RECENT

Energy efficiency in district heating, Sweden

Jokkmokk municipality has about 5000 inhabitants on an area of 19 334 km². Jokkmokk district heating company successfully works with increasing the cooling performance in district heating sub-stations. A sub-station with poor cooling extracts less energy per unit volume of water. That means an overconsumption of flow to meet the consumers' heat demand. The positive effects of increased cooling are particularly reduced heat losses in the district heating network and efficiency increase for flue gas condensation. In Jokkmokk's case the fuel demand has decreased by about 435 MWh due to efficiency increase in flue gas condensation. The pipeline losses have been reduced by about 570 MWh, but more energy for pumping was needed, approximately 6 MWh.

Energy production in Jokkmokk district heating

Jokkmokk's disctrict heat plant sells about 34 GWh heat annually. The heat is delivered to 522 customers, of which 332 are households. About 99% of the heat is produced with wood chips, bark and wood pellets. A 17 MW wood chip boiler is used during the main part of the year. A pellet boiler of 3 MW is used end of May to mid September.

Investment and payback time

Investment costs for material were about 1200 € and labour costs about 9000 €, while the cost saving is about 14 815 €/year. However, it is important to notice that the most economic projects for maintenance of sub-stations have been done now, next projects will most likely be less profitable.

Energy efficiency

Asset owner: Jokkmokk district heating, Sweden

Used assets: District heating network and its sub-station

Cost saving potential: 14 815 €/year

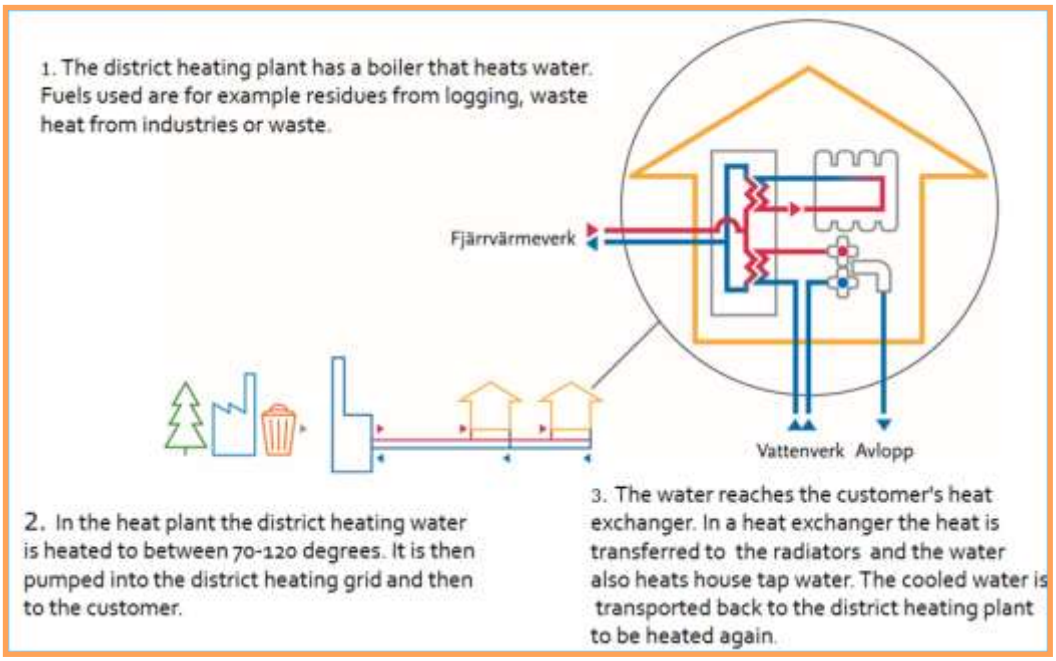
Environmental benefits: + 3,5% energy efficiency; - 210 kg NOx/yr; - 100 kg CO/yr

Investment costs: 10 200 €

Payback time: less than 1 years

Technology

The energy efficiency campaign focuses on the return temperature of the water coming back from the customers. This is a key indicator of heat network efficiency.



Low return temperature results in a larger delta T, which means lower flow rates are required for the same kW delivered. In this way, pumps and pipes will work safer and more efficiently. A cooler return pipe also lowers heat losses. An important economic factor is the need to use reserve capacities for winter time's peak load. Those use oil an electricity, which makes it very expensive. There are significant economic savings to be made if the need for reserve heat production reduces.

By installing new meter at the customer's facility will enable to find out where problems exist and to fix the problems, often by adjusting the customer's heat exchanger.

Sustainability

Points of success:

- New measuring units will allow for good control of flow for each customer
- Making efficiency a priority
- Educated staff
- Political commitment

Jokkmokk is a Swedish Eco-Municipality and a signatory of the EU Covenant of Mayors. It has developed its Sustainable Energy Action Plan and is committed to reduce its greenhouse gas emissions by at least 20% until 2020, compared to 2005.
Another success factor for a district heating efficiency campaign is the lower cost both for the company and the customers.