

| <b>Setting</b>      |                      |
|---------------------|----------------------|
| Country             | Sweden               |
| Location            | Göteborg and Lysekil |
| Project start date  | End of 1970s         |
| Project end date    | ongoing              |
| Technology keywords | District heating     |
| Host sector         | Oil industry         |

### **Technical summary of the project**

|                          |  |
|--------------------------|--|
| Objective of the project | The objective of the project is to sell waste heat from the refining industry to district heating networks and to Volvo. |
|--------------------------|--|

#### **Project description**

Industrial excess heat is generated as a result of the industrial production processes such as refining. Some of the primary energy needed to run a production process is not consumed and must be cooled away if the process is to work. Traditionally the excess heat has been cooled away to the ambient air and/or water and is wasted. Using waste heat from industry in a local district heating network is a way of covering some of society's heat demand without causing any additional greenhouse gas emissions.

Preem has two refineries on the west coast: Lysekil refinery with a production capacity of 11 Mtons per year and Göteborg refinery with a capacity of 6 Mton per year. Both have good conditions to deliver excess heat as district heating.

At the end of the -70ies Preem started to install systems to recover waste heat and to deliver it to nearby district heating systems. The delivery to Volvo started in 1981. Sweden was the first country in the world to make use of these unexploited resources.

In Preem's refinery in Göteborg there are two systems installed that deliver waste heat to the Volvo factory in Torslanda and to the Göteborg district heating network. The latter was taken in use in 1997.

From the Preem refinery in Lysekil waste heat is delivered to the Lysekil district heating network.

In 2008 543.8 GWh of waste heat was delivered from the two refineries to the district heating networks of Göteborg and Lysekil. The saving of greenhouse gas emissions is estimated to correspond to 152,400 tons of CO<sub>2</sub>.

#### **Technical information**

##### **Göteborg**

To Volvo:

The delivery of waste heat takes place via hot water with the supply temperature of 130 degrees C and a return temperature of 90 degrees C. The delivered heat corresponds to a consumption of 14,900 m<sup>3</sup> fuel oil if the same amount of heat were to be produced in the Volvo boiler rooms. The emissions would have been 40 000 tons CO<sub>2</sub>.

To Göteborg Energi:

The delivery of the waste heat takes place via hot water with the supply temperature of 90 degrees C and a return temperature of 50 degrees C. In 2008 363 GWh of waste heat was delivered which corresponds to 37,800 m<sup>3</sup> fuel oil. The emission would have been 101 700 tons CO<sub>2</sub> if the heat would have been produced from fuel oil.

##### **Lysekil**

To Lysekils Energi:

The delivery of the waste heat takes place via hot water with the supply temperature of 90 degrees C and a return temperature of 50 degrees C. In 2008 38 GWh of waste heat was delivered which corresponds to 4,000 m<sup>3</sup> fuel oil. The emission would have been 10 700 tons CO<sub>2</sub> if the heat would have been produced from fuel oil.

### *Environmental and social benefits*

|   |                         |
|---|-------------------------|
| (Estimate of) Greenhouse Gases abated<br>(in metric tons of CO <sub>2</sub> -equivalent)  | Annual:<br>152 400 tons |
| Number of reduction units<br>(EAU, CER, ERU, AAU)   |                         |
| Socio-economic aspects<br>What social and economic effects can be attributed to the project and which would not have occurred in a comparable situation without that project? |                         |
| Methodology used<br>(if applicable: approved baseline methodology or study done - refer to this; and monitoring organisation)   |                         |

### *Economic data*

|  |  |
|--|--|
| Capital costs                              |  |
| Financing scheme                           |  |
| Financing organisation<br>(if third party) |  |

### *Project developer*

|                               |  |
|-------------------------------|--|
| Name of the project developer | Preem AB   |
| E-mail and/or web address     | <a href="mailto:Helene.samuelsson@preem.se">Helene.samuelsson@preem.se</a> |
| Contact person                | Helene Samuelsson  |

### *Host organisation*

|                           |  |
|---------------------------|--|
| Name of Host organisation | Preem AB   |
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| Contact person            | Helene Samuelsson  |