

Stockholm connects its district heating networks underwater

Fortum Värme AB has been focusing on improving the efficiency of its operations and on its customer service. As part of this, its separate district heating networks in Stockholm are currently being connected. This is being done with underwater pipes that KWH Thermopipe has produced especially for Fortum Värme.



Fortum supplies customers in Stockholm, Sweden with district heating, district cooling and town gas.

“Approximately 75% of the city is covered by our district heating network,” explains Niklas Eriksson, purchasing manager for district heating services at Fortum Group.

“Fortum aims to be the natural choice of energy provider in its areas of operation, the preferred option for customers. This is why we are constantly developing our operations and making them more efficient. The decision to link up our four district heating networks in Stockholm is part of this,” explains Eriksson.

Eriksson is project manager of the City-Söder building project, in which the district heating networks in the centre of Stockholm and the city’s southern districts will be connected. These two networks account for 6.7 TWh of Stockholm’s entire network capacity of 8.6 TWh.

The background to this project is the desire to improve customer service and environmental protection while boosting the efficiency of operations.

“During the summer, we will be able to concentrate our output by running some of our plants at full capacity rather than running all of them at reduced capacity. During the winter, we will be able to minimize the use of the least environmentally friendly form of energy, i.e. energy produced using oil to meet peak consumption, as we will now be able to transfer energy to where it is needed better than before. One large network is also much more beneficial for customers if there are malfunctions,” explains Eriksson.

PIPES MADE TO BE SUNK

According to Niklas Eriksson, Fortum Värme first considered extending its district cooling system in conjunction with the

connecting of the networks but the final decision was to carry out the two tasks separately, and the work on the district cooling system was completed a few years ago.

“There is a very high demand for district heating,” explains Eriksson.

The initial plan was to connect the district heating networks using an above-ground solution, with the new pipeline running along islands and underneath bridges and through the new railway tunnel that is being planned for the centre of Stockholm. However, the railway tunnel option would have meant delaying the work for at least ten years, according to the latest information, and it would have been difficult to landscape the pipes in the above-ground option.

“The total pipeline structure is approximately 1 metre high and 3 metres wide, after all.”

The planning was eventually based on one of the options presented by the project



STOCKHOLM DELIVERY

KWH Thermopipe delivery comprised:

- Pipes DN800/DN1000, 2,200 m
- Bends DN800/DN100, 22 pcs
- Materials for joints

planners, FVB District Energy: laying the new pipes underneath the Riddarfjärden bay. Fortum Värme put out an invitation to tender regarding suggestions for how to construct the pipeline and for information about previous similar projects.

“This is an unusual technical design and totally different from anything we have ever done before. That is why our choice of partner was governed by their design concept, their experience and their reliability. There was a lot of interest in the project, but we eventually chose KWH

Thermopipe to supply the pipes, as they have installed a lot of underwater pipes.”

KWH Thermopipe delivered the 1 km of DN 800/1000 pipeline in 16-metre sections, which significantly reduced the number of joints compared to the other options. The pipe elements are pre-stressed and have a casing made from PE-coated steel pipe. The quality of steel used in the pipes and bends has been customized to the requirements of Fortum Värme.

KWH Thermopipe has constructed a special foaming table, which is well suited for the manufacture of pre-stressed pipe elements for this and future projects. This pre-stressed pipe construction makes installation easier and reduces heat losses. Sture Andersson, one of Sweden’s leading experts in material strength, provided support for the project.

“It was important for Fortum that the entire team worked well and supported one

another. The expertise of KWH Thermopipe has been a great asset during the various stages of the project,” explains Niklas Eriksson.

DEMANDING CONDITIONS DURING INSTALLATION

A total of 2.2 km of new pre-insulated underwater pipes will be laid during the project. At the same time, a DN 900 drinking water main will be supplied and installed for Stockholms Vatten AB. The pipes will be welded and joined together on land. The work is divided into three stages measuring 200, 300 and 500 metres. The pipes will be pulled into place in stages, and the final joints will be made on location where the pipe will be submerged.

“The installation is demanding on many levels. We are in the middle of the city, there are a lot of boats and ships, the currents are quite strong, and there are also unusual conditions on the sea bed. An assessment of the sea bed was also needed in order to remove or avoid rocks and other objects on the sea bed that might damage the pipe, and we also needed to find and avoid ship wrecks. Safety has been the most important factor regarding the work itself, other people on the water, and the environment. We have been closely monitored by environmental officials and the people of Stockholm.”

The installation timetable was one of the important factors when choosing the pipe supplier. Installation had to be completed well in advance of the water freezing over.

“We have a long history of cooperation with KWH and have been satisfied with the way they keep to timetable, with their advice and support and with their prices – all the fundamental issues, in fact. That is why KWH Thermopipe supplies a significant percentage of the pipes we need every year.” ●