



# SCO2OP-**TES**

sCO<sub>2</sub> Operating Pumped  
Thermal Energy Storage  
for grid/industry cooperation

**LESS CO<sub>2</sub> IN EU ENERGY SYSTEM  
THANKS TO CO<sub>2</sub>**



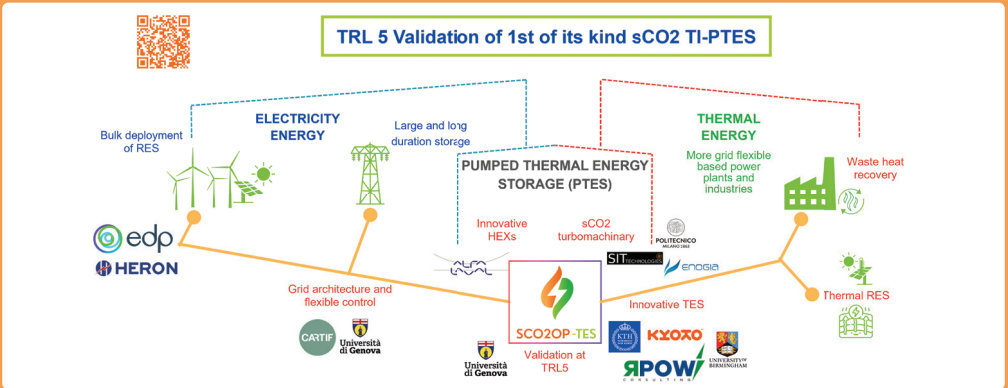
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## CHALLENGE

**Renewable Energy Sources (RES)** presence in the EU Energy system and electric grid are constantly growing while **electrified processes** are becoming more and more common. Since **many renewable sources are non-programmable**, it is important to achieve convenient ways to **store a large amount of energy for a long time horizon** in order to **shave peaks** and align production and demand via **grid flexible** and **fast reactive energy storage** based on rotating machines as new long-duration energy storage should be able to fast-respond to grid flexibility needs, being able to **provide significant amount of power (>10 MW)** in daily ramp-up moments.



SCO2OP-TES promotes a new **Thermally Integrated Pumped Thermal Energy Storage** based on **sCO<sub>2</sub> technologies** and integrates **mid-temperature (200 - 400°C) waste heat and thermal RES sources** to increase the overall storage round trip efficiency (RTE). This solution will be **validated up to TRL5** in UNIGE Laboratories hosted in **Tirreno Power Combined Cycle power plant** in Vado Ligure, valorising local waste heat.

### THE PROJECT AIMS TO:

- Make EU fossil-based power plants and industries **more grid flexible**;
- **Valorise waste heat from fossil-based power plants** for energy storage solutions (DOUBLE FLEXIBILITY);
- **Use sCO<sub>2</sub>-based rotating machines** thus enabling **faster grid services**;
- **Unlock the potential of power to heat-to-power solutions** (also via aggregation) to facilitate, at local and Regional/National level, **higher RES penetration**.

## PARTNERS

