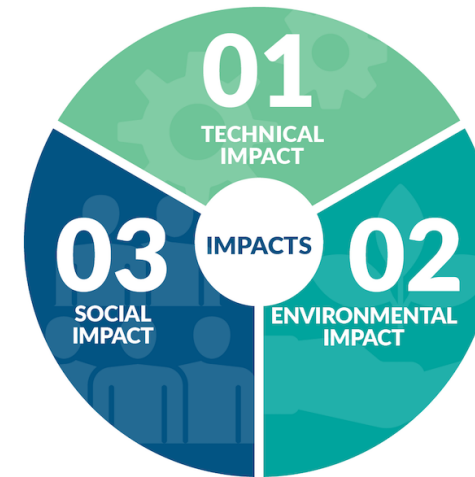
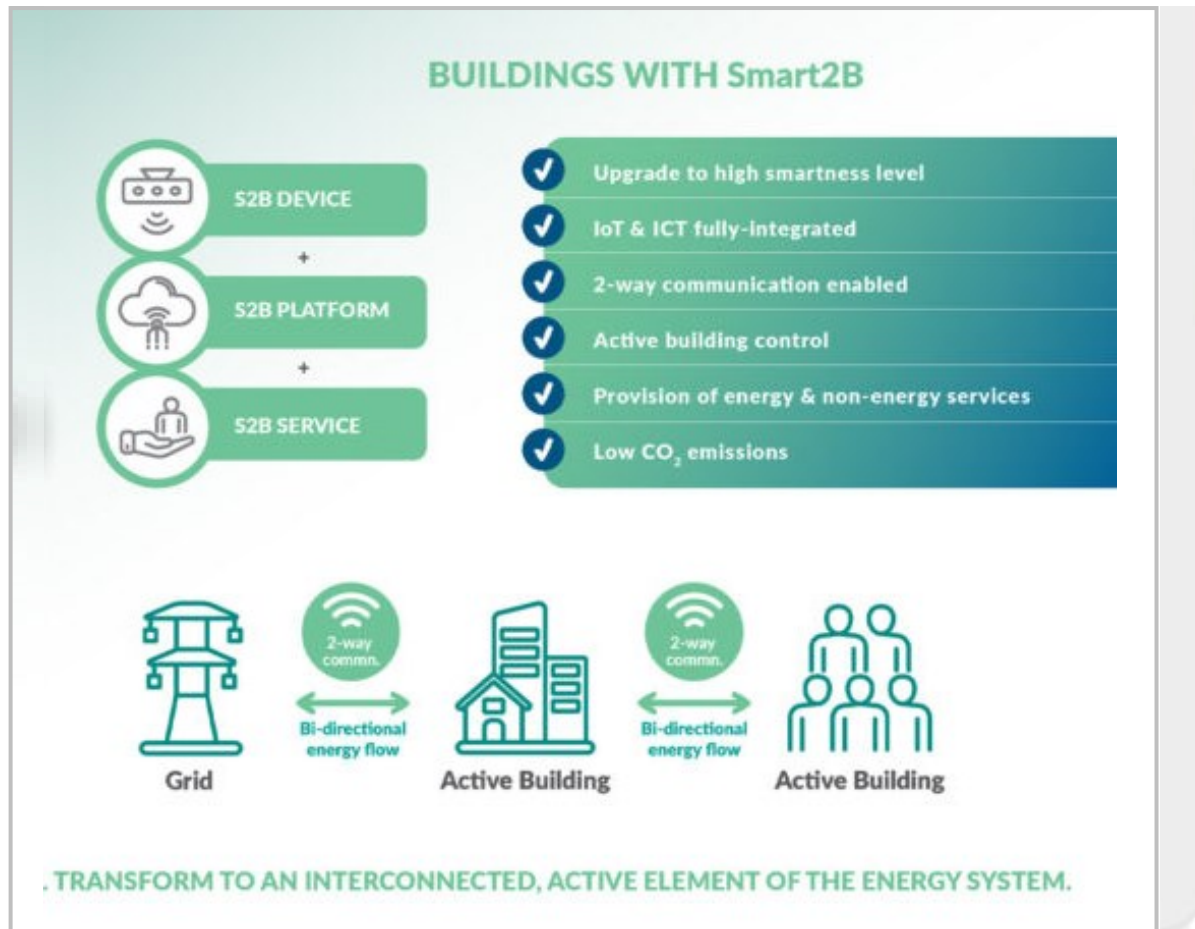


- Coordinator: EDP NEW
- Start: September 2021
- End: August 2024
- Duration: 3 years
- EU budget: 4 M€
- 11 Partners from 8 countries
- 5 Pilots



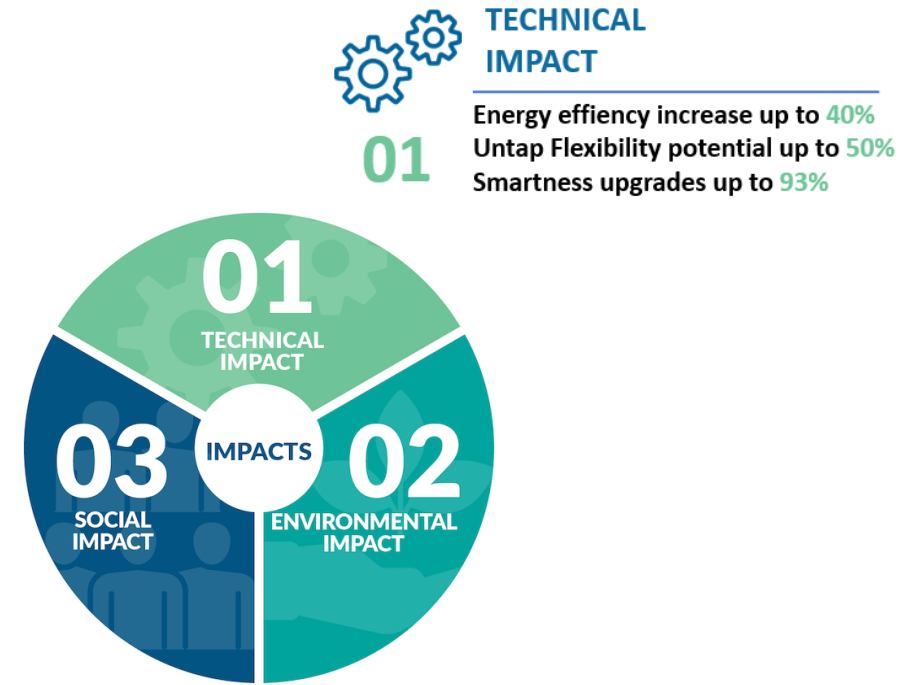
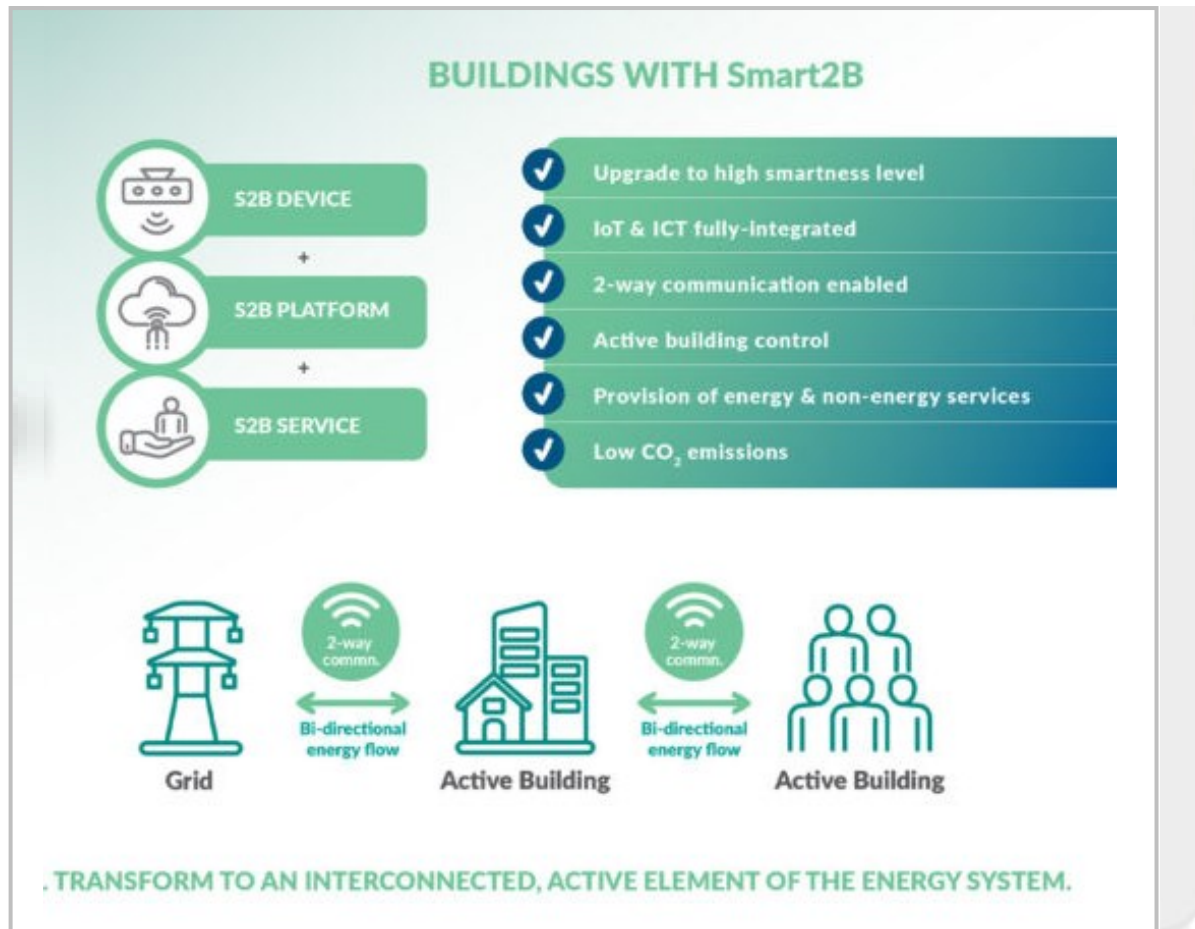


Smart2B Concept & Impacts

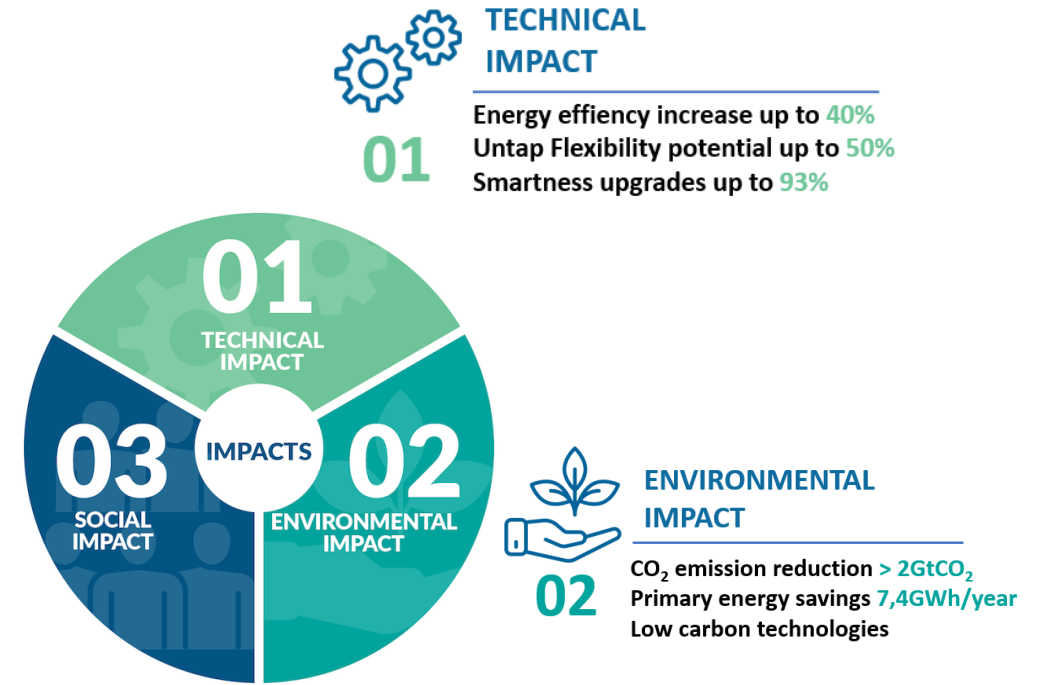
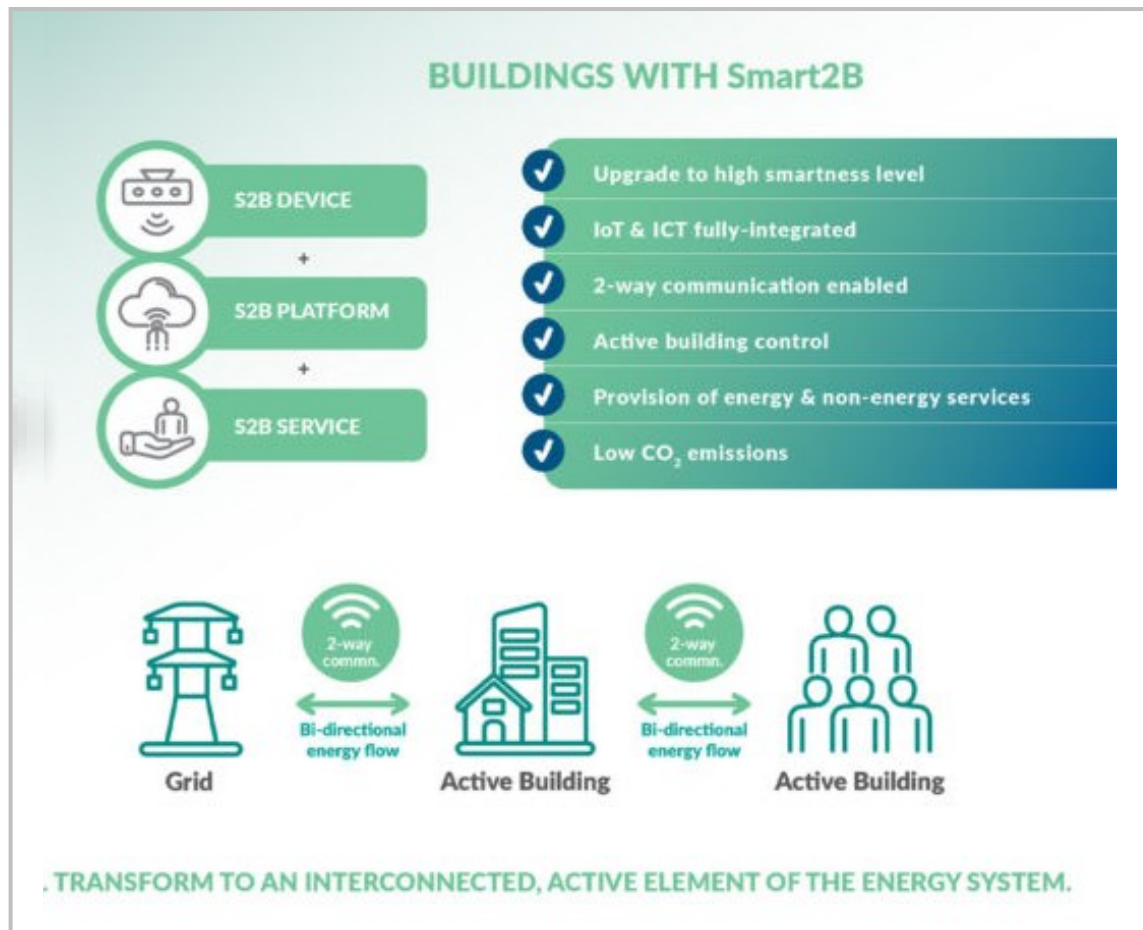




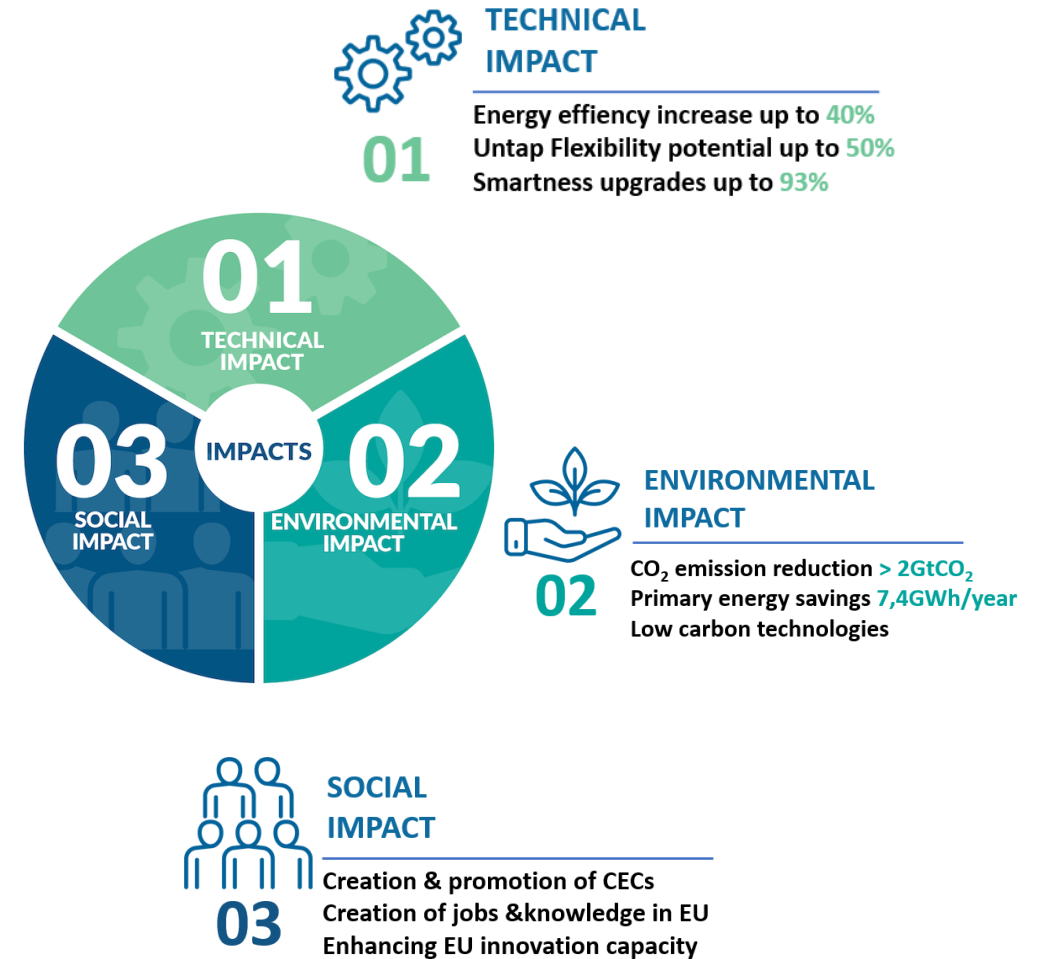
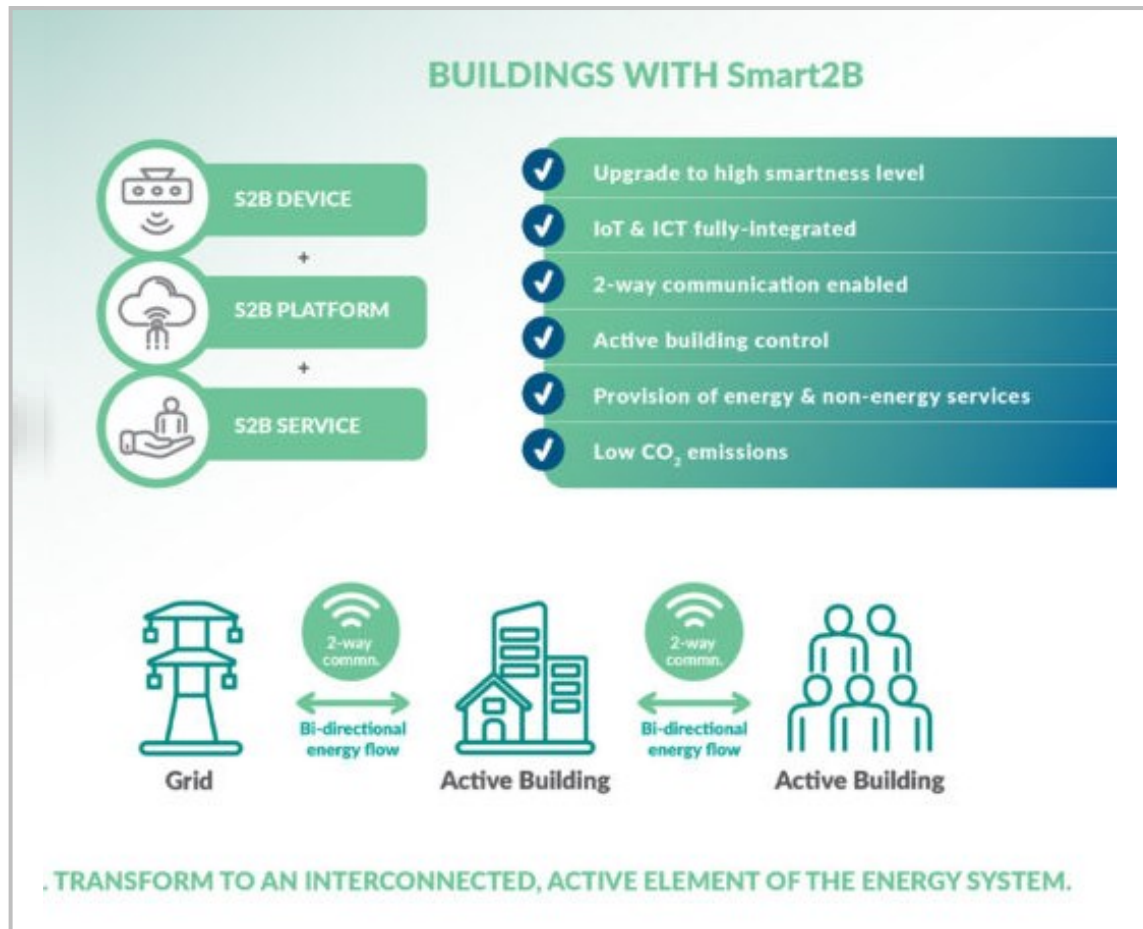
Smart2B Concept & Impacts



Smart2B Concept & Impacts



Smart2B Concept & Impacts





Smart2B Ecosystem

Upgrade the smartness of existing buildings

SERVICES SPACE



Flexibility



Smart Performance Assessment & Advisor



Energy efficiency



Indoor Comfort

PLATFORM & USER INTERACTION SPACE



Grid operator



Active Building



Occupants

USER INTERFACE (APP)



DEVICES SPACE



Legacy Equipment



Smart appliances



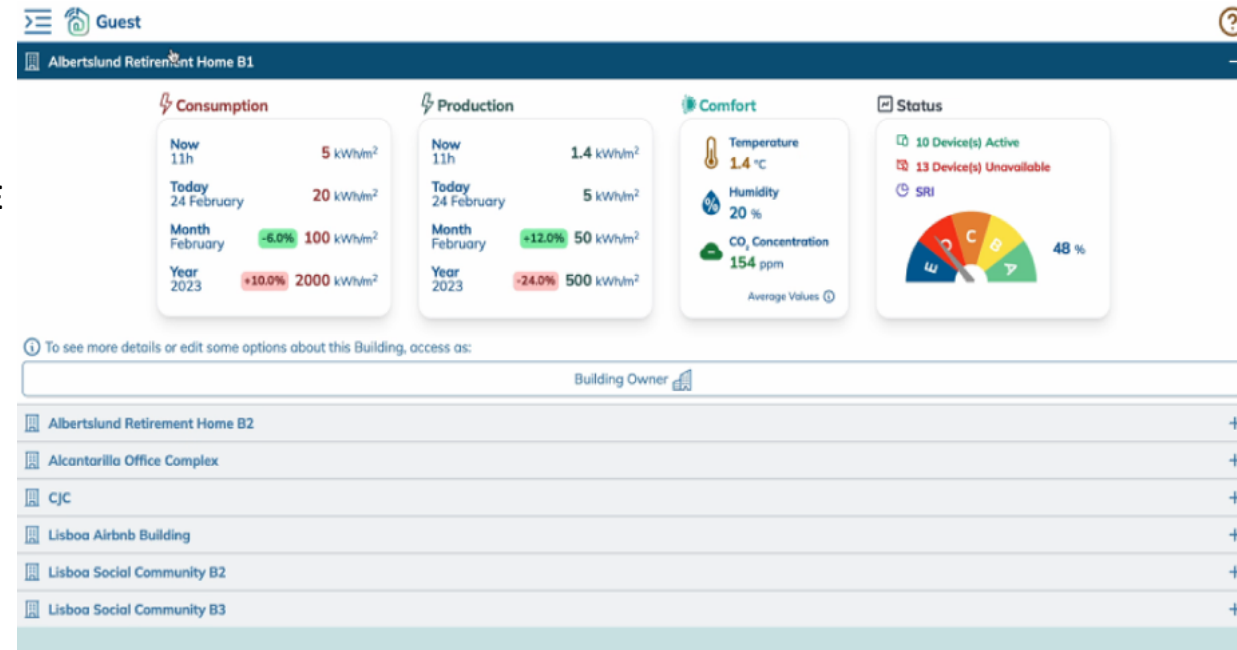
Storage



Electric vehicles



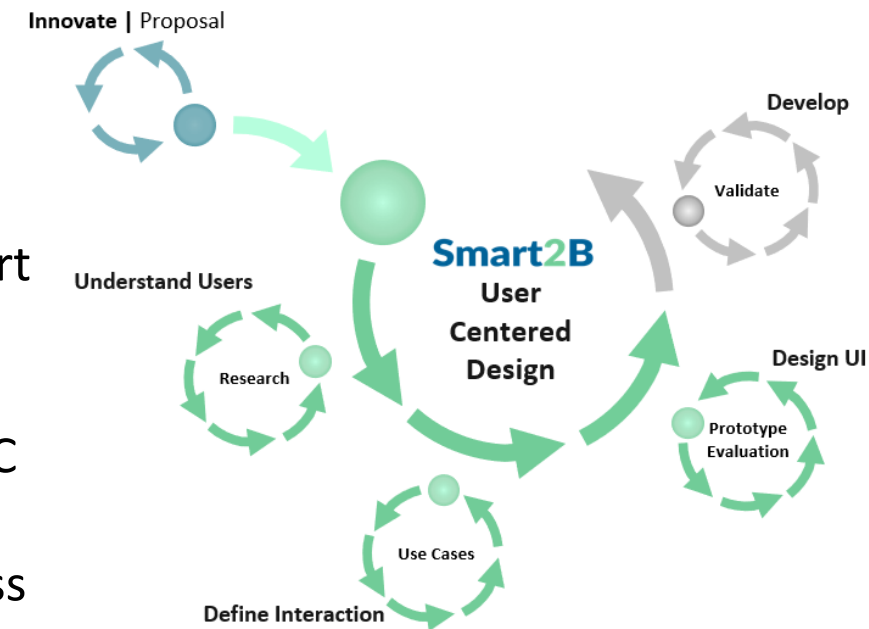
Distributed RES



Lessons Learnt & Good practices



1. Building energy systems are **not IOT enabled or “open”**
2. Hard to convince building owners to allow us to monitor and control part their equipment's: **distrust in cloud solutions**
3. **Incompatible expectations:** Buildings owners vs Project Consortium vs EC
4. **User-in-the-Loop service** reveals big potential to reduce the intrusiveness
5. **User centered design** as a valuable “tool”



SB4EU Strategic Research and Innovation Agenda: focus on data

Karine LAFFONT-ELOIRE, DOWEL Innovation

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 956936.



- Our SRIA is based upon the work done with our 4 Task Forces from the Smart Building Innovation Community, from February 2021 to July 2022.
- Starting from a longlist of R&I gaps and possible areas for improvement, **ten concrete key priorities for EU** were derived in order to support to research, innovation and market uptake in the field of smart buildings.



Topics covered



PRIO1: Standardisation for interoperable products and services in a building

1

Development of a methodology for assessment of semantic interoperability using open, standardised ontologies

(aiming at TRL 4-6) – RIA

2

Reference implementation for assessment of semantic interoperability using open APIs and standardised ontologies

(aiming at TRL 6-8) - IA

3

Support programme for stakeholders on ontologies standardisation

CSA

4

Interoperability label

5

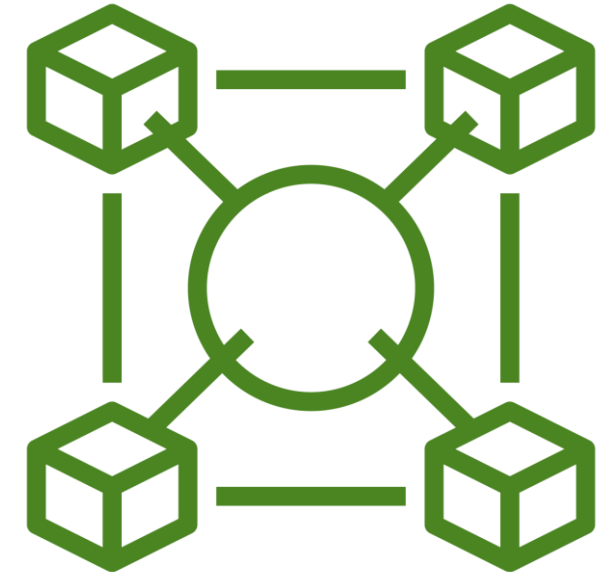
Marketplace for interoperability services and user-friendly software tools

(aiming at TRL 4-6)

6

Citizen lab initiative about interoperability to quickly show benefits of giving access to (certain parts of) their data

(aiming at TRL 4-6)



PRI02: Standards and Business Models for connecting Smart Buildings to the External Environment

1

Harmonised definition of roles and responsibilities for actors involved in energy flexibility

(aiming at TRL 8)

2

Regulation for flexibility market

3

Development of a flexibility certification scheme at EU level

(aiming at TRL 8)

4

End users as new and valuable partner in the energy flexibility ecosystem of the future

(aiming at TRL 4-6)

5

Interoperable data exchange environment to provide power flexibility to the grid

(aiming at TRL 4-6)

6

“Ready to service” and “ready to grid” buildings

(aiming at TRL 6)



PRI07: Making better use of the data

1

Expand the data collection
(amount/type)
(aiming at TRL 4-5) RIA

2

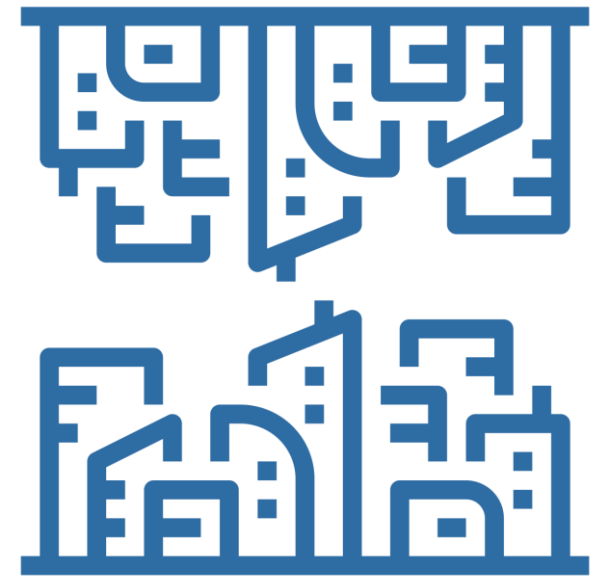
Strive for multi-use data possibilities
(aiming at TRL 8-9) RIA

3

Expand the Digital Twin Concept (aiming at TRL 6-7)

4

Encourage/showcase testing of data collecting/usage
(aiming at TRL 7-8)



PRI09: Data privacy and cybersecurity in smart buildings



1

Development of regulatory frameworks & legislations and certifications

(aiming at TRL 4-6)

2

Develop models and methodologies to strengthen the value chain

(aiming at TRL 6-9)

Smart Buildings & Data

Panel discussion



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