

# The Project

- Heat4Cool is a 4-year project started in October 2016.
- Heat4Cool proposes an innovative, efficient and cost-effective solution to optimize the integration of a set of rehabilitation systems at building and district level in order to meet the net-zero energy standards.
- This retrofitting solution together with a closer interaction between building monitoring, demand/respond supply match, weather forecast and HVAC activation/control through a Self-Correcting Intelligent Building Energy Management Systems (SCI-BEMS) aims to demonstrate saving of at least 20% of energy consumption.
- The project will be implemented in three buildings and one district area in four different European climates, with an expected return on investment lower than ten years.

## Targets

Heat4Cool key performance targets are :

1. Reduction of energy consumption by 30 % in retrofitting residential buildings.
2. Payback period of below 10 years.
3. Best practice examples for the construction sector based on innovation and competitiveness.

# Pilot Buildings

The Heat4Cool solutions will be demonstrated both, at building and district level across four different demo sites. The heating and cooling integrated systems will be firstly tested in KUBIK, a facility located in Spain specifically designed for testing new energy efficiency solutions.



Sofia, Bulgaria

**Building structure & living area**  
Residential building

**Climate**  
Humid subtropical climate with continental influence

**Current heating system**  
Natural gas and electric boilers



Valencia, Spain

**Building structure & living area**  
Residential building

**Climate**  
Humid continental

**Current heating system**  
Natural gas boiler



Chorzów, Poland

**Building structure & living area**  
Residential building

**Climate**  
Humid continental

**Current heating system**  
Natural gas boiler



Budapest, Hungary

**Building structure & living area**  
District

**Climate**  
Humid continental

**Current heating system**  
Natural gas boiler

## The integrated Heat4Cool solution will provide:

### 1. Space heating, cooling and domestic hot water :

The two main heating & cooling solutions will be a solar assisted Adsorption Heat Pump (AdHP), which will be easily integrated to the existing natural gas building installation, and an advanced DC Heat Pump powered by photovoltaic panels (PV) and coupled with a modular advanced Phase Change Materials (PCM) heat and cold storage.

A high performance heat exchanger utilising sewage water will be developed in order to connect low temperature heat streams to Heat4Cool solutions.

### 2. Renewable energy :

The solar thermal and PV system are important components of the retrofitting solution due to the active energy production and their high integration ability to Heat4Cool heating and cooling solutions (AdHP and DC Heat Pump).

### 3. Smart control :

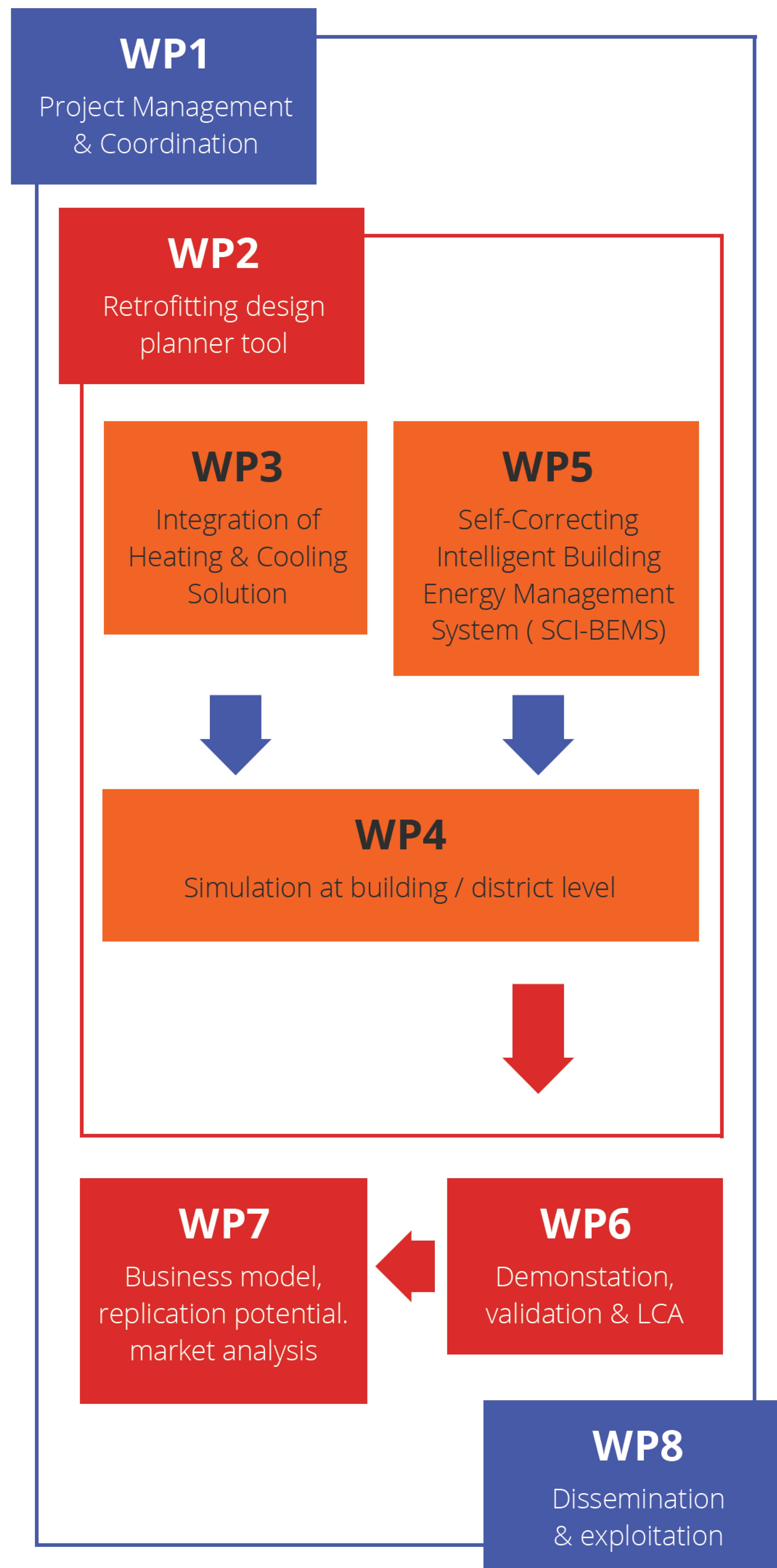
As the brain of the heating and cooling energy system, the smart control will continuously monitor performance and environmental conditions in order to identify the optimal, in terms of energy efficiency, control strategy for the end user, whilst respecting his/her personalised comfort boundaries.

### 4. Scale up to district and building installations :

The AdHP and DC Heat Pump coupled with a heat storage system assisted by RES are proper solutions for individual building, while the sewage and smart control systems enable wider implementation and aggregate the benefits from larger scale application.



## OUR STRUCTURE



## PARTNERS



## SOCIAL



# The Heat4Cool Project

Integrating advanced technologies for heating and cooling at building and district level



The Project has received funding from the European Union's Horizon 2020 programme for energy efficiency and innovation action under agreement No.

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