

# GEO THERMAL IWG



12 DECEMBER 2023, PTUJ, SLOVENIA

# Mission and membership

**The mission of the SET Plan Geothermal IWG is to coordinate research and innovation efforts and jointly support the transition to a resilient and climate-neutral Europe which utilizes geothermal energy to its full potential.**

## **Membership**

- ▶ France, Finland, Germany, Iceland, Ireland, Italy, Netherlands, Portugal, Spain, Turkey, Sweden, Switzerland, Wallonia + European Commission
- ▶ ETIP Geothermal
- ▶ ETIP Renewable Heating and Cooling
- ▶ European Geothermal Energy Council (EGEC)
- ▶ EERA Joint Programme Geothermal Energy

ETIP: European technology and innovation platform;  
EERA: European Energy Research Alliance

# Heating and cooling

- ▶ 50% of Europe's end use energy is for heating
- ▶ 25% of European cities are located in regions suitable for direct use of geothermal
- ▶ Mainly for space heating, but 10% of geothermal heat for industrial applications
- ▶ Indigenous dispatchable source, main use of geothermal in West/Central Europe
- ▶ Expecting increased momentum





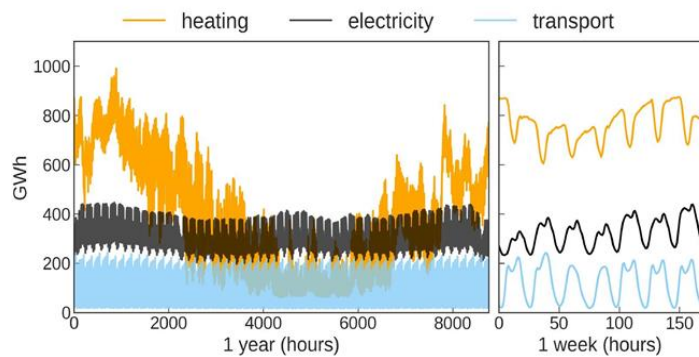
# Power production

- ▶ Cost-effective baseload/dispatchable electricity production
- ▶ Innovation and bold thinking can boost the potential for Europe
  - ▶ Super hot – Super critical
  - ▶ Magma Energy
  - ▶ Offshore Geothermal
  - ▶ New technologies / new materials
- ▶ 10% **baseload** power demand in 2050

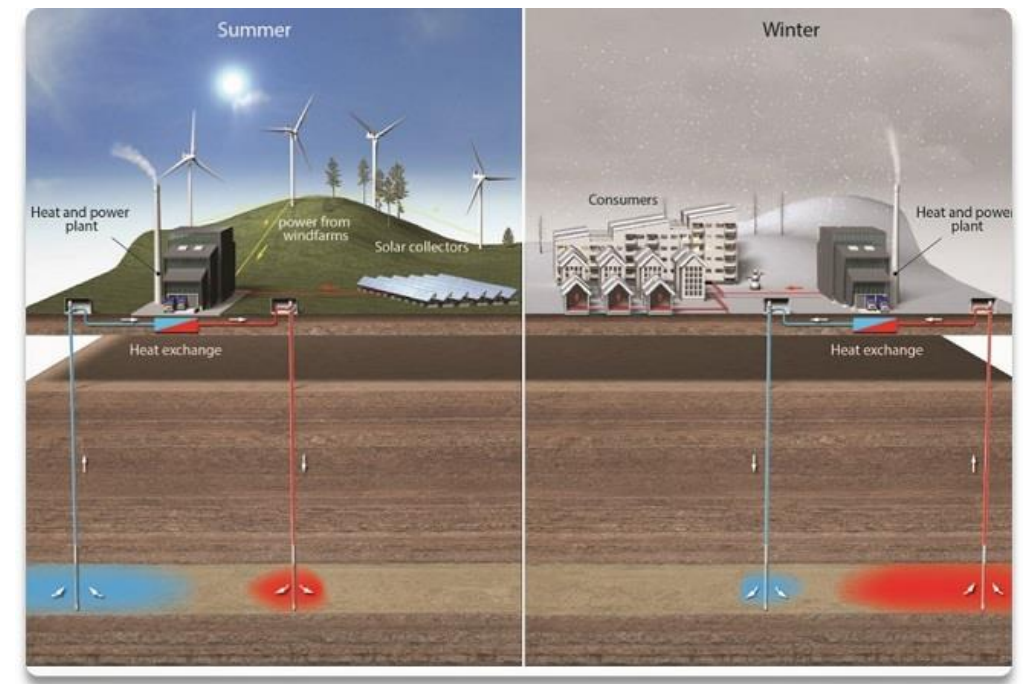
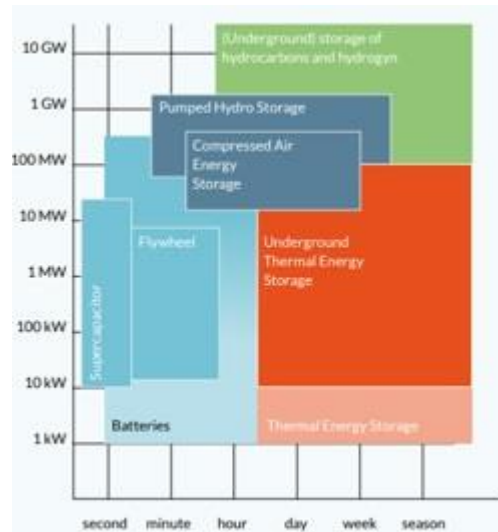


# Storage

- ▶ 50% of the European energy demand is for heating
- ▶ Bridging the winter peak is essential
- ▶ Scale of subsurface needed
- ▶ Storage adding > 10% to the heat supplied from the subsurface

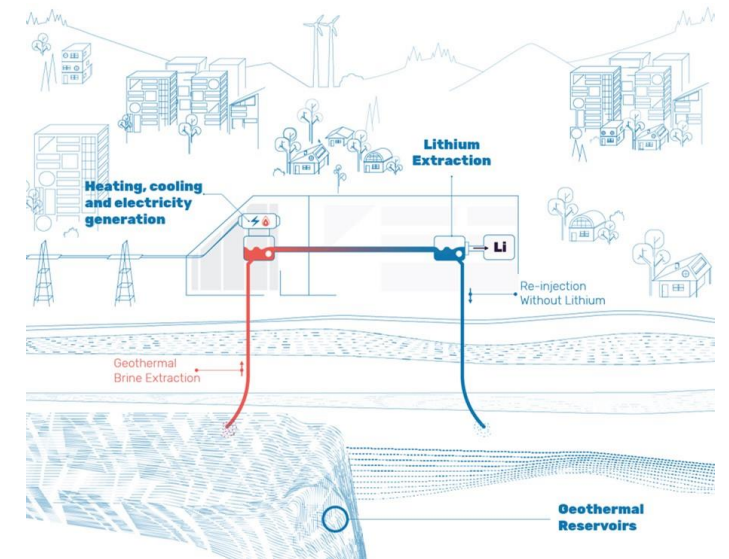


Source: M. Victoria, K. Zhu, et al, Energy Conversion and Management 201 (2019) 111977



Graphics courtesy HEATSTORE [www.heatstore.eu](http://www.heatstore.eu)

# Co-production of minerals and critical raw materials



Resilient mobility.  
First European Li produced from geothermal reservoirs  
2050: ten European regions producing valuable minerals or critical raw materials



# Vision of the SET Plan Geothermal IWG

The IWG envisages a net-zero Europe in 2050, where:

- ▶ Geothermal **heat** supplies more than 25% of Europe's demand for space heating and cooling, and more than 25% in the agricultural sector (greenhouses) and 5% in industrial sectors in the low to medium temperature range.
- ▶ 10% of the **power** production in SET Plan countries is from geothermal power.
- ▶ Underground **thermal energy storage** supplies more than 10% of Europe's demand for space heating, mainly for district heating, thus requiring collective systems.
- ▶ Co-production of **minerals and critical raw materials** (CRM) such as lithium for resilient transportation sector and strategic autonomy is established in at least 10 European regions.

In line with EU goals on resilience, the IWG aims to **increase resilience** of the geothermal energy supply chain, and to have 40% of the supply chain "Made in Europe" by 2030.

## R&I Priorities for Geothermal Energy for Heating & Cooling

### Assessment

Innovative exploration techniques for resource assessment and drilling target definition

Deployment of geothermal resources in a wider range of geological settings

### Development

Advanced drilling/well completion techniques for all depth ranges

Sustainable & efficient production technologies

Technologies/materials to improve efficient & secure operation

Integration of geothermal heat/cold in the energy system

### Operation

Geothermal heat/cold in urban areas

Cascade use of geothermal heat\*

\*Repeated use of heat from the same source at different temperature levels.

**R&I  
Priorities  
for each  
'key  
priority'  
(example)**



# Contact and further information

The new Implementation Working Plan: [LINK](#)

- ▶ Chair Gerdi Breembroek; [Gerdi.Breembroek@rvo.nl](mailto:Gerdi.Breembroek@rvo.nl)
- ▶ Geothermal IWG secretariat: Ester Halldórsdóttir [ester@georg.cluster.is](mailto:ester@georg.cluster.is)
- ▶ [www.geothermal-iwg.eu](http://www.geothermal-iwg.eu); work on the website in progress
  
- ▶ ***Contact us about membership possibilities.***