AEGIR

Incremental Renovation Package

AEGIR project Workshop
Architectural approach

Shaping sustainable futures event
06.03.2025, Brussels

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aegirproject.eu

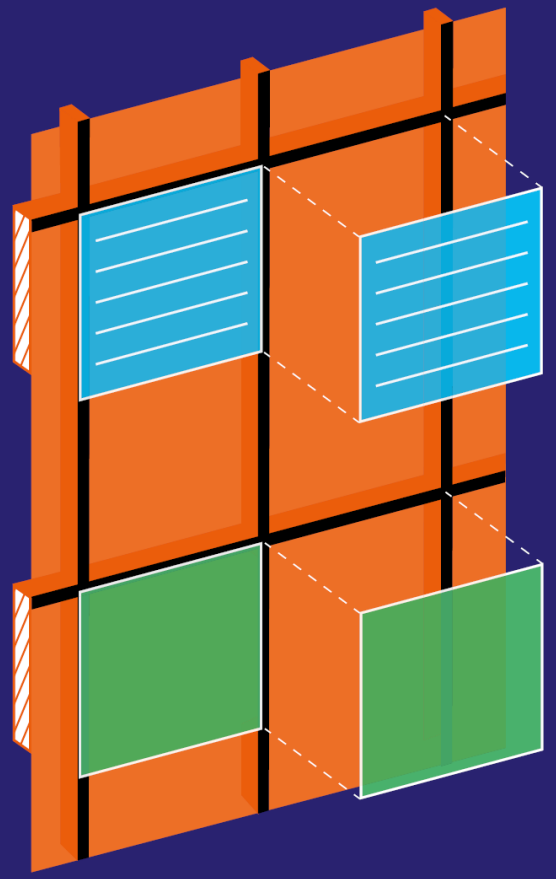

85% of the European building stock was built before 2001 and does not comply with low energy standards.

Europe’s objective is to achieve climate neutrality by 2050, an economy with net-zero greenhouse gas emissions, through the deep decarbonisation of all sectors.

Work description

The building envelopes combine a package of solutions including:

- **Improved ventilation:** air ducts connected to a central heat-pump and smart windows
- **Insulation:** biobased thermal insulation and acoustic insulation
- **Bio-composite/bio-resources profile systems and cladding**
- **Renewable energy generation:** flexible PV system and PVT panels
- **Electric storage technologies:** second life batteries



BIOCOMPOSITE / WOOD BASED PROFILES

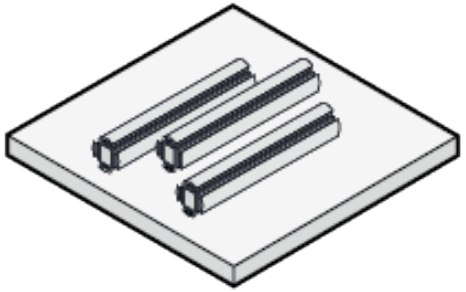
TRADITIONAL PHOTOVOL-TAIC ELEMENTS

MODULAR FACADE

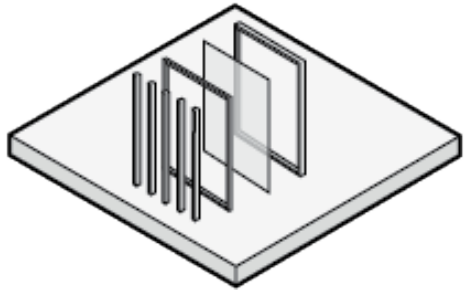
TRADITIONAL CLADDING

BIO-SOURCED / RECYCLABLE FABRIC INSULATION

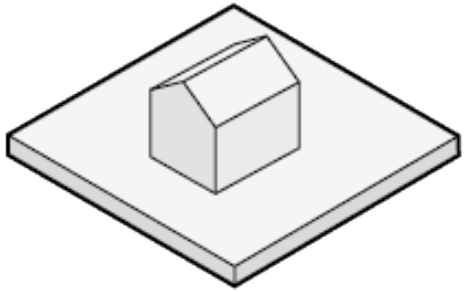
Strategy



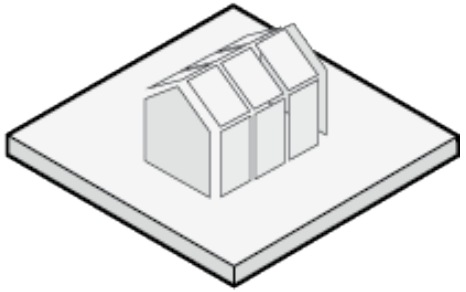
The AEGIR solution consists of nine distinct components, developed collaboratively by the consortium partners.



These components are integrated into a sustainable and standardized curtain wall system module.



To evaluate the adaptability and versatility of these facade systems, four distinct demo sites across the EU have been selected.



Each module is tailored to meet the specific requirements of the demo site, enabling a complete facade retrofit while minimizing disruption to the building's occupants.

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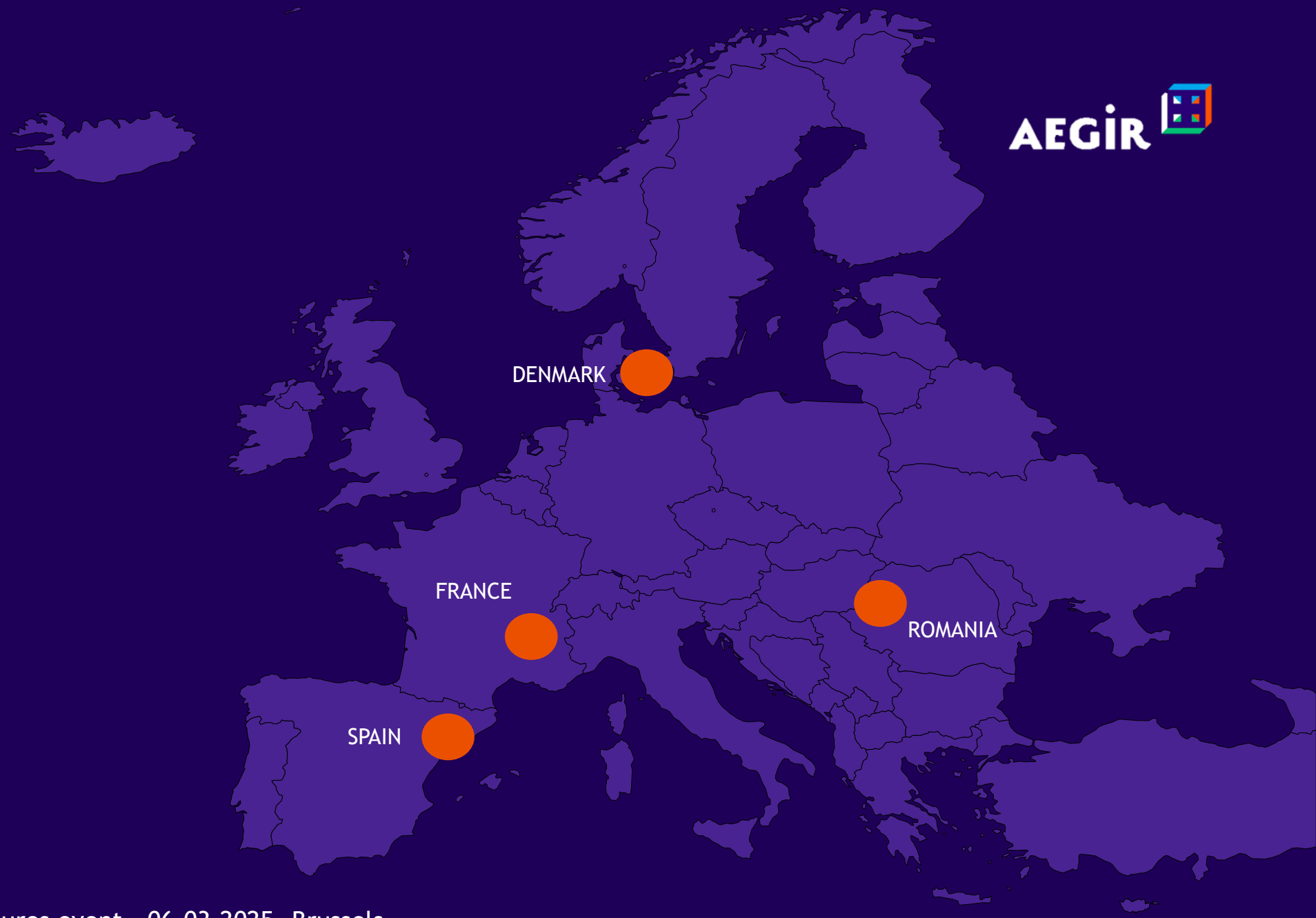
Demo Sites



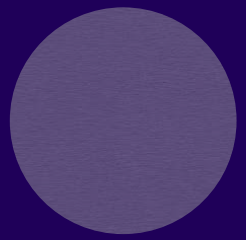
Demo Sites

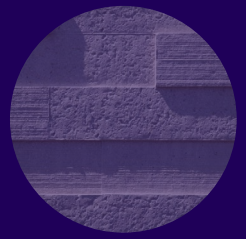
PROFILES

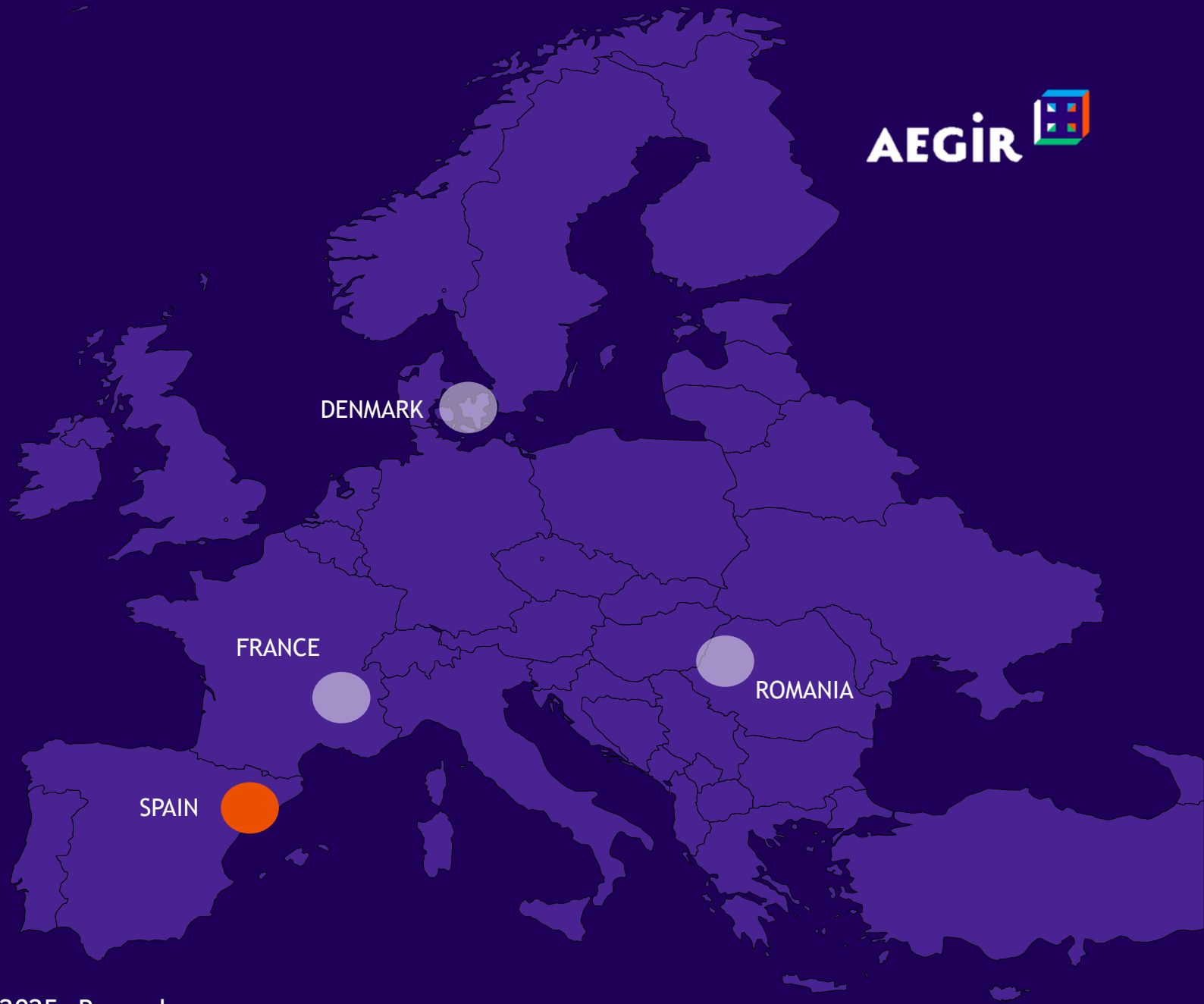
CLADDING

Biobased

Recycled wood





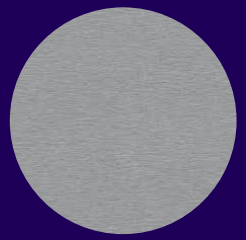


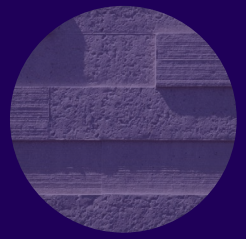
Demo Sites

PROFILES

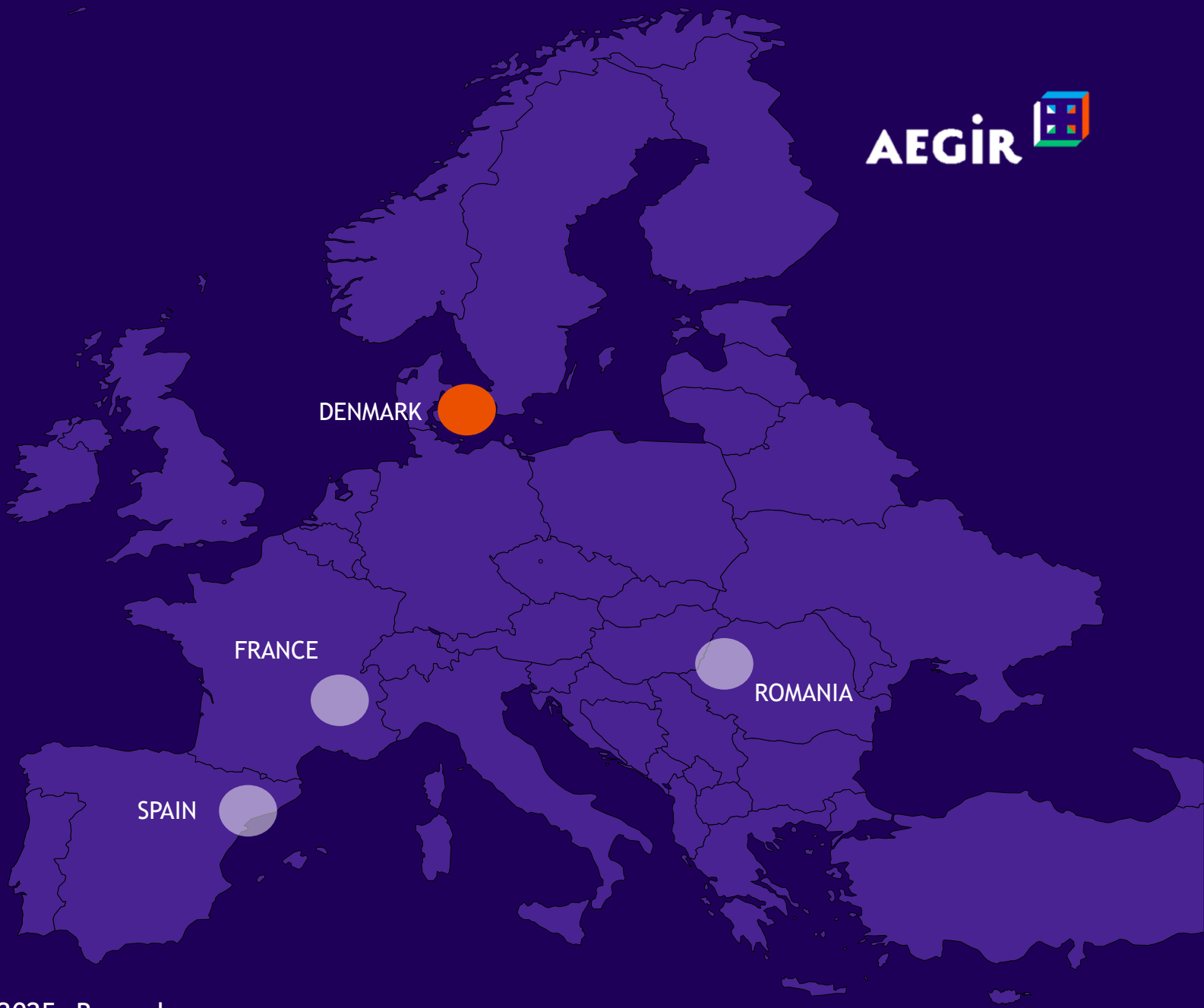
CLADDING

Ceramic





Aluminum based

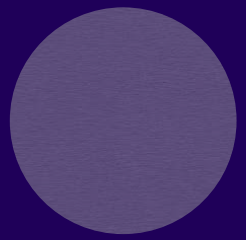


Demo Sites

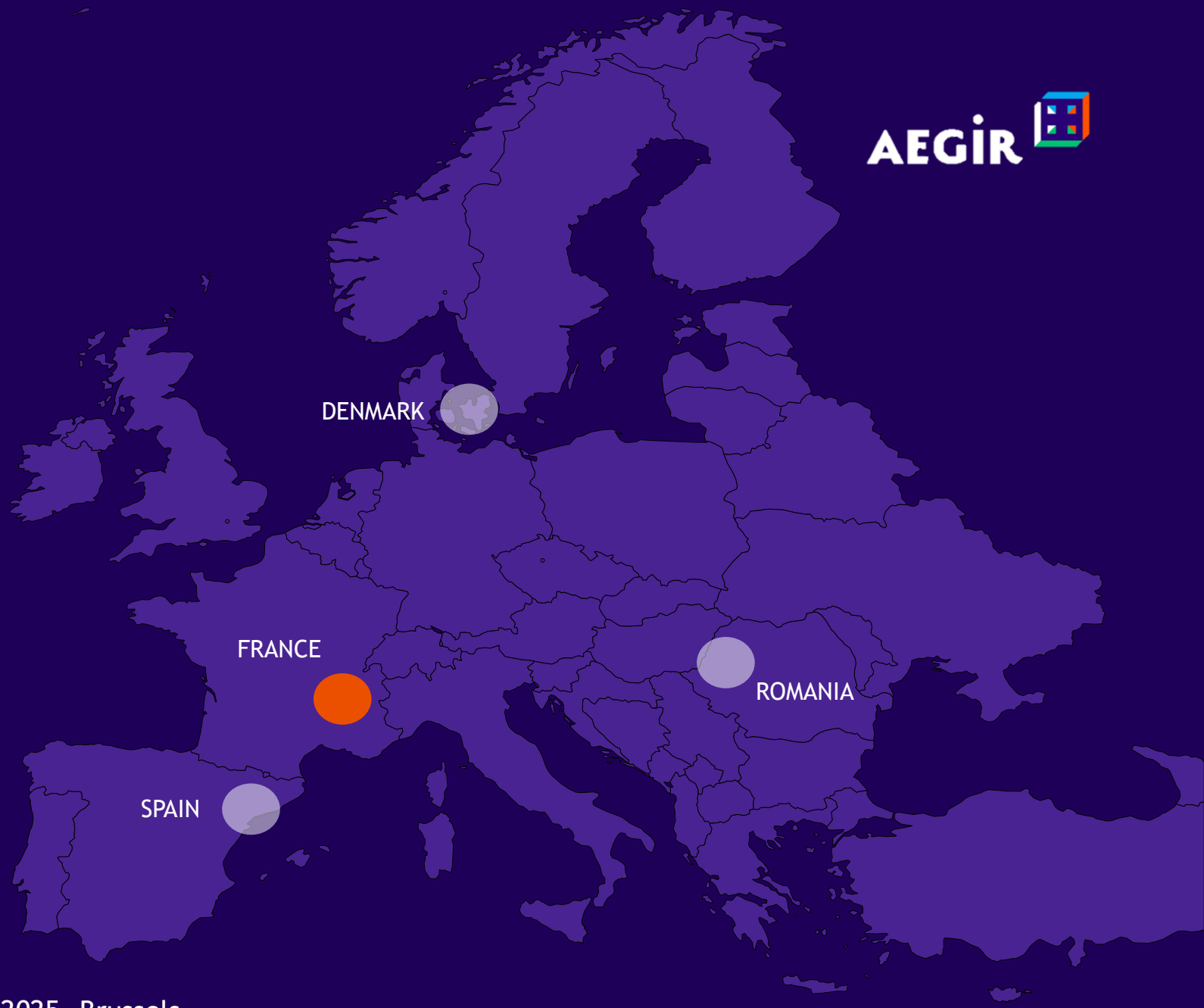
PROFILES

CLADDING

Wood based



Recycled PVC

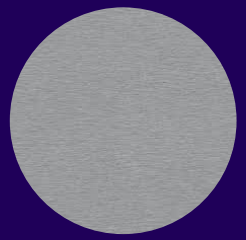


Demo Sites

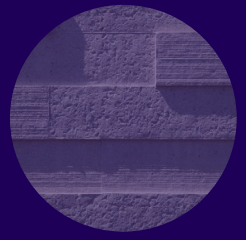
PROFILES

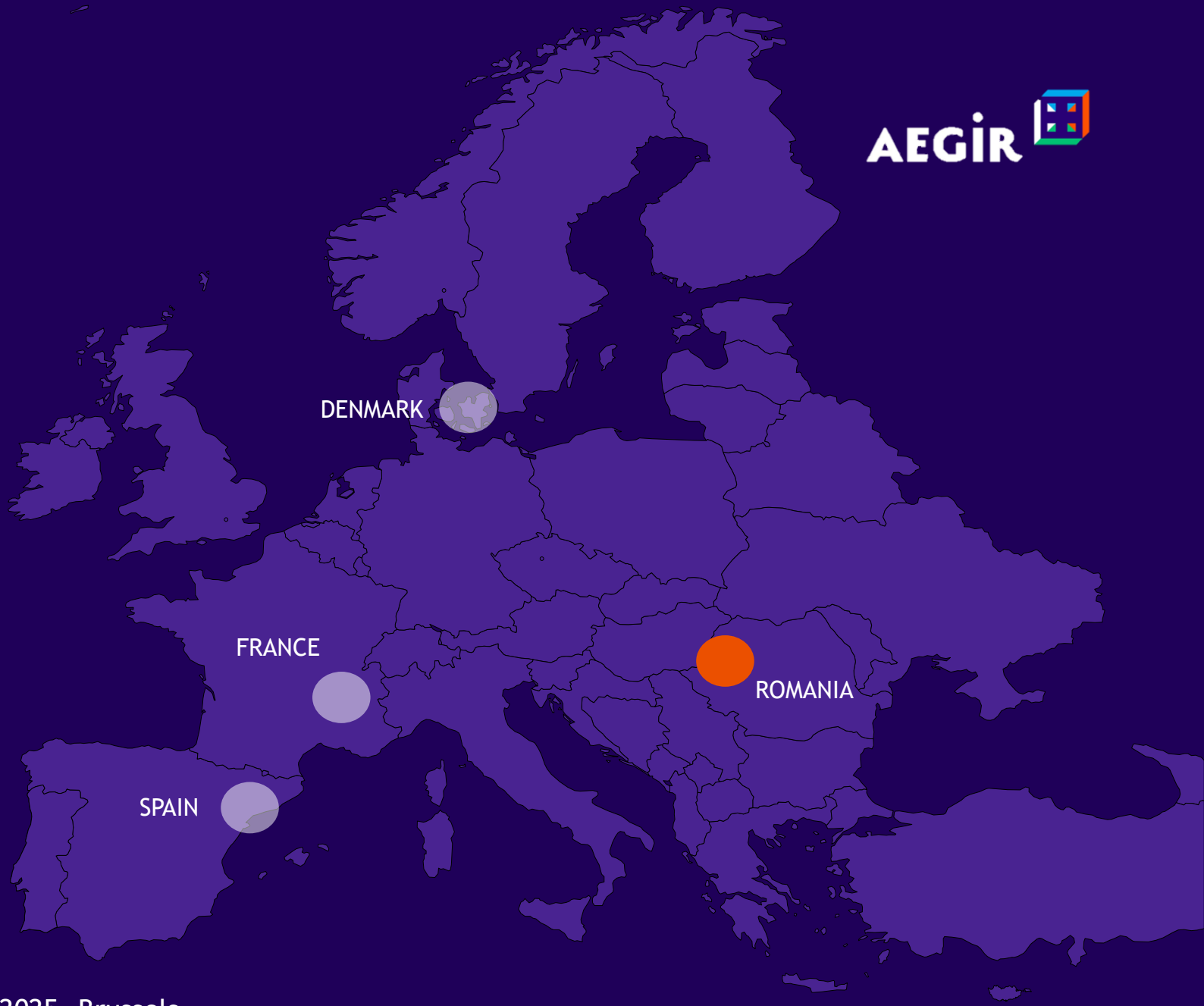
CLADDING

Bio composite



Aluminum based

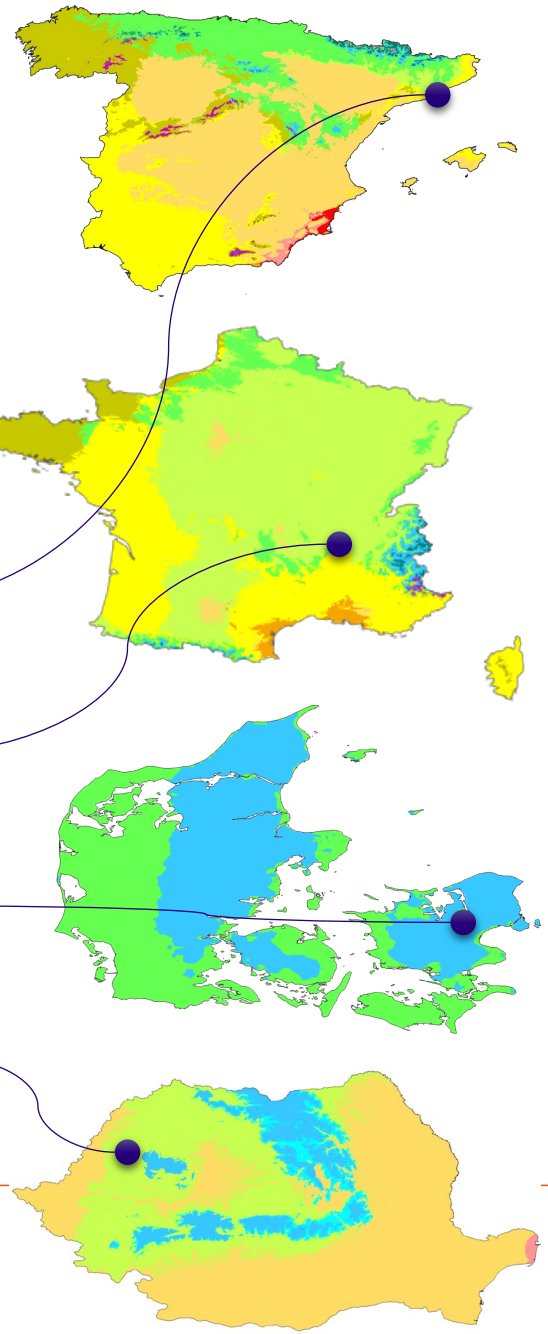




Components Markup

Envelope mesh
Ventilation system
Active windows
Bio-based insulation
Fabric insulation
Standard PV module
Flexible PV module
PVT module
Second-life battery

1 Spain
2 France
3 Denmark
4 Romania



- Arid, desert, hot (BWh)
- Arid, desert, cold (BWk)
- Arid, steppe, hot (BSh)
- Arid, steppe, cold (BSk)
- Temperate, dry summer, hot summer (Csa)
- Temperate, dry summer, warm summer (Csb)
- Temperate, dry summer, cold summer (Csc)
- Temperate, no dry season, hot summer (Cfa)
- Temperate, no dry season, warm summer (Cfb)
- Temperate, no dry season, cold summer (Cfc)
- Cold, dry summer, hot summer (Dsa)
- Cold, dry summer, warm summer (Dsb)
- Cold, dry summer, cold summer (Dsc)
- Cold, no dry season, warm summer (Dfb)
- Cold, no dry season, cold summer (Dfc)
- Polar, tundra (ET)

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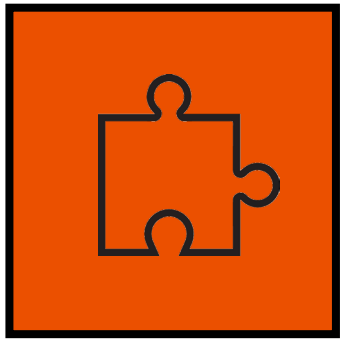
Key Features

THE PLUG & PLAY

Simplify installation by making components easily connectable, reducing assembly time, minimizing errors.

ADAPTABLE SYSTEM

Provide flexibility and compatibility with components, allowing customization for different contexts.



HOLISTIC FAÇADE DESIGN

Integrates sustainability, energy efficiency, customized structures, innovative materials, and diverse energy solutions.

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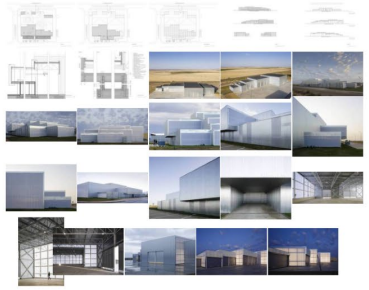
Façade reference study

Brigadas - Estudio arquitectura Hago

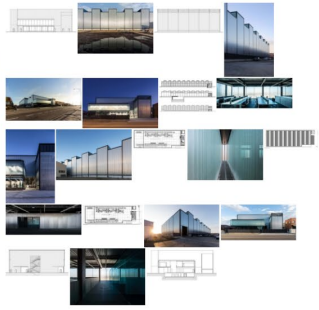


Unique Design Stands out in its surroundings

Quickly assembled on-site

Cost efficient, Aesthetic appeal

Cortes Metalurgicos - Oscar Miguel Ares alvarez

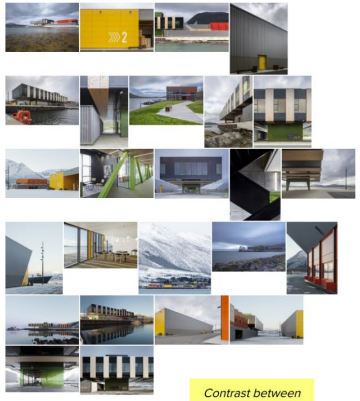


Reduction in maintenance requirements

Modular facade solution

Time and cost efficient, aesthetic appeal, functional

Holmen industrial area - Snohetta



Contrast between Color Sky Forest Water, Architecture Nature

Locally sourced materials

Modular construction

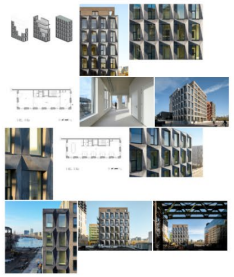
Sustainability:
- Natural ventilation
- Solar heating
- Rainwater harvesting

Joke Vos TU-Delft data center

Architecture: sloping lines, elegant solution

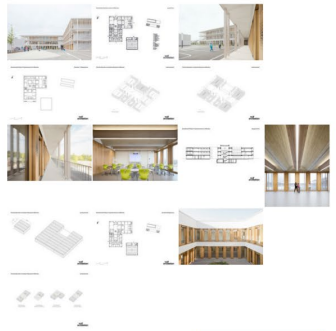
modular prefabricated concrete elements

The Modular - Bureau Fraai



Facade built-up from 25 identical prefabricated concrete facade elements that have been assembled at the construction site in a very short time frame.

Wulf architekten - primary school

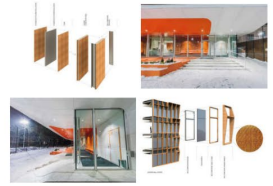


4 primary school in Germany

4 classrooms
2 interconnected rooms for all-day care
workroom staff
communal space

modular construction

Osirys Bio composite Facade - UNStudio



Curtain wall system modular facade system

4 classrooms
2 interconnected rooms for all-day care
workroom staff
communal space

modular construction

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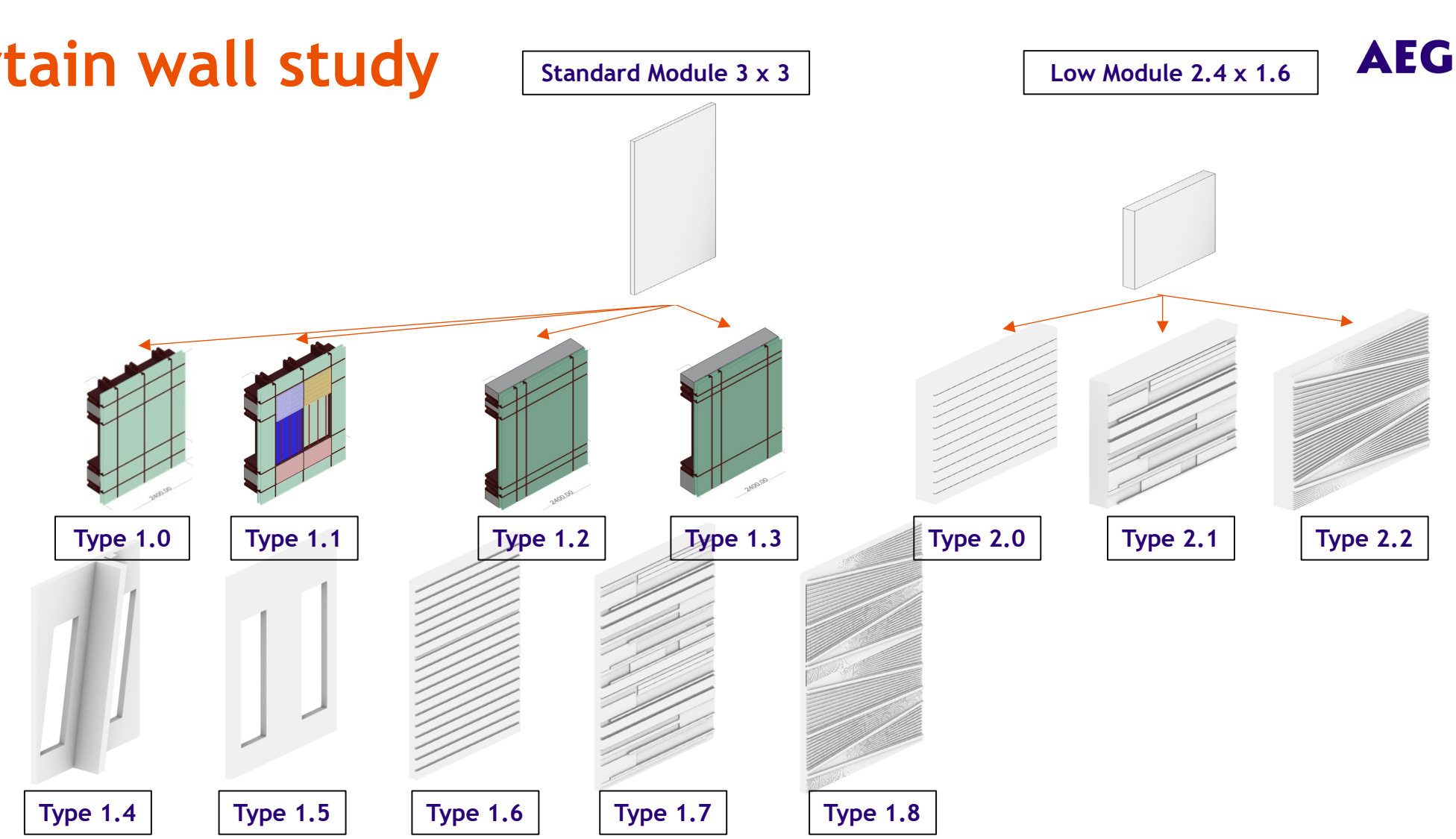
Curtain wall study



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“Transforming Education Spaces: Retrofitting a Primary School in Malgrat de Mar”

Application: Spain

Components markup

P001	Industrialized envelope
P002	Envelope mesh
P003	Ventilation system
P004	Active windows
P005	Bio-based insulation
P006	Fabric insulation
P007	Standard PV module
P008	Flexible PV module
P009	PVT module
P010	Second-life battery

Escola Pública Marià Cubí i Soler

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Site Visit

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Site Visit

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Site Visit

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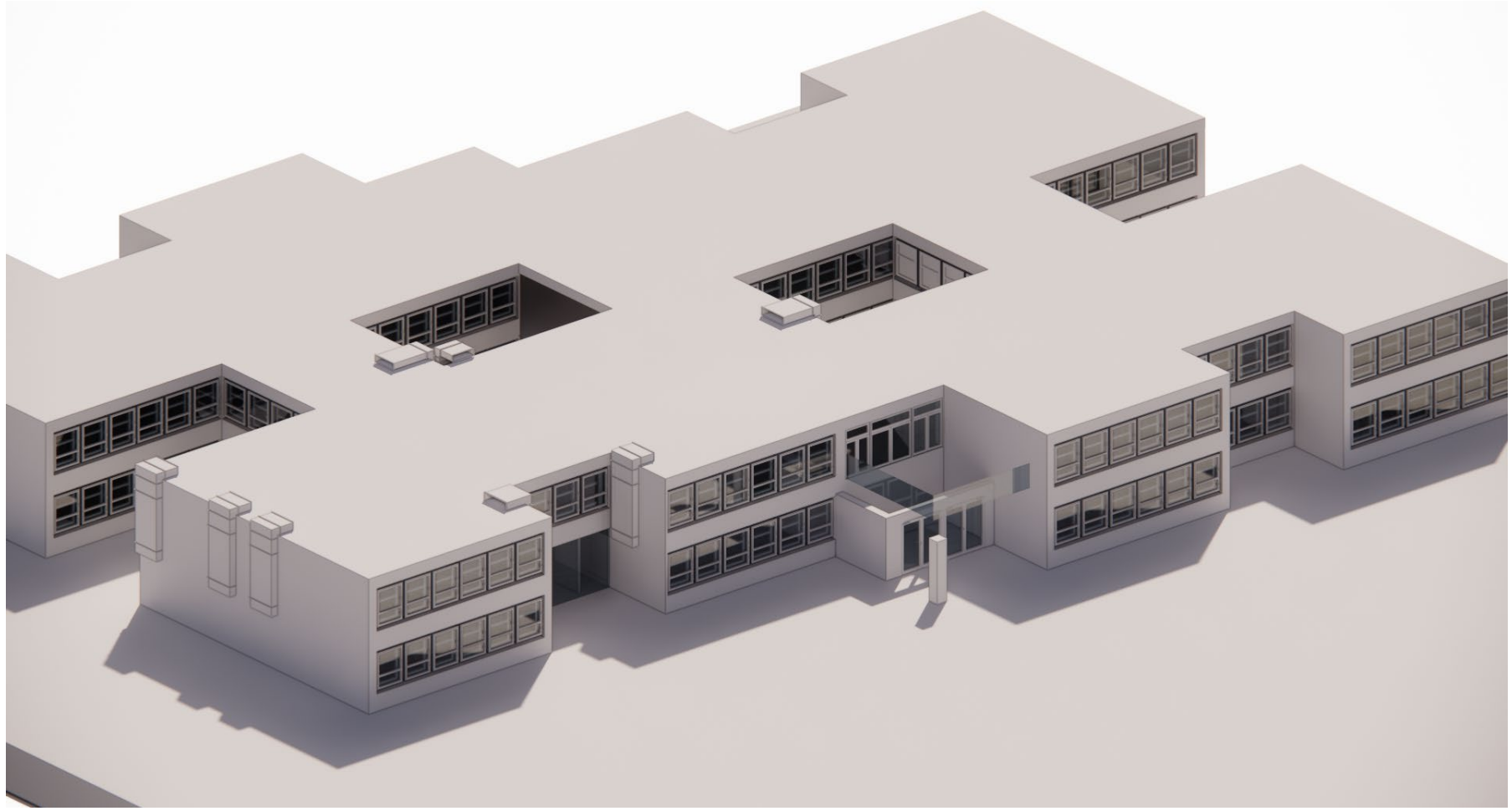
Base model



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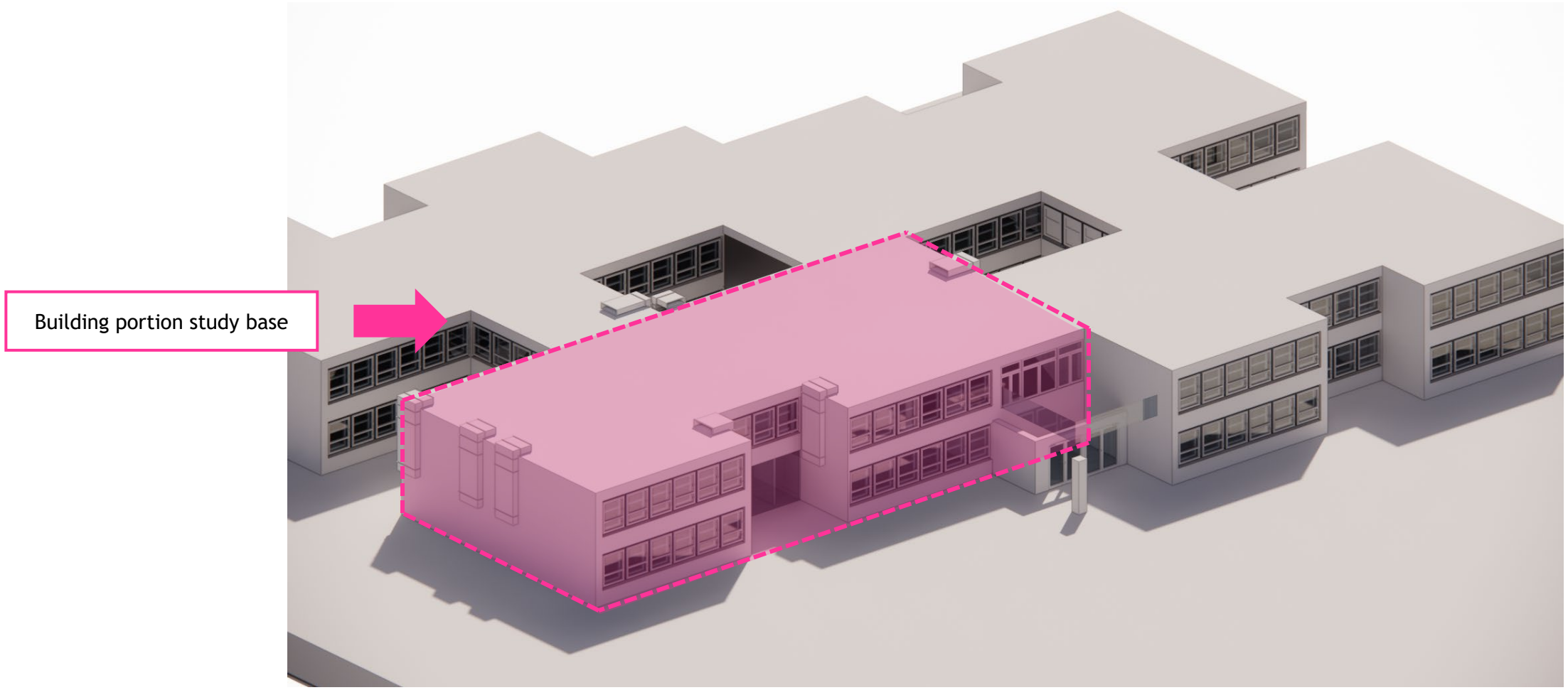
Base model



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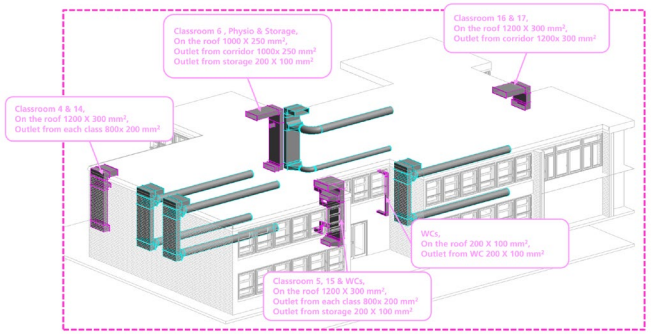
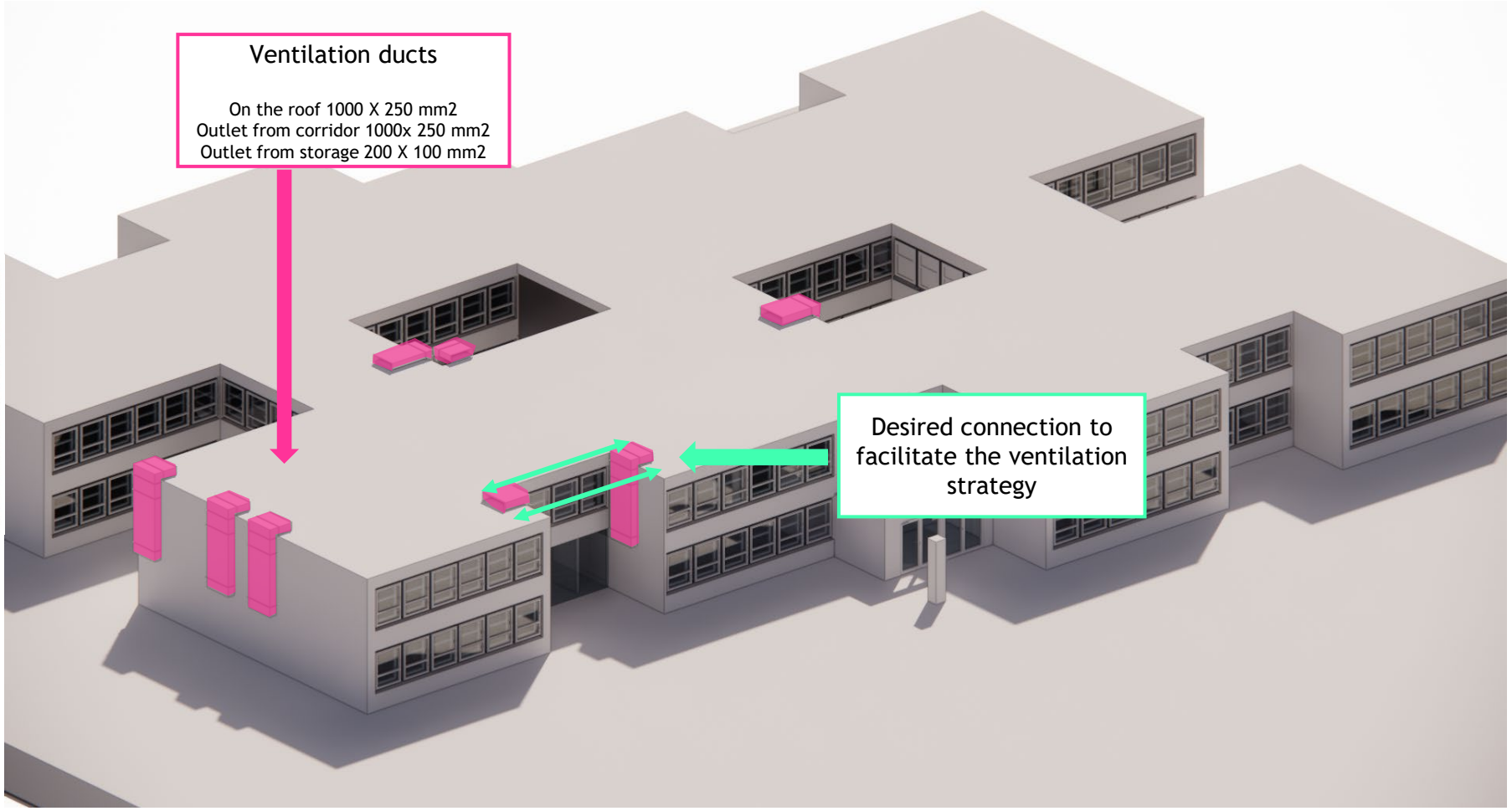
Base model

Design restrictions due to façade ventilation study





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Design model

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Design development

Options

OPTION 1

OPTION 2

OPTION 3

OPTION 4

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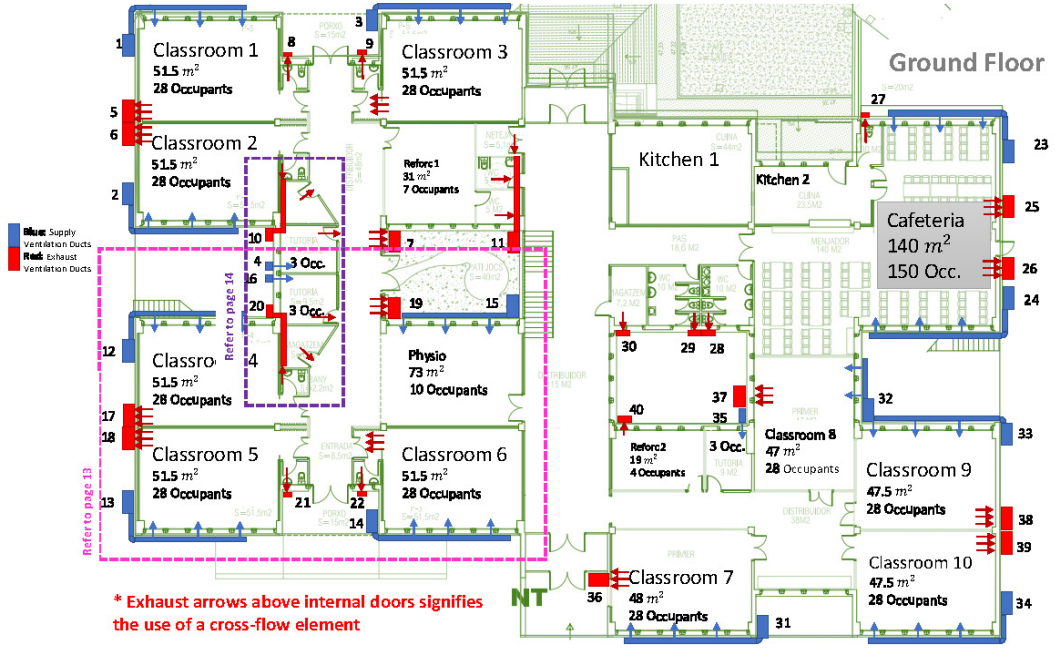
Research



We consider local needs, like ventilation in large school classrooms, and prioritize accommodating prominent ventilation ducts. Celebrating these ducts, we design around them, ensuring they become prominent features of our architectural vision.

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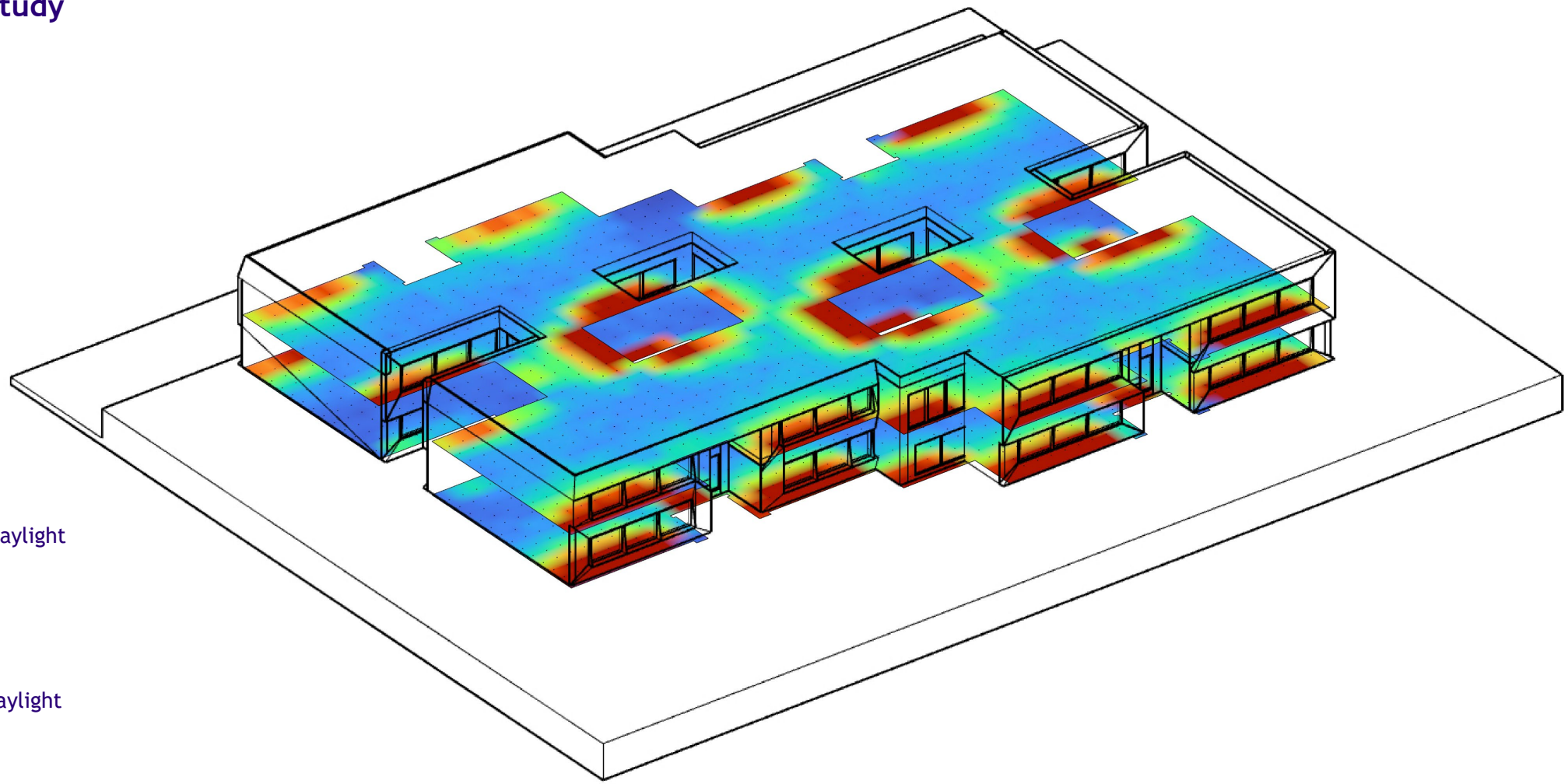
Design development

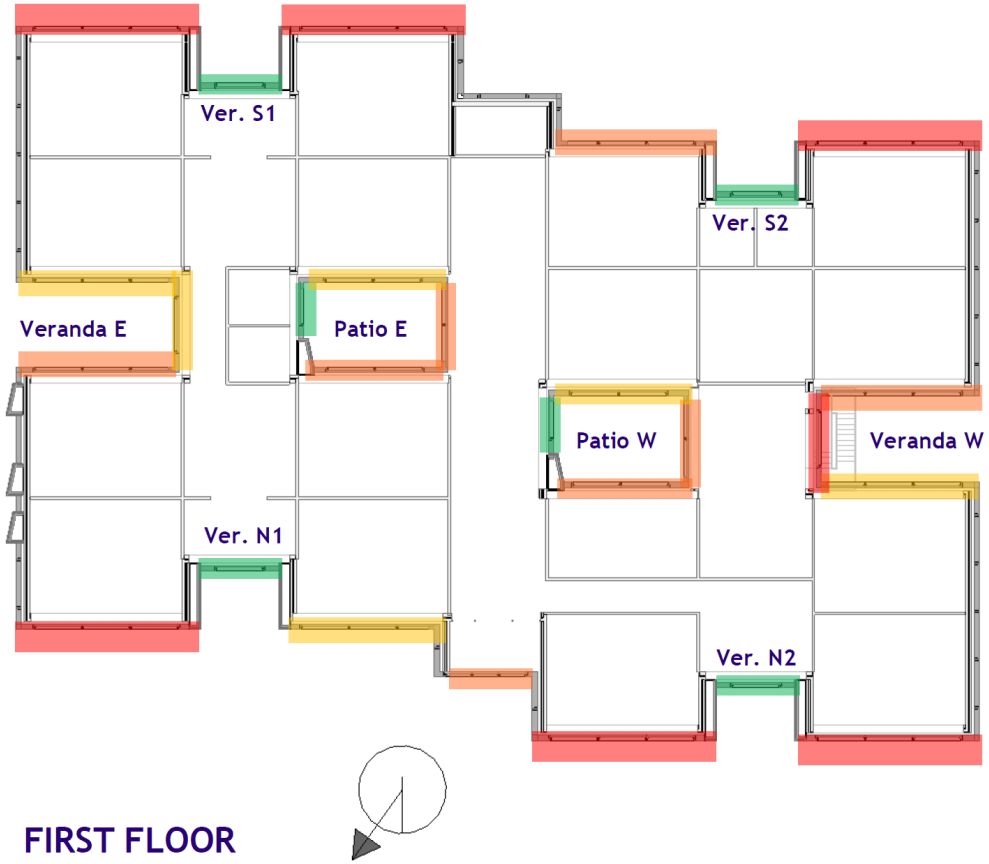
Solar study



Funded by the European Union

Solar study

GROUND FLOOR



FIRST FLOOR

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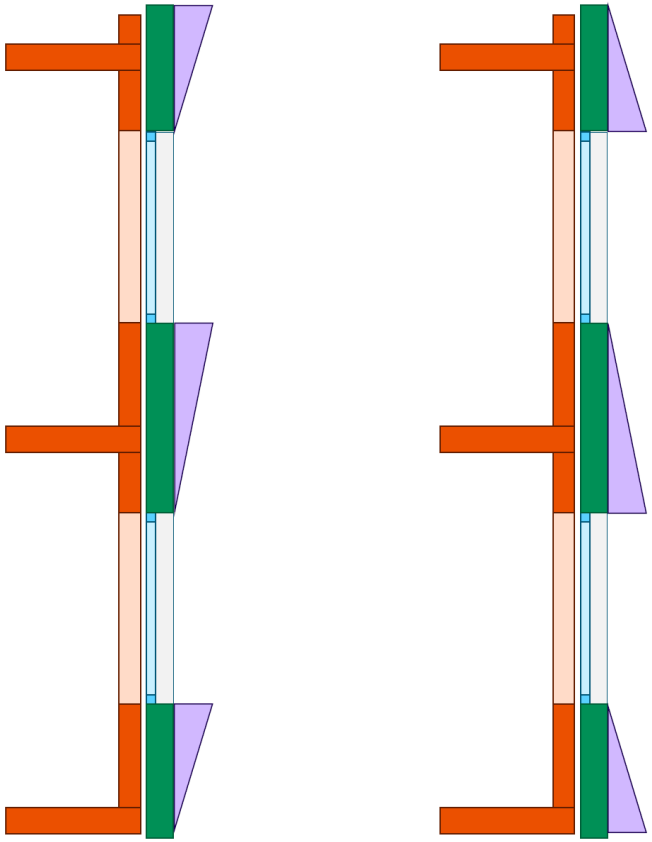
Solar study



		Fsh Tilt 1 - Down		Fsh Tilt 2 - Up	
S	148,32	127,17	0,86	80,84	0,55
E	103,40	86,61	0,84	59,15	0,57
N	79,94	58,75	0,73	40,33	0,50
W	125,19	106,54	0,85	68,54	0,55

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Design development

Options

OPTION 1

OPTION 2

OPTION 3

OPTION 4

CHOSEN OPTION

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CHAPTER 3

DESIGN PROPOSAL

Design development

Material

Secondary material

Wooden Planks

Primary material

Laminate Panels

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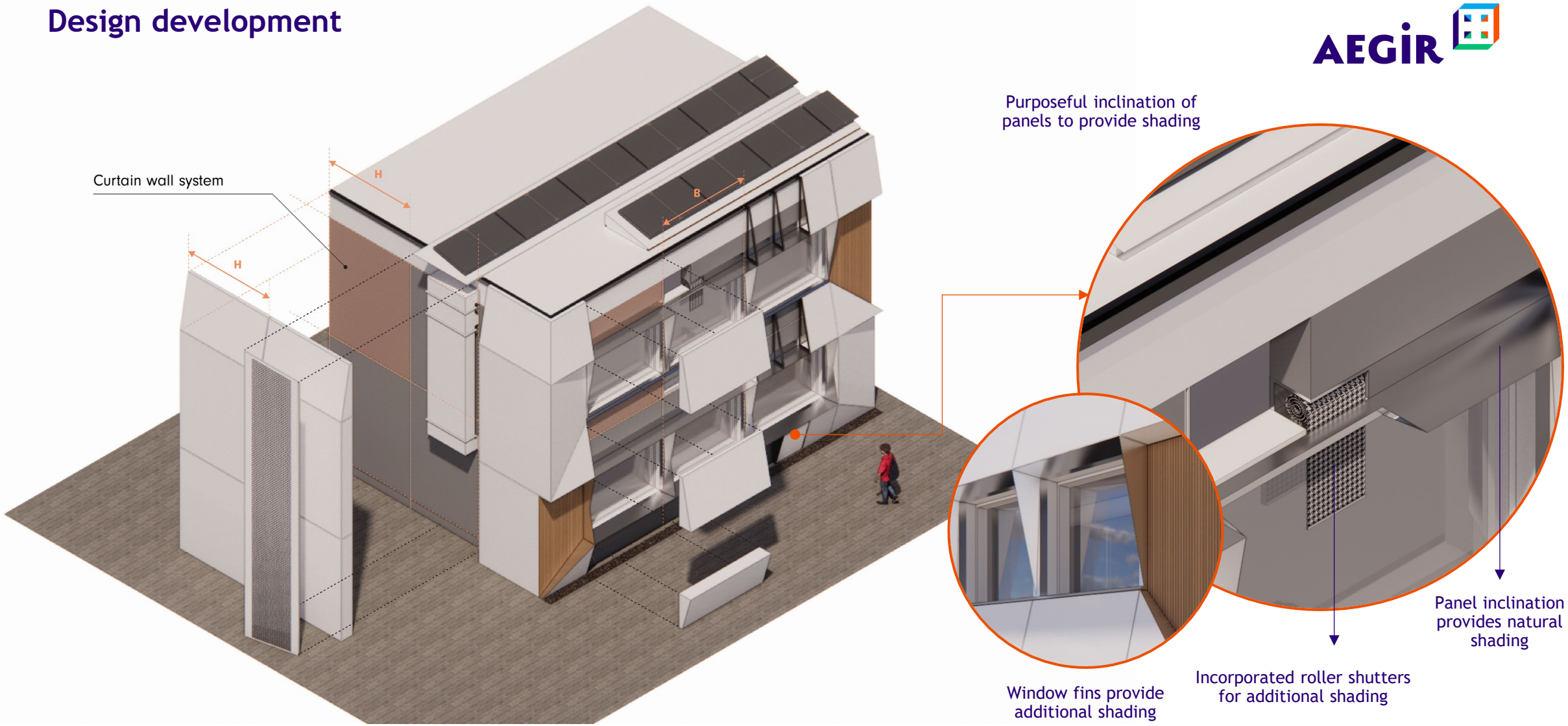
Design development



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AEGiR

Incremental
Renovation
Package

Thank you!

Julen.astudillo@tecnalia.com

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