CONSULTANCY SERVICES WITHIN DISTRICT COOLING

Urbanisation, globalisation and rising cooling demands have led to an increased interest in the environmental and economic benefits of district cooling.

The greatest benefit of district cooling is not only its high energy efficiency, but also the scale of cooling is not only its high energy efficiency, but also the scale of cooling.

For comfort and process cooling, solutions ranging from snow-based cooling to solar heat-based cooling makes it more cost effective than local cooling facility and a district cooling system, respectively.

Hand in hand with district cooling, and we have a long history in district cooling networks based on different areas.

Choosing the most optimal cooling solution depends greatly on the surrounding environment. We conduct planning for short- and long-term opportunities, while paying attention to alternative scenarios.

Our approach
Ramboll has a very systematic approach to the various cooling concepts. We have extensive knowledge of the processes and technologies behind district cooling, and we have a long record of estimating profitability and the technical feasibility of a district cooling network.

Typical role
Ramboll will typically be chosen as a consultant to identify district cooling opportunities, provide feasibility studies, conceptual and detailed design and network layout, outline thermal stores, assist with procurement and supervision and follow up with performance tests and optimisation once the systems are in operation.

Liaison with key stakeholders
It is imperative for Ramboll to ensure early involvement of key stakeholders such as our clients’ customers, municipal authorities and environmental agencies along with plot and land owners.

Road map
As a major consultant, Ramboll has access to all the software required to plan, design and optimise district cooling systems, which enables us to locate clusters of potential customers and make it easier to plan the ideal development in stages for a district cooling network.

For this purpose, Ramboll has developed a unique tool, DCmapper, which is able to identify areas with district cooling potential, by gathering information regarding the cooling demand and geographical location of buildings. These pieces of information are then measured against the difference between the preliminary expenses of a local cooling facility and a district cooling system, respectively.

Hydraulic analysis
Hydraulic/thermal analysis of district cooling networks based on computer models is one of Ramboll’s core competencies. This includes steady-state and dynamic modeling, with focus on surge analysis.

The hydraulic analysis is also a very important part of feasibility studies for investigating the potential for district cooling in different areas.

What is district cooling?
District cooling (DC) distributes chilled water through an underground network, with the purpose of providing efficient, reliable and environmentally safe cooling for buildings and industry, using one or more of the following technologies:

- Conventional compressor cooling
- Absorption cooling, transforming waste heat into cooling
- Free cooling, using cool ambient air, ocean, lake or river as a source of cooling

Furthermore, district cooling often makes use of different kinds of cooling storage systems, in order to improve economy and energy efficiency.

Ramboll’s services
Ramboll typically provides support and advice as advisers for the developer, project managers, project supervisors, construction managers, technical supervisors or detailed design engineers. Our clients include supply companies, investment companies, pension funds, city developers, private and public buildings and industrial facilities, and our services include:

- Business plan
- Pre-feasibility study
- Conceptual design
- Basic design
- Sizing of thermal storage
- Conceptual design of energy centre
- Cooling of thermal storage facility
- Basic design
- Outline of district cooling networks
- Conceptual design of energy centre
- Cooling of thermal storage facility
- Detailed design
- Design of pipe networks
- Design of installations and constructions
- Procurement
- Outline design
- Feasibility studies
- Conceptual design
- Basic design
- Sizing of thermal storage

Selected project references
- Chicago Lakeside Development, LCC Chicago, USA: District cooling pre-feasibility study, 2011-2013
- UMM AL QURA Development and construction, Kingdom of Saudi Arabia: District cooling design for King Abdul Aziz Road (KAAR) project in Makkah, 2015-2016
- Municipality of Høje-Taastrup, Denmark: Design of a district cooling system for commercial buildings and supply of surplus heat to the district heating system, 2015-2016
- Danish Energy Agency, Denmark: Mapping of Denmark’s cooling potential, 2011-2015
- Freiburg-Kreis Utility, Denmark: Construction and commissioning of a district cooling system based on groundwater cooling and compressor cooling, 2012-2014

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Why choose Ramboll for your district cooling project?
- We provide 360 degree consultancy in all fields related to district cooling.
- We possess a leading position as market makers in district heating consulting, and will consequently be able to locate synergies between the supply forms.
- We have developed a unique mapping tool, DCmapper, which easily recognises and identifies potential DC customers.
- We are experienced in the art of working as an integrated team, as well as part of a client team.

Ramboll’s geographical district cooling project experience