

echo-euproject.eu



EFFICIENT COMPACT MODULAR THERMAL ENERGY STORAGE SYSTEM

The project's goal is to develop and demonstrate **novel** modular, compact, high performances and Plug&Play thermal energy storage (TES) solutions for heating, cooling and hot tap water production, able to provide electricity load shifting with meaningful peak shaving of the thermal and electric load demands.

ECHO project will provide a key tool for thermal energy storage in the context of sector coupling and provision of flexibility of demand. ECHO system will be adapted to the different energetic scenarios. Additionally, its modularity will allow to use the concept in different scales, from small apartments to larger buildings. The developed systems will be adaptable to different energy sources and user demands. They will be feasible to be charged directly by means of an internal heat pump, exploiting the electricity overproduction from the grid, or directly connecting to renewable energy sources installed in the building.



ECHO System scheme







2024

202

Padova Demo site



Built around 1993 as a single-story office building with a structure made of prefabricated walls, with an area slightly higher than 70 m2 and an orientation close to North-South. It is located in Padova (Italy), in a building inside the Research Area of CNR.

Demo targets

• Demonstrating the feasibility of installation and operation of ECHO system

- Testing the storage capability up to 4 weeks.
- Optimizing the control strategy to integrate renewable energies. Monitoring heating and cooling efficiency and thermal comfort

EXISTING HVAC SYSTEM:

- Two geothermal heat pumps, which operates alternatively.
- Two 200-I tank for each heat pump for the Domestic Hot Water.
- A 180-l thermal storage tank that serves the heating and cooling system.

Installation of ECHO system and new data logging system

Testing of ECHO system in Winter and Summer conditions





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