IEA REWP Workshop

GEOTHERMICA

HEATSTORE
HIGH TEMPERATURE UNDERGROUND THERMAL ENERGY STORAGE

heatstore
High Temperature Underground Thermal Energy Storage

if Bas Godschalk

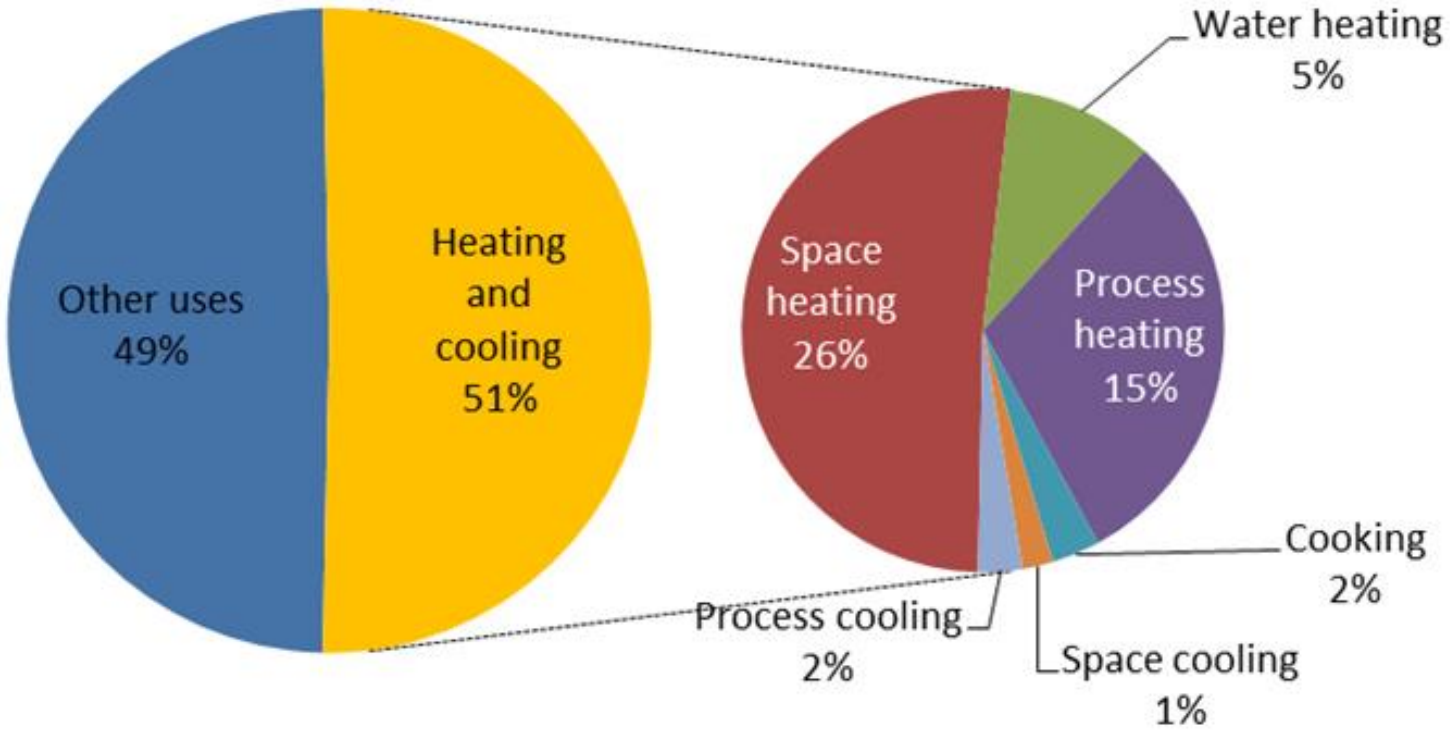
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UNIVERSITÉ DE GENÈVE
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- GEOTHERMICA ERA-NET funded project focused on demonstration of high-temperature underground thermal energy storage.
- Consortium of 23 partners in 9 European countries, coordinated by TNO, the Netherlands.
- Strong involvement of industry, providing close to 50% project funding.
- 6 demonstration sites, 8 case studies. One full scale demo is ECW = Energy Combination Wieringermeer
- 16.3 MEUR total project budget.

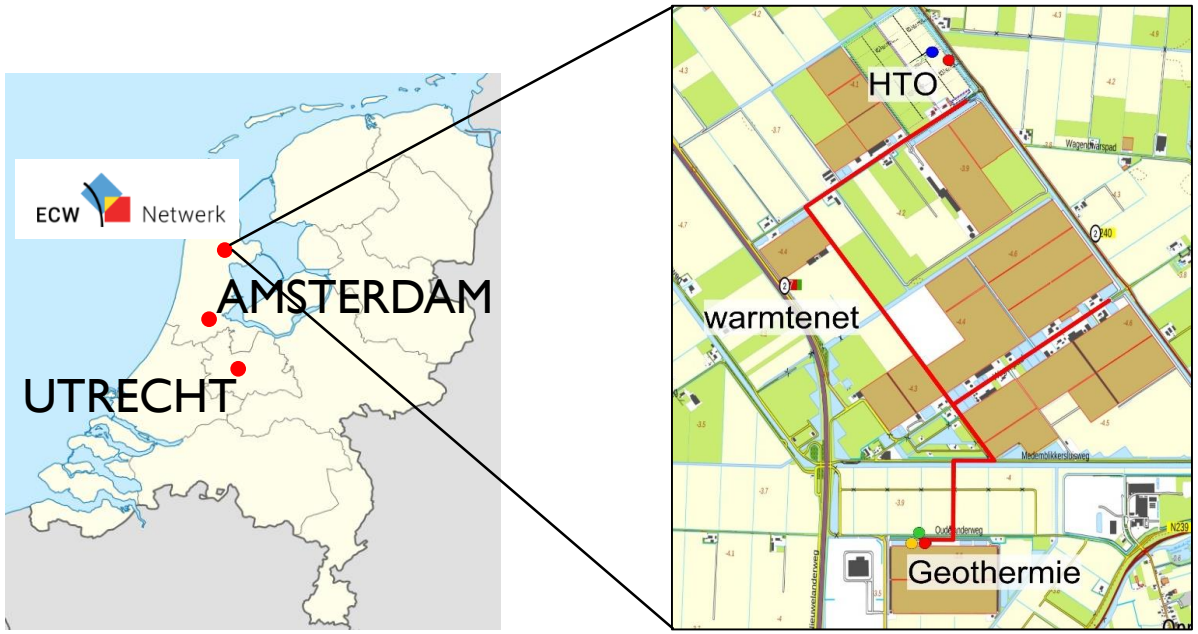
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TRANSITION IN THE HEATING AND COOLING SECTOR

- Heating and cooling is responsible for half of all consumed final energy in Europe.
- The vast majority – 85% - of the demand is fulfilled by fossil fuels, most notably natural gas. 68% of all EU gas imports.
- Dutch challenge to get rid of the gas and increase use of sustainable energy sources.
- Seasonal Underground Thermal Storage is an important technique to archive the sustainable energy goals!



DEMONSTRATION PROJECT ECW





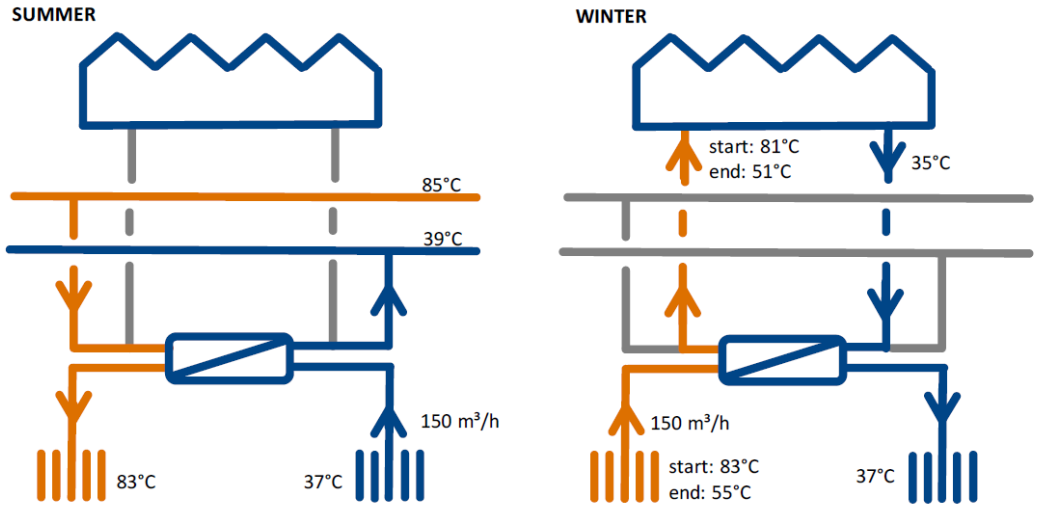


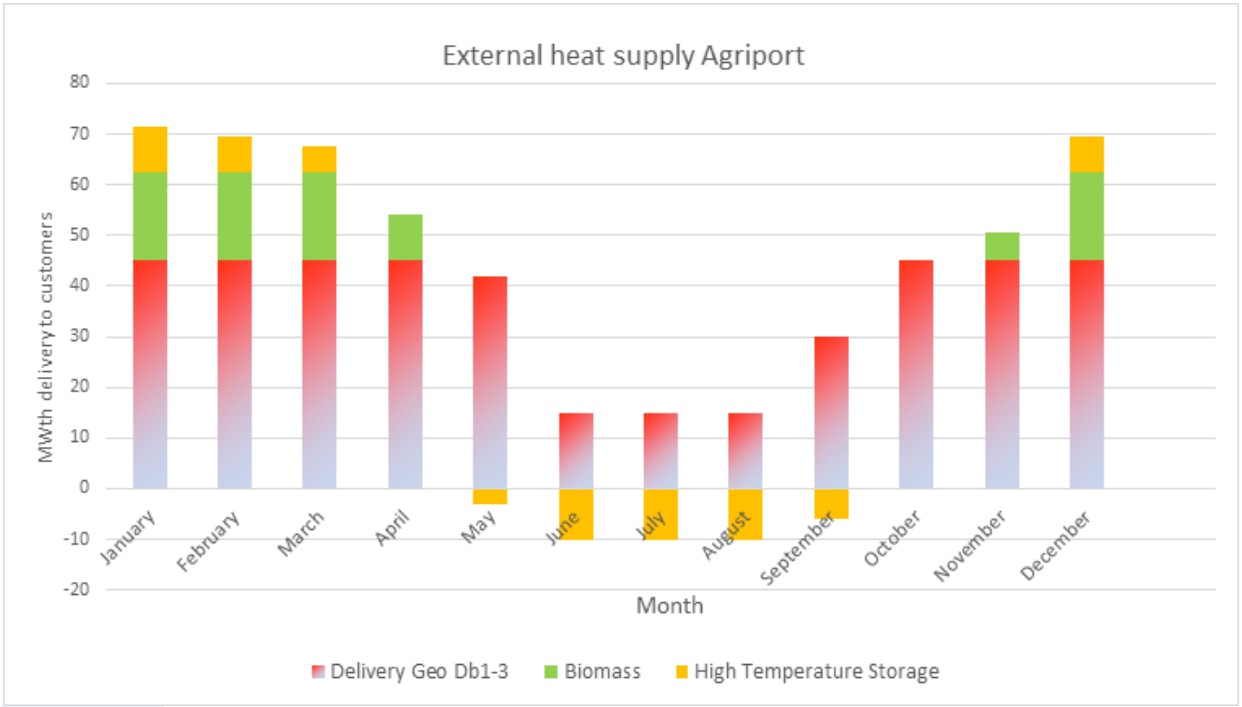




DEMONSTRATION PROJECT ECW

How HT-ATES works





Parameters permit application	10 MW	Winter	Summer
maximum water displacement	[m³/season]	350,000	350,000
Target flow	[m³/hour]	150	150
Average injection T	[°C]	35	85
Energy supply and charge	[MWht/yr]	20,000	27,000

SEASONAL HIGH TEMPERATURE ENERGY STORAGE: IMPORTANT PART OF THE SUSTAINABLE ENERGY TRANSITION

- Application
  - Balance heat supply and heat demand
  - Geothermal heat / industrial heat / solar heat / waste heat sources
  - Greenhouse (own deep geothermal wells combined with high temperature storage)
  - Residential areas (heat stored and balanced – used in winter time)
- Advantages
  - Bridging the cap between supply and demand
  - Makes it possible to supply year round heat and to guarantee the working of the deep geothermal wells
- Future perspective
  - Big opportunities for municipalities and greenhouses to increase the speed of the energy transition

THANK YOU FOR YOUR ATTENTION

www.heatstore.eu

HEATSTORE (170153-4401) is one of nine projects under the GEOTHERMICA – ERA NET Cofund aimed at accelerating the uptake of geothermal energy by 1) advancing and integrating different types of underground thermal energy storage (UTES) in the energy system, 2) providing a means to maximise geothermal heat production and optimise the business case of geothermal heat production doublets, 3) addressing technical, economic, environmental, regulatory and policy aspects that are necessary to support efficient and cost-effective deployment of UTES technologies in Europe. The three-year project will stimulate a fast-track market uptake in Europe, promoting development from demonstration phase to commercial deployment within two to five years, and provide an outlook for utilisation potential towards 2030 and 2050.

The GEOTHERMICA project is supported by the European Union's HORIZON 2020 programme for research, technological development and demonstration under grant agreement No 731117.