

Providing environmentally friendly district cooling

The Biomass fired district heating is the greenest and the most efficient way of providing heat to individual households, and when equipped with a Combined Heat and Power (CHP) unit, it provides green electricity as well.

Issue

In 1997 VEAB, a municipality owned company built a 100 MW CHP unit, run solely on biomass. For Växjö it meant a switch from a partly oil based District Heating (DH) system to a more sustainable one, and a step forward to fulfilling its ambition of becoming a fossil free region. Moreover, the investment was complimented by the process of expanding the DH network and so in 2010 nearly all dwellings were connected to the grid.

However, the process did not stop there. A problem arose during the summer periods when the heat demand is lowest and the electricity production is limited. Municipality of Växjö managed to find a solution to that problem by introducing a district infrastructure, which uses the excess heat for cooling.

Application

In 2007 VEAB installed a pilot 300 kW absorption cooling unit, which costs reached 1000 EUR/kWh of installed power. The equipment produces cool water using heat, and utilizes it for cooling of VEAB's office premises. The pilot cooling installation is just a beginning step in creating a full scale district cooling system in Växjö, which, on one hand, will allow for greater production of electricity in the summer, and on the other will provide users with an environmentally friendly cooling system. In May 2011 two absorption cooling units with capacity of 2 MW each were started. This includes a new pipeline system for the cooling water distribution and a unit for free cooling using low outdoor temperature. The local hospital and the university are connected and work is in progress to connect costumers in the city center.

Växjö, Sweden



Environmental type

Urban

Funding Sources

Company own resources

Starting Year

2007

Contact

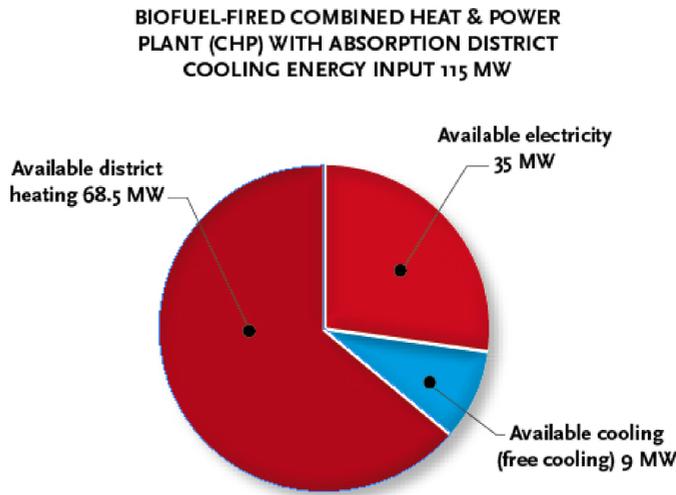
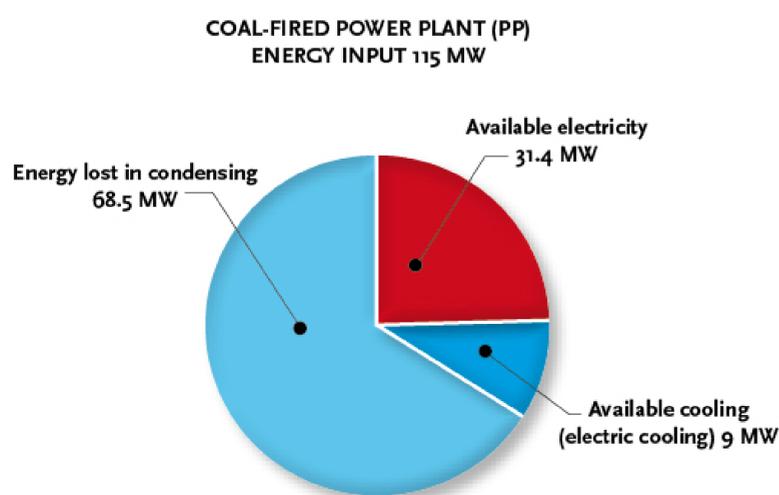
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Links

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Keywords

- District heating
- Cooling
- Renewable energy sources
- Biomass
- Woodchips
- Accumulator



Innovation

Apart from the district cooling installation the plant comprises a very effective accumulator, which is a 60m high tank that acts both as a pressure tower, expansions vessel and as a support when the heat demand exceeds the production. It provides the additional hot water capacity that is "charged" during lower demand and distributed in higher demand periods. The investment return periods is estimated for approx. 5 years.

Transferability

District cooling poses a great opportunity in conjunction with biomass fired DH systems, however it requires a holistic approach including the expansion of a DH network and creation of a new district cooling network. Transfer of the practice is particularly advisable in towns/municipalities with a developing DH infrastructure where cooling pipe system can be simultaneously built.

