CASE STORY

ORC-systems are helping to create a sustainable energy future.

ORC (Organic Rankine Cycle) technology made possible by SWEP brazed plate heat exchangers is being used in Sweden to transform waste heat into renewable electricity. This high efficiency and low maintenance way to produce sustainable electricity is being adopted by district heating systems around the world. Read how Ronneby Municipality put this innovative technology to use.

CHALLENGE_FEEICIENCY

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The growth of combined heat and power (CHP)
The popularity of small-scale combined heat and power generation (CHP) connected to district heating or its own use is on the rise in many places, including Sweden. These systems can generate electricity and useful heat by putting available energy to productive use. The reasons for this rise in popularity are the ability to generate green available electricity and heat on-site, the reduction of the impact of energy price fluctuations and the want or need to be independent of major electricity suppliers.

In southern Sweden, biofuel use has increased significantly over the past 15 years. Small-scale CHP systems are being used in conjunction with these bioenergy plants to produce heat and electricity, further optimizing the overall energy output of the biofuels.

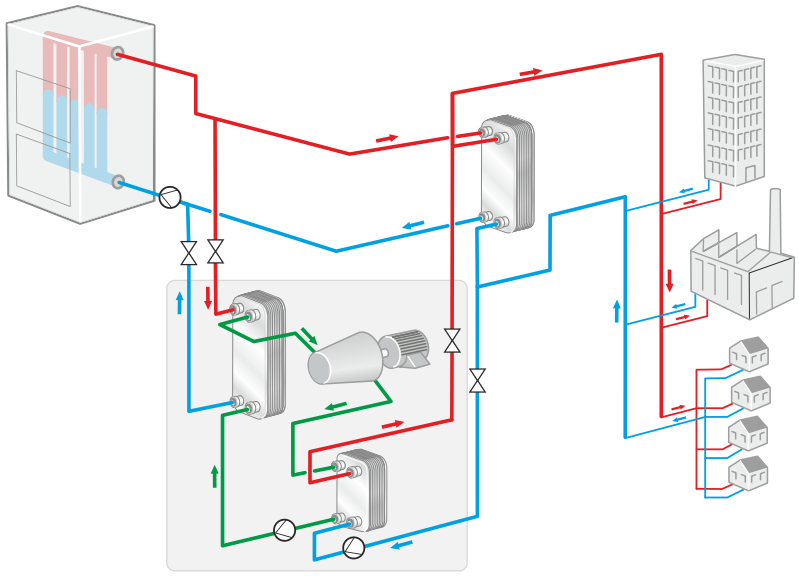
Ronneby Miljö & Teknik AB seized the opportunity
Ronneby Miljö & Teknik AB, in the south of Sweden, manages electricity, heat, water and sewage to Ronneby municipality's residents and businesses. By connecting an ORC (Organic Rankine Cycle) system to one of its existing district heating systems it is now possible to produce renewable electricity in addition to heat.

The installation of the ORC system requires minimal effort and takes up very little space in the plant. The system uses an organic working medium that has a lower evaporation temperature compared to a traditional steam process, but without the risk of moisture vapor and corrosion and erosion in the expander. The ORC uses available heat from the boiler to vaporise the organic medium that drives the expander, then the medium is condensed through the return water from the district heating network.

Designed by Againity
The company that designed this innovative ORC system for Ronneby Miljö & Teknik AB is Againity. Based in Norrkoping, Sweden, Againity are ORC system specialists and experts in converting low-grade heat to electricity. SWEP has partnered and collaborated with Againity since 2014. SWEP´s role in these ORC system projects is to scope and define the right heat exchanger for each installation. SWEP has long experience with ORC systems globally and our proven BPHE technology has a track record of extremely low maintenance and high efficiency, while also being compact and modular.

What is the potential?
In Sweden only, there are about 250 district heating plants (below 10 MW heat) that produce heat only. Also, there is heat being produced or wasted at smaller industries, sawmills, forestry, agriculture and greenhouses that have the potential to transform energy systems to small-scale CHP by adding the ORC technology.

ORC system integrated to a District Energy plant.



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