EUB SuperHub

EUB SuperHub
Overview of insights & outcomes

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This project has received funding from the European Union's H2020 research and innovation programme under Grant Agreement No. 101033916.

EUB SuperHub RESULTS

Developed a harmonized EU approach to enhance the adoption of energy performance certificates (EPCs), improving the delivery, storage, and communication processes.

The EuB SuperHub certification scheme and tools have been studied to foster a demand-driven market by addressing the needs of various stakeholder groups through an online platform (one-stop shop).

The EuB SuperHub platform integrates diverse systems, and market actors into a cohesive hub, utilizing standardized criteria.

Centralizing all information about buildings in one place through an innovative DBL, users easily track the energy performance and carbon footprint of their buildings and bridge the performance gap.

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KEY OUTPUTS

HARMONISATION

From the energy performance to a more holistic approach:: the **CWA EUB SuperHub** *(harmonized Key Performance Indicators)*

COMPARABILITY

The **EUB Certification process** *and the* **EUB *e-Passport,*** *a holistic, interoperable and transparent tool to report and transnationally compare the performance of buildings*

DIGITALISATION

EUB Platform and the EUB Digital Building Logbook (DBL): *web-based platform able to provide access to the elements characterising a building, evaluating its energy performance, facilitating the exchange between demand (owners) and supply (professionals-companies) for energy renovation processes*

ENGAGEMENT

EUB SuperHub Local Advisory Team (LAT) *as the main strategy to actively involve target groups in the EUB SuperHub project*

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HARMONISATION

From the energy performance to a more holistic approach, towards a new harmonized energy certification system:
the CWA EUB SuperHub

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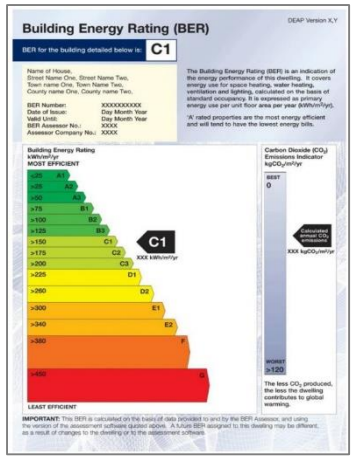
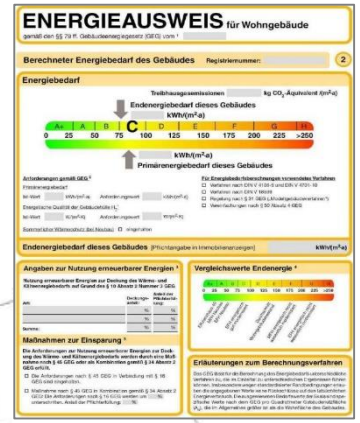
EPCs COMPARISON AMONG DIFFERENT COUNTRIES





Germany

Ireland

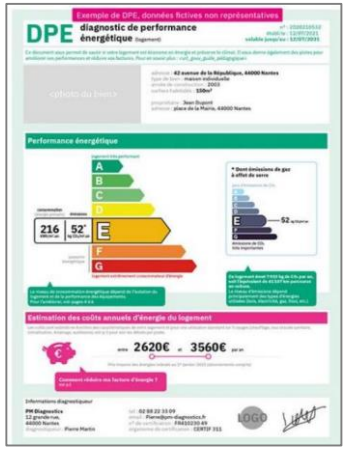
France

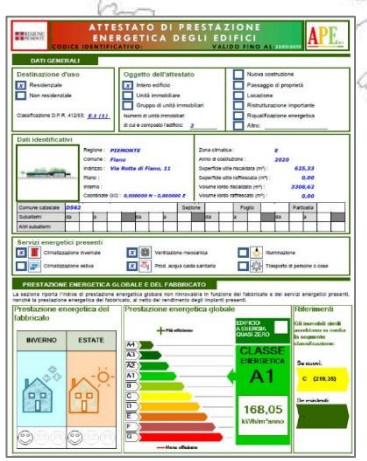
Italy

Voralberg (Austria)

Hungary

Croatia





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Integrated Approach to Assessing Buildings' Energy Performance

EUB SuperHub

The evolving landscape of building energy performance requires a comprehensive and expanded evaluation. In response to EU policies on building energy performance and GHG emissions, **certification processes must evolve to encompass a wider array of performance indicators** *to ensure adherence to these evolving standards.*

Climate Change mitigation – Whole Life Carbon

An expansive approach transcends energy consumption, encompassing energy generation, material utilization, and the overall carbon footprint.

Technological evolution

Technological evolution has transformed buildings from static structures to dynamic entities equipped with intelligent systems capable of real-time modulation to optimize energy utilization, comfort, and operational efficacy.

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Integrated Approach to Assessing Buildings' Energy Performance

EUB SuperHub

Occupant Health and Well-being

The reconceptualization of buildings as human habitats has shifted the focus towards indoor environmental quality, encompassing air quality, thermal comfort, and illumination. These factors significantly influence occupant health and productivity.

Energy Security and Autonomy

The transition towards renewable energy sources and the incorporation of energy storage and generation within buildings necessitate a revised framework for evaluation. Buildings can now contribute to the energy grid, warranting assessments that account not only for energy consumption but also for generation and storage capabilities.

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Integrated Approach to Assessing Buildings' Energy Performance

EUB SuperHub

Economic Considerations (Life Cycle Cost)

Operational expenditures, inclusive of energy, maintenance, and repairs, significantly influence the total cost of ownership of a building. An expansive evaluation approach considers these aspects, offering a more precise depiction of a building's efficiency and long-term economic value.

Resilience and Adaptability

In light of climate changes, buildings must exhibit resilience and adaptability. A comprehensive certification shall examine how buildings can adapt to climatic hazards, including their capacity to accommodate emergent technologies or shifts in usage.

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Holistic set of common KPIs

Elaborated a system of KPIs for the next generation EPC: **CWA EUB SuperHub.**

The use of EUB SuperHub KPIs furnishes a comprehensive perspective on the building's overall functionality and its implications on sustainability, occupant welfare, and operational efficacy.

The CWA EUB SuperHub outlines a comprehensive framework of 21 Key Performance Indicators organized into 10 thematic areas: Energy Consumption, Renewable Energy, GHG Emissions, Thermal Comfort, Indoor Air Quality, Costs, Smart Buildings, Resilience to Overheating, E-mobility, and Daylight Sufficiency.

The development of these indicators stems from a bottom-up approach, incorporating feedback from stakeholders and aligning with European Commission policies.

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A system of interconnected KPIs

The EUB SuperHub system of KPIs promotes and facilitate an integrated approach to buildings' design, construction and operation that acknowledges the interactions among various energy-related issues.

The interrelation among the EUB SuperHub Key Performance Indicators (KPIs) within the domain of building energy performance encapsulates the multifaceted and interdependent associations between disparate facets of a building's design and operational dynamics.

The EUB SuperHub CWA supports the management of these interrelations for an all-encompassing approach to the design and operation of high performance buildings.

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EUB SuperHub KPIs

Thematic area	Indicator
Energy Consumption	1. Total annual primary energy demand per useful floor area
	2. Delivered annual final energy demand per useful floor area
	3. Non-renewable primary energy demand per useful floor area
	4. Total use of non-renewable primary energy resources used as raw materials (PENRT)
Renewable Energy	5. Renewable annual primary energy demand per useful floor area
	6. Renewable energy ratio (on-site, nearby)
Greenhouse Gas Emissions (in use stage)	7. Use stage energy-related Global Warming Potential (GWP)
Greenhouse Gas Emissions (life cycle)	8. Life Cycle Global Warming Potential (GWP)

Thematic area	Indicator
Thermal comfort	9. Time outside of thermal comfort range
Indoor Air Quality	10. Ventilation rate
	11. CO_2 concentration
	12. Relative humidity
	13. Total VOCs
	14. CMR VOCs concentration
	15. R value
	16. Formaldehyde concentration
Costs	17. Operational Energy Costs
Smart Buildings	18. Smart Readiness Indicator
Resilience	19. Summer thermal discomfort in 2030 and 2050
E-mobility	20. Installation of pre-cabling / number of recharging points in relation to the number of parking spaces
Daylight sufficiency	21. Daylight Provision

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COMPARABILITY

The **EUB Certification process** *and the* **EUB e-Passport:**
the Electronic Passport of the building's energy and sustainability performance is a holistic, interoperable and transparent tool

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EUB SuperHub Certification: process

The EUB SuperHub certification process is **articulated in three stages:**

DESIGN: phase where the design is refined and plans, specifications and estimates are created . All design information required to manufacture and construct the project are completed. The final output of this phase in the *"**EUB e-Passport Design**".*

CONSTRUCTION / AS BUILT: phase where the construction of the building takes place on the base of the construction documents. The building is concluded but not occupied by users. The final output of this phase in the *"**EUB e-Passport As Built**".*

IN USE: phase where the building is used, operated and maintained. The final output of this phase in the *"**EUB e-Passport In Use**".*

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EUB Certification process: actors

ACTORS involved in the certification process are:

- **CLIENT:** His/her activities concerns the registration of the building and the appointment of the assessor for the evaluation of the building.
- **CERTIFICATION BODY**: His/her activities concern the appointment of the auditor and the issue of the final certificate, the EUB e-Passport for the technical design phase.
- **ASSESSOR:** His/her activities address the indicators' characterisation and the drafting of assessment report.
- **AUDITOR:** His/her activity is to revise the content of the technical reports produced by the Assessors in the different certification phases.

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EUB Certification process: quality assurance

- ✓ **Third-party verification** (to maximise the reliability of the EUB e-Passport)
- ✓ **Monitoring** of the certification procedures
- ✓ **Standards for conformity** assessment
- ✓ Measurement of **KPIs affordability and operativity**
- ✓ **Collecting feedback** from users involved in all the process phases

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e-Passport for next gen EPCs

The EUB SuperHub certification scheme is intended **as a roadmap to implement it across EU and a guide to assess the KPIs** of the **EUB e-Passport**.

All the aspects of a certification scheme such as quality control, verification, monitoring and inspection procedures, have been taken into account.

The final output of the certification process is the **EUB e-Passport, a next generation EPC based on a common set of KPIs (CWA EUB SuperHub)**

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EUB SuperHub e-Passport

EUB e-PASSPORT

EUB SuperHub

BUILDING DATA	
Building code	
Building name/ project denomination	
Building address	
Type of intervention	
CLIENT DATA	
Name of the client	
Contact person	
Phone number and e-mail address	
ISSUED PASSPORT	
Name of the technical expert	
Issue date	
Validated (optional)	

Energy consumption:

Daylight Sufficiency:

Renewable energy:

Smart Buildings:

Energy costs:

E-mobility:

Indoor Air Quality:

Resilience:

Thermal comfort:

Greenhouse Gas emissions:

EUB e-PASSPORT

EUB SuperHub

Energy consumption

Key Performance Indicator (KPI) name	Indicator meaning	Reference framework	KPI calculation result
Total annual primary energy demand per useful floor area	Your building needs this amount of energy per year per square meter	The indicator was based on the EN ISO 52000-1	125 kWh / (m2.a)
Delivered annual final energy demand per useful floor area	Your building consumes this amount of energy per year per square meter	The indicator was based on the EN ISO 15978	170 kWh / (m2.a)
Non-renewable primary energy demand per useful floor area	Your building needs this amount of non-renewable energy per year per square meter	The indicator was based on the EN ISO 15978	100 kWh / (m2.a)
Total use of non-renewable primary energy resources used as raw materials	The building materials of your building were produced with this amount of energy	The indicator was based on the EN ISO 52000-1	50 MJ

Renewable energy

Key Performance Indicator (KPI) name	Indicator meaning	Reference framework	KPI calculation result
Renewable annual primary energy demand per useful floor area	Your building needs this amount of renewable energy per year per square meter	The indicator was based on the EN ISO 52000-1	25 kWh / (m2.a)
Renewable energy ratio	The share of renewable primary energy demand in total primary energy demand of your building	The indicator was based on the EN ISO 52000-1	20 %

Indicator meaning	Reference framework	KPI calculation result

Energy costs

Key Performance Indicator (KPI) name	Indicator meaning	Reference framework	KPI calculation result
Operational Energy Costs	Your building costs this amount of money per year per square meter	The indicator was based on the NewTREND B-10.1	120 EUR/ (m2.a)

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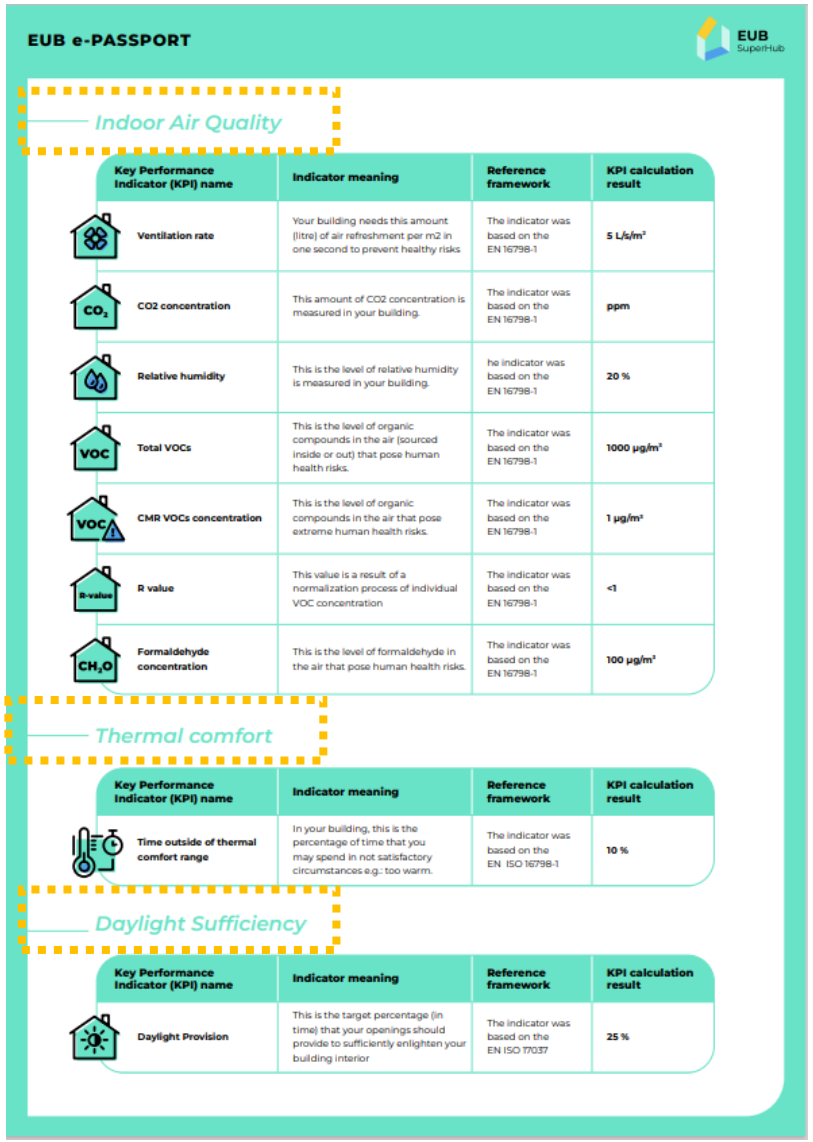
EUB SuperHub e-Passport



EUB e-PASSPORT

EUB SuperHub

Indoor Air Quality

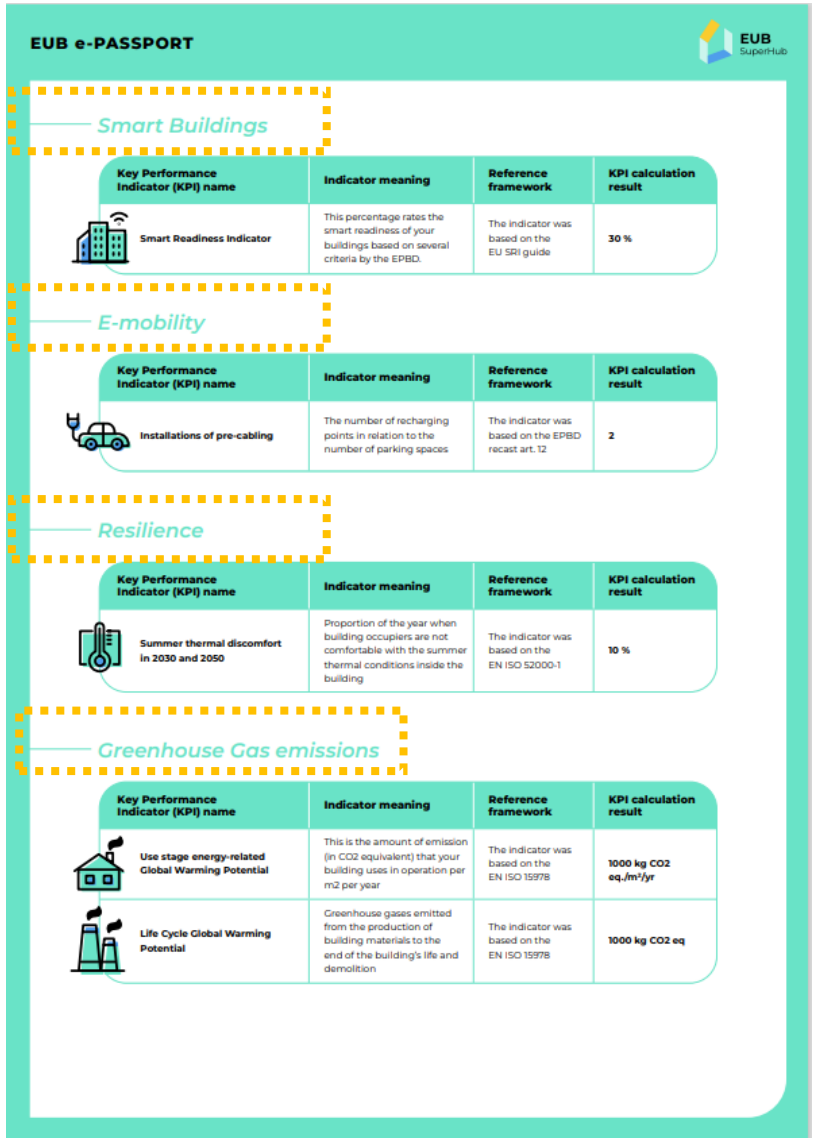
Key Performance Indicator (KPI) name	Indicator meaning	Reference framework	KPI calculation result
Ventilation rate	Your building needs this amount (litre) of air refreshment per m2 in one second to prevent healthy risks	The indicator was based on the EN 16798-1	5 L/s/m²
CO2 concentration	This amount of CO2 concentration is measured in your building.	The indicator was based on the EN 16798-1	ppm
Relative humidity	This is the level of relative humidity is measured in your building.	he indicator was based on the EN 16798-1	20 %
Total VOCs	This is the level of organic compounds in the air (sourced inside or out) that pose human health risks.	The indicator was based on the EN 16798-1	1000 µg/m³
CMR VOCs concentration	This is the level of organic compounds in the air that pose extreme human health risks.	The indicator was based on the EN 16798-1	1 µg/m³
R value	This value is a result of a normalization process of individual VOC concentration	The indicator was based on the EN 16798-1	<1
Formaldehyde concentration	This is the level of formaldehyde in the air that pose human health risks.	The indicator was based on the EN 16798-1	100 µg/m³

Thermal comfort

Key Performance Indicator (KPI) name	Indicator meaning	Reference framework	KPI calculation result
Time outside of thermal comfort range	In your building, this is the percentage of time that you may spend in not satisfactory circumstances e.g.: too warm.	The indicator was based on the EN ISO 16798-1	10 %

Daylight Sufficiency

Key Performance Indicator (KPI) name	Indicator meaning	Reference framework	KPI calculation result
Daylight Provision	This is the target percentage (in time) that your openings should provide to sufficiently enlighten your building interior	The indicator was based on the EN ISO 17037	25 %



EUB e-PASSPORT

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Smart Buildings

Key Performance Indicator (KPI) name	Indicator meaning	Reference framework	KPI calculation result
Smart Readiness Indicator	This percentage rates the smart readiness of your buildings based on several criteria by the EPBD.	The indicator was based on the EU SRI guide	30 %

E-mobility

Key Performance Indicator (KPI) name	Indicator meaning	Reference framework	KPI calculation result
Installations of pre-cabling	The number of recharging points in relation to the number of parking spaces	The indicator was based on the EPBD recast art. 12	2

Resilience

Key Performance Indicator (KPI) name	Indicator meaning	Reference framework	KPI calculation result
Summer thermal discomfort in 2030 and 2050	Proportion of the year when building occupiers are not comfortable with the summer thermal conditions inside the building	The indicator was based on the EN ISO 52000-1	10 %

Greenhouse Gas emissions

Key Performance Indicator (KPI) name	Indicator meaning	Reference framework	KPI calculation result
Use stage energy-related Global Warming Potential	This is the amount of emission (in CO2 equivalent) that your building uses in operation per m2 per year	The indicator was based on the EN ISO 15978	1000 kg CO2 eq./m²/yr
Life Cycle Global Warming Potential	Greenhouse gases emitted from the production of building materials to the end of the building's life and demolition	The indicator was based on the EN ISO 15978	1000 kg CO2 eq

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EuB SuperHub

Web Platform

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DIGITALISATION

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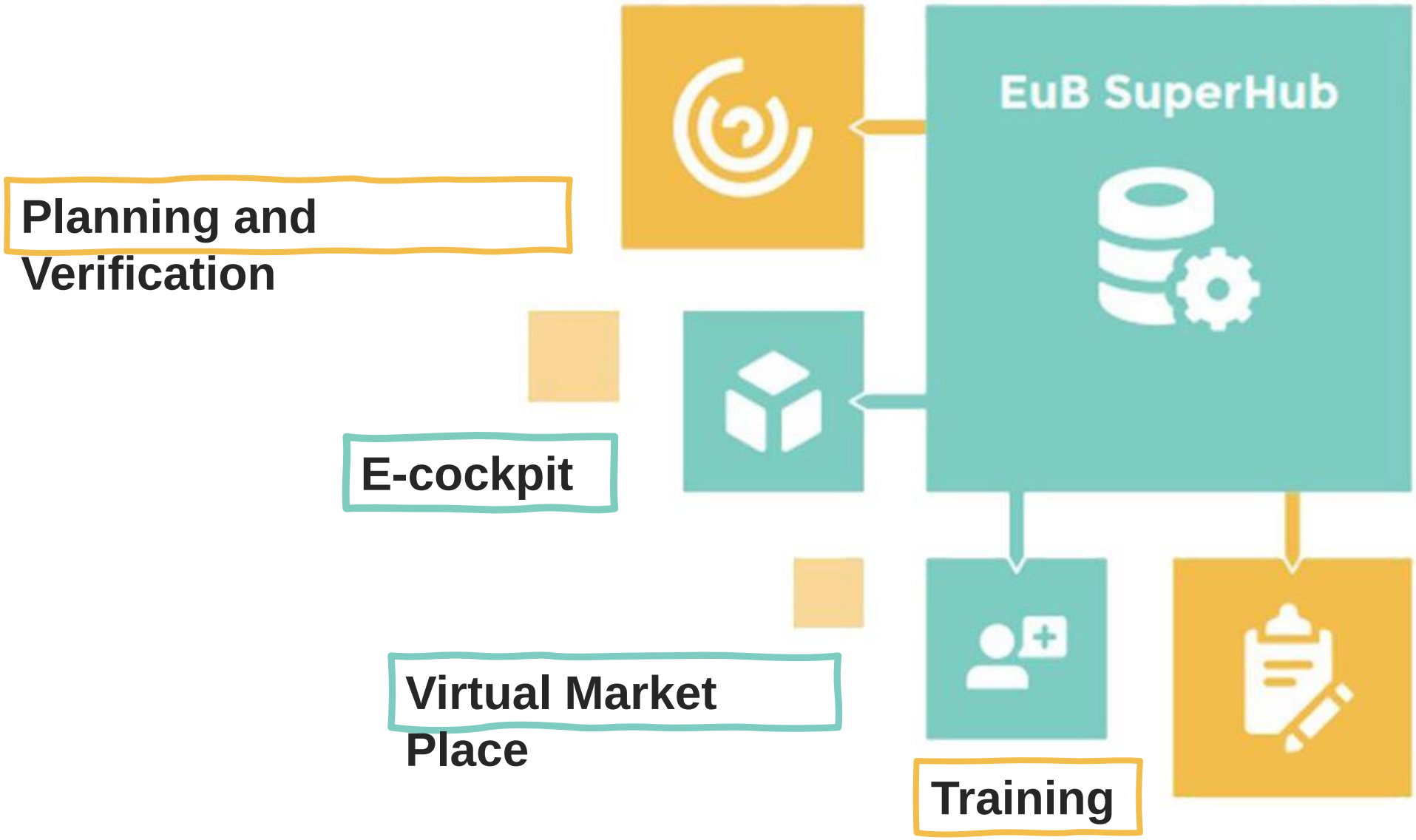

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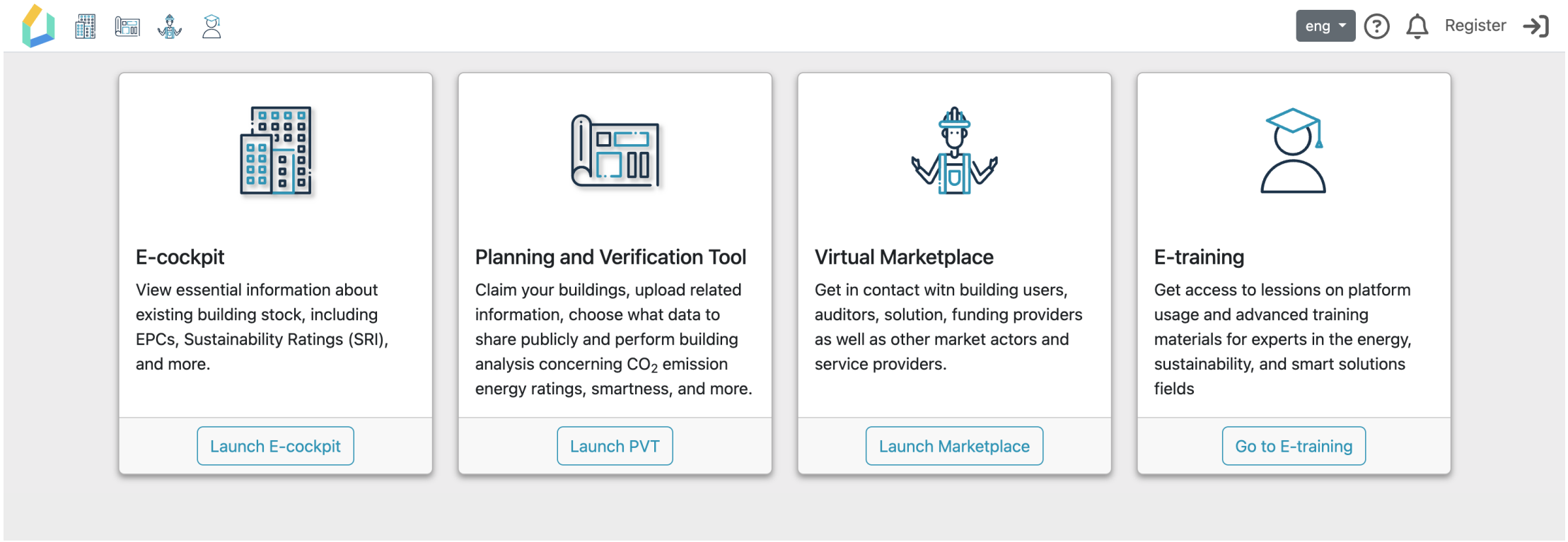

Four interconnected modules: E-cockpit, Planning and Verification Tool, Virtual Marketplace, and E-training.

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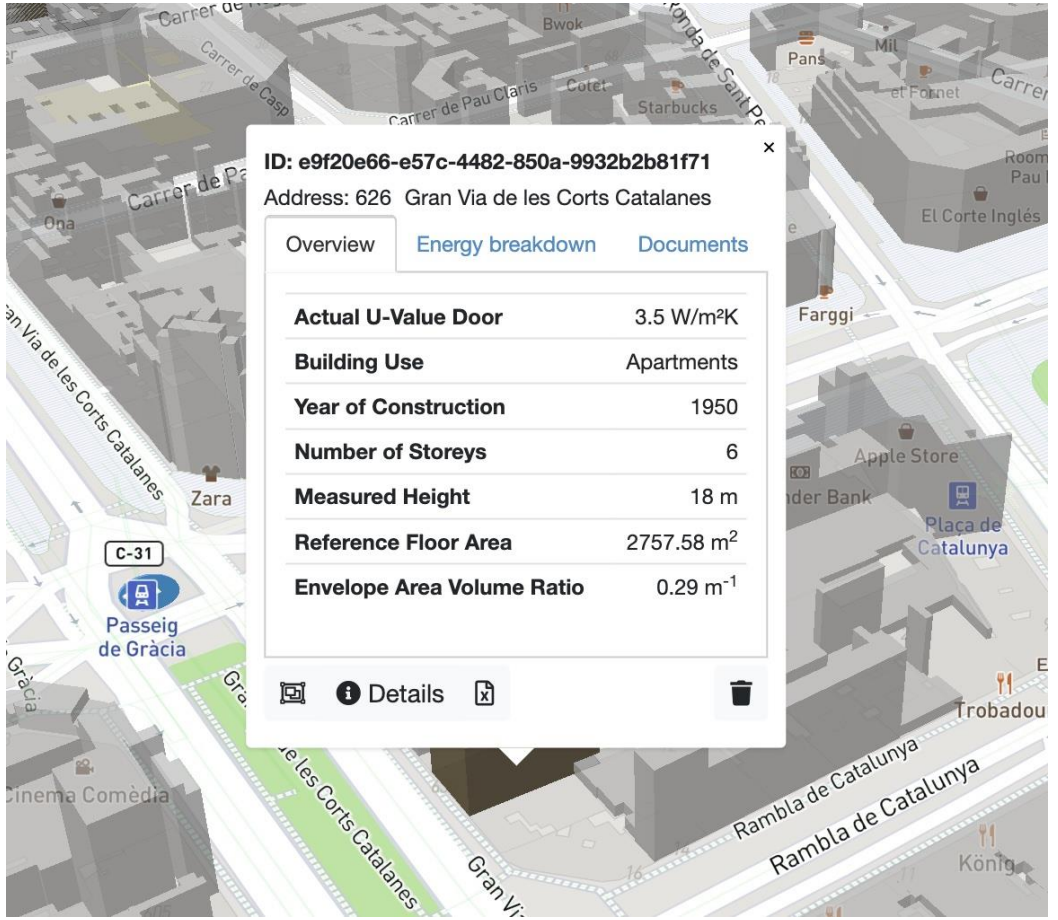
EUB SuperHub Platform

- *Geo-referenced one-stop shop data and communication hub*
- *Available in all EU languages*
- *Digital building logbook*
- *Simulation engine*



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EUB SuperHub Digital Building Logbook structure

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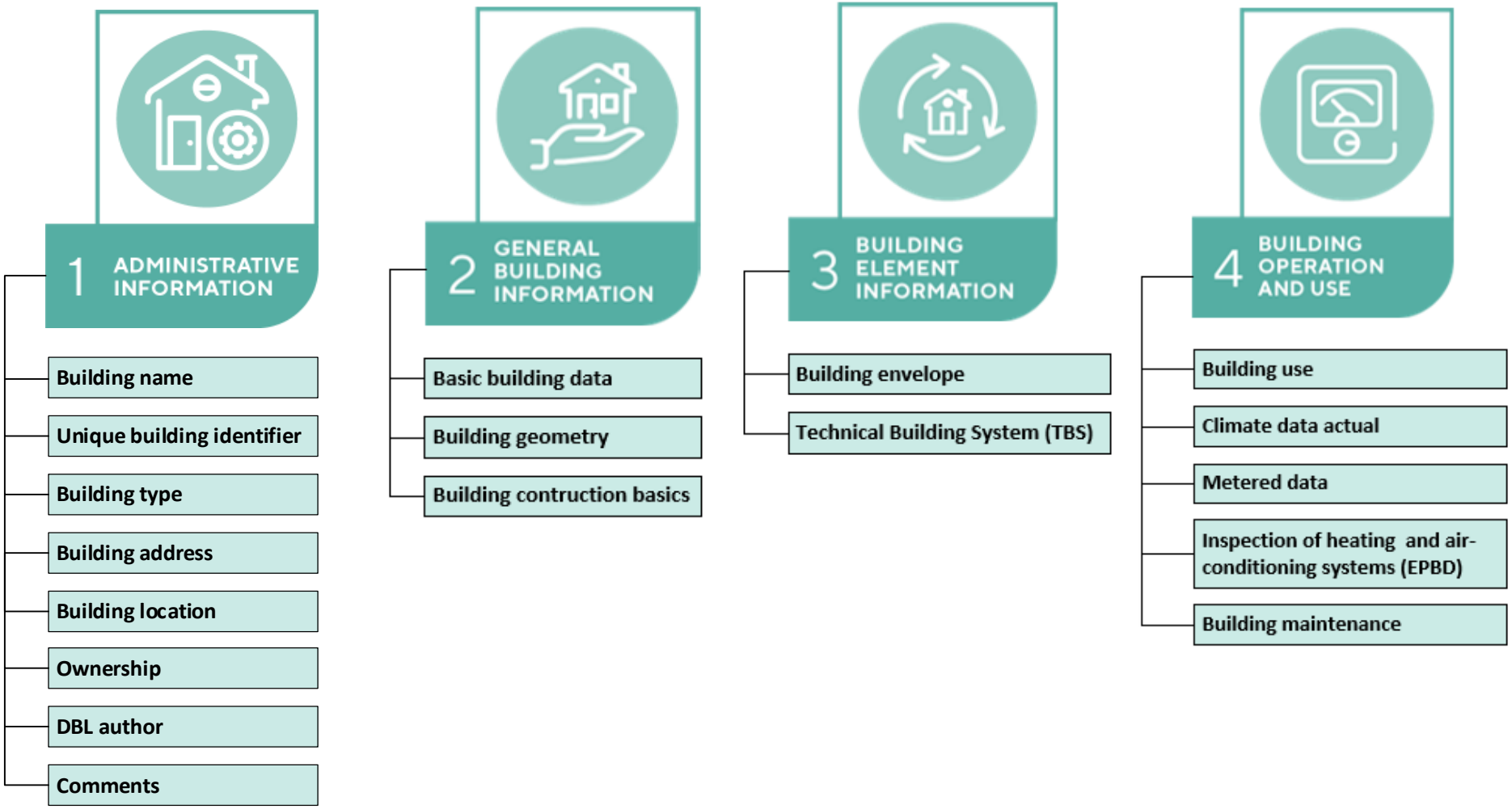
EUB SuperHub Digital Building Logbook structure



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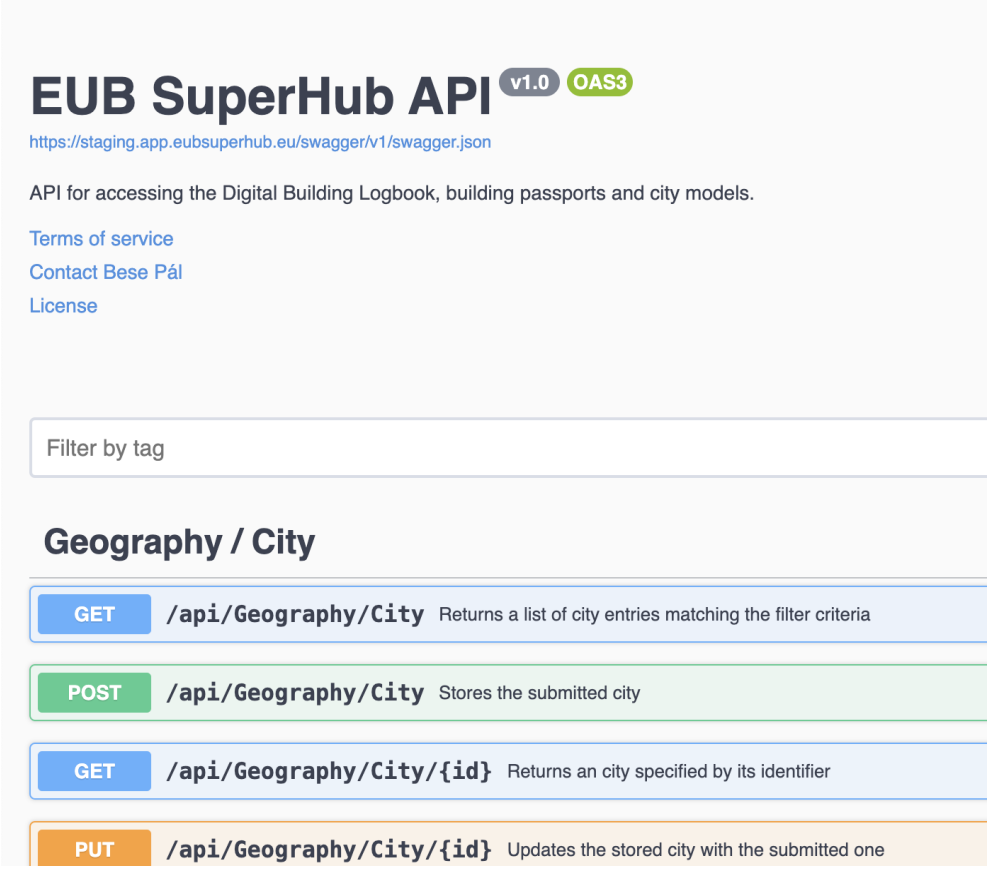
EUB SuperHub Platform

- *API publishing the EUB SuperHub features for external services.*



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ENGAGEMENT

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Local Advisory Teams (LAT)

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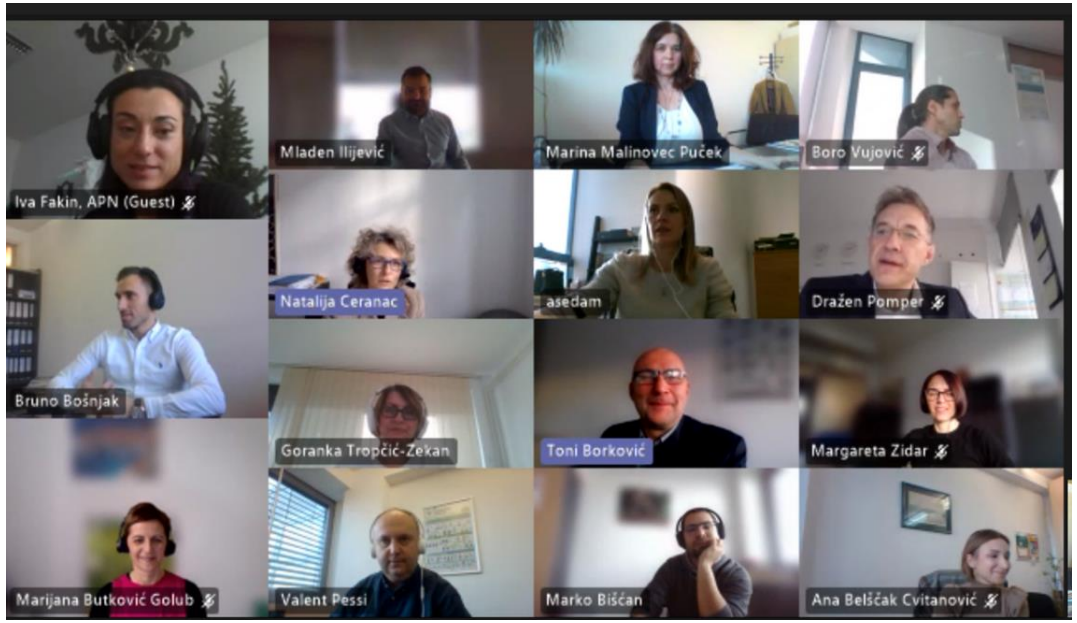

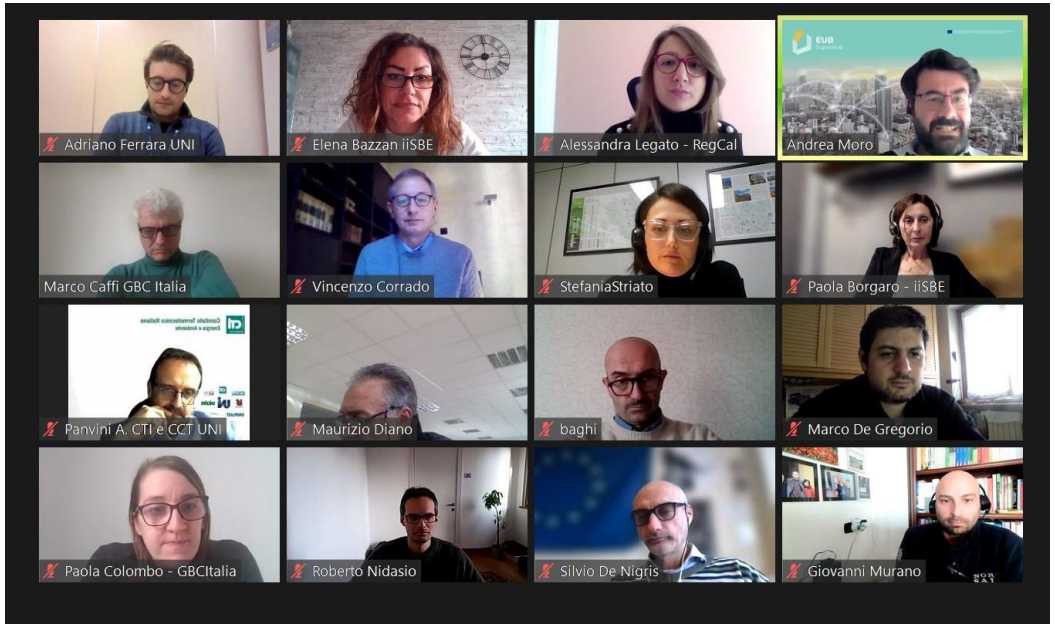

LATs aims to collect feedbacks and exchange information about the main tasks

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Local Advisory Team (LAT)

LATs were informal working groups established to:

- fostering the awareness of the Project in the local contexts;
- provide feedbacks on Project's activities/results;
- get feedbacks from stakeholders involved in order to provide advices and guidance for developing results that meet their needs and expectations;
- engage potential end users in the Project;
- support the dissemination and communication activities;
- support the exploitation of project's outcomes

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Thank you!

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