

## MORE—CONNECT

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# D5.4 Realization of 5 pilot sites



# Realization of 5 pilot sites

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This deliverable documents the work of task 5.4, which concerns the actual renovation of the pilot buildings.

This may include the partial or total removal of existing structures (facades, roofs, installations), depending on the renovation methodology (total replacement, partial replacement, addition of elements).

# Content of deliverable

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For each of the five pilot projects this presentation documents the actual renovation of the buildings using among other things the prefab renovation elements. For each country the pilot project documentation covers:

- The total process, including recordings of the essential steps on photos and videos.
- The recording and evaluation of the working of the smart plug & play connectors in practice

# Production process

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Elements include ducts



Sealed to be delivered



Beam supported facade finishing

Automated production

Quality approved



Extra support when over 8 meters



# Pilot Zoetermeer (1)

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# Pilot Zoetermeer- NL (2)

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## Graaf Jan straat Zoetermeer



PRivate  
NOM renovation in 10 days  
Build in 1974  
Energy overshoot



Airtightness  $Q_{v10} < 0,3 \text{ l/s.m}^2$   
Brine heatpump water-water  
PV-cellen and  
Heatwatercollector  
WTW and boilerbuffer 150l  
 $R_c$  roof 7,  $R_c$  wall, 5  $R_c$  vloer 5



Opening november 2015 by minister Blok





# Arnhem Presikhaaf pilot – NL (1)

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Before



During the proces



During the proces



# Arnhem Presikhaaf pilot – NL (2)

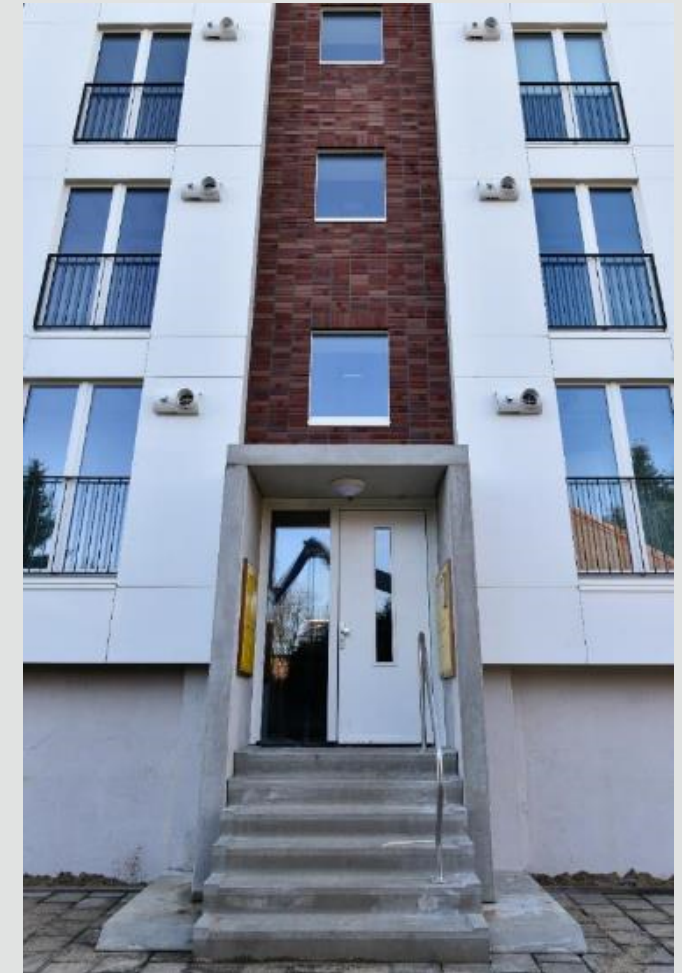
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# Arnhem Presikhaaf pilot – NL (3)

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# Saules iela 4a Cecis pilot - Latvia

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- Production process



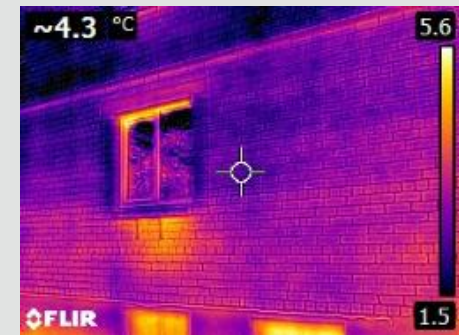
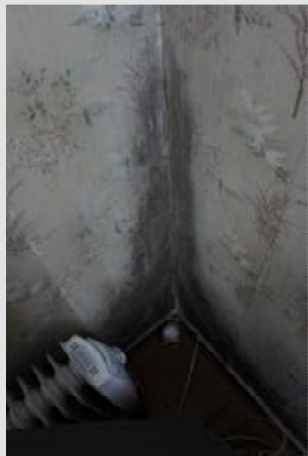
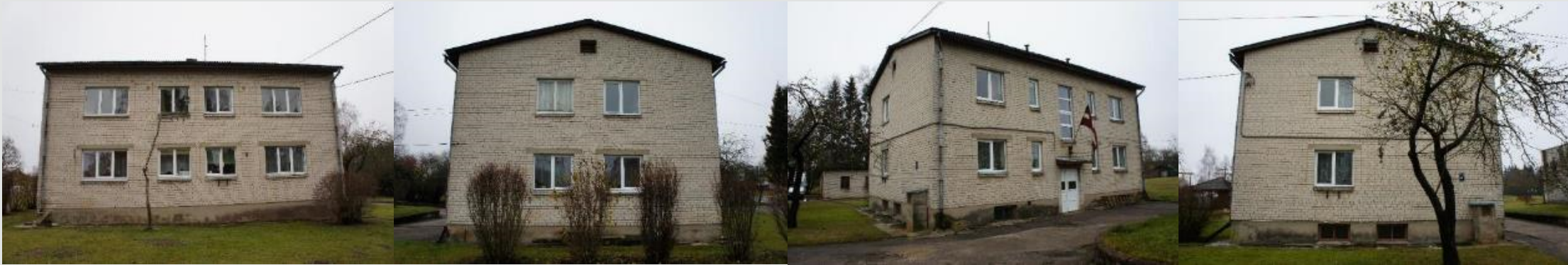


# Latvian demo building

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- Before the renovation



# Latvian demo building

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- Renovation process



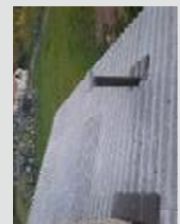


# Latvian demo building

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- After renovation



# Akadeemia tee 5A pilot - Estonia

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- Overview of the pilot building before renovation

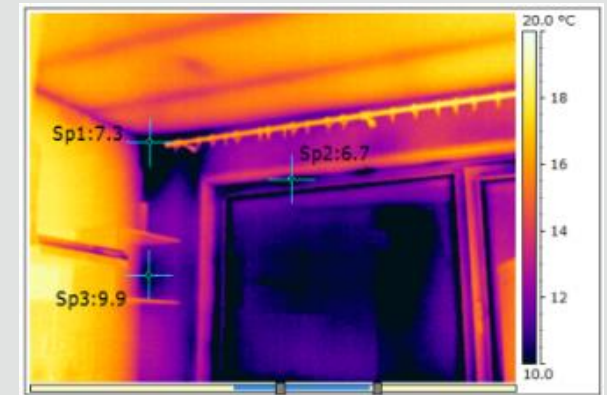
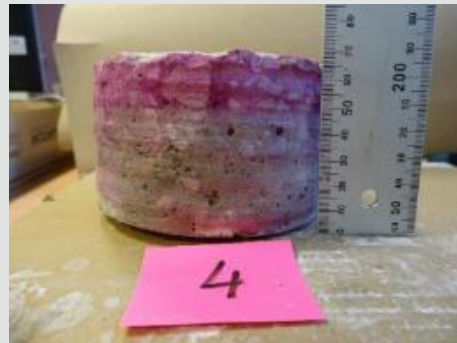
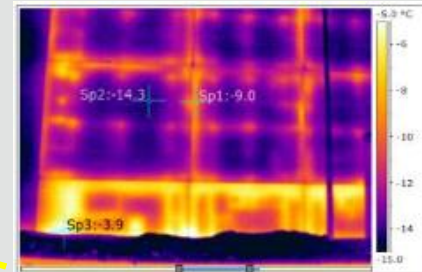
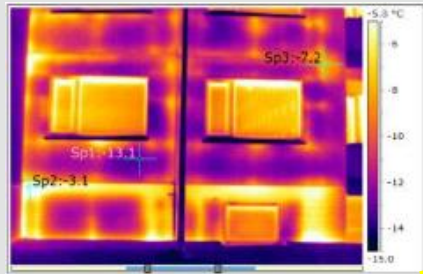




# Akadeemia tee 5A pilot - Estonia

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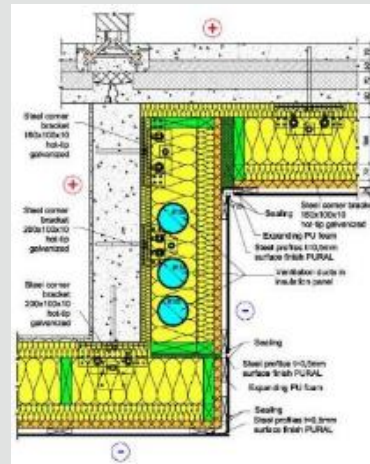
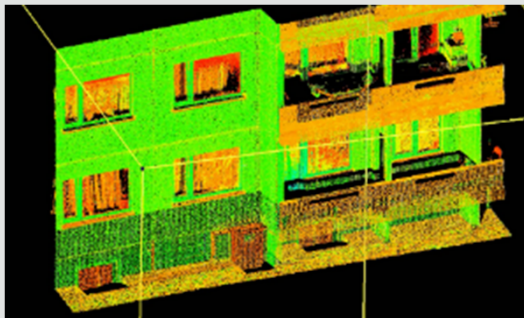
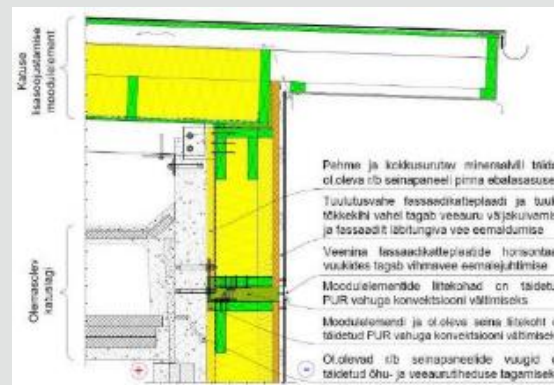
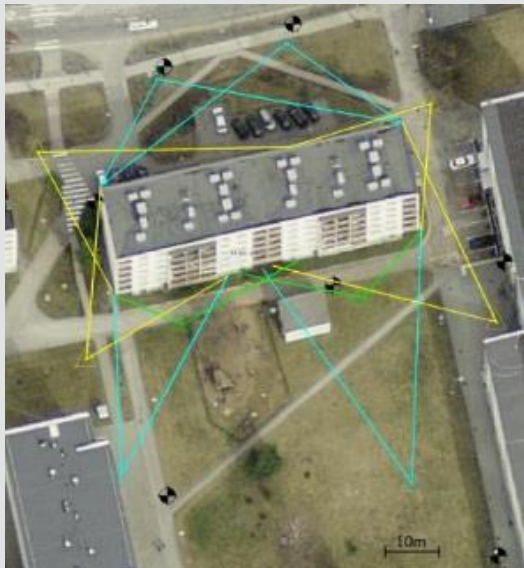
- Studies of and measurements at the pilot building before renovation (2015)



# Akadeemia tee 5A pilot - Estonia

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- Design process of the pilot building (2015-2016)



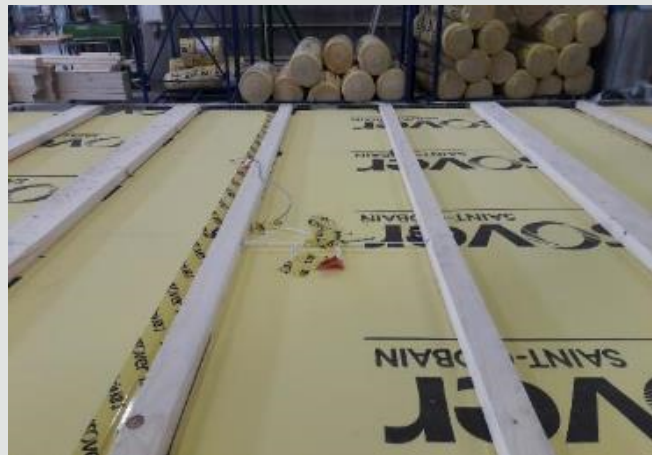


# Akadeemia tee 5A pilot - Estonia

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- Production of the modular elements of the pilot building (spring 2017)

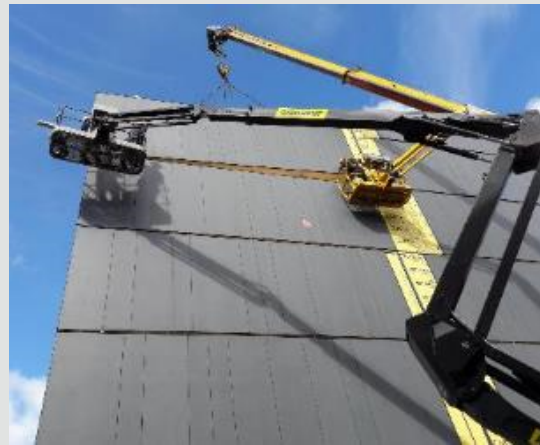


# Akadeemia tee 5A pilot - Estonia

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- Installation of modular elements at the pilot building (summer 2017 )





# Akadeemia tee 5A pilot - Estonia

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- Overview of the pilot building after the nZEB renovation with modular elements ( autumn 2017)



# Korsløgkeparken pilot - Denmark

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The renovation covers the installation of the PV-roof developed by Innogie through the MORE-CONNECT project and the insulation, finishing and 3D-printing of a decoration by a robot solution develop by Invela in the MORE-CONNECT project. Besides the energy renovation covers: New low-energy windows, mechanical ventilation with heat recovery and breaking of thermal bridges.



Rendering of the facade after renovation.



# Korsløkkeparken - building 34.6

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The very long pilot project building – Korsløkkeparken – building 34.6, where renovation has started in one end.

At the right of the photo it can be seen how the building looked before the renovation.

The photo has been taken June 29, 2017

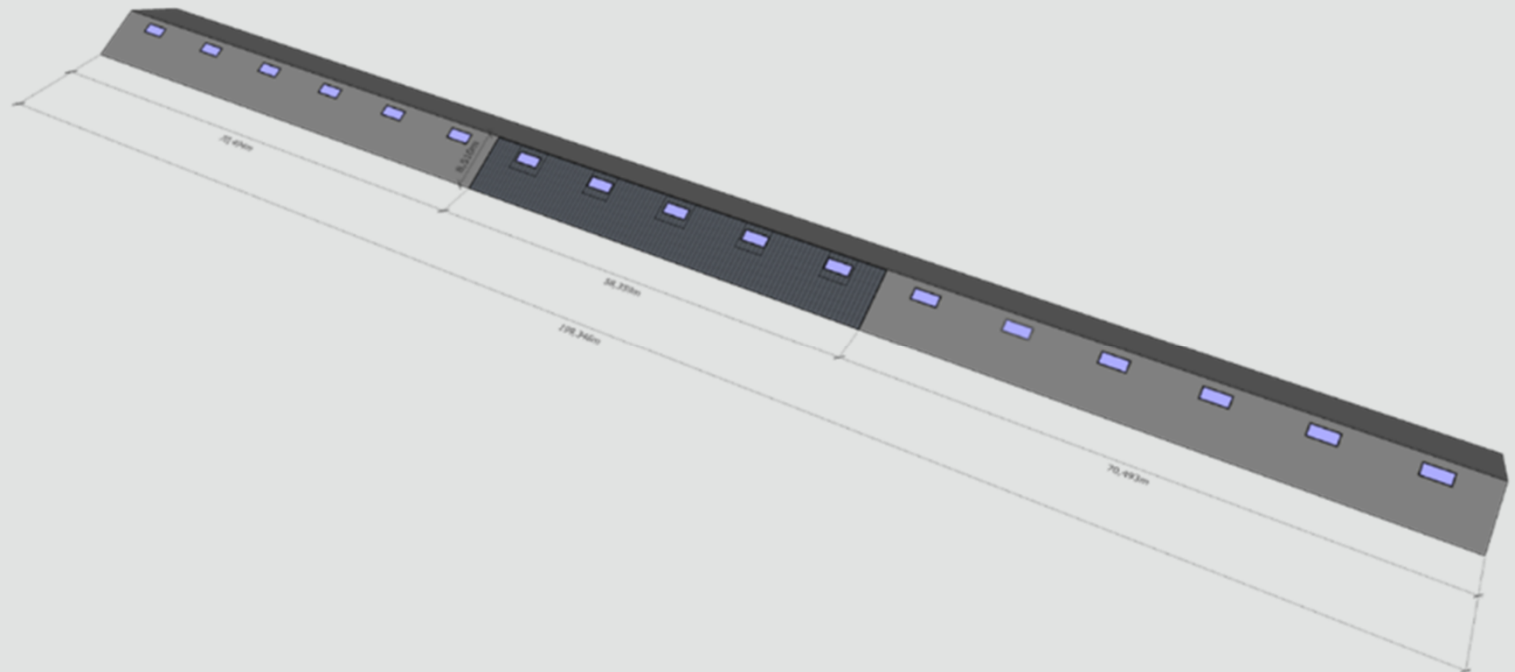


# Installation of the PV-roof

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Design drawing showing the actual location of the app. 400 m<sup>2</sup> PV-roof on the pilot building.





# Installation of the PV-roof

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Preparation of the roof to make it ready for the mounting of the PV-roofing elements



# Installation of the PV-roof

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The PV-roofing elements being mounted on the roof.

The work is shielded by a movable plastic cover – mounted on a scaffold.





# Installation of the PV-roof

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Micro-inverters have been installed at the top end of each row of PV-roofing elements.



# Installation of the PV-roof

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Details showing the flashing around a roof window and a ventilation outlet.



# Installation of the PV-roof

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The almost  
finished PV-roof –  
photo from end of  
November 2017





# Invelas gable wall insulation and 3D decoration printing

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Preperations on site with 250 mm of mineral wool insulation and plastering done by hand – ready for 3D design by robot





# Invelas gable wall insulation and 3D decoration printing

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First test of on site printing a unique 3D design vertically on a wall – actual work on the pilot project starts spring 2018



# Invelas gable wall insulation and 3D decoration printing

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The logo design of the building association FAB to be 3D printed in concrete on the vertical gable wall on site.

The design has been pre-programmed by Invela for the Graphical User Interface on the tablet to be used to control the robot, when the actual 3D printing is to be carried out,



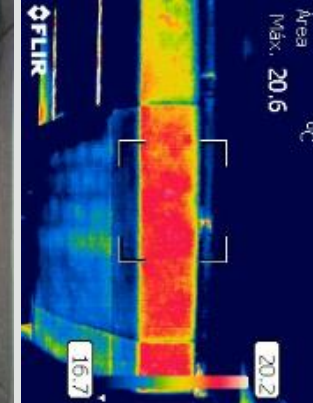
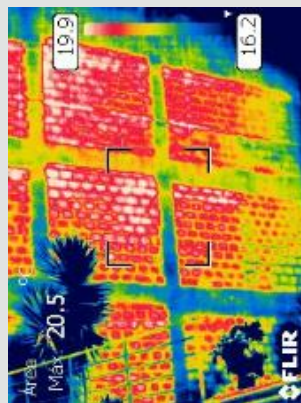
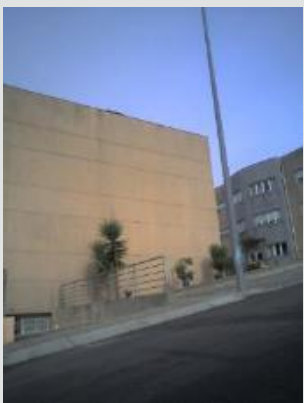


# Edifício Mota Pinto pilot - Portugal

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Before renovation



# Edifício Mota Pinto pilot - Portugal

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## Prototype production process

### PINEWOOD FRAME

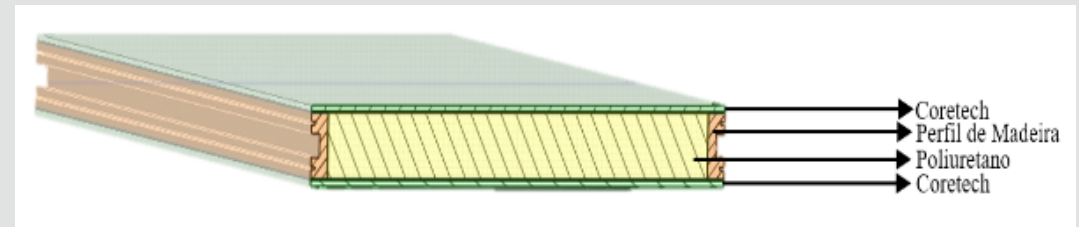
- Good thermal performance
- Innovative in the construction sector, which is used to work with aluminium

### CORETECH PANELS

- Recycled material from automotive industry (kraft and cellulosic paper, polyurethane foam, fabrics and fiberglass)
- High durability, water and fire resistant, very good thermal performance
- Supports any type of coating (paint, ceramic, plaster, etc)

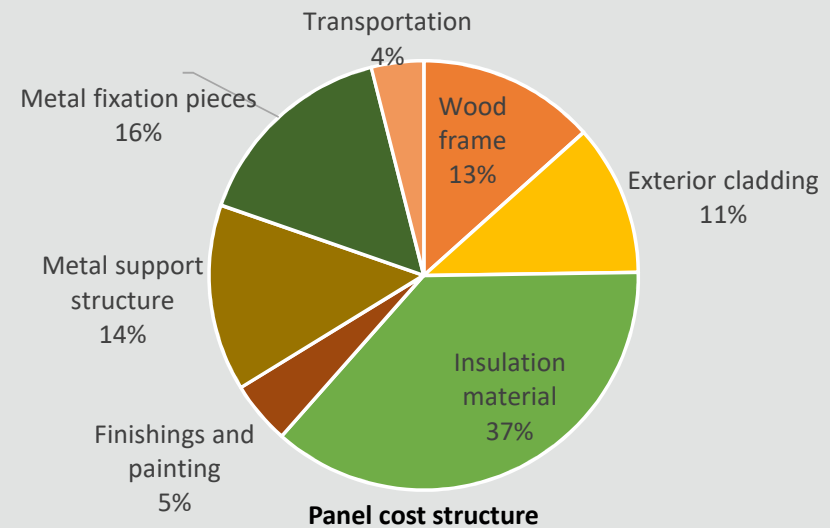
### POLYURETHANE FOAM

- Injected into the panel
- High thermal performance and durability



Module composition illustration

THICKNESS: 12 CM  
DENSITY: 19.7 KG/M<sup>3</sup>

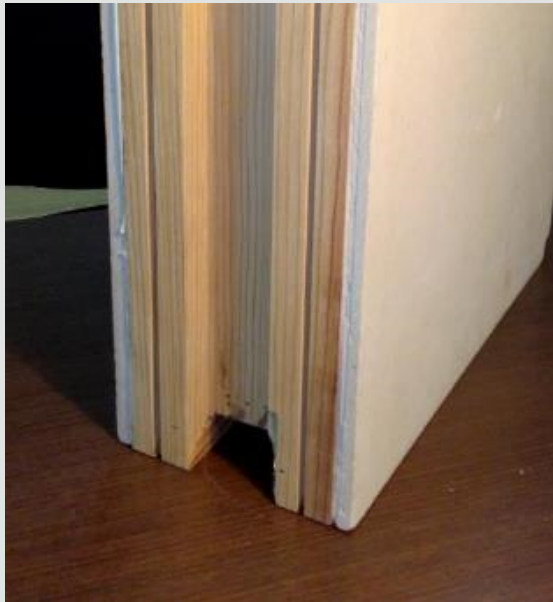




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### Prototype production process



Frame detail



Prototype assembly

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### Prototype production process



Frame detail (demo wall)



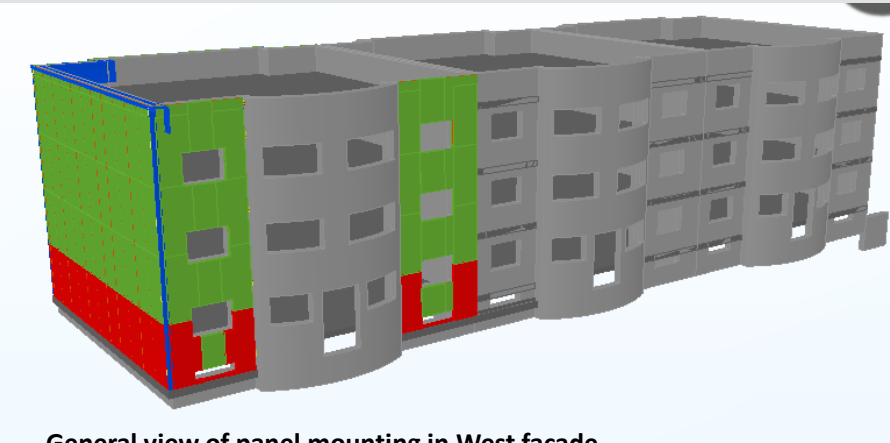
Demo wall for panel connection test



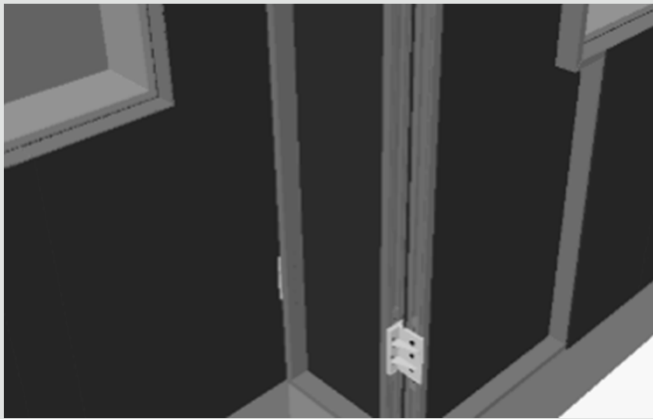
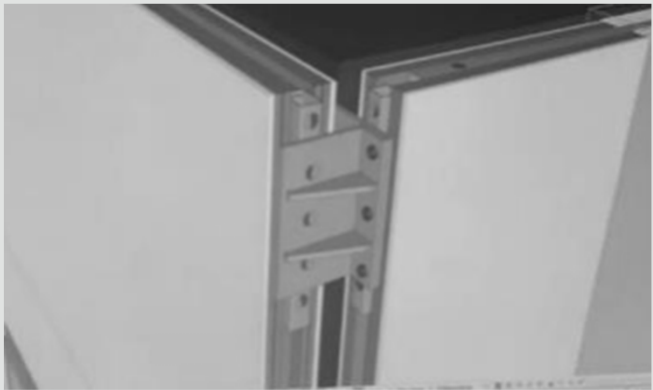
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Planned renovation process

Activities	Time schedule
Start of panels production	January 2018
Preparatory works on site	End of February 2018
Panels transport and mounting	March 2018
Delivery of completed renovated site	End of March 2018



General view of panel mounting in West façade

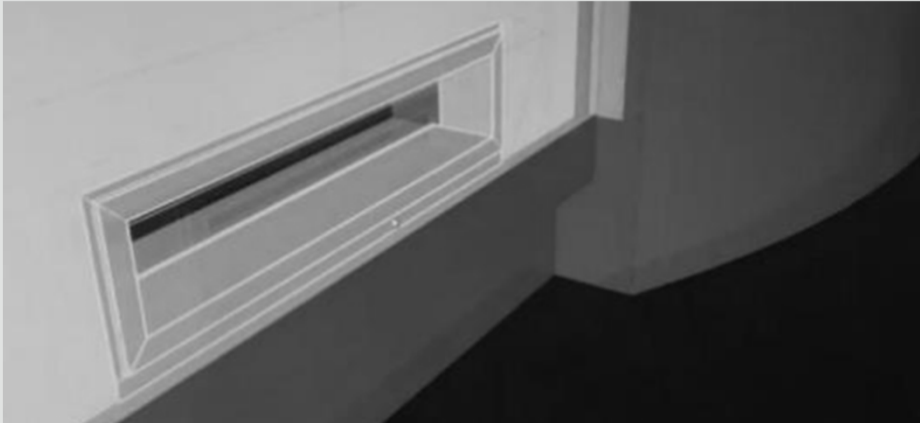


Corner detail

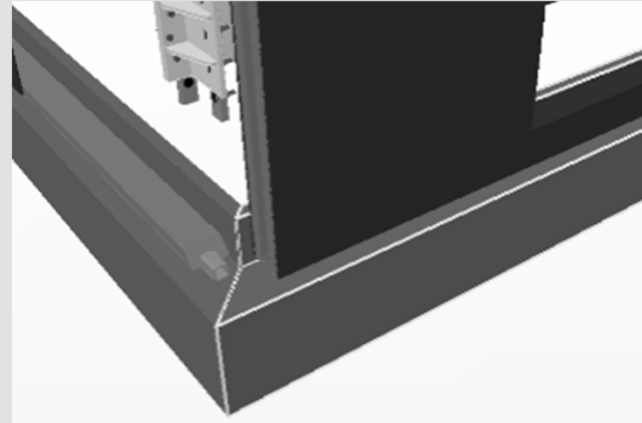
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### Planned renovation process



Window sealing box



Lintel detail