

Exploiting excess heat from a converter station in Endrup, Denmark

This case study is part of a project catalogue produced by [ReUseHeat](#) to provide inspiration on how to utilize excess heat from urban sources for heating and cooling purposes. The catalogue contains 25 existing or planned projects out of which 12 cases are Danish and 13 cases are from other European countries.^[2]

Facts about this case

Heat source: Excess heat from a converter station (35 °C).

Heat pump COP: Expected above 6.0

Temperatures: Surplus temperature from the converter station is expected to be 35 °C.

Period: Expected to be finished in 2019

District heating network: 2500 consumers

Link to web page: <https://energinet.dk/>
<http://www.brammingfjernvarme.dk/>

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Source: Energinet^[1]

Description

The Danish and Dutch TSO's Energinet and TenneT are currently establishing an international connection between Denmark and the Netherlands called COBRA cable. The HVDC converter station in Endrup near Bramming is expected to deliver excess heat to the local district heating network.

In Denmark multiple HVDC converter stations exist, which connect the Danish electricity grid with surrounding countries and enable international electricity transmission. Near Endrup in Jutland such a converter station is built, where DC is transported to Eemshaven in the Netherlands through the COBRA cable. The cable has a voltage of 320 kV with a transmission capacity of 700MW and is expected finished and ready for usage in 2019. The converter station will generate surplus heat, which, without energy recovery is cooled away by fans. The surplus temperature will reach approximately 35 degrees Celsius and the converter station will have a full load capacity of 3150 kW. Due to the origin of this excess heat, there is no tax involved, which benefits the project.

The accessible end-user of excess heat from the converter station is the district heating company Bramming Fjernvarme, located 7km from Endrup. Bramming Fjernvarme currently has a decentralized natural gas-powered CHP unit and a district heating network with approximately 2500 households and buildings connected. Multiple options for harvesting the excess heating potential from the converter station exist, but so far, no real project proposal have been made. An option is to transport low-temperature heat from the converter station to Bramming before heat pumps increase the temperature to district heating network levels around 68 degrees Celsius. A second option is to increase the temperature directly at the converter station and then transport the heat to Bramming. Which option is chosen largely depends on the actual costs and transmission losses. A high-level COP is obtainable due to a relatively high exit-temperature from the converter station. Estimates suggest a COP-factor above 6.0. The costs of establishing the project is currently unknown, but heating production costs will probably be lowered compared to the existing natural gas-fired units.^[2]

References

1. [Energinet](#)
2. Handbook - 25 cases of urban waste heat recovery