

Accelerating Energy renovation solution for Zero Energy buildings and Neighbourhoods





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General overview

- Call: H2020-EEB-2017
- 48 months: October 2017 August 2021
- 19 European partners
- 3 demonstration buildings + 3 virtual demonstration buildings
- \rightarrow To achieve:
- 16% cost reduction of renovation
- 60% energy consumption reduction
- 65% renovation process time reduction







Context



- Currently only **1.2 % of the building stock** is replaced annually
- To accomplish the 2050 targets increase the rate to **2.9% necessary**
- Currently retrofitting processes are expensive, complex and disturbing, with many uncertainties and several inefficacies
- Information is not properly shared, multiple errors and duplicated efforts

RenoZEB strategy:

- technological attractive solutions (multifunctional modular "plug and play" system)
- a well-designed renovation methodology
- cloud collaborative environment
- **involvement** of all key stakeholders
- **property value** as main trigger for nZEB renovation Market









Unlock the nZEB renovation market leveraging the gain on property value through a new systemic approach to retrofitting that will include:

- innovative components
- processes
- decision making methodologies
- to guide all value-chain actors in the nZEB building renovation process

4 main pillars:

- **Reduce energy consumption**, increasing the share of RES in buildings
- **Cost & risk reduction** with low disruption during building renovation, to attract customers interest
- **Replicability and adaptability** through modularity in order to capture a largescale renovation market
- Property-value as trigger









- Prefabricated window module and roller shutter
- Multifunctional insulation boards
- Ventilation units with heat recovery
- Building Integrated Photovoltaics (**BIPV**) and batteries
- Building Integrated Solar Thermal Systems (**BIST**)
- Intelligent façade controller (integrated sensors and façade controller)
- "Click-in" fixing mechanisms









WINDOW UNIT

PV UNIT







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RenoZEB facade - Prototype







Solution: nD Collaborative Environment



Ongoing work: KPI management

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KPI weight



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Solution: nD Collaborative Environment

Ongoing work: IFC viewers







Georreferenced view (GIS context) Automatic IFC to KML conversion & web viewing (cesium libraries)





Solution: BIM Model Generation Tool









Solution: Smart logistic and construction management tool



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- **READ IFC ENTITIES**
- CREATE A QR CODE FOR THAT ENTITY
- ADD INFORMATION TO THE QR CODE
 - DATES
 - PDF, YOUTUBE
- GANNT CHART WITH ALL THE ELEMENTS





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RenoZEB Pilot - Durango



1960' building



Pre-intervention (left column) and Post-Intervention (right column) infographics





RenoZEB smart modular customizable facade

Overall energy model and	d thermal zones created in F2	
overall energy model an	PRE kWh/m2	POST kWh/m2 (scen 3)***
Space heating energy demand	110	14.5
DHW demand	9*-19	9 -19**
SH+SH energy use	166.3 -180	33-47 (80% reduction
	Consumo Eprim total (kWh/m2 año) A cr 2,57 B 237 38.5 C 38.5 59.6 O 59.6 91.7 E 91.7 218.2 Y 218.2 246.5	Consumo Eprim total (kWh/m2 año)



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1992 building











	Before (existing) kWh/m2	After kWh/m2
Space heating energy demand	110	70
DHW demand	33,3	33,3
Heat for ventilation	0	26
Heat adjustment	Not present	Controlled Temp. range 18-23 °C
Indoor climate	no	II indoor climate class
Ventilation	Freeflow, not mechanical	Mechanical (by II indoor climate class)
Solar enegy generation	0	30 kW PV station ca 50% of yearly demand will be covered
Energy class and label	"E" 231 kWh/m2 a	"B" 124 kWh/m2 a 53% reduction

Energy model before and after intervention





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Thank you for your attention

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