

Bioheat produces steam for Nynas refinery

In a unique project, Fortum Nynas AB's oil refinery in Nynäshamn is supplying process steam from a biofuel-powered combined heat and power plant. In return, Fortum gains access to the surplus heat from the refinery to heat the Municipality of Nynäshamn. Among other things, the project has resulted in a decrease of nearly 100,000 tonnes per year in carbon dioxide emissions in the region.

The refinery in Nynäshamn became the first biofuel-powered refinery in the world and is a successful example of energy switch. The “EkoSamVärme Nynäshamn” project was partly financed by money from the local investment programme (LIP). The project is based on utilising the extensive waste heat from Nynas AB's oil refinery in Nynäshamn for the district heating network. At the same time, Fortum expanded the district heating system in Nynäshamn. The energy system was inaugurated in 2004.

POSITIVE ENVIRONMENTAL AND ECONOMIC IMPACTS

The project has been financially beneficial both for Nynas and property owners in Nynäshamn and for Fortum. Cost-effective energy improves the prospects of the municipality attracting new industry.

- The plant replaces 230 GWh/year of heat produced by oil and electricity with biofuel and waste heat.
- 45 GWh/year of waste heat is utilised through the project for heating.
- Carbon dioxide emissions have decreased by 98,500 tonnes/year.
- Emissions of nitrogen oxides have decreased by 129 tonnes/year.
- Emissions of sulphur dioxide have decreased by 91 tonnes/year.
- Particulate emissions have decreased by 20 tonnes/year.

These are estimated values. Experience shows that the actual emissions are lower.

Photographs: Nynäs AB



IMPLEMENTATION

The core of the project was that Fortum built a biofuel-fired combined heat and power plant. The plant delivers the steam the refinery in Nynäshamn needs for its processes. In return, Fortum is allowed to use surplus heat from the refinery in the district heating network.

The improvements Fortum has made include a plant for flue gas condensation that further improves the plant's efficiency. The combined heat and power plant also supplies heat directly to apartments, business premises and industrial sites. Fortum is building a new district heating network in the municipality as part of the project.

Municipalities, energy players, industrial representatives and other stakeholders have come on study visits. The level of interest has been so great that Fortum has been forced to limit the number of study visits.

POTENTIAL AND FUTURE BENEFIT

District heating systems reduce air pollution locally, make use of waste heat from other activities possible and enable combined heat and power to be produced. If biofuels or waste heat are used in the systems, major climate benefits are achieved. As urbanisation advances globally, the prospects for expansion of district heating are improving.

WHY BEST PRACTICE

The refinery in Nynäshamn became the world's first biofuel-powered refinery. The reduction in carbon dioxide emissions is equivalent to around 5 percent of Sweden's total target according to the commitment made under the Kyoto Protocol.

The district heating system is a good example of what is known as a low-temperature system, a system that utilises waste heat in the best way possible.

The project is a good example of collaboration between energy supplier, society and industry that has benefited the environment while maintaining or improving energy economics, availability and safety.

Fortum is using the experience from this project both in other Swedish municipalities and abroad.

FOR FURTHER INFORMATION

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Contractors/providers:

Kvaerner, which has now been taken over by Metso, supplied the boiler and much of the process equipment. A very large number of contractors were also involved.

For further information on Best Practice:
www.swedishepa.se/bestpractice
www.naturvardsverket.se/mir

FACTS

LIP Nynäshamn 2000
Action 01
Environmental investment: SEK 300m
Grant: SEK 80.8m

