



Demo#2 (Soria, Spain):
Smart Microgrid Integration
at CEDER-CIEMAT

Connection of the electrical microgrid with the district heating system through **geothermal energy**. Integration of two fast-response energy storage prototypes for advanced **frequency and voltage control**, enhancing the system's stability and efficiency.

Integration of the electrical microgrid with the district heating system through geothermal energy, supported by the development of an advanced control system. This facilitates the efficient flow of energy between the electrical and heating networks via the geothermal field, optimizing energy management.

Additionally, the demonstrator incorporates two fast-response prototypes: a flywheel and a supercapacitor bank, both capable of delivering large amounts of energy in a very short time. These technologies ensure advanced frequency and voltage control, significantly enhancing the stability, efficiency, and responsiveness of the system.

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*Storage INNOvations for Green
ENERgy Systems.*



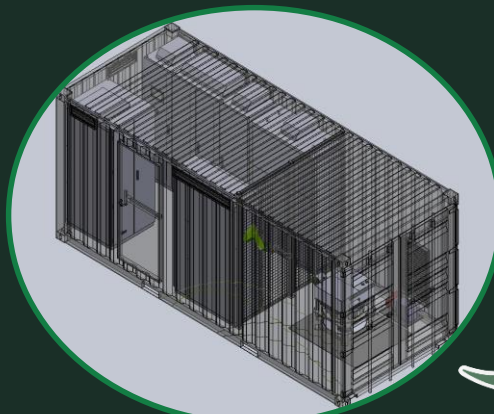
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Partners



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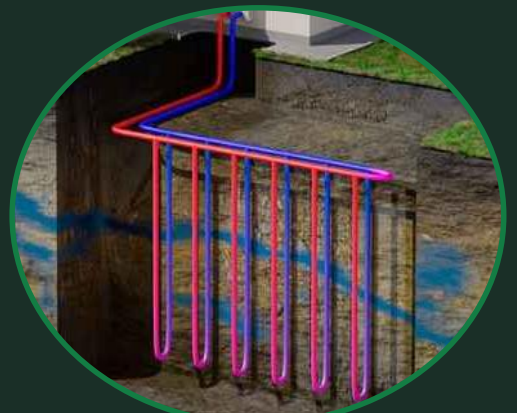


Flywheel

- Max Power: 25 kW
- Stored Energy: 4.2 kWh
- Max Speed: 13.000 rpm

Fast-Response Energy System

- Integrated into smart microgrid
- Voltage support and frequency stability
- Short – term energy management (t < 15 min)
- Suppress power spikes (t < 10 s)



Geothermal Field

- Connected to district heating via geothermal heat pump
- Testing energy seasonal storage
- Integrated with electrical microgrid
- Real time & remote control system
- Optimization of management strategies



Ultracapacitor Bank

- Max Power: 120 kW
- Stored Energy: 0.77 kWh
- N° Cells: 256

