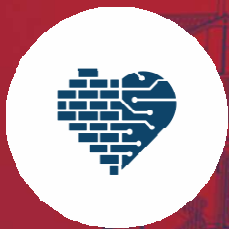


# HEART

Holistic Energy and  
Architectural Retrofit Toolkit

MEDITERRANEAN  
MEETING

ON SOCIAL HOUSING POLICY  
IN THE AREA OF REHABILITATION AND  
ENERGY POVERTY



HEART

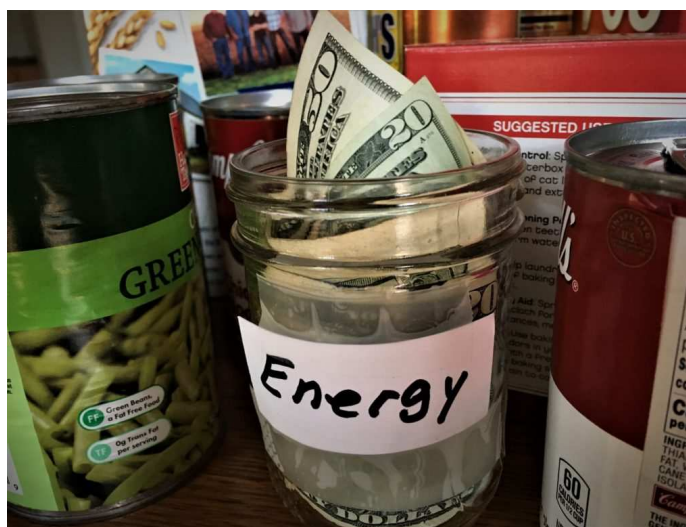
This project has received funding from the  
European Union's Horizon 2020 Research and Innovation  
Programme under grant agreement N° 768921.



# Energy Poverty

Energy poverty can be defined “a situation where a household is unable to afford basic energy services (heating, cooling, lighting, mobility and power) to guarantee a decent standard of living due to a combination of low income, high energy expenditure and low energy efficiency of their homes”.

(European Commission, Citizens’ Energy Forum 2016)

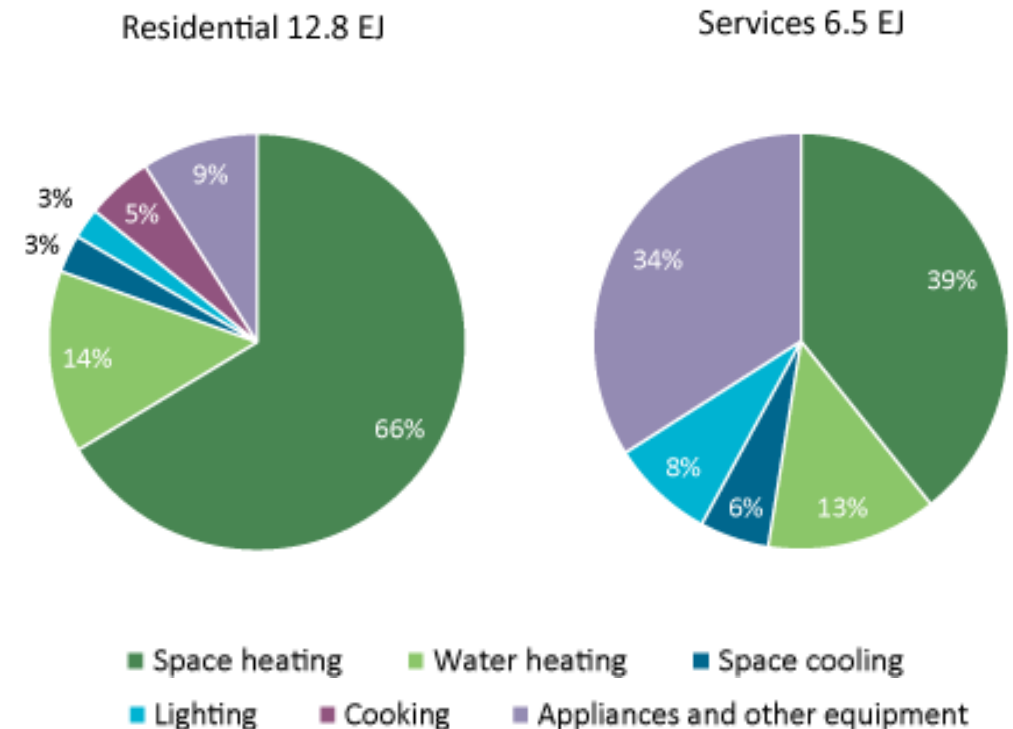


# Energy poverty and building retrofit

Energy poverty occurs mainly in old buildings, where often low income people live. The biggest opportunity for reducing energy consumption in existing buildings is in the area of heating, cooling and hot water, which account for more than 60% of their energy consumption.

Deep renovation, which is the focus of H2020 project HEART, could reduce energy demand for heating by 70% or more.

Residential and services sub-sectors energy consumption by end-use for EU (27)



## HEART Project General information

- **OFFICIAL TITLE:** HEART - Holistic Energy and Architectural Retrofit Toolkit
- **RELEVANT KEYWORDS:** Renovation, Energy efficient buildings, Internet of Things, Interoperability, Integrated design
- **DURATION:** 48 months (01/10/2017 - 30/09/2021)
- **EU CONTRIBUTION:** 5,669,012.50 €
- **PROJECT COORDINATOR:** Politecnico Di Milano
- **WEBSITE:** [www.heartproject.eu](http://www.heartproject.eu)
- **LINKEDIN:** [www.linkedin.com/groups/8642064/profile](https://www.linkedin.com/groups/8642064/profile)
- **TWITTER:** [twitter.com/HEARTProjectEU](https://twitter.com/HEARTProjectEU)



[www.heartproject.eu](http://www.heartproject.eu)



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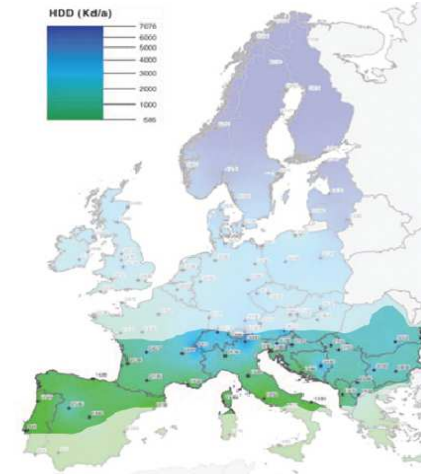
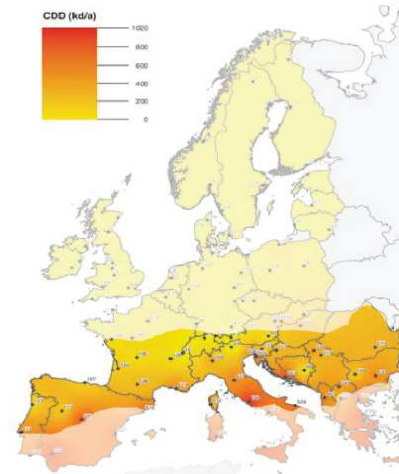
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# Application context

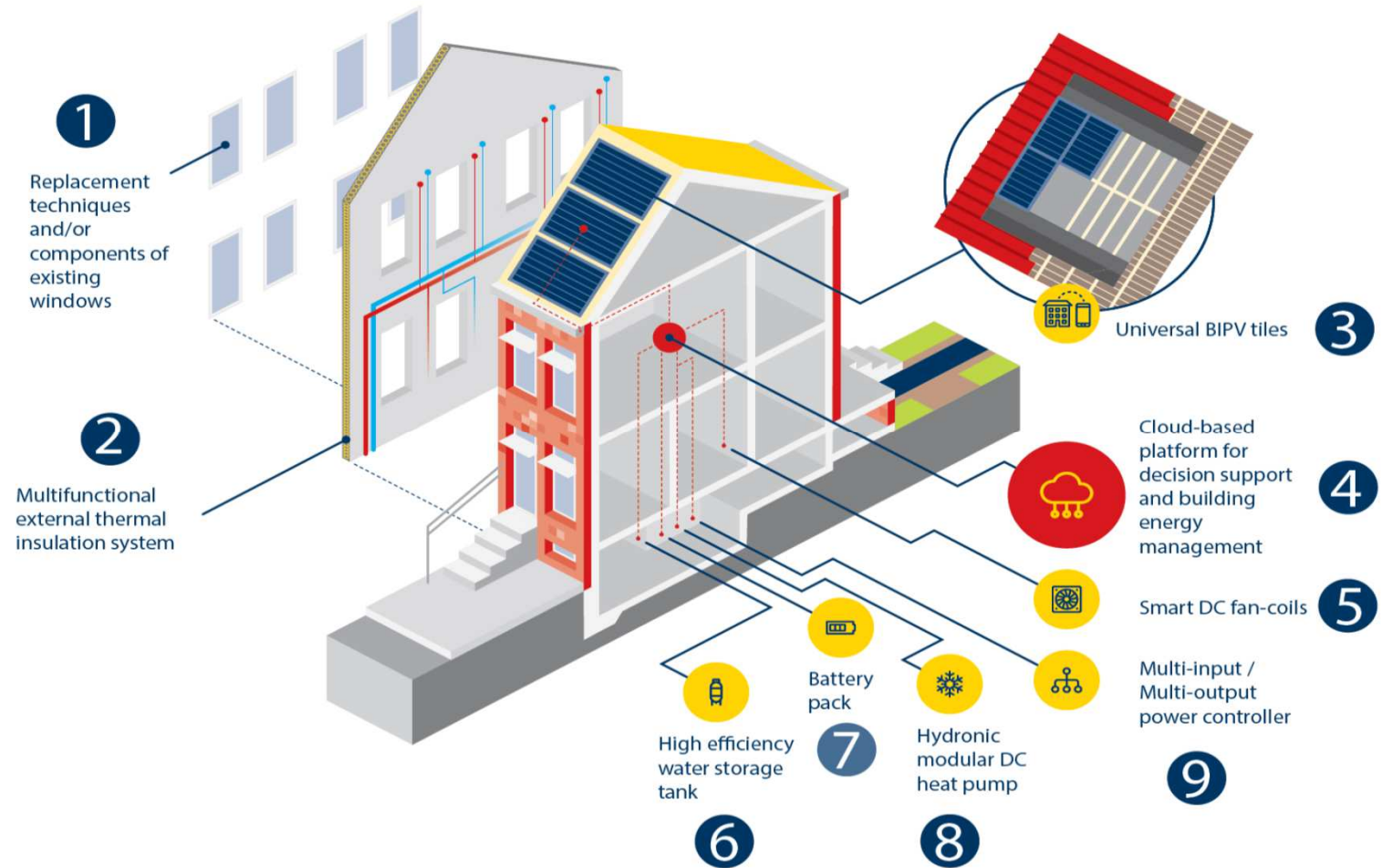
The project's geographical focus is **Central and Southern Europe**, where the moderate climate requires building energy performance to relate as much as to **heating, overheating and cooling**.

The application target are **multi-storey residential buildings** of the second half of the last century, with particular reference to social housing. Within this category, the most common types are **4-5 floors linear condominium buildings**.



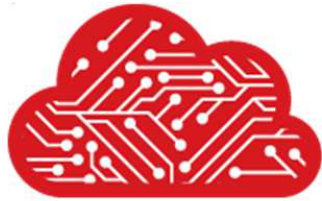
# HEART Toolkit

- 1) Retrofit components/techniques for existing windows;
- 2) Multifunctional external thermal insulation;
- 3) Universal PV tiles;
- 4) Cloud-platform;
- 5) DC Smart fan coils;
- 6) Thermal storage;
- 7) Battery pack;
- 8) DC heat pump;
- 9) Multi-Input/Multi-Output converter (MIMO);



# The decision-making phase

The HEART cloud platform allows the decision maker (designer, building owner, investor) to find the **optimal configuration** under the technical-economic point of view.



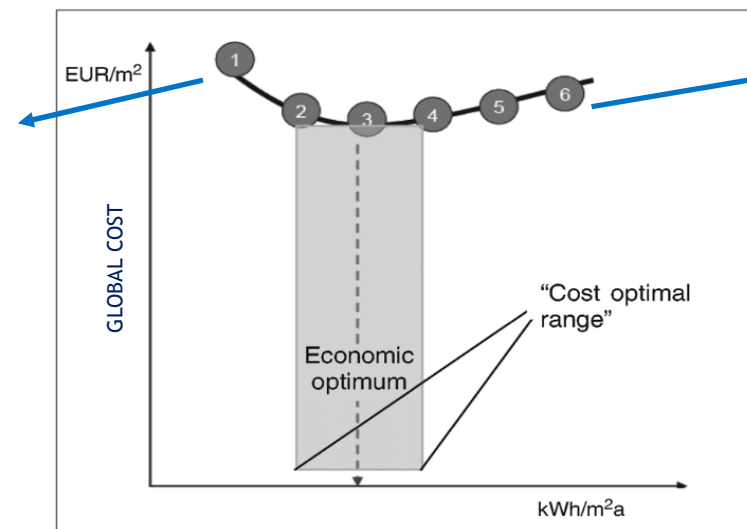
CLOUD-BASED PLATFORM  
FOR DECISION SUPPORT AND  
BUILDING ENERGY MANGEMENT



Cost-optimal choice

High investment  
cost - high energy  
performance

Low investment  
cost - low energy  
performance



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## How HEART faces energy poverty

Specifically, regarding the Energy Poverty issue, HEART can contribute to face many problems by means of the followings:

1. **Reduces total energy consumption (and related costs)** for heating, cooling and domestic hot water preparation by at least **80%** (i.e. an average energy expenditure of 1500€/year can be reduced at 300€/year;
2. By means of its advanced energy management system with adaptive-predictive features, **reduces uncertainty and fluctuation in energy consumption and expenditures;**
3. At the same time **avoids incorrect behaviours** (forced energy austerity, energy waste, parasitic consumption between dwellings, etc.);
4. **Ensures affordable and proper comfort levels** in all seasons.





Thanks for your attention



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