Is geothermal energy already competitive?

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Philippe Dumas, EGEC Secretary general
Shallow Geothermal Market Development
Geothermal heat pumps stocks and sales
Average depth of BHE for very large system per period
Average depth very large BHE per country
Most Member States are lagging behind on their 2020 objectives for the deployment of geothermal heat pump systems.

The examples of Sweden, which exceeds its objective by far shows that a mainstreaming of geothermal heat pump is possible in the market.

Stop & go policies have had a very negative impact in many markets, notably Germany and France.
Competitiveness
The competitiveness in the heat sector—Large buildings

LCoE of heating in large buildings, comparison with gaz boilers (France, 2019)

Source: ADEME
The competitiveness in the heat sector—Individual buildings

LCoE comparison for individual heat systems (France, 2019)

Source: ADEME
The operating costs in the heat sector—Individual buildings

Heat operating costs for individual buildings

- **Electricity**: 15 €ct / KWh
- **Oil & Propane**: 14 €ct / KWh
- **Heating fuel**: 9.3 €ct / KWh
- **Fossil gas**: 7.7 €ct / KWh
- **Wood pellets**: 6 €ct / KWh
- **Wood stove**: 4 €ct / KWh
- **And Geothermal Heat Pumps**: 6 to 7 €ct / KWh

Source: Pegase, French Energy Ministry
Smart Sector Integration with geothermal
Visualising smart sectoral integration for geothermal energy
Electricity demand in Europe

The demand is stagnating. An issue for the power decarbonization and the electricity supply to HP

Source: Eurostat (online data code: reg_ind_peh)
Decarbonisation of the power sector: where are we?

Gross electricity production by fuel, EU-28, 2000-2017

Source: Eurostat (online data code: nrg_bai_eah)
How to decarbonize?

“Obviously, system integration will not be a one-size-fits-all process: ...EU Member States have different starting points”.*

e.g. The complexity of electrification in the heating & cooling sector

Operating a geothermal heat pump system: for a capacity of 50 kWth in a new building, supplying heating at $T = 35^\circ C$ during 2200 h per year and cooling at $T = 7^\circ C$ during 1200 h, in western Europe climate conditions, use a SPFheating of 4

$= 44.6 \text{ MWh/year electric}$

According to efficiency (never accounted in modelling), increase of the electricity demand is between 50% to 100% ! (1500 to 2500 TWh)

*EU Strategy for Energy System Integration (2020)
Conclusions
2020

The #GeothermalDecade begins...