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SCOTLAND

2016

## International Case Studies for Scotland's Climate Plan

# Large Scale District Heating, Drammen, Norway

### Facts & Figures

At 90°C the hot water produced by the pump can be used in older buildings. This feature makes the pump the only large scale one of its kind in the world

The water temperature in the fjord from which source seawater is taken is 8°C

85% of the area's heating needs are met by the large-scale heat pump

The average annual energy supply is 67 GWh

The heat pump is significantly cheaper than a gas heating system, saving the city around €2.7m a year.

1.5million tonnes of CO2 have already been saved by switching from gas to the heat pump

### Overview

The city of Drammen lies 40 miles west of Oslo in Norway and is home to 63,000 people. Winter temperatures can dip as low as -20°C in the city, making heating vital for homes, businesses and municipal buildings. The Glasgow-based company Star Renewables tendered for and won the bid to build a 13MW heat pump to meet the city's heating needs – pictured above. By the start of 2011, their heat pump was supplying 85% of the area's heating needs by turning the 8°C water of the fjords into hot water at temperatures up to 90°C. The system is owned and operated by a Drammen Fjernvarme - a company which is 50% owned by the municipal energy company and 50% by a commercial energy company. Every new building bigger than 1000 square meters is required by law to have a water-based heating system and to be connected to the district heating system.

### Aims

The heat pump aims to meet the heating needs of the local population in a sustainable way. It provides heat at a lower cost than fossil fuels and means that the city has cleaner air and lower emissions.

### How it works

The heat pump works like a refrigerator in reverse, taking the near-freezing waters of the fjord and using ammonia - a non GHG refrigerant - to produce water at 90°C. This high temperature means that the water can be used to heat older buildings without the need to retrofit them. The city has retrospectively established a heat concession area which covers most of the city centre. Every new building or refurbishment in the concession area must connect to the network. In addition, the heat cannot be sold at a higher price than alternative fuels ensuring consumers get a good deal and proactively opt for district heating.

## Benefits

The Drammen heat pump delivers significant emissions savings and provides sustainable heat at a much lower price than fossil fuels. The pump meets 85% of the area's heating needs and has already paid for itself in the savings made.

### Economic

The city and its residents have saved around €2,690,000 a year by switching from fossil fuels to the sustainable heat pump. One unit of heat costs 1p compared with 5p for gas or 8p for oil.

### Environmental

The introduction of the heat pump has resulted in CO2 savings of 1.5 mtCO2. In addition, the ammonia used in the heat pump is not an ozone-depleting refrigerant so causes significantly less damage to the environment.

### Social

The cost of supplying heat to residents in Drammen through the heat pump is significantly lower than supplying heat through gas or oil.

*"The projects we have done really demonstrate that heat pumps have now become environmentally and economically viable. The technological advancements of the Neatpump in Drammen have revolutionised the way we should heat factories, hospitals, universities and houses. Large scale heat pumps offer a real solution to fuel poverty and fight climate change. There is no place better for heatpumps than the UK as we have an abundance of water resources that can be harnessed all year round."*

Dave Pearson, Director, Star Renewable Energy



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## Further information

<http://www.ehpa.org/about/news/article/the-worlds-largest-natural-district-heat-pump/>  
<http://www.prweb.com/releases/2014/05/prweb11861133.htm>  
<http://www.bbc.co.uk/news/business-31506073>

