Financing shallow geothermal projects

REGEOCITIES
Factsheets on geothermal heat pumps

The operation and maintenance costs of shallow geothermal projects are lower than those of conventional systems, however the initial installation cost is often higher. Overcoming this unusual expenditure curve, where most costs are concentrated at the beginning of a project, has been a barrier to shallow geothermal development. There are, however, effective ways to overcome this issue.

Costs

The installation cost of shallow geothermal systems varies slightly depending on site conditions, whilst operational costs are affected by electricty and fuel prices, as well as the efficiency of the system.

Investment cost

Drilling for a shallow geothermal system is possible virtually anywhere, without much difference in costs from one location to another.

The investment costs for a geothermal system, however, is influenced by the **geological underground**, such as the availability of groundwater, which determines the choice among open or closed systems.
Thermal properties of the underground also control the necessary lenght of the Borehole Heat Exchanger (BHE).
Case studies demonstrates that a gas boiler becomes more expensive than the geothermal heat pump after less than 3 years of operation: this indicates that savings of a geothermal system can quickly compensate the costs of installation.

Operational cost

The operational cost is mainly influenced by electricity and fuel prices, and by the efficiency of the GSHP system: the Seasonal Performance Factor (SPF).

Systems used for heating and cooling can usually be more efficient than heating or cooling only systems, as the underground installation is used all year round. The price of heat and cold from a GSHP meanwhile falls into the same range than conventional alternatives, including the amortisation of investment cost.
For large commercial installations with both heating and cooling needs, geothermal heat pumps or geothermal energy storage can result in substantial reductions in operational cost, with favourably short payback periods.

Why choose a shallow geothermal technology:

- ✓ Suited for European-wide geology, hydrogeology, and climate;
- ✓ Suitable for a variety of small as well as large applications;
- ✓ High energy savings potential for both heating and cooling;
- ✓ Energy capture and storage capability, around the clock operability;
- ✓ Integration through (thermal) storage potential as controllable load into smart electrical grids on small and large scale;
- ✓ Integration and amplification options with other sustainable technologies (hybrid systems);
- ✓ Current state of the technology already allows practical implementation on large scale (proven technology with good track record);
- ✓ Potential of integrating shallow geothermal technology in local existing businesses, especially SME;
- ✓ Zero pollution systems.

SUPPORT SCHEMES

Support schemes can play an important role in the promotion of geothermal, by removing barriers and raising awareness.

Financial incentives schemes for geothermal heat pumps are not available in all European countries, although **competition in the heating sector** can be considered unfair with fossil fuels still receiving subsidies. As geothermal heat pumps can be considered a mature and competitive technology, a level playing field with fossil fuels in the heating sector will allow the phasing out of subsidies for shallow geothermal.

Financial support is still required in emerging markets where they should be tailored for both individual and collective installations. Possible schemes are **grants, tax reduction, loans with zero interest rates**.

MAP: EXAMPLES OF SUPPORT SCHEMES