Environmentally friendly district cooling for the university hospital in Linköping

A facility for district cooling was erected in Linköping in 2001–2004. The facility runs on district heating and waste heat from a waste incinerator and largely replaces locally produced electrically powered production of cooling.

Tekniska Verken in Linköping built a facility for district cooling in Linköping with support from the Local Investment Programme (LIP). The facility consists of two machines. One runs on district heating and the other through flue-gas cooling at an incinerator. The facility was the first stage in which has subsequently become an extensive expansion of district cooling in the town.

POSITIVE ENVIRONMENTAL AND ECONOMIC IMPACTS

- District heating-powered production of cooling replaces 2 500 MWh electricity/year.
- Energy from flue gases replaces 10 000 MWh electricity/year.
- Carbon dioxide emissions decreased by 12 500 tonnes/year.
- Emissions of nitrogen oxides decreased by 15.5 tonnes/year and those of sulphur dioxide by 20.7 tonnes/year.
- The use of freon-based refrigerants decreased by 1 900 kg.
- District cooling becomes cheaper and makes it significantly easier for customers.
IMPLEMENTATION
The purpose of the measure was to provide the University Hospital and surrounding properties with district heating-based cooling, and to expand the network for district cooling. The district heating comes as waste heat from a waste incinerator.

After it started, the project was modified by replacing one of the two planned absorption cooling machines with an absorption heating pump at the waste incinerator.

The absorption heating pump has a refrigerant that is not harmful to the environment. The absorption heating pump makes the facility less sensitive to high return temperatures. An absorption cooling machines requires there to be good access to heat, for example from district heating or waste heat from other production. As a result of the change, the project has switched three times as much energy as originally estimated.

POTENTIAL AND FUTURE BENEFIT
Like district heating systems, district cooling can reduce the need for energy and, as in this case, utilise waste heat from other activities. Increased urbanisation globally, in particular in hotter countries, is improving the prospects of expanding district cooling.

WHY BEST PRACTICE
District cooling is in a stage of development, which is reflected by the changes during the project. The project was therefore of a pilot nature. The measure enhanced Tekniska Verken’s knowhow on district heating-based cooling and initiated the company’s expansion of district cooling in Linköping. The absorption heating pump has attracted attention in the media. These heat-driven units produce cooling from heat in an environmentally friendly way and have a refrigerant that is not harmful to the environment. Tekniska Verken has also received enquiries about providing consultancy services to other energy companies.

FOR FURTHER INFORMATION
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Contractors/providers:
Carrier AB supplied the cooling machines.
Otherwise standard contractors.

The project on the Internet:
www.hultsfred.se

Further information on Best Practice
www.swedishepa.se/bestpractice
www.naturvardsverket.se/mir

FACTS
LIP Linköping 2001
Action 8 b
Environmental investment: SEK 30m
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