Thermal Energy Storage Systems for energy efficient building an integrated solution for residential building energy storage by solar and geothermal resources

**TESSe2b Project**

**Project Presentation**

Geothermal Panel Webinar, RHC - ETIP

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Project Title


- TESSe2b Project –

Project number: 680555

Call identifier: H2020-EeB-2015 Call for EeB – Energy-efficient Buildings

EeB 6 – 2015: Integrated solutions of thermal energy storage for building applications

Budget: 4.311.700 euros;
Number of participants: 10
Number of countries: 8
Starting date: 01/10/2015;
Duration: 48 months
Thermal Energy Storage Systems
for energy efficient building an integrated solution for residential building energy storage by solar and geothermal resources

Latent Thermal Energy Storage
- Heating, Cooling and DHW Tanks
  - (NEPCM)
- Enhanced PCM BHEs

Renewable Energy Sources
- Solar (Thermal Collectors)
- Heating and DHW
- Geothermal - GSHP
- Cooling, Heating and DHW

Hydraulic scheme
Expected results

• The TESSe2b solution will reduce the building energy consumption at 25-30%, with a corresponding reduction in operating costs.

• The estimated payback period is expected to reach 8-9 years.

• The suggested adaptive control and management system will additionally increase the utilization degree of the PCM storage of up to 20%.
Expected results

• The **smart control algorithm** will take into account the individual working-point-dependent efficiency characteristics and select the optimal overall rating of each component with regard to system efficiency which will optimize the operation on a system-wide basis **increasing the overall efficiency by another 5%**.

• TESSe2b solution will design and **deliver modular stackable TES tanks** that can be scaled according to the application and will not require a large single volume of space. It is expected that the **2.5m³ limit will not be exceeded**. (1.85 m³ in demo sites)
Expected results

• The system will lead to a **higher average annual solar collector efficiency by 18%** (increase of solar fraction on 8%, Austria; 27%, Barcelona; 31% Cyprus).

• The **PCM in the BHE** will contribute to:
  
  • **Increase the GSHP efficiency**, with the corresponding reduction of energy consumption and reduction of operating costs (maintaining the length of the boreholes);
  
  • **Decrease the length of the boreholes**, with the corresponding reduction of initial investment costs (maintaining the GSHP efficiency)
Expected results

The **HPCM, CPCM** and **DHW-PCM tanks** can contribute to:

- Increase the GSHP efficiency;
- Decrease the GSHP installed capacity;
- Decrease the length of the boreholes (reduction of the initial investment costs).
Thank for your attention

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