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BuildON Data-Centric Digital Building Logbook

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SUSTAINABLE PLACES 2025

8-10 OCTOBER 2025 | MILAN



BuildON







27°
Sunny

09:03
TUE
08/31



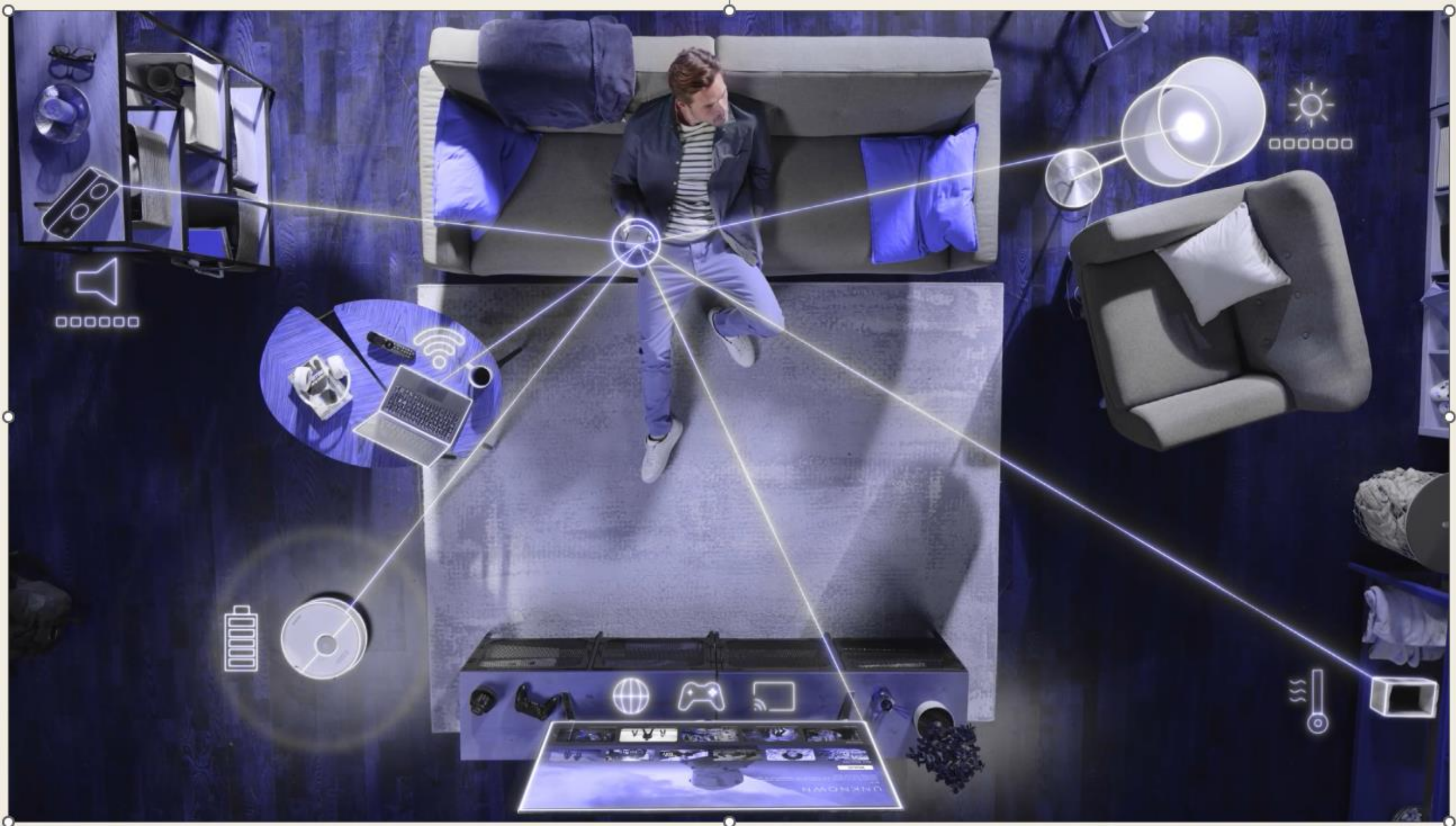
24°

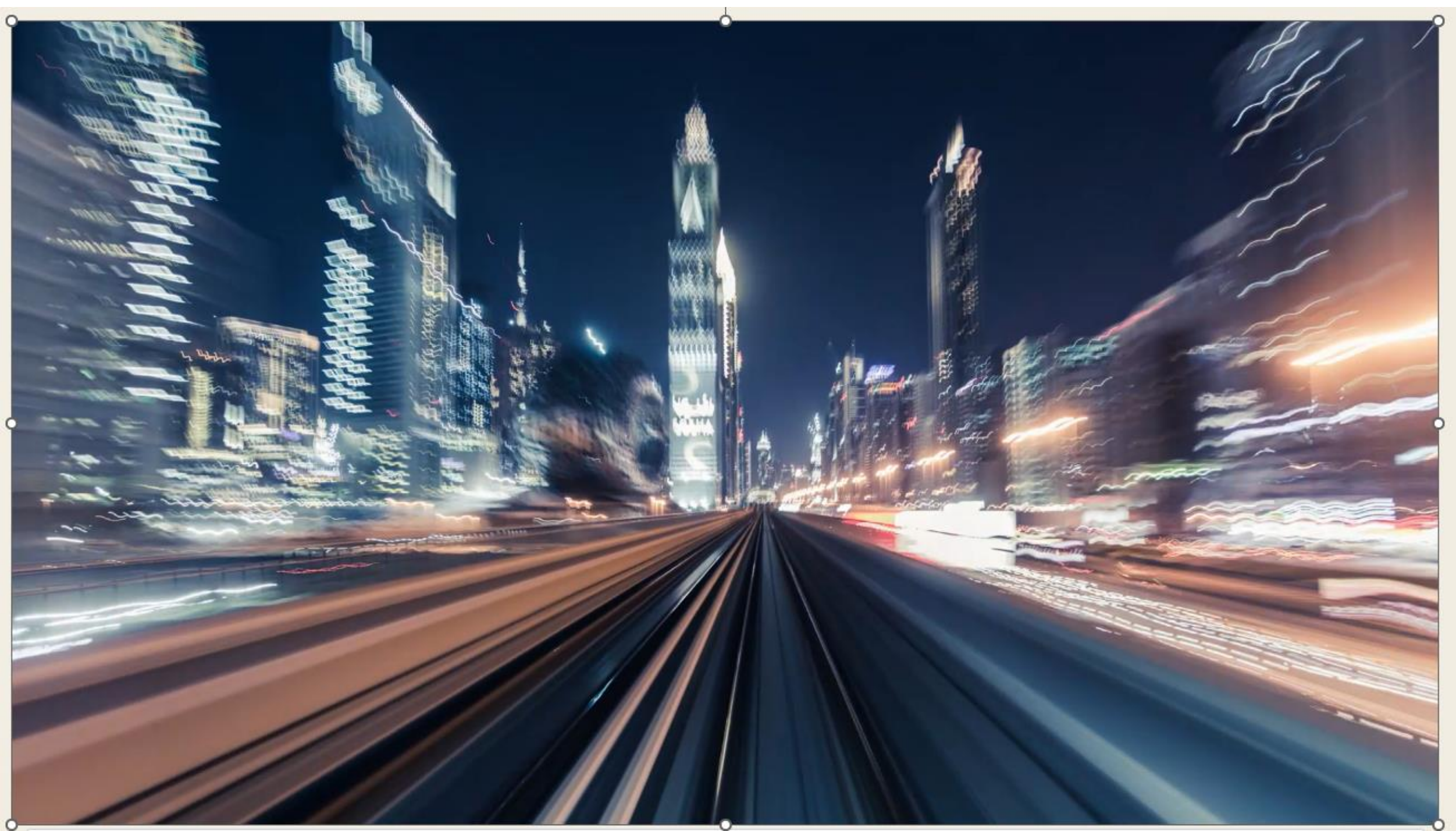
Fan: Auto

Good morning!
You have new email
Windows are open
Washing machine has finished the cycle









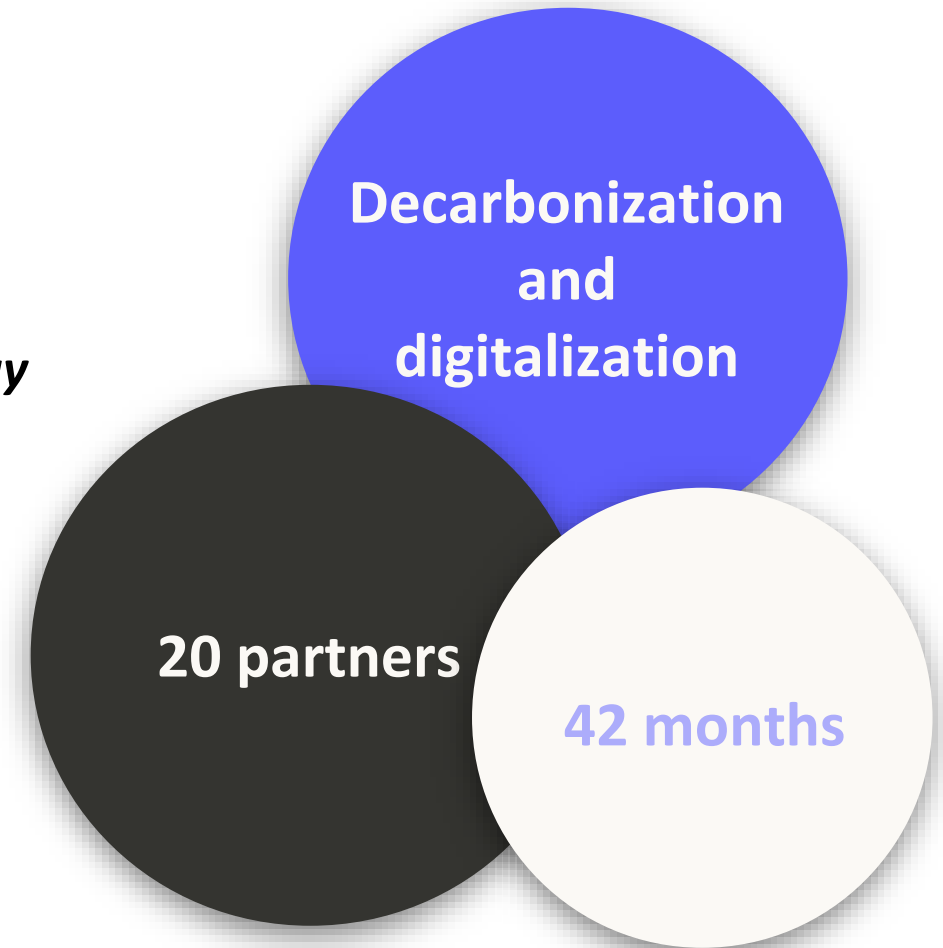
Lead the way towards building digitalization

BuildON project aims to support digital transformation of buildings towards sustainable, low-carbon living for the benefit of building occupants, owners and the energy system.

Building digitalization offers excellent potential for improved energy performance.

How?

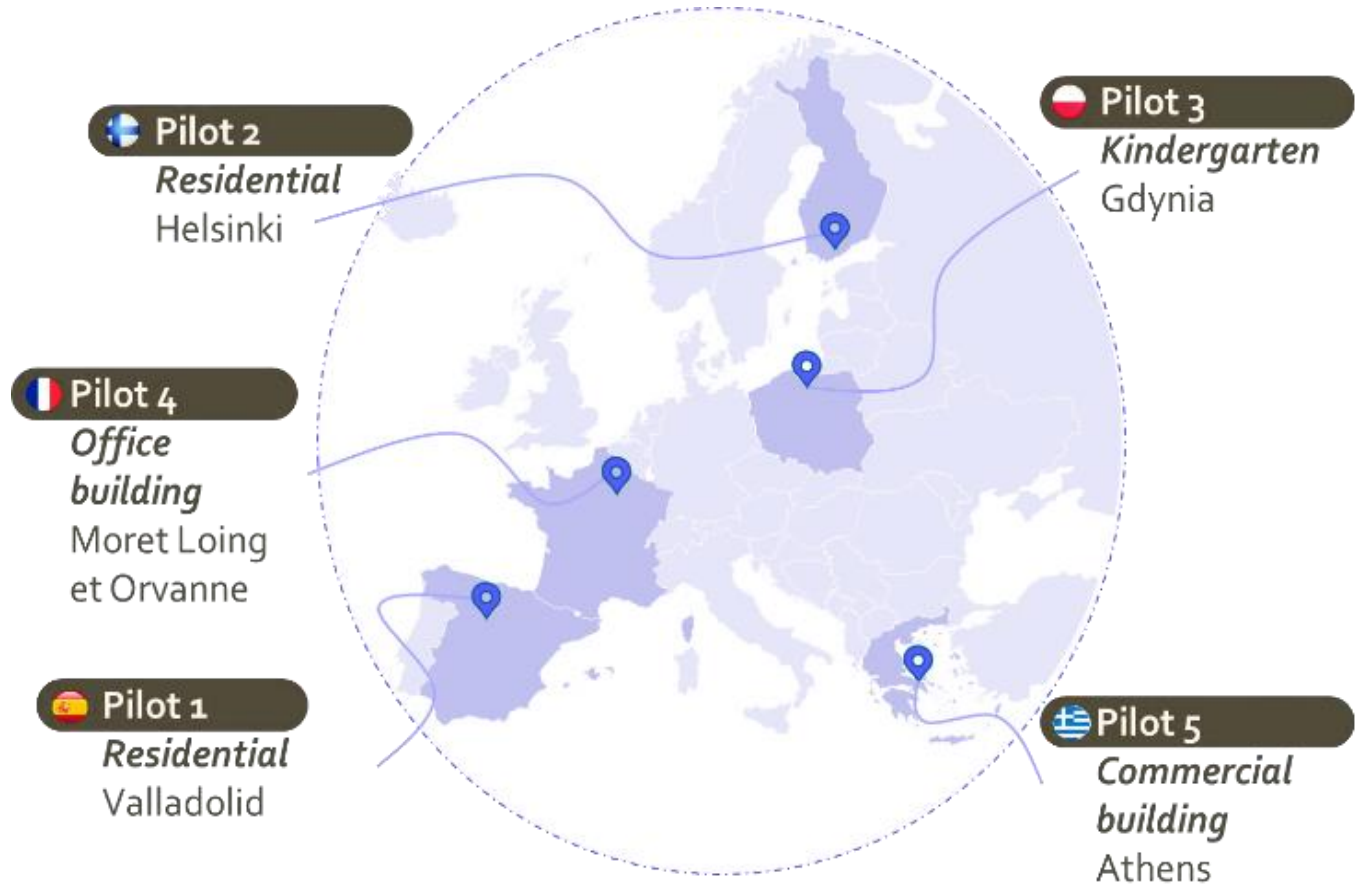
By using a combination of technologies that enable human-centric operation and improve the efficiency, flexibility and resilience of building, supported by better informed decisions.



BuildON Project

- 42 months project, started in April 2023
- 5 different pilots across the continent
- 4 different building types

The aim is to change the concept of buildings from a static perspective to a flexible “**building-as-a-service**” approach.



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BuildON aims to



Deliver user-friendly tools to empower users towards more efficient energy use.



Develop an interoperability framework for the integration of multiple building assets, data exchange and operation.



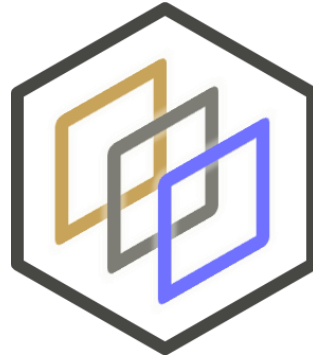
Implement scalable AI-based systems for buildings monitoring, assessment, prediction and optimisation.



Provide Digital Twins for building performance simulation and smart building operation.



Smart Transformer Toolbox



Smart energy management system

Powered by the MAPO analytics and optimization services. It includes services for data monitoring, assessment and prediction, as well as control strategies for optimizing performance.

IoT Edge- Cloud interoperable framework

This framework ensures seamless integration and communication between various energy systems and devices within the building.

Digital Twins

Virtual representations of physical systems that simulate their behaviour. We use DT for building performance simulation and for smart building operation.

User-friendly tools to empower users towards more efficient energy use

Data-driven innovative energy business models

Project partners



The Digital Building Logbook

(40) ‘pay-as-you-save financial scheme’ means a loan scheme dedicated exclusively to energy performance improvements where a correlation is established in the designing of the scheme between the repayments on the loan and the achieved energy savings, also taking into account other economic factors such as the indexation of the energy cost, interest rates, increased asset value and loan re-financing;

Directive (EU) 2024/1275 on the energy performance of buildings

“1. Member States shall ensure that the building owners, tenants and managers can have **direct access to their building systems’ data**...

For the purposes of this Directive, building systems’ data shall include at least all readily available data related to the energy performance of building elements, ...to the **digital building logbook**.”

Article 16 - Data exchange



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A Digital Building Logbook will act as
“flight recorder”
of the Building asset.



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Definition

A digital building logbook (DBL) is a **centralized repository** for all relevant building data, during the entire building lifecycle, promoting and contributing to improve within the AEC sector:

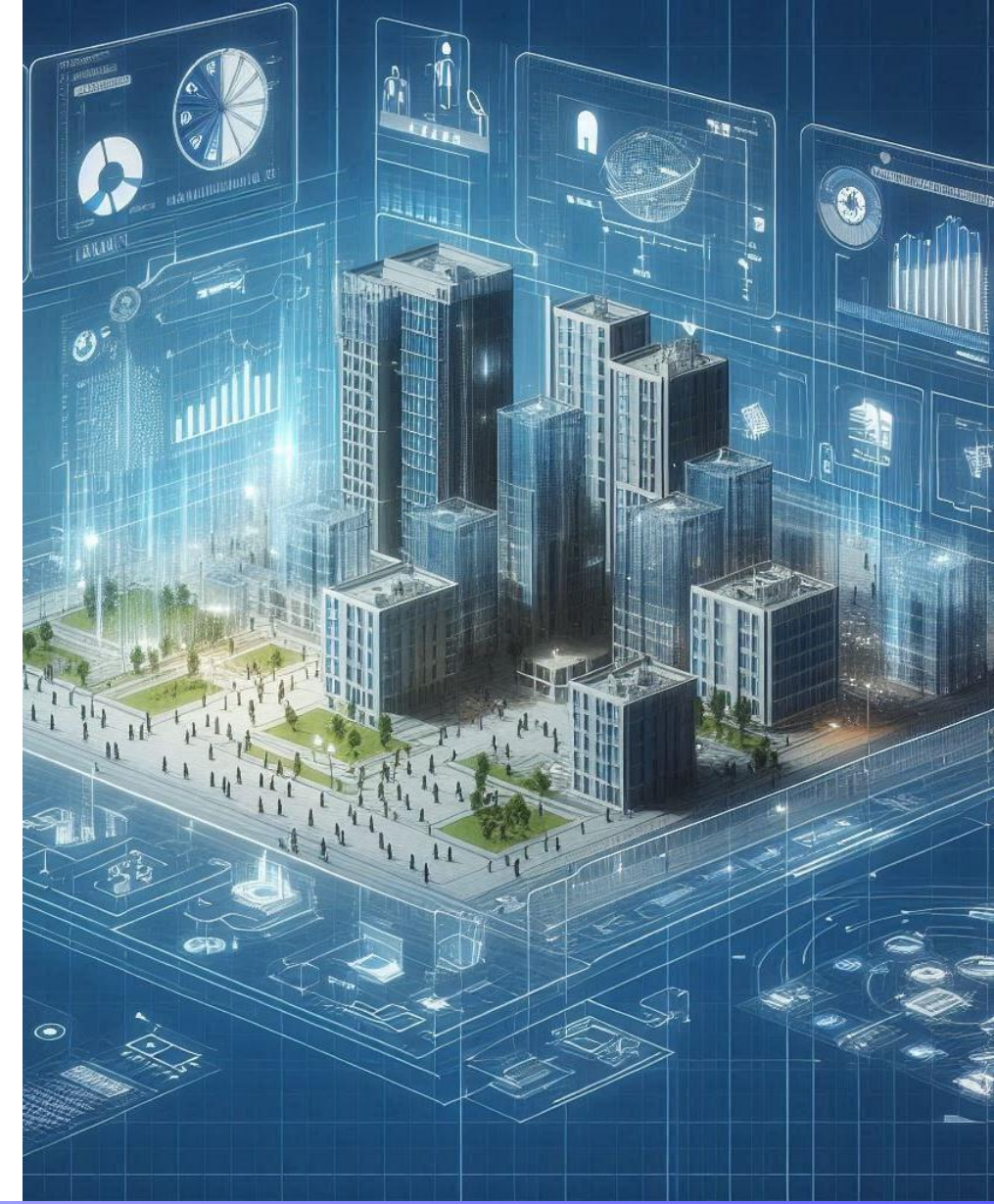
- Data quality, reliability and standardisation
- Regulatory compliance for informed decision-making
- Fostering interoperability
- Transparency and accountability



Data repository

The Digital Building Logbook will store **static data** such as:

- Building cadastre information, ownership titles, supplier contracts.
- Technological systems, Maintenance contracts, Interventions registry and Warranties.
- Together with **dynamic and interactive data** for building management:
- Live Energy consumption and production
- Maintenance notification alert and benchmark of buildings with similar characteristics.



BuildON's DBL

The platform will contain multiple data types organized into five main categories:

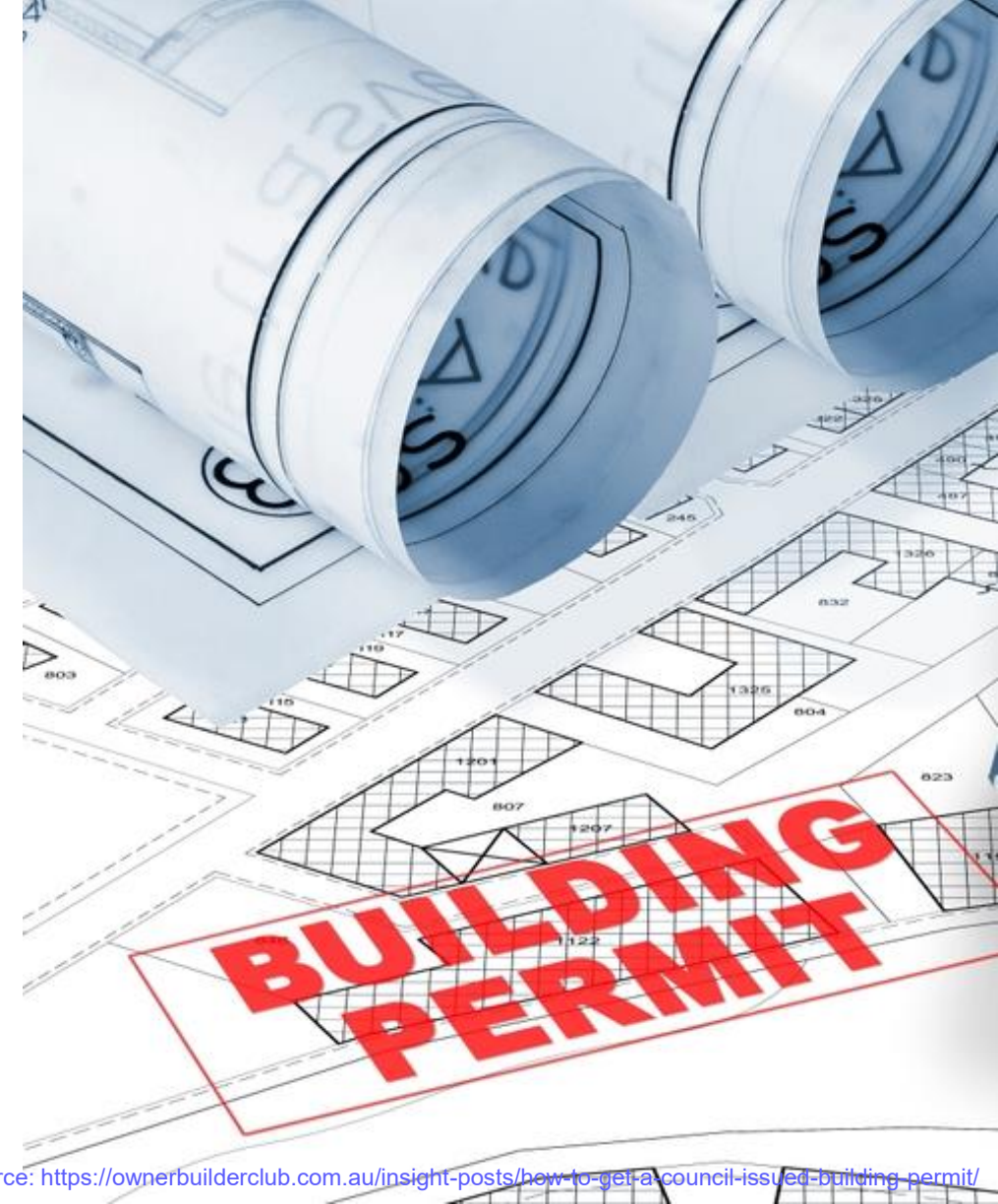
- General and Administrative Information
- Building Construction Information
- Building Energy Performance
- Building Operation and Use
- Building Logic Behaviours



BuildON's DBL

1. General and Administrative Information

- Ownership documents
- Property tax records
- Insurance policies
- Regulatory certifications (ex. Fire safety, health and safety)



Source: <https://ownerbuilderclub.com.au/insight-posts/how-to-get-a-council-issued-building-permit/>



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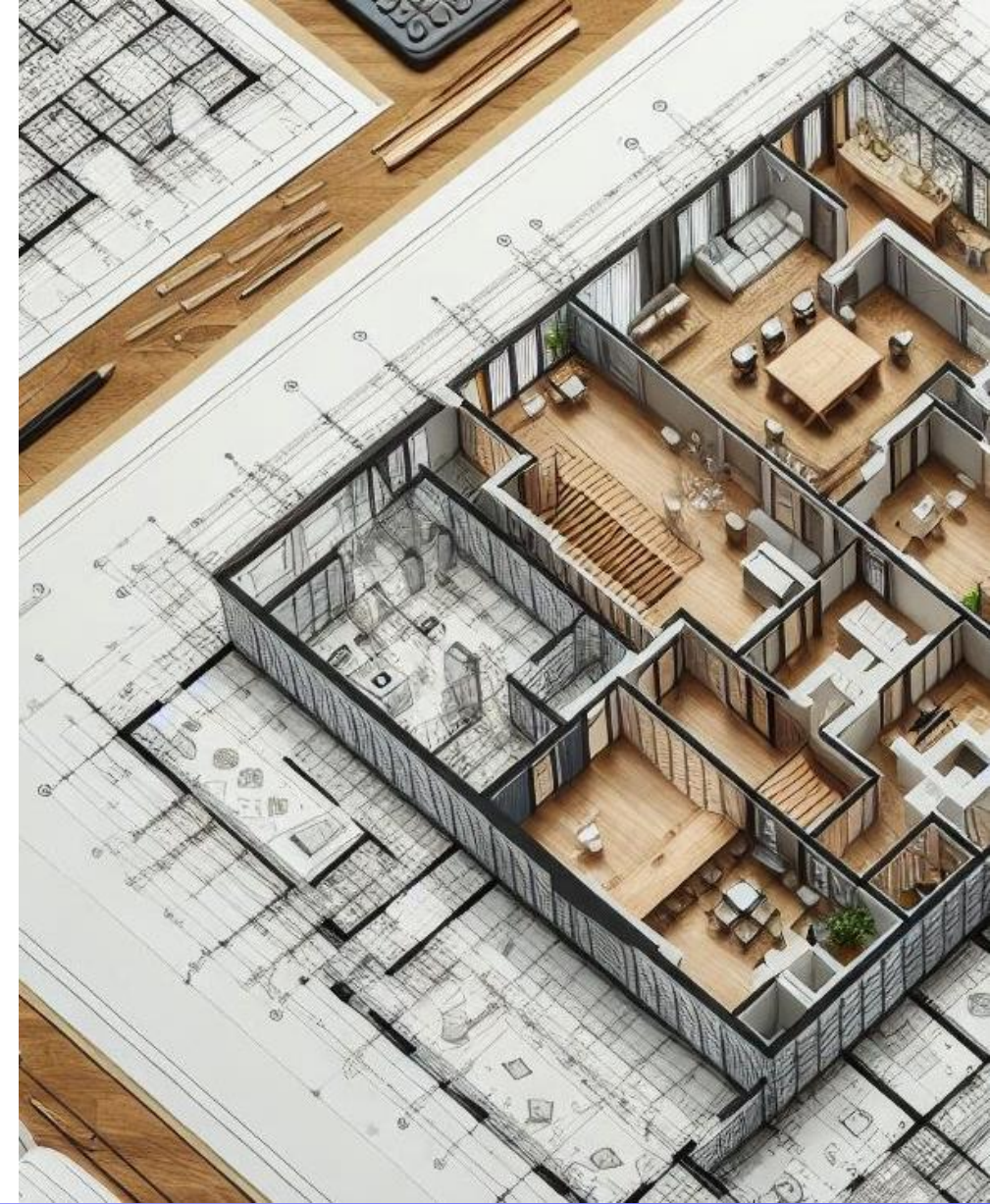


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BuildON's DBL

2. Building Construction Information

- Building plans and blueprints
- Structural engineering reports
- Technical building systems structures
- Building codes and standards



BuildON's DBL

3. Building Energy Performance

- Energy Certificates such as EPC, LEED
- Monthly and annual energy metered consumption
- Utility supplier bills (electricity, water)



Credit: rehva.eu



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BuildON's DBL

4. Building Operation and Use

- Maintenance Logs
- Operational manuals for building systems
- Operator schedules (cleaning, waste management, reception)
- Alerts and Events Logs



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BuildON's DBL

5. Building Logic Behaviours

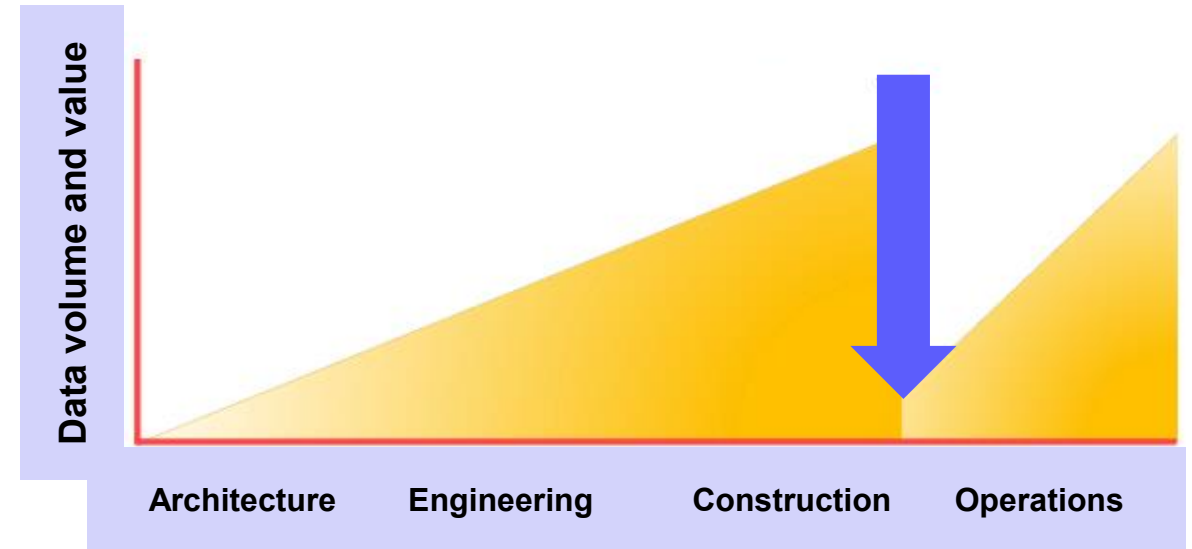
- Smart building system data
- Automation system settings
- Energy forecasting and benchmarks
- Analytics and predictive maintenance reports



The Challenge: Handover Gap

The Digital Building Logbook will collect data generated through BIM processes, including as-built models, building specifications, and construction documents.

Currently, the majority of data generated through the construction process is lost and not shared downstream in operations, causing a **handover gap**.



The Challenge: Handover Gap

Deliver **tailored data** to address each user's specific needs and requirements

Transition from a traditional file storage system to a **metadata-driven access system.**



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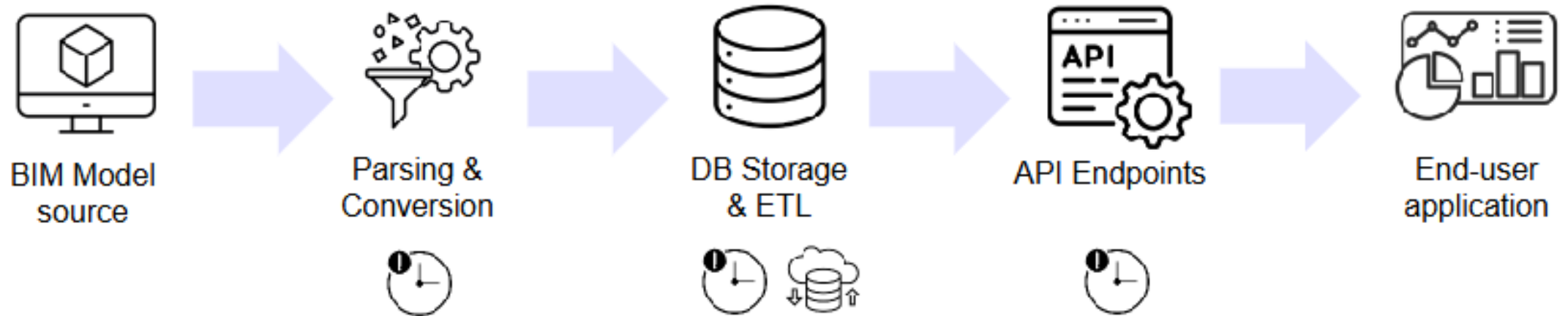
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Traditional Data Flow

Top-Down Workflow



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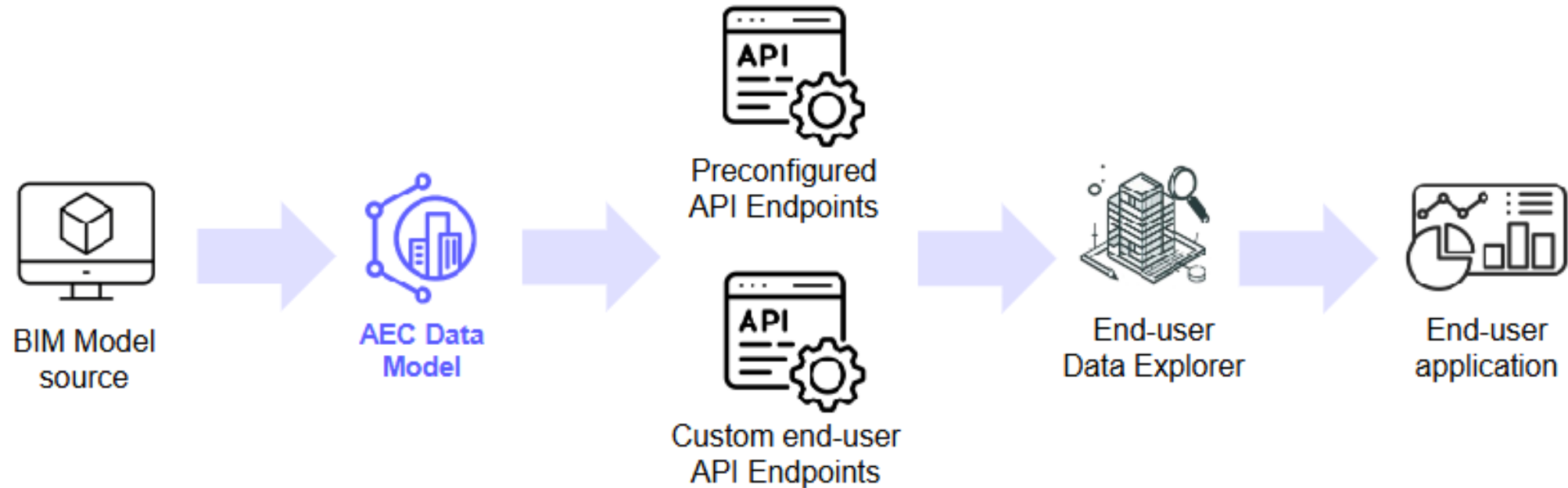
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The Solution: graph data explore

Bottom-Up Workflow



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DBL Functionalities

The DBL will filter and organize metadata tailored to each user's persona by leveraging a range of application tools, including:



User & Role
Management



Building Data
Management



3D BIM Viewer



Building Data
Explorer



Digital Twin
Dashboard

DBL Functionalities

We envisioned the DBL not just as a repository but a range of application tools that help users to access and interact with the data that they need:



User & Role Management for defining and setting up access control right based on Archetypes



Building Data Management is a tables format interface containing the key building information and related documentation.



3D BIM Viewer is to facilitate the building understanding and enable an easier asset localization.



Building Data Explorer is a tool powered by a Large Language Model AI, that enables users to search for elements and extract quantitative data using everyday language.



Digital Twin Dashboard is an application used to monitor the live building performances and forecast depending on the asset.



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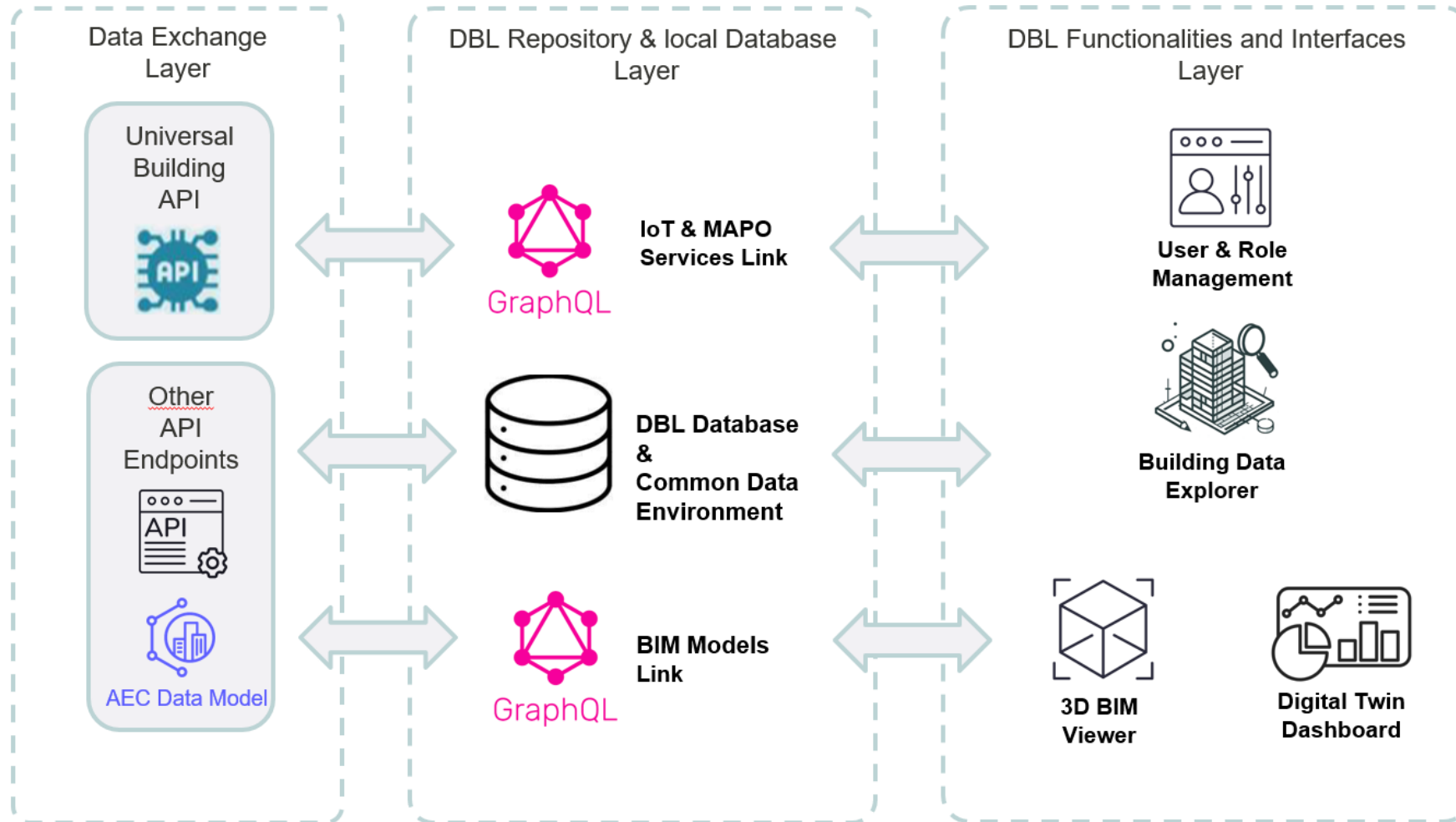


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BuildON's DBL Architecture



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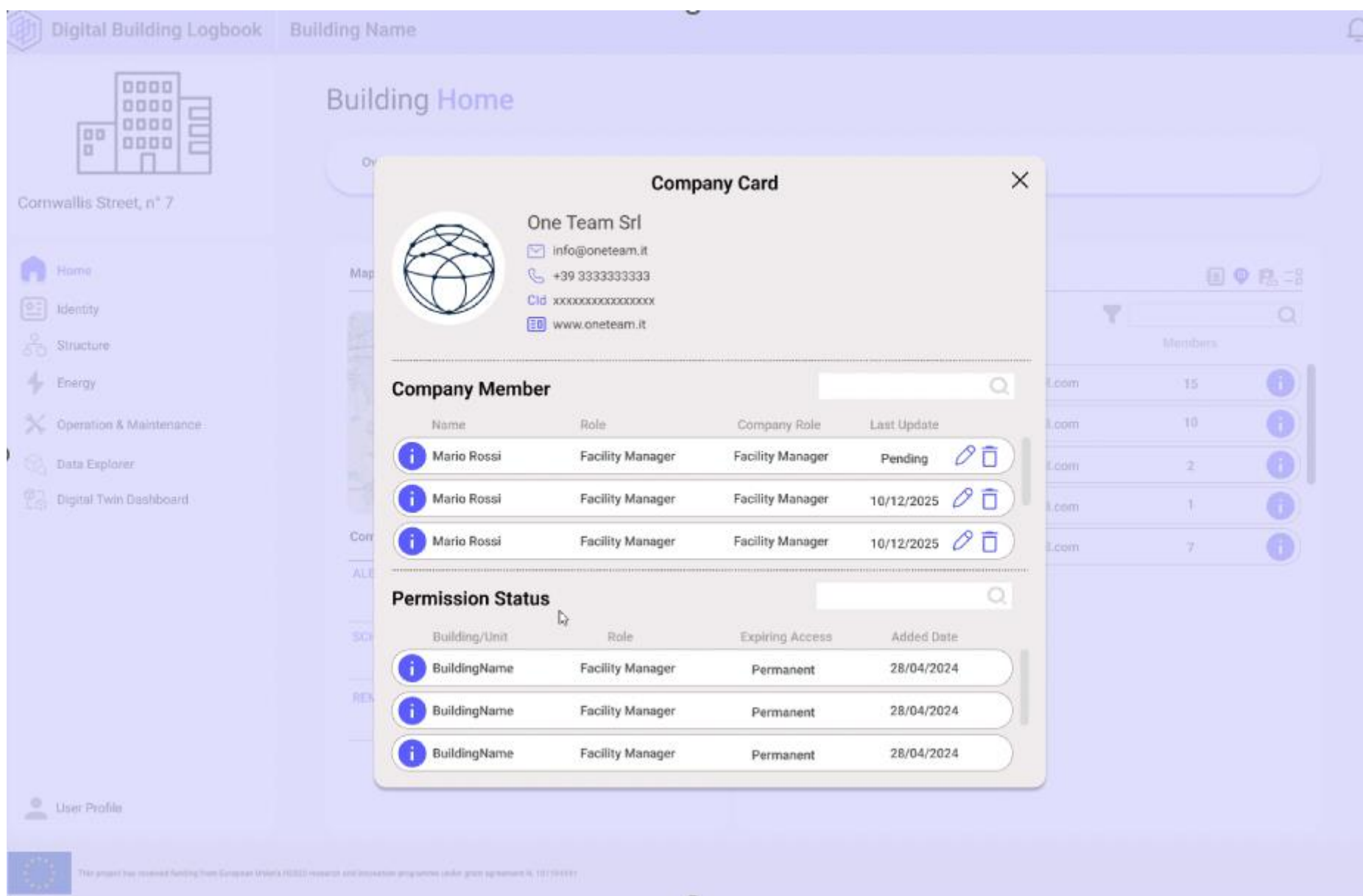
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USER & ROLE MANAGEMENT

**BuildON**Italy Greve in Chianti via Roma 1 Greece
Poland

Home

Identity

Building Identity

Sustainability

Energy

Operation & Maintenance

Elements

Energy

Operation & Maintenance

Data Explorer

Digital Twin Dashboard



User Profile

Building Identity

Building Identity

Sustainability

Energy

Operation & Maintenance

Identity

Location

Weather data

General Dimension

Name	BuildON Poland
Main destination	-- Select Option --
Other destination	-- Select Option --
Category	-- Select Option --
Construction year	gg/mm/aaaa
Last renovation	gg/mm/aaaa



This project has received funding from European Union's H2020 research and innovation programme under grant agreement N. 101104141

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Poland

Home

Identity

Elements

Energy

● Energy summary

● Water meter

● Energy metered

● Energy simulation

● EPC

✕ Operation & Maintenance

Home Data Explorer

Digital Twin Dashboard

User Profile

Building Energy

Energy summary

Water meter

Energy metered

Energy simulation

EPC

Metered Energy consumption

Metered Exported on-site

Metered Generation on-site

▲ Biomass Energy

Thermal energy by biomass per useful floor area

kWh/(m2yr)

Thermal energy by biomass

kWh/yr

▲ Wind Energy

Electricity by small wind turbines per useful floor area

kWh/(m2yr)

Electricity by small wind turbines

kWh/yr

▲ Heat Pump

Thermal energy heat pump per useful floor area

kWh/(m2yr)

Thermal energy heat pump

kWh/yr



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**BUILDING DATA
MANAGEMENT**Co-funded by
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Digital Building Logbook

Building Name

Cornwallis Street, n° 7

Home

Identity

Structure

Levels

Units

Systems

Energy

Operation & Maintenance

Data Explorer

Digital Twin Dashboard

User Profile

Building Structure

Levels

Units

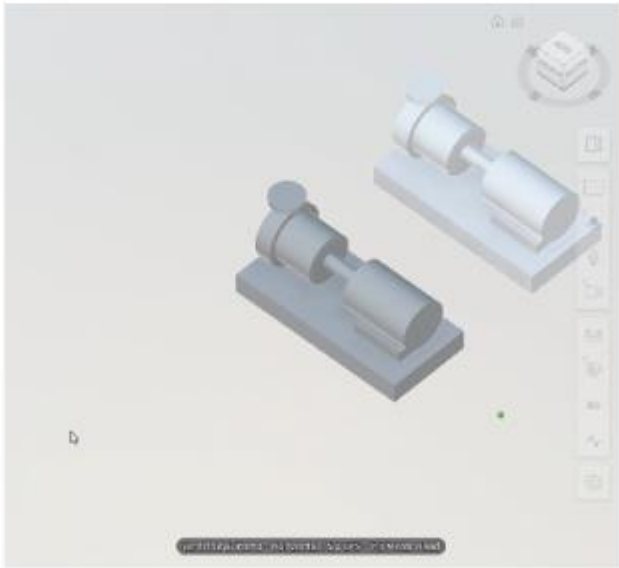
Systems

Systems List

DHW System

Equipments	Typology
Eq Name	Water Pump Basement
Eq Type	IfcPump
System Name	DHW
Host	-
Mark	02
Description	Water pump for DHW supply
Manufacturer	Grundfos
Model	150S78 Pump head
Type	Circulating pump
Installation Year	2022
Register code	A102CXLD00222
Eq Name	Water Pump Store
Eq Name	Water Heater Gas
Eq Name	Water Heater Electric

BIM Viewer



This project has received funding from European Union's Horizon research and innovation programme under grant agreement N. 101154541

BUILDING DATA
MANAGEMENT

3D BIM VIEWER

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Italy Greve in Chianti via Roma 1 Greece
Poland

- Home
- Identity
- Elements
- Energy
- Operation & Maintenance
- Data Explorer
- Digital Twin Dashboard

User Profile

Building Energy

Levels Units Spaces Equipments

Spaces

Search:

	Name	Number	Area	Perimeter	Volume	Unit or HVAC Zone	Setpoint Room Temperature Cooling period
	F01_09_Classroom 4 F01_09	F01_09	60.15791999999984	33.76999999999999	220.40441445105571	F00_Classrooms	
	F00_08_Classroom 3 F00_08	F00_08	60.12586403895742	34.256000000000155	220.32756760214093	F00_Classrooms	
	F00_07_Classroom 2 F00_07	F00_07	61.42932999999998	33.889999999999992	225.16021057535028	F00_Classrooms	
	F00_06_Classroom 1 F00_06	F00_06	74.67190000000001	38.120000000000026	280.9586785122661	F00_Classrooms	
	F00_17_Corridor F00_17	F00_17	69.76910453122952	63.760195506131666	210.0253475906765	F00_Corridors	
	F00_10_Bathroom F00_10	F00_10	29.225778320711687	32.910530975591406	87.46694256003812	F00_Bathrooms	
	F00_10a_Bathroom F00_10a	F00_10a	6.6447000000000237	12.3900000000000322	18.306148500000614	F00_Bathrooms	
	F00_11_Toilet F00_11	F00_11	9.954373338133088	13.764734512204999	27.4242985465567	F00_Bathrooms	
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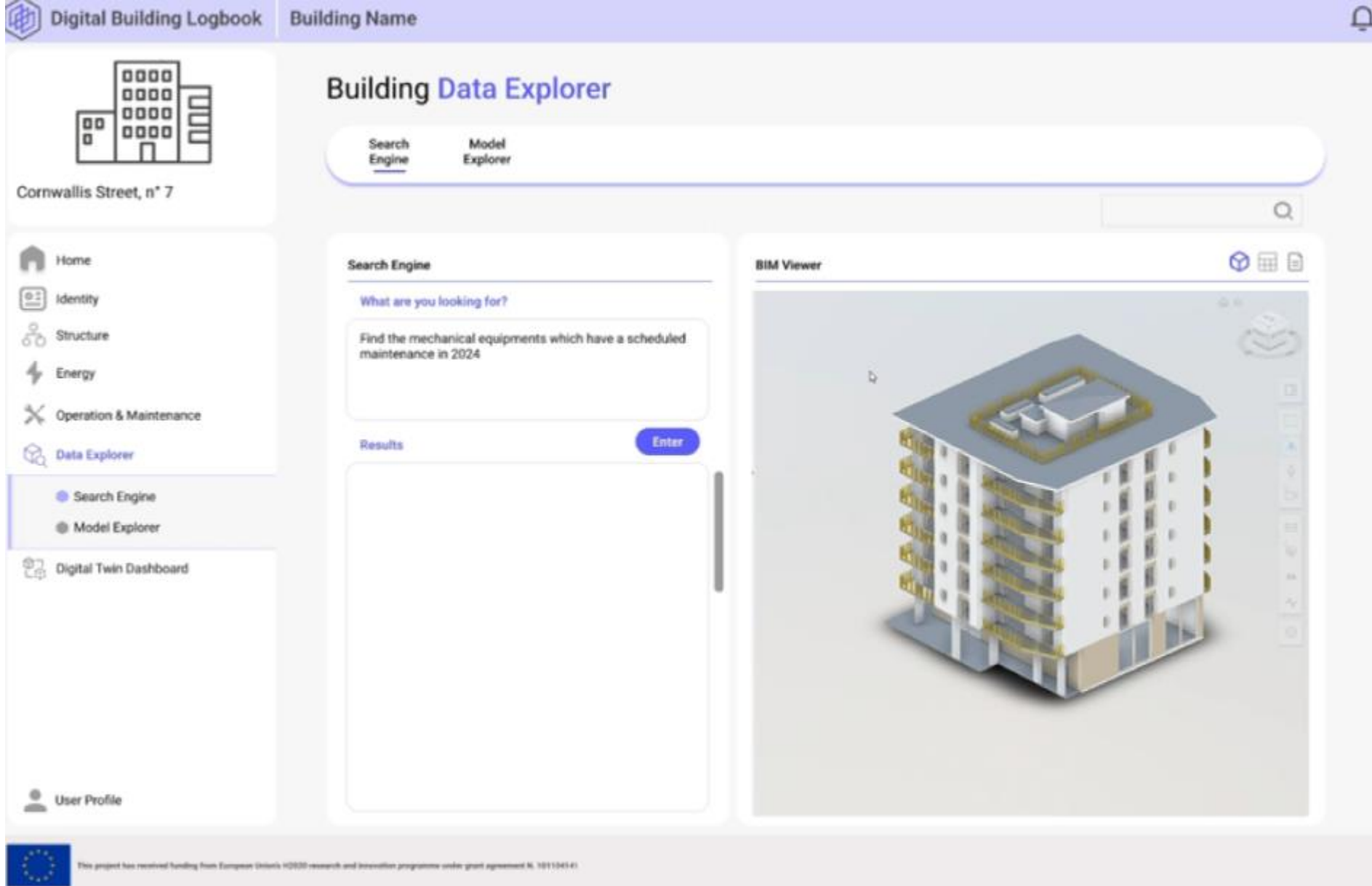
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BUILDING DATA
EXPLORER



3D BIM VIEWER



**BUILDING DATA
EXPLORER**



3D BIM VIEWER



**LLM AI SEARCH
ENGINE**



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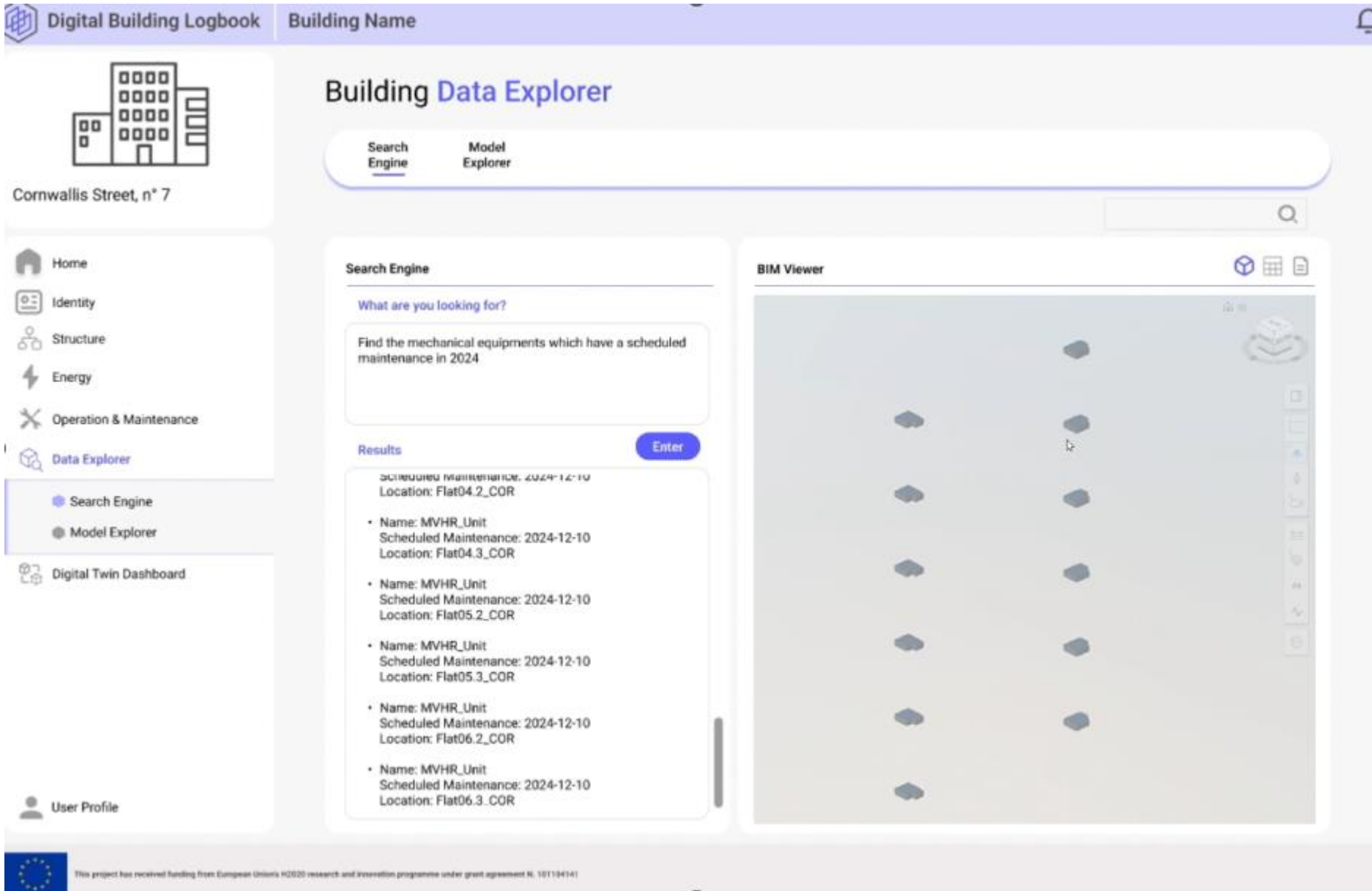
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**BUILDING DATA
EXPLORER**



3D BIM VIEWER



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ENGINE**



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BuildON's DBL Parametric data fields

Digital Building Logbook

Building Name



L1 -> UI_Chapter

L2 -> UI_Topic

L3 -> UI_subTopic

Address Street, N°

Home

Identity

Structure

Energy

Energy Metered

Energy Needs

EPC

Operation & Maintenance

Data Explorer

Digital Twin Dashboard

User Profile

Settings

Energy Performance

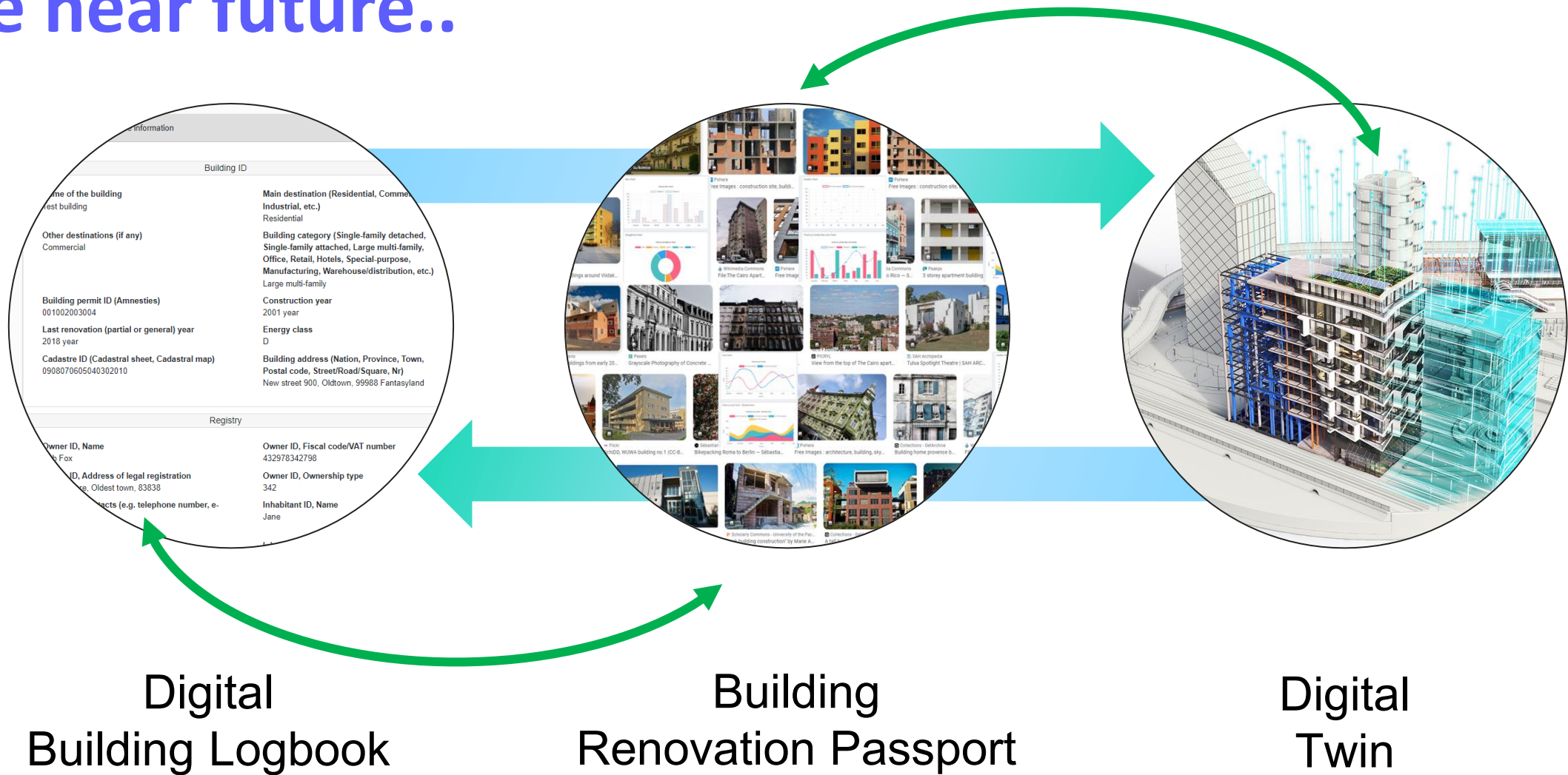
Wind Energy

Unit X - System Name

L4 -> UI_Card

UI_Chapter	UI_Topic	UI_subTopic	UI	Order	MAIN	AlwaysVisib	UI_name	Data typ	U	Values	Source#1	Source#2	Q	SUM	AEC DM Category	AEC DM Parameter
Building Elements	Levels			1	1	1	1 Name	VARCHAR(50)		BIM	DB		1		Levels	Name
Building Elements	Levels			2	1	1	Elevation	FLOAT(5,2) m		BIM	DB		1		Levels	Elevation
Building Elements	Levels			3	1	1	Gross FloorArea	FLOAT(5,2) m2		BIM	DB		1		1 Floors	Area
Building Elements	Levels			4	0	0	Gross Volume	FLOAT(5,2) m3		BIM	DB		1		1 Rooms	Volume
Building Elements	Levels			5	0	0	Net FloorArea	FLOAT(5,2) m2		BIM	DB		1		1 Rooms	Area
Building Elements	Levels			6	0	0	Net Height	FLOAT(5,2) m		BIM	DB		1		2 Rooms	Unbounded Height
Building Elements	Levels			7	0	0	Net Volume	FLOAT(5,2) m3		BIM	DB		1		2 Rooms	Volume
Building Elements	Units	Identity		1	1	1	1 Level	VARCHAR(50)		BIM	DB					
Building Elements	Spaces	Identity		1	1	1	1 Name	VARCHAR(50)		BIM	DB		1		Spaces	Name
Building Elements	Spaces	Identity		2	1	1	1 Number	VARCHAR(50)		BIM	DB		1		Spaces	Number
Building Elements	Spaces	Dimension		3	1	1	Area	FLOAT(5,2) m2		BIM	DB		1		Spaces	Area
Building Elements	Spaces	Dimension		4	1	1	Perimeter	FLOAT(5,2) m		BIM	DB		1		Spaces	Perimeter
Building Elements	Spaces	Dimension		5	1	1	Volume	FLOAT(5,2) m3		BIM	DB		1		Spaces	Volume
Building Elements	Spaces	HVAC		6	0	0	Cooling Load	FLOAT(5,2) kWh		BIM	DB		1		Spaces	Calculated Cooling Load
Building Elements	Spaces	HVAC		7	0	0	Heating Load	FLOAT(5,2) kWh		BIM	DB		1		Spaces	Calculated Heating Load
Building Elements	Spaces	HVAC		8	0	0	Supply Airflow	FLOAT(5,2) l/s		BIM	DB		1		Spaces	Calculated Supply Airflow
Building Elements	Units	Identity		2	1	1	1 Name	VARCHAR(50)		BIM	DB		1		HVAC Zones	Name
Building Elements	Units	Identity		3	1	1	1 Number	VARCHAR(50)		BIM	DB		1		HVAC Zones	Number
Building Elements	Units	Identity		4	1	1	Type	ENUM	Resident	BIM	DB					
Building Elements	Units	Identity		5	1	1	Description	VARCHAR(50)		BIM	DB		1		HVAC Zones	Description
Building Elements	Units	Dimension		11	1	1	Gross Area	FLOAT(5,2) m2		BIM	DB		1		HVAC Zones	Gross Area
Building Elements	Units	HVAC		20	1	1	Cooling Load	FLOAT(5,2) kWh		BIM	DB		1		HVAC Zones	Calculated Cooling Load
Building Elements	Units	HVAC		21	1	1	Heating Load	FLOAT(5,2) kWh		BIM	DB		1		HVAC Zones	Calculated Heating Load
Building Elements	Units	HVAC		24	1	1	Supply Airflow	FLOAT(5,2) l/s		BIM	DB		1		HVAC Zones	Calculated Supply Airflow
Building Elements	Units	Energy		40	1	1	Lighting Load Density	FLOAT(5,2) kWh		BIM	DB					
Building Elements	Units	Energy		41	1	1	Gross heated volume	FLOAT(5,2) m3		BIM	DB		1		HVAC Zones	Gross Volume
Building Elements	Units	Dimension		10	0	0	Perimeter	FLOAT(5,2)		BIM	DB		1		HVAC Zones	Perimeter
Building Elements	Units	Dimension		12	0	0	Occupied Area	FLOAT(5,2)		BIM	DB		1		HVAC Zones	Occupied Area
Building Elements	Units	Dimension		13	0	0	Occupied Volume	FLOAT(5,2)		BIM	DB		1		HVAC Zones	Occupied Volume
Building Elements	Units	HVAC		21	0	0	Calculated Supply Airflow per area	FLOAT(5,2)		BIM	DB		1		HVAC Zones	Calculated Supply Airflow per area
Building Elements	Units	HVAC		22	0	0	Calculated Area per Heating Load	FLOAT(5,2)		BIM	DB		1		HVAC Zones	Calculated Area per Heating Load
Building Elements	Equipment Electrical	Identity		3	1	1	1 System name	VARCHAR(50)		BIM	DB		1		Equipment Electrical	System Name
Building Elements	Equipment Plumbing	Identity		3	1	1	1 System name	VARCHAR(50)		BIM	DB		1		Equipment Plumbing	System Name
Building Elements	Equipment Mechanical	Identity		5	1	1	Description	VARCHAR(50)		BIM	DB		1		Equipment Mechanical	Description
Building Elements	Equipment Mechanical	Energy		207	0	0	Fuel	VARCHAR(50)		DB						
Building Elements	Equipment Mechanical	Energy		206	0	0	Nominal power	FLOAT(5,2) kW		DB						
Building Elements	Equipment Mechanical	Energy		204	0	0	Energy class (EU Label)	ENUM	A+++ A++	DB						
Building Elements	Equipment Mechanical	Energy		205	0	0	Efficiency	FLOAT(5,2)		DB						

The near future..



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