



STORAGE RESEARCH INFRASTRUCTURE ECO-SYSTEM

RI Information sheet 2022

Ciemat, HESINT

Technology(ies) of Energy Storage: Mechanical energy storage and

Contact person 1:

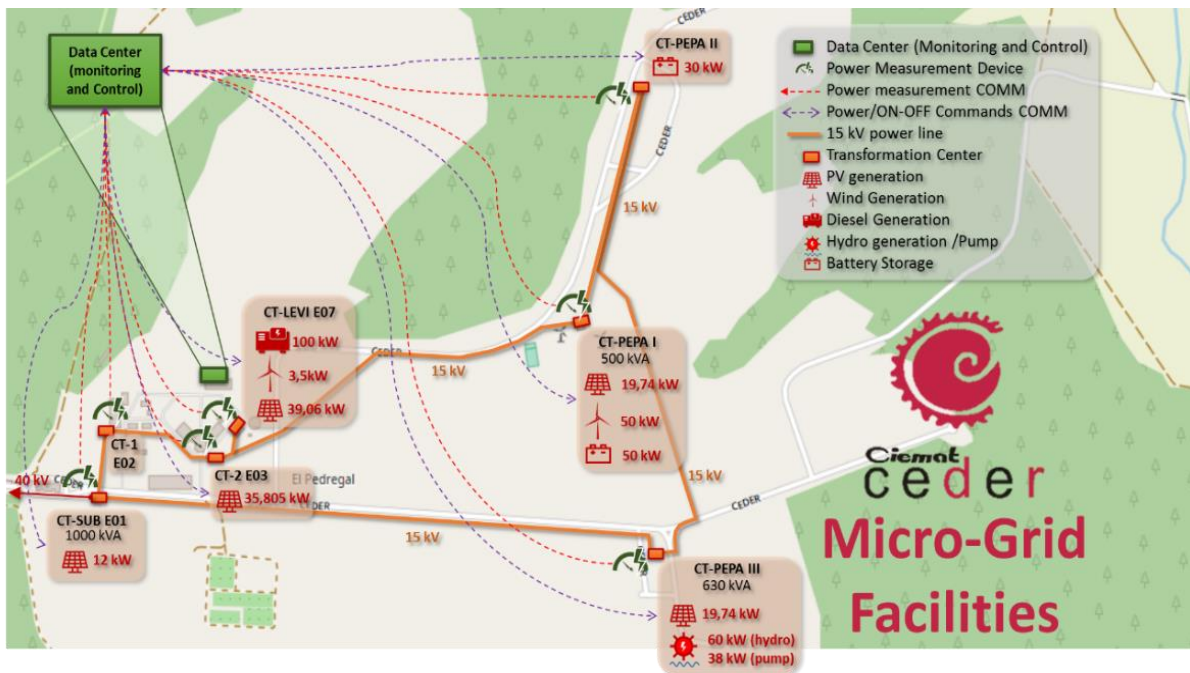
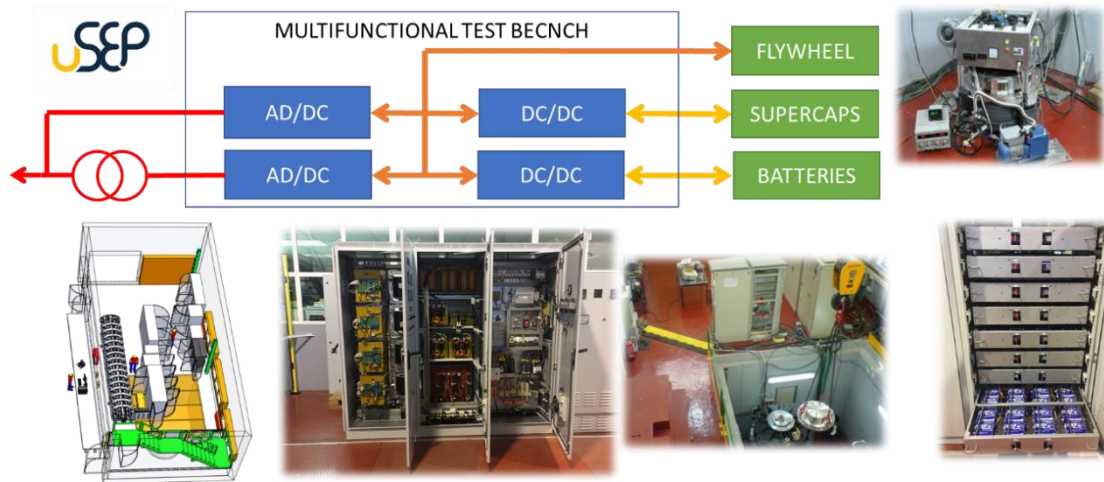
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Project Acronym	StoRIES
Call	H2020-LC-GD-2020
Grant Agreement No.	101036910
Project Start Date	01-11-2021
Project End Date	31-10-2025
Duration	48 months

1. Photo



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2. Geographical coordinates (°, ′, ... N/S, E/W)

Latitude: 41° 36′ 20.328″ N

Longitude: 2° 29′ 48.719″ W



3. Description of the research infrastructure for the webpage

The infrastructure comprises two complementary facilities for characterization, validation and integration into electric grids of hybrid energy storage technologies, one main facility (TRL6-7) and one complementary testing facility to complete its functionality (TRL4-5). On the one hand, HESINT includes a multifunctional test bench based on power electronics with possibility to connect three different technologies of electric energy storage (batteries, supercapacitors and flywheels, for instance), connecting them to the electric grid. Additionally, a power generation emulator based on hardware-in-the-loop scheme is able to reproduce any generation or load profile in real time. On the other hand, HESINT comprises an experimental microgrid based on a 4.2km electric ring of 15 kV with a total installed generation power of 230 kW based on renewable energy sources (wind and solar PV power) with the possibility to work isolated from the general grid, transformed in a grid with different characteristics of P/f and Q/U response, provided by power electronic equipment, behaving as different electric grids. Several energy storage resources are also available of significant power range: pumped-hydro, Lithium and Pb batteries, flywheel and supercapacitors. The experimental grid is completely instrumented and fully controllable. The facility is complemented with a multifunctional test bench based on power electronics to characterize and validate hybrid energy storage systems as well as their control strategies and grid codes compliance. TRL 5 to TRL7 can be demonstrated.

4. Availability of the research infrastructure

(Please indicate time periods in which infrastructure will not be available for StoRIES in the next 2 years – if already known)

5. Special considerations (confidentiality / NDA agreements, insurance requirement, special training, HSE training)

NDA required when infrastructure drawings have to be shared.

6. Energy storage technology that can be analysed/studied by using the research infrastructure

- Electrochemical
- Chemical



- Thermal
- Mechanical
- Superconducting Magnetic
- Cross-cutting (Specifically: Hybridization of technologies)

7. Key words for the webpage

Flywheel,

Pumped hydro,

Hybrid storage operation

8. TRL level (if applicable):

- 1-3
- 4-6
- Above