



Demonstrate the use of high temperature geothermal reservoirs to provide energy storage for the energy system

High-temperature underground thermal energy storage (HT-UTES) covers the 25-90°C temperature range, and the targets of interest can reach up to 2000 m in depth. The development of UTES is linked to a multidisciplinary understanding of the whole system, including waste-heat source, exploration and subsurface characterisation, production, implementation and distribution systems, as well as the adaptation of the regulatory framework and social acceptance. The main technical challenges are the adaptation of the return temperature from the surface site to the subsurface temperature and to the regulatory frameworks, identification, characterisation and monitoring the reservoirs for UTES, the geo-mechanical effects of the reservoir linked to the seasonal injection/ production operations related to pressure and temperature changes, hydrogeochemical problems associated with scaling and corrosion of the piping system, circular design and optimisation of the distribution network.

The proposal is expected to:

- Develop and demonstrate appropriate control systems and infrastructure to manage geothermal heat and electricity production, heat demand and storage connected to the installation.
- Use the flexibility of geothermal reservoirs as thermal energy storage systems and flexibility in the network coping with daily, weekly and seasonal variations in heat demand.
- Demonstrate the innovative technologies in at least 2 different plants with different characteristics.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

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