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the European Union**

Project funded by



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INDustrialised and PErsonalised Renovation for Sustainable sOcieties

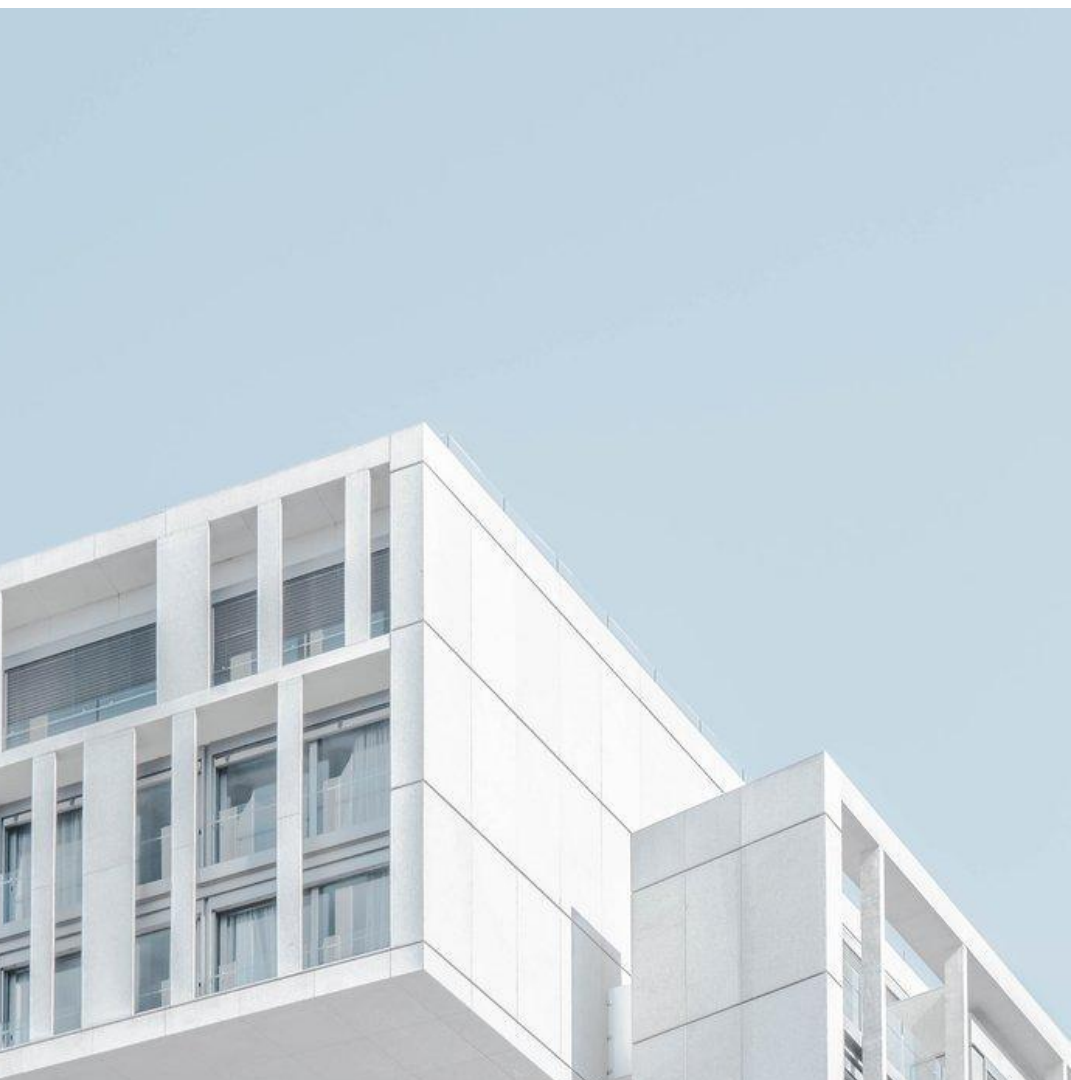
José Luis Alapont (Technical Manager)
Universitat Politècnica de València

22 Partners | 9 Countries | 48 Months | 9.1M Budget



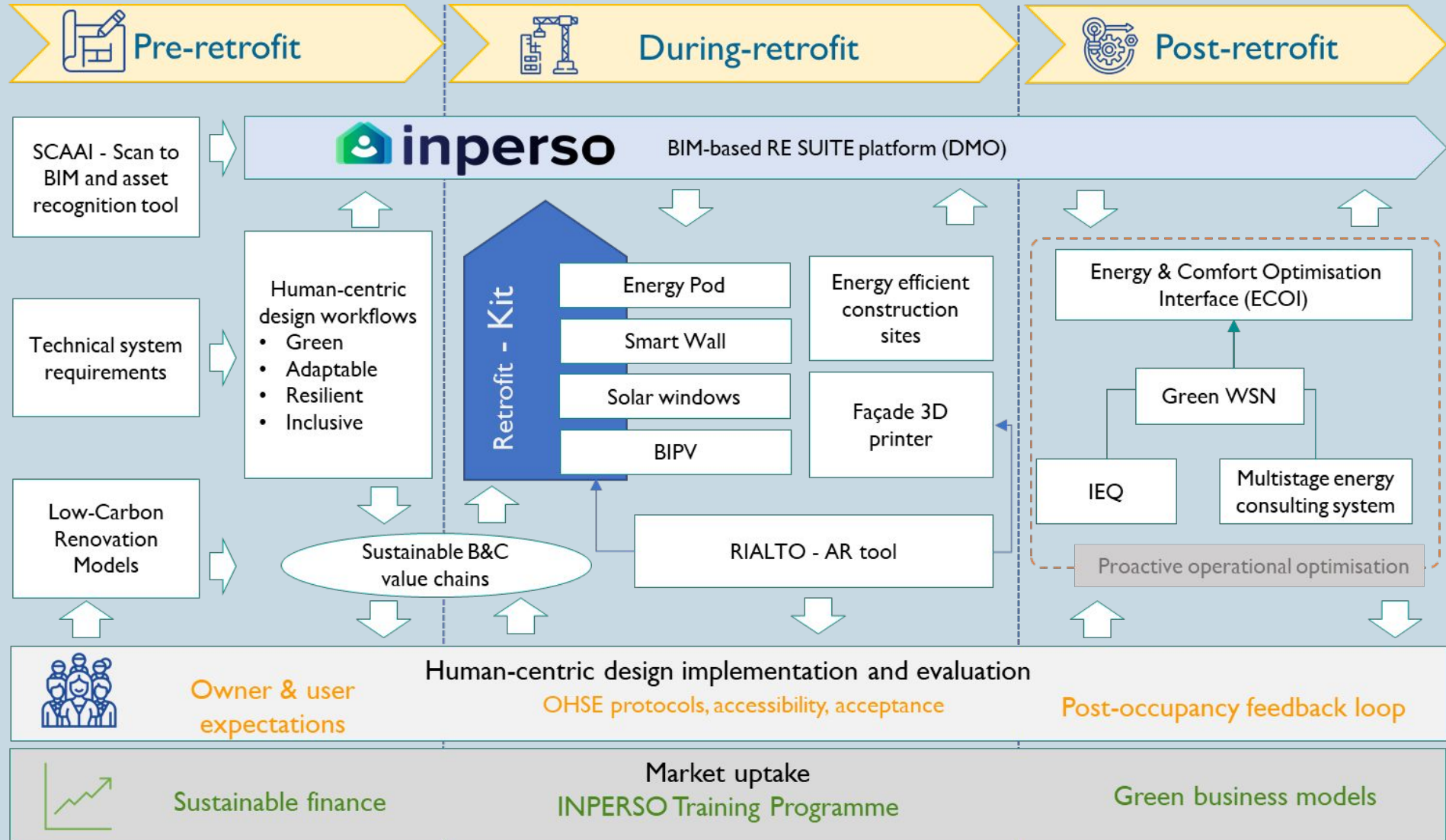
The Challenge

Buildings in Europe account for
In circular economy, the focus is on
renovating existing structures for zero
net energy consumption
40% of final energy consumption
however renovation
rates have stagnated
66% of greenhouse gas emissions



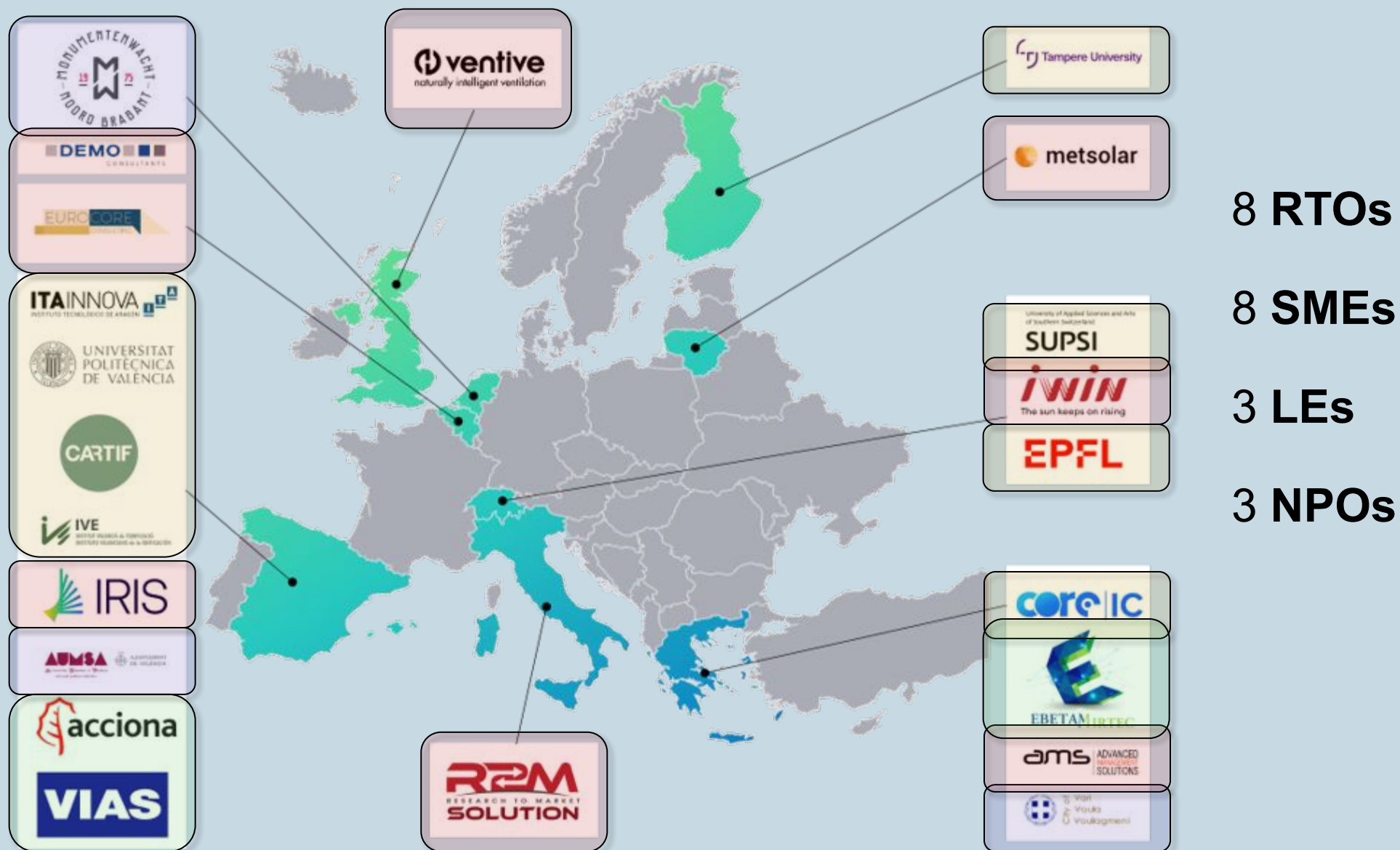
Proposes innovative solutions flexible to adapt to the specific characteristics and needs of each building and user, and industrialised and digitalized processes to improve the retrofit works, reducing the time and disturbance, increasing comfort and energy savings.

The project (in a nutshell)



22 Partners | 9 Countries

Consortium overview



Objectives - Integrated results

1 Deliver an Integrated Digital Platform

2 Generate new, Low Carbon Renovation Models

3 Advanced manufacturing technologies

4 Deploy on-site 3D façade printing

5 Address personalised E&C requirements

6

Deliver a
Complete
System
tested
in three
Pilots

Project
Coordinator



Technical
Management



DEM

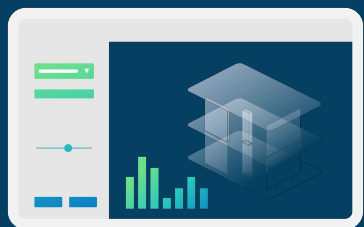


Innovation &
Communications



 inperso

Technology



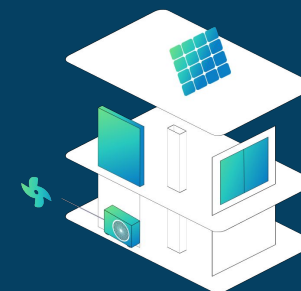
AI & AR-based
solutions in RE SUITE
platform



Low-Carbon
Renovation Models



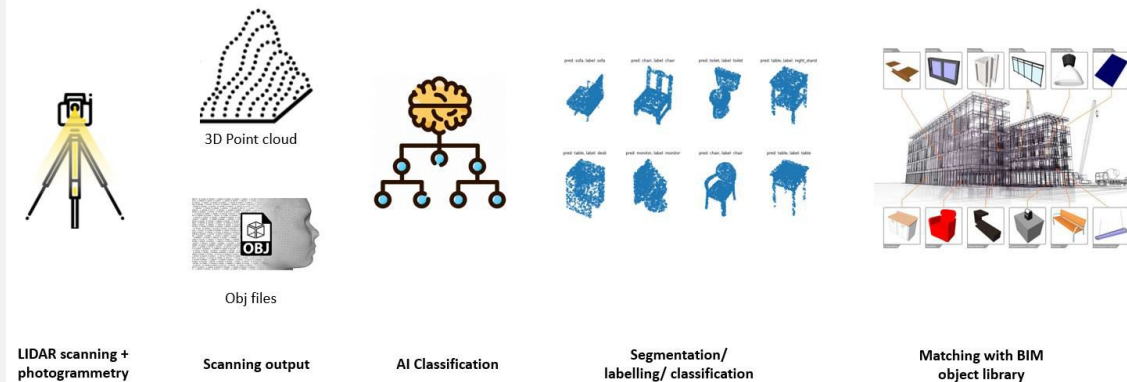
The Energy & Comfort
Optimisation Interface



The INPERSO
Retrofit – Kit

AI and AR-based solutions in RE SUITE platform

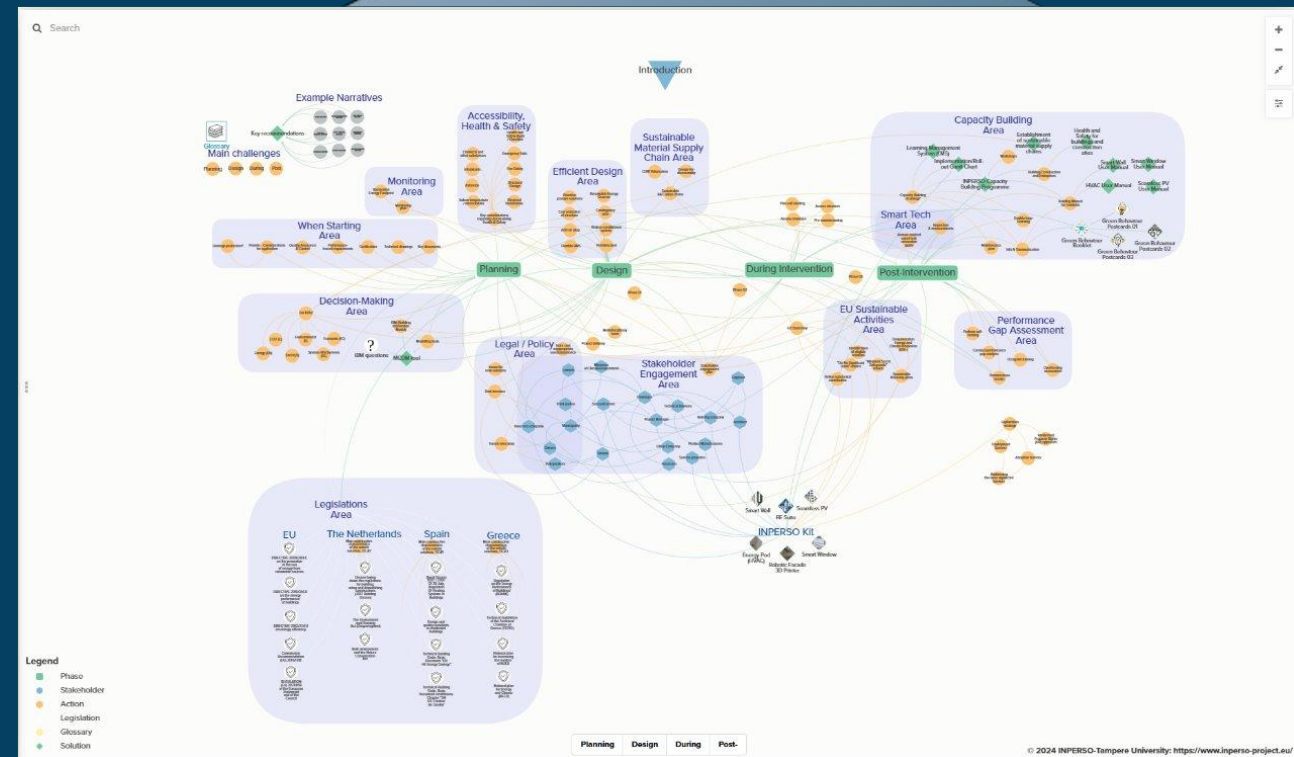
INPERSO aims to accelerate digitalisation and unify resources across a building's lifecycle by integrating AI and AR solutions into the RE SUITE renovation management platform. This comprehensive toolset will enhance building management, improve efficiency, and result in substantial cost savings.



SCAAI

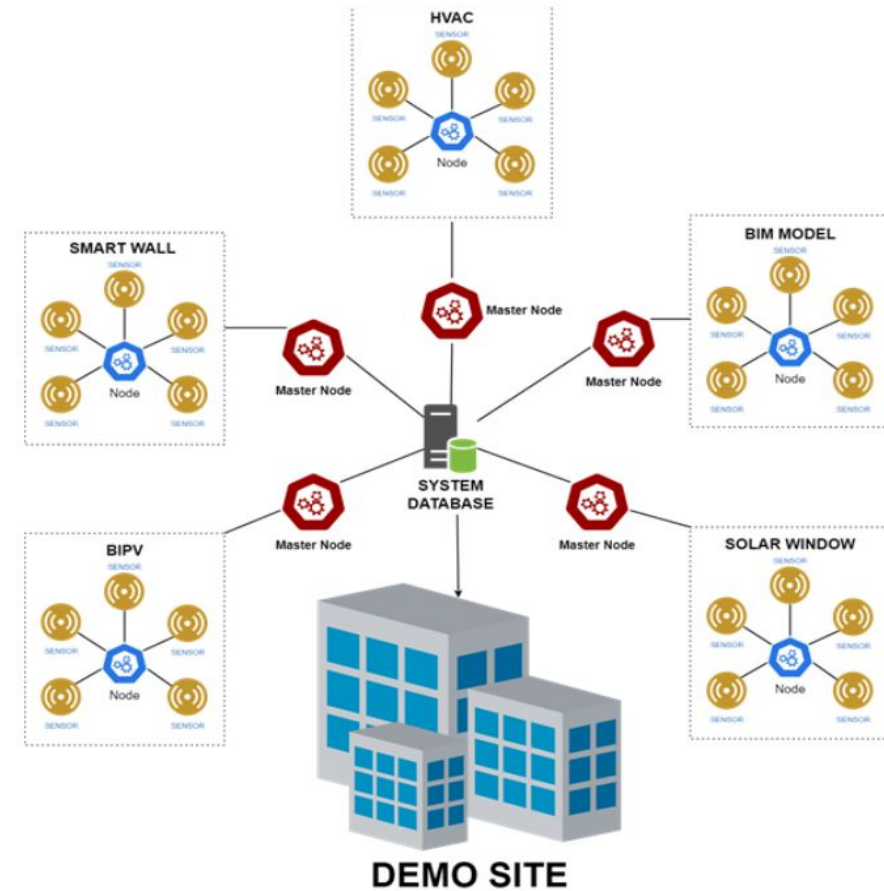
Low-Carbon Renovation Models

The project will address the fragmented renovation and construction value chain, emphasising Low-Carbon Renovation Models that prioritise user satisfaction, sustainability, and reduced performance gaps in renovation projects.



The Energy & Comfort Optimisation Interface

The Energy & Comfort Optimisation Interface focuses on achieving and maintaining building performance, catering to user needs through personalised renovations and optimising energy demand, particularly in warmer climates with natural ventilation and cooling potential.

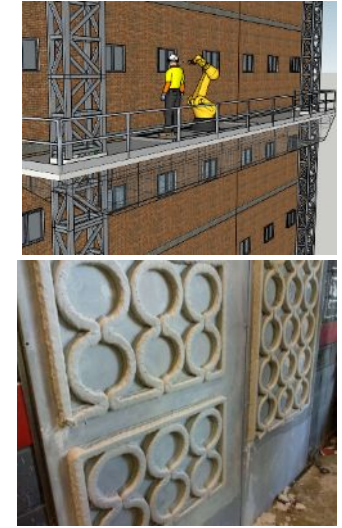
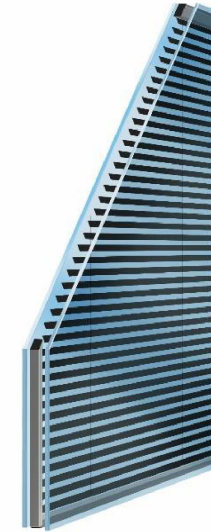
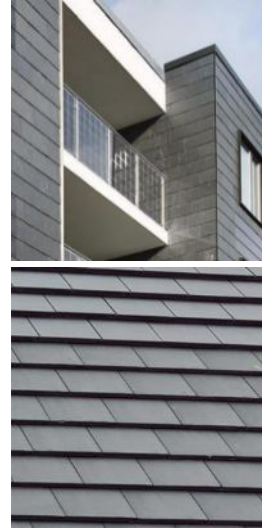


The INPERSO Retrofit – Kit

The INPERSO Retrofit-Kit aims to reduce construction and demolition waste, enhance productivity, upskill the workforce, improve workplace conditions, and reduce the embodied CO2 of buildings. It includes active/passive envelope systems, renewable energy generation, ventilative HVAC solutions, and a vertical Façade 3D Printer for efficient retrofits.



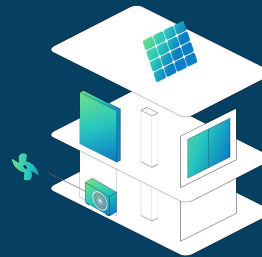
Technology



Smart Wall
Prefabricated
all-in-one wall
panel

Energy Pod
Exhaust air
with heat
pump and
balanced
ventilation

BIPV
Tiles & balconies



Solar Window
PV
venetian-blind
shading
device inside
an insulating
window

**Façade 3D
printer**
Autonomous
system for vertical
printing onsite



**The INPERSO Retrofit –
Kit**

+ Façade 3D printer

3 different pilots



Valencia (Spain)

- Kit synergies
- Indoor environment and ventilation.
- Adherence to the heritage status



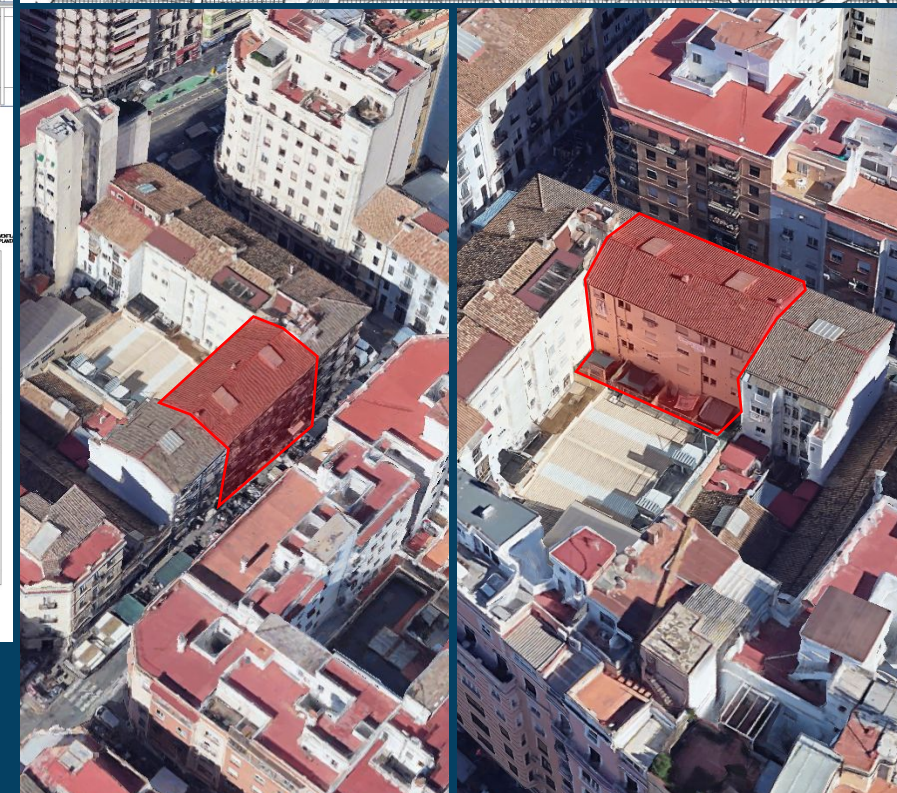
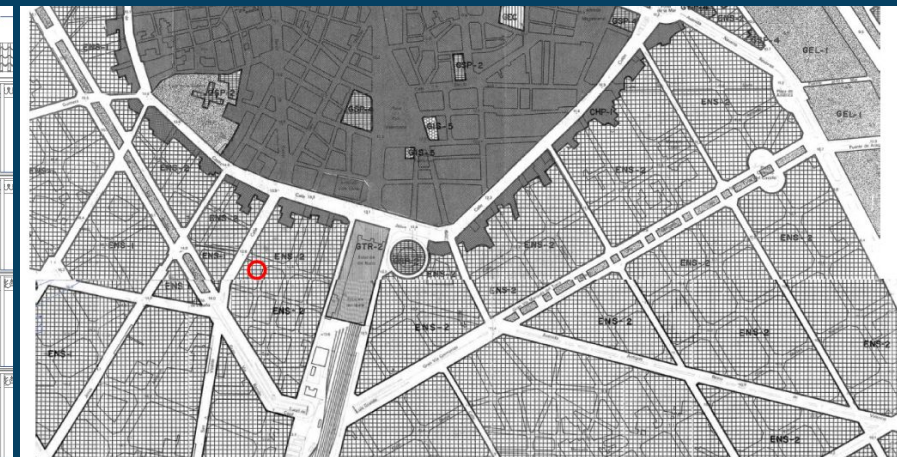
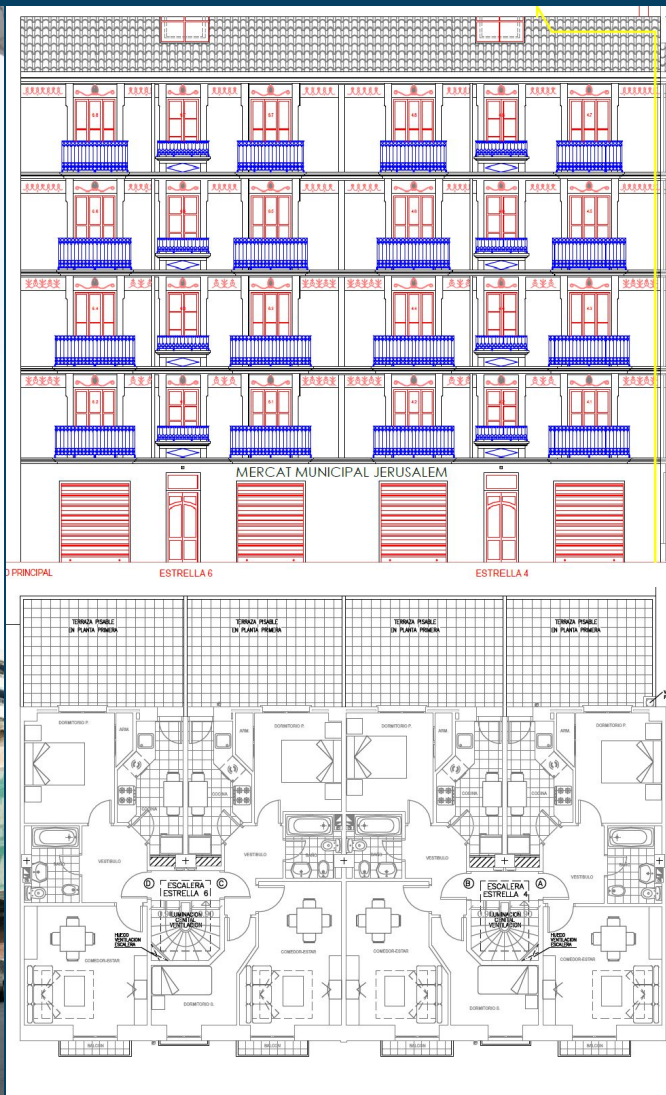
Velp (Netherlands)

- Culturally heritage-protected
- Low-disruption & Low-pollution
- Energy-efficient retrofit

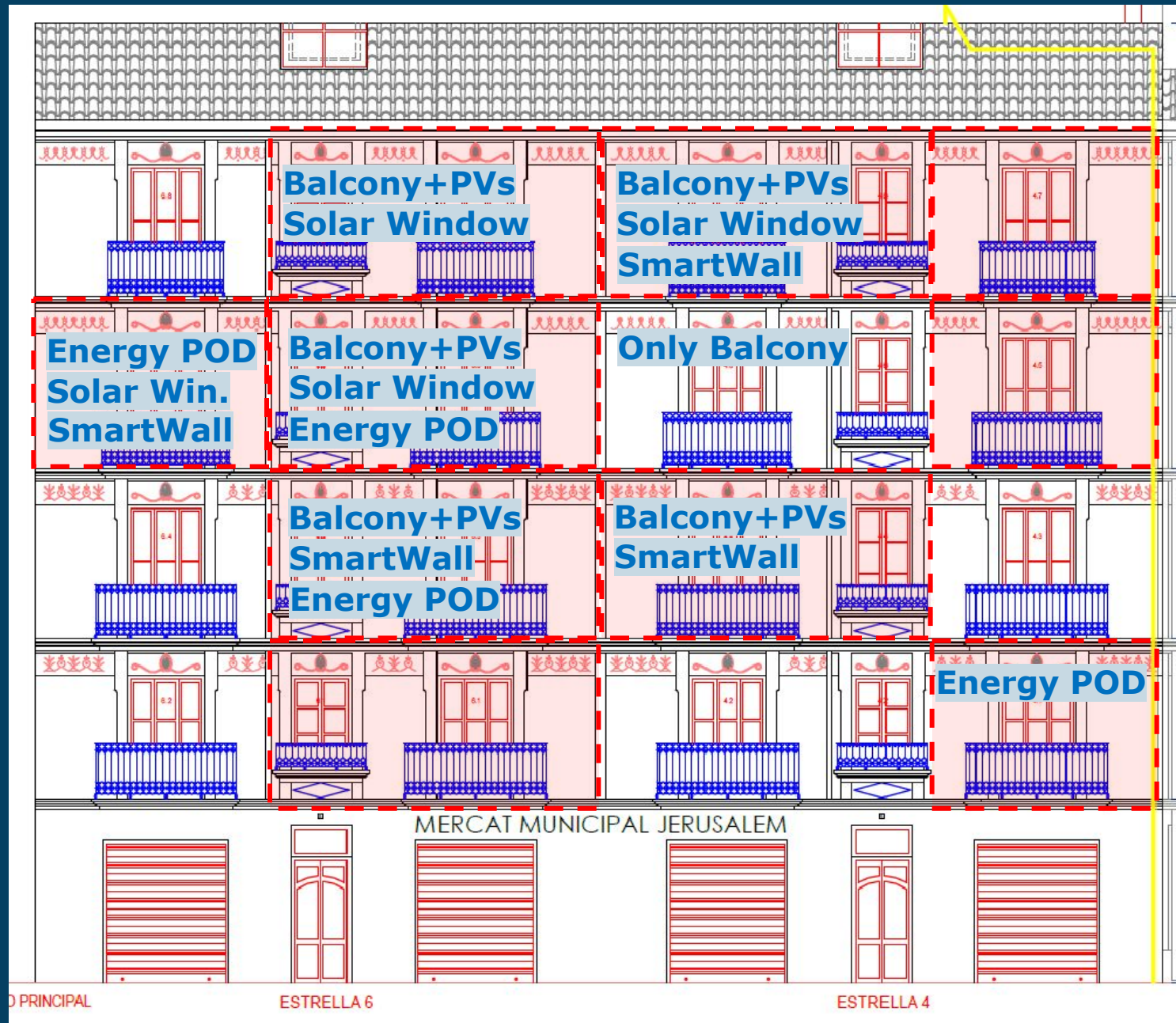


Vouliagmeni (Greece)

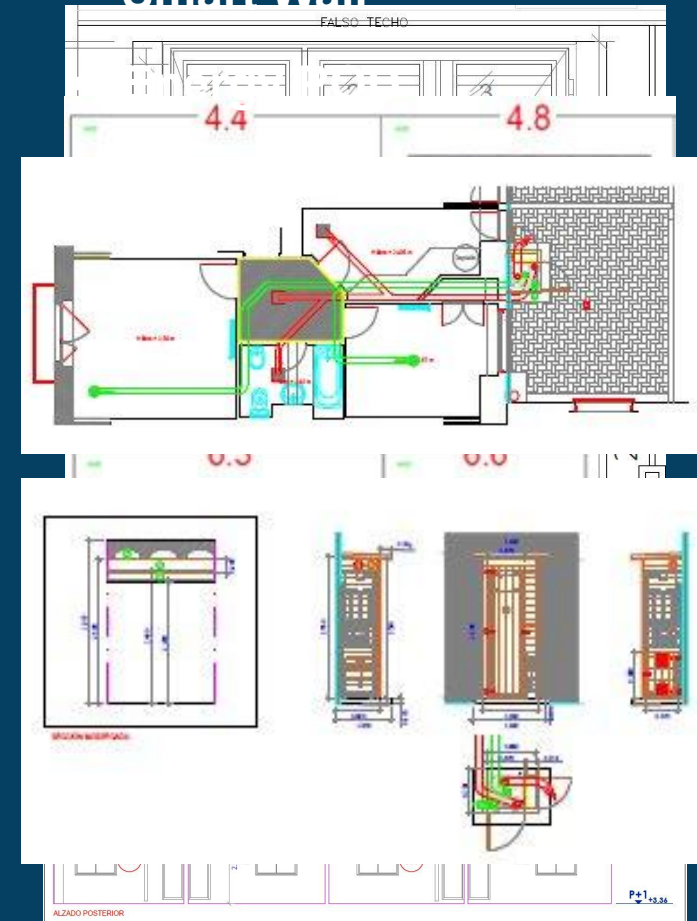
- Comparison with conventional retrofit
- Maximise indoor comfort and energy performance

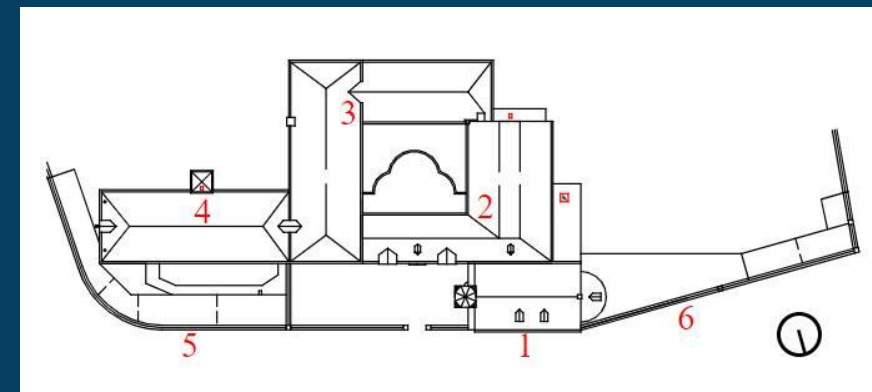
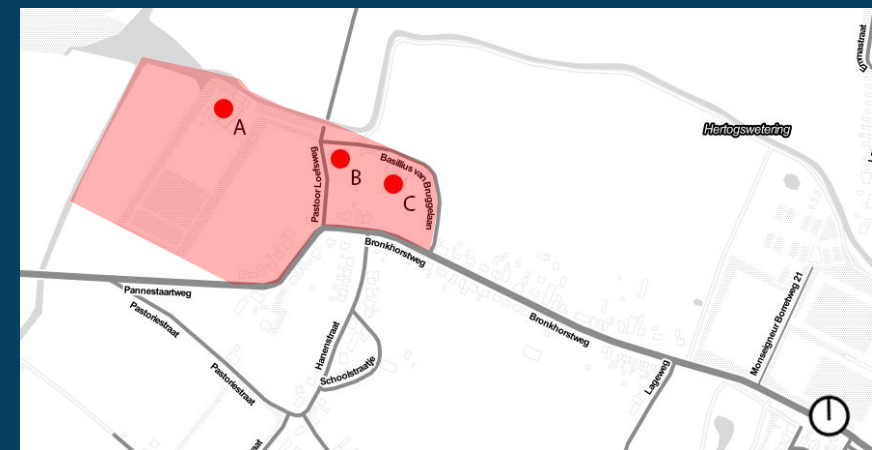
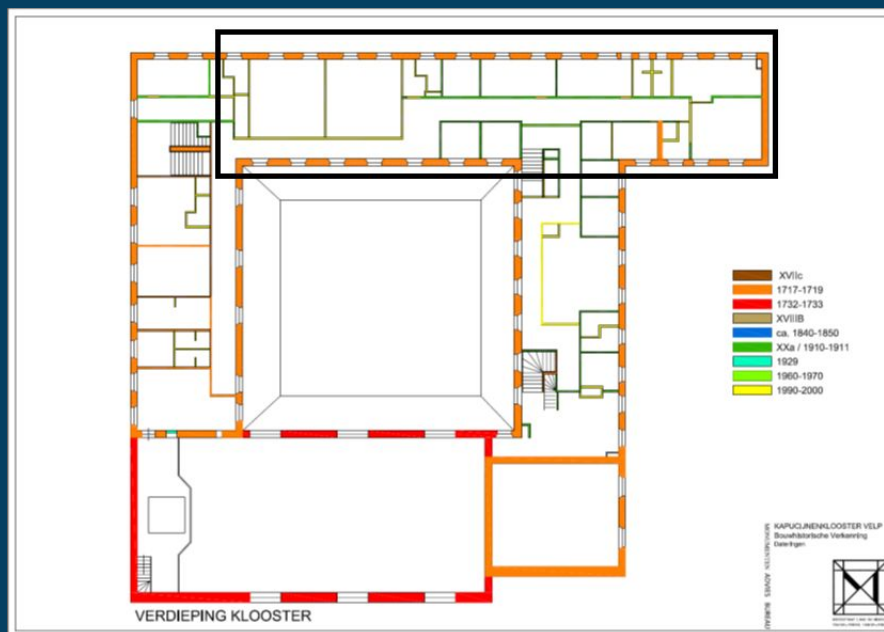


Calle la Estrella 4-6 (AUMSA)



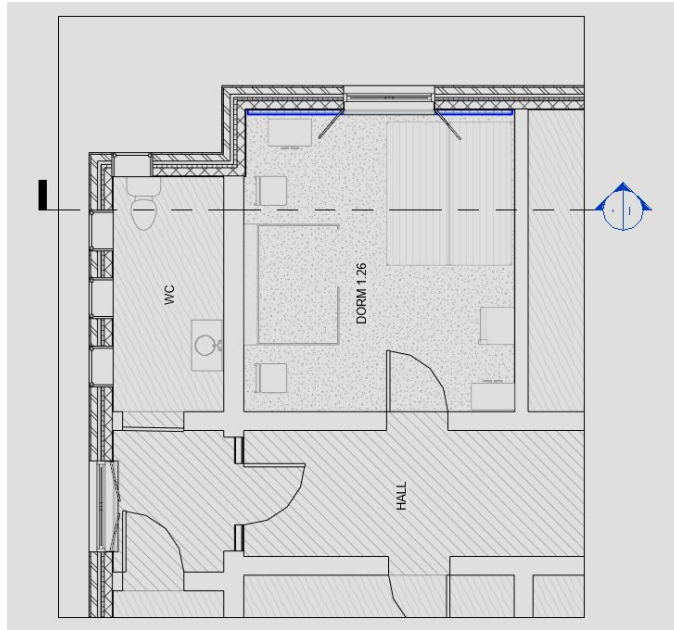
- Monitoring IEQ & EP
- Balcony+PVs facing courtyard
- Solar windows
- Smart Wall



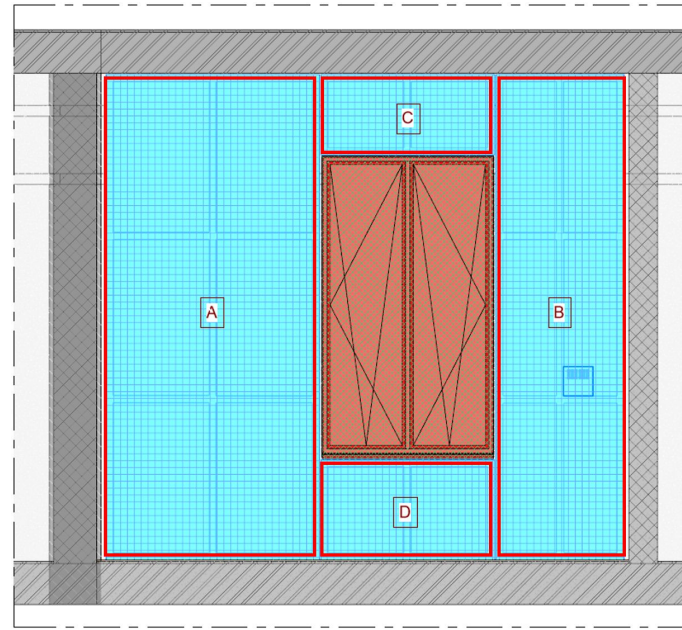


Trinity Complex (MWNB)

Bronckhorst Monastery



**Floor
plan**



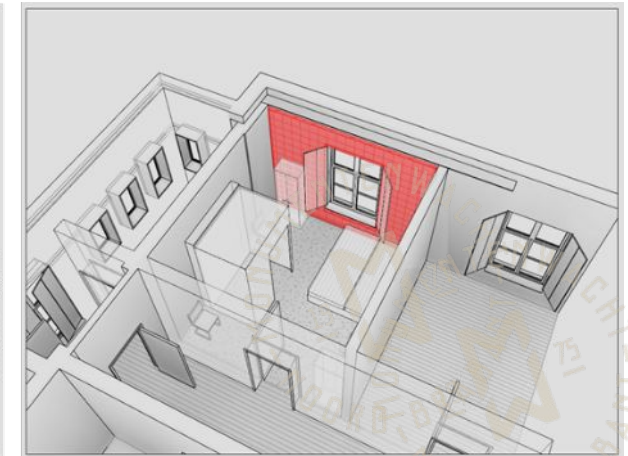
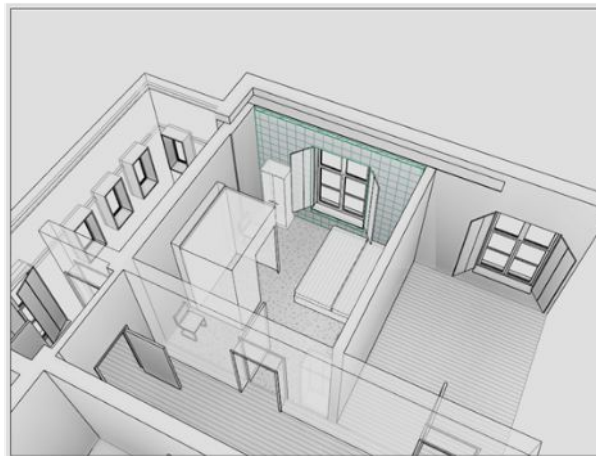
Section

SmartWall basic design:

- SmartWall installation at Bronckhorst building (room # 126);
- Covers all West- Northwest side;
- Existing window is replaced by iWin window;
- 4 SmartWall items:
 - ✓ (A) 1490mm x 3360mm
 - ✓ (B) 895mm x 3360 mm
 - ✓ (C) 560 x 1210 mm
 - ✓ (D) 690mm x 1210mm
- Shutters are preserved;
- Aesthetics (colors, architectural characteristics, etc.) remain the same.

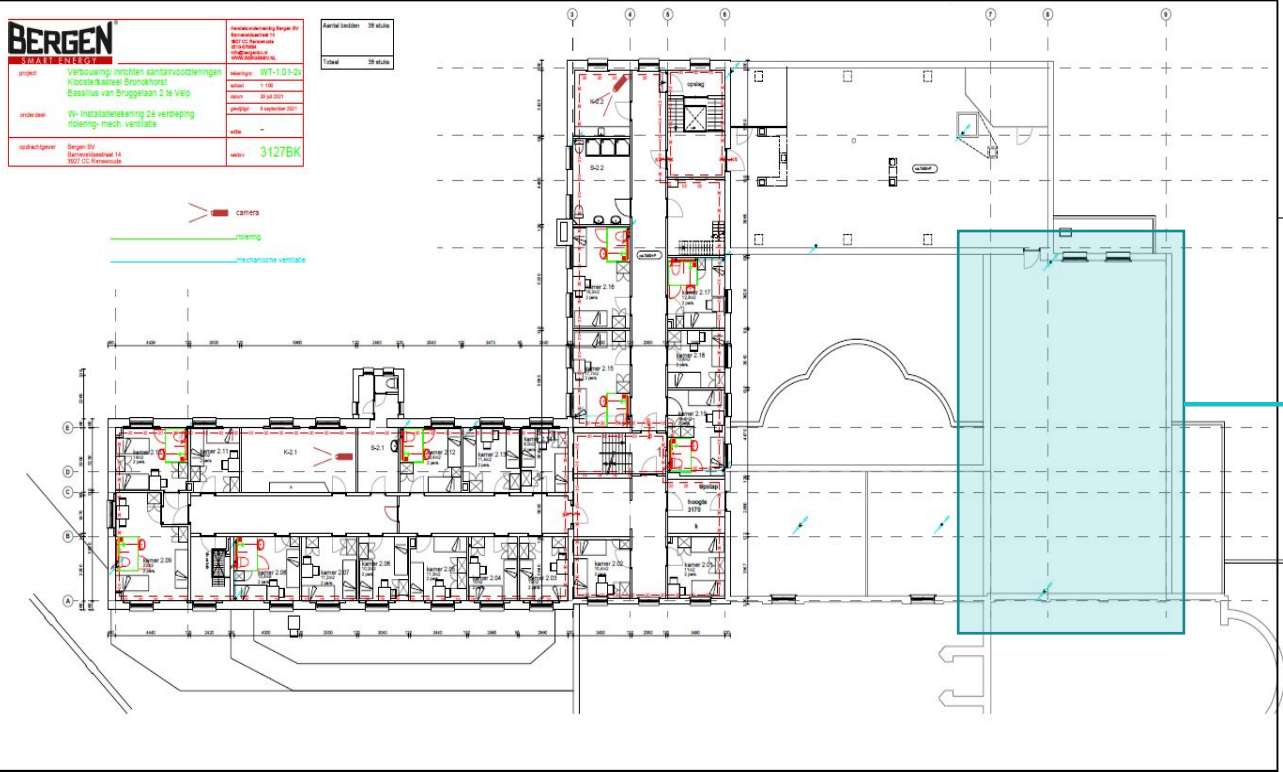


**Perspective views of
existing condition**

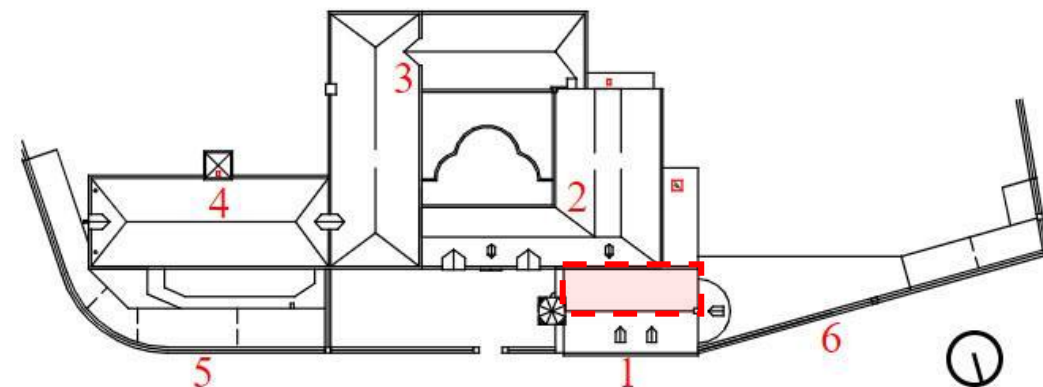


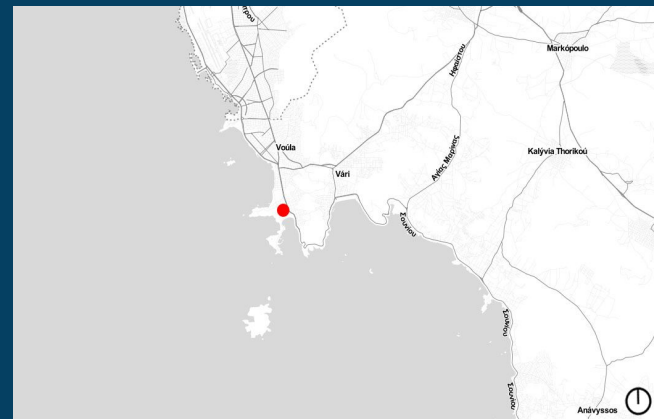
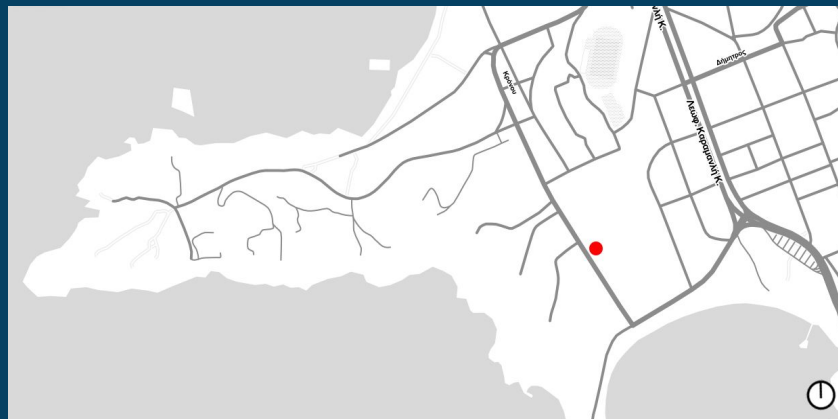
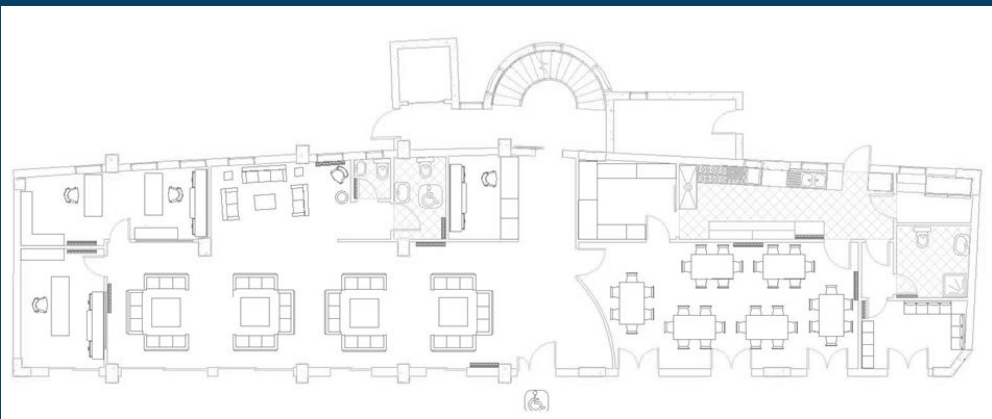
**Perspective views of SmartWall
installation**

Bronckhorst Monastery



Bronckhorst Monastery

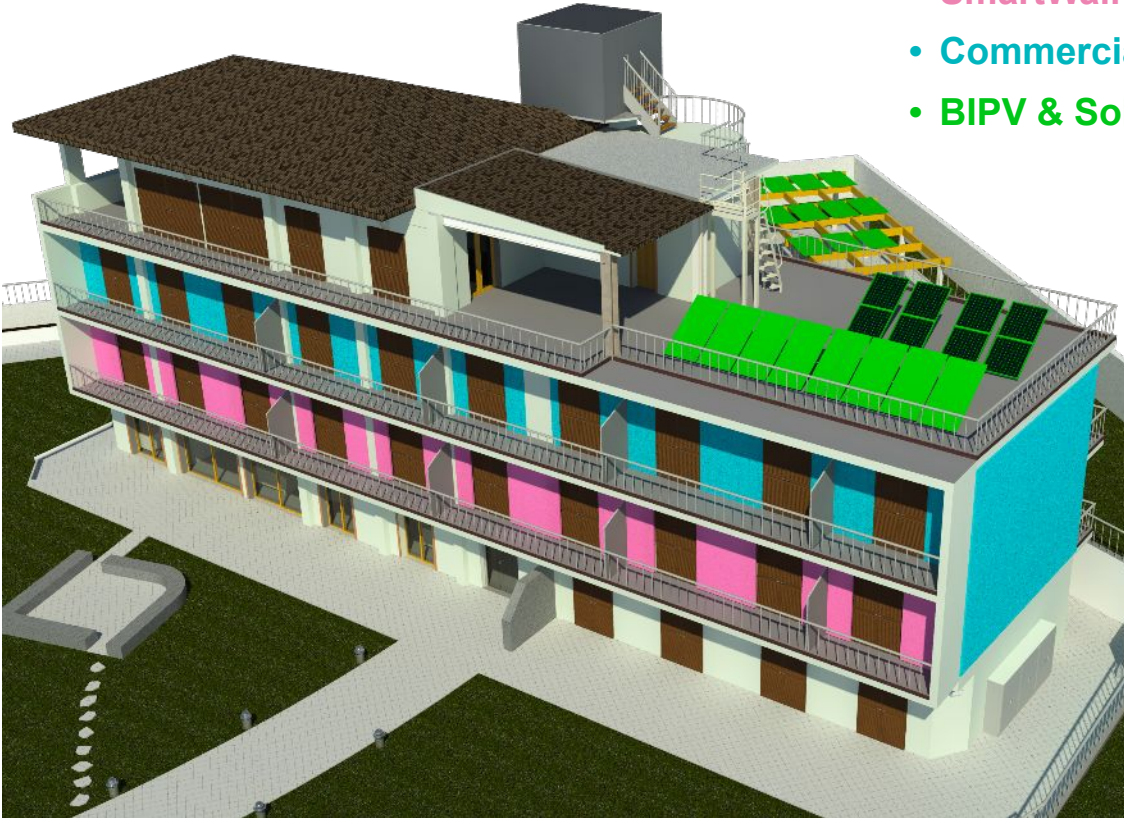




Litous Social Shelter (AMS-VVV)

Social Shelter Litous street (VVV)

- SmartWall units
- Commercial ETICS
- BIPV & Solar Panels



South-East View



North-West View

Expected Impact:



Full Life Cycle (LC):

- **Time savings:** 10-12% shorter project duration, 30-50% digitalization time reduction
- **Cost savings:** 5-7% project cost reduction, 30% lower design costs
- **Quality:** Performance gap reduced to less than 10%

Construction & Renovation Phase

- **Time savings:** 40% faster retrofit, >70% reduction in onsite tasks (with AR)
- **Cost savings:** 25% lower costs for construction tasks
- **Quality:** 50% less dust/noise, 40% less CO2 and construction waste, 70% fewer mistakes

Operational Phase

- **Time savings:** 80% reduction in inspection and maintenance frequency
- **Cost savings:** 25-75% energy savings, 30% lower maintenance costs
- **Quality:** >70% CO2 reduction, >90% energy cost savings

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Thank you

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