Consultancy Services within District Energy

District energy systems have a number of overall benefits, including improved energy efficiency, enhanced environmental protection, ease of operation and maintenance, reliability, comfort along with a superior convenience for customers. The fuel can be conventional fuels, including coal, oil and natural gas, or renewables including various forms of biomass. A district energy system can also use geothermal heat, solar heat and combine the production of heat and power (CHP).

Ramboll offers a full range of services on district energy projects from feasibility studies and planning to follow-up on operation and maintenance. Our specialists in district energy, waste-to-energy, CHP, renewable energy and building installations work closely together to provide optimal use of heating and cooling sources.

Scandinavian roots

Our roots are in Scandinavia where heat recovery is a proven and well-established part of the energy sector. In Denmark, over 60 per cent of the heat market is covered by district energy, and Ramboll has been the leading consulting engineer on the projects leading to where Denmark is today.

As cities aim to become carbon neutral, district heating and cooling systems become more important than ever. Our international market for these services is growing, not least due to a growing concern with climate change.

Full-range services

Our project references cover all aspects of district energy schemes with sizes ranging from the heat supply of smaller communities, new urban developments, villages to city-wide CHP and large scale district energy systems.

As engineering consultants we understand the plethora of issues associated with district energy ranging from policy, planning, technical and economic feasibility, design, construction and commissioning to operation, maintenance, network extension and decarbonisation.

Modelling capabilities

We can also bring added value in terms of our highly sophisticated modelling capabilities:

- CHP and Low/Zero Carbon Technologies Energy Model
- System Rornet Heat Network Hydraulic Analysis Tool
- Lifecycle Costing Model

Our specialist software tool System Rornet, which has been developed in-house over the last 30 years, allows us to conduct highly detailed hydraulic analysis of heat networks. At planning and design stages, we use the tool to size the network for costing and space planning purposes. The tool is also used for optimization of existing networks and their operation and maintenance.

At design stage analysis of networks include sizing pressure losses, temperature losses, optimum seasonal pressure and temperature operating characteristics, sizing of distribution pumps, pressurisation units and thermal stores, transient and static pressure design and resilience options.

What is district energy?

District energy is a generic term for the central production and distribution of thermal energy for heating and/or cooling homes and buildings and to industry. District energy comprises three main elements:

- A central energy plant that produces thermal energy. The central plant may also incorporate combined heat and power (CHP) plants.
- A network of pre-insulated pipes to distribute the thermal energy from the central plant to buildings.
- The interface with services at the building including space heating, domestic hot water services, cooling and process heat.

Ramboll’s services

On district energy projects, Ramboll typically acts as project manager, main engineering consultant, project designer, owner’s engineer, site supervisor and health & safety coordinator. We provide support and advice to public and private clients throughout the project on relevant technical, environmental and financial matters. Our services include:

- In-depth project understanding from both the district heating network and the heat production perspective.
- Extensive experience of delivering heat links from a variation of heat production technology plants.
- Extensive experience in planning, design, delivery and O&M of city-wide district energy schemes.
- Excellent understanding of the requirements of the district energy contracting market.
- A team with the breadth and depth of skills to ensure excellent delivery whilst offering great value.
- Broad experience of operating as an integrated team and as part of a client team.

Selected project references

- CTR, Copenhagen, Denmark: Planning, design and consultancy services during construction and commissioning of 1650 MWth heat transmission system, transporting heat from large CHP plants and waste-to-energy plants to the local distribution networks.
- ADAs Calore & Servizi, Srl, Italy: Strategic plan for a city-wide heat transmission network, supplying heat to the local district heating networks from large CHP plants.
- Veolia Environmental Services, Sheffield, UK: Specialist services to the UK’s largest district heating system (60 MWth).
- Korean District Heating Corporation, South Korea: Technical district heating studies, including review of existing systems and conceptual design of transmission line.
- Nordforbrending, Horsholm, Denmark: Planning, design and construction management for district heating network supplied from 110 MWth waste-to-energy facility.

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District energy in Ramboll

Number of specialists: 90
Annual turnover: €7.5 Million
Years of experience: 45

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Ramboll's geographical district energy project experience

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