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Economic Cooling and Heating
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GEOTeCH
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- Drilling equipment
- Ground Heat Exchanger
- Heat Pump prototypes
- Plug and play energy management systems

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**Operational Complexity**

Operating geothermal/heating and cooling systems to achieve peak energy efficiency requires successful control system integration.

**Design Complexity**

Innovation in the design process and better management of design risks are required.

**Construction Management Complexity**

Vertical borehole heat exchangers are the most appropriate form of ground heat exchanger in approximately 80% of applications. Drilling technology, installation capacity, and expertise have been transferred from other industries, due to the market growth since the 1990s in geothermal heating and cooling.

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**Borehole drilling technology**

Dripping concept based on dry auger methods will enable:
- compact equipment capable of working in restricted areas
- very low noise and pollutant emissions
- high stability borehole capable of drilling near foundations and structures
- low (clean) water usage

**Vertical borehole heat exchangers**

The innovative spiral co-axial vertical borehole heat exchanger technology will enable:
- improved thermal performance that allow designers to be delivered using shorter boreholes
- improved hydraulic performance and lower pump energy costs, emissions
- improved short-timescale response and thermal storage capacity
- complete integration with the innovative dry auger-based drilling technology

**Foundation heat exchangers**

Systematic development of foundation heat exchanger design, fabrication and integration methods result in:
- more accurate predictions of thermal behaviour
- design risk reduction and wider range of configurations
- higher levels of optimization with regard to structural stability/integrity and thermal performance
- economic optimization of fabrication and installation methods

### Building energy management and control systems

- Whole system geothermal heating and cooling solutions management
- foundation heat exchanger technology integration with other heating/cooling sources
- interactions between the building, the heat pumps, the ground heat exchangers and control systems
- energy costs reduction maintaining the comfort conditions within given thresholds

### Demo Site

Validate the overall performance on different demonstration sites:
- Leicester small-scale house
- Barcelona large-scale tertiary building
- Amsterdam small-scale office building
- Padova small-scale office building