Geothermal energy is a natural, climate friendly and renewable energy source. Ramboll offers a wide range of consulting services in this field.

Geothermal energy is produced from geothermal reservoirs in the underground. In some geological formations, the right geological conditions allow for steam and/or geothermal brine to be produced, which can be used for heat and/or power production. In other, tighter formations, water is injected from surface in order to produce steam for power production (EGS).

Opportunities for exploiting geothermal energy depend on the local geological structures and the temperature of the underground reservoirs. Once built and commissioned, a geothermal energy plant is able to provide base load with quite high efficiency and low operational costs, independently of weather and climate.

Ramboll offers a wide range of services on geothermal district heating plants from planning and project development to design, implementation and follow-up on operation and maintenance. We provide support and advice as the project manager and owner’s engineer throughout the project. Our clients are typically district heating utilities.

Feasibility of geothermal energy
Geothermal energy may be an obvious solution in some countries, e.g. in countries with hydrothermal features like Iceland where the geothermal energy is used for power production and for heating of almost all buildings.

In other countries, the geothermal resources are not as abundant as the subsurface temperature increases less rapidly with depth. Furthermore, there are often no visible signs on the surface of the geothermal energy resources below. In this case, geothermal energy can often only be explored and exploited at large scale and with considerable investments.

Project planning
Ramboll’s services in the planning stage include the preparation of master plans for project development and feasibility studies; seismic, geological and geophysical studies and investigations including tendering and procurement of such; and environmental impact assessments and authority liaison.

Important issues to consider
Ramboll recommends that the following be considered when exploring this climate friendly solution:

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It is very expensive to drill exploration and production wells and to establish the necessary surface facilities. Therefore the plant should be of a certain scale and operate with as many full load hours as possible, e.g. as base load in a large district heating system.

There is always a risk that the exploration well(s) will demonstrate that the geothermal reservoir has too low permeability and/or temperature. Therefore detailed seismic or other geophysical/geological investigations are important before a decision to invest is made.

Low enthalpy geothermal resources can be utilized more efficiently for low temperature heating, e.g. in buildings using floor heating, and through heat pumps.

**Project implementation**

In addition to having the skills required to successfully plan a geothermal project, Ramboll can assist the client in implementing the project. Our services in this phase include:

- Conceptual and detailed design of the surface plant, buildings and piping
- Tendering and procurement in relation to the surface plant
- HQSE (Health, Quality, Safety, Environmental) management
- Well site layout/infrastructure and permissions

**Why choose Ramboll for your geothermal energy project?**

As a multi-disciplinary company, Ramboll can cover many services required to develop a geothermal district heating project. We have comprehensive seismic and geophysical expertise, enabling us to assure the best possible foundation for making precise assessments of the geothermal potential.

**A-Z PROJECT SUPPORT**

Ramboll offers a wide range of services on geothermal energy district heating plants from planning and project development to design, implementation and follow-up on operation and maintenance.