



KAUKAAN VOIMA POWER PLANT

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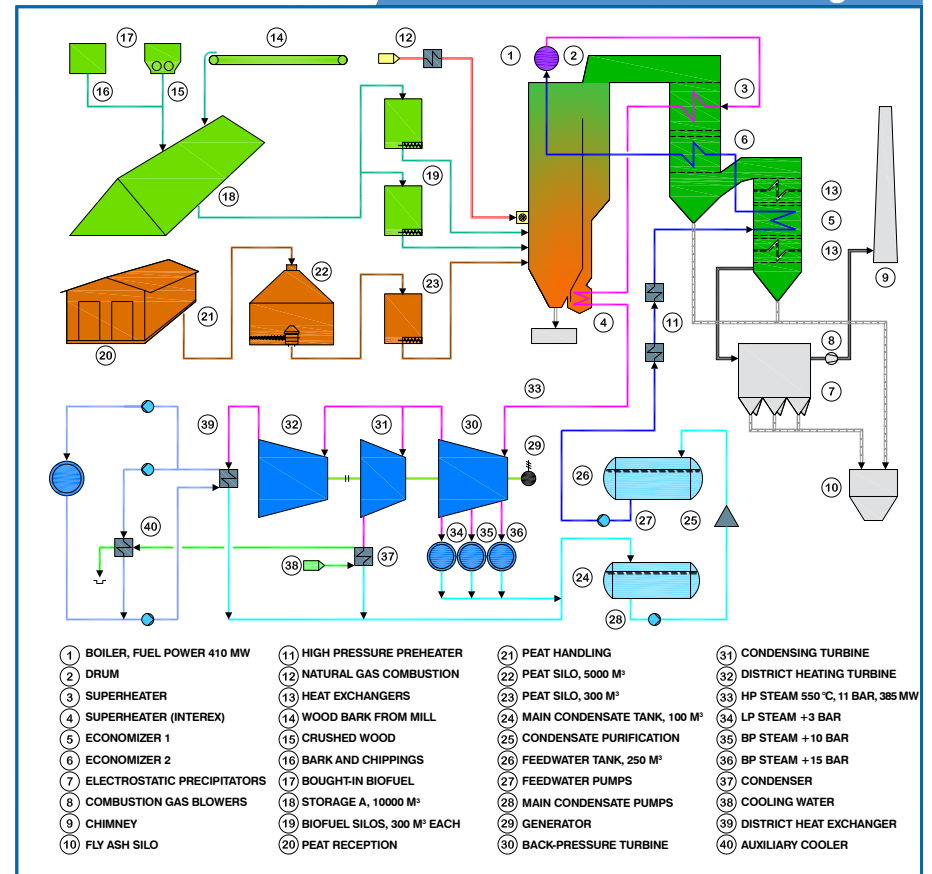


The bioenergy plant of Kaukaan Voima Oy is located at UPM-Kymmene Corporation's Kaukas mill site in Lappeenranta.

The bioenergy plant is a joint venture by Pohjolan Voima, Lappeenrannan Energia and UPM. The power plant will produce process steam and electricity for the Kaukas mill, and electricity and district heating for Lappeenrannan Energia. The plant is connected to the steam pipeline network of UPM and helps ensure a sufficient supply of steam at the factory site. The plant supplies about 85 per cent of the total district heating power consumed by the City of Lappeenranta.

Trial production began at the biopower plant in August 2009, and commercial operation commenced in November 2009. The plant is fuelled by wood bark, stumps, logging waste and other wood-based fuels as well as peat.

Process Diagram



Natural gas and light fuel oil are used for back-up and firing up.

Like Pohjolan Voima Oy, Kaukaan Voima Oy also operates on an "at-cost" basis where the shareholders bear the operating costs. This operating model is also known as the Mankala principle. Pohjolan Voima owns 54 per cent and Lappeenrannan Energia 46 per cent of the biopower plant.

TECHNICAL DATA

Commissioning:

- 2009

Fuel handling and processing:

- supplier Raumaster Oy
- about 2 km of new conveyor lines at the plant site
- separate stations for receiving peat and biofuel
- 10,000 m³ of covered storage space for biofuel
- 5,000 m³ storage silo for peat
- wood stump and twig crushing plant (Saalasti)

Fuels:

- annual consumption about 2,000 GWh
- fuels: wood-based fuels (80 %), peat and natural gas
- the fuel materials generated at the plant site cover about 40% of annual consumption
- the fuel ash is utilized

Boiler plant:

- supplier Foster Wheeler Energia Oy
- circulating fluidized bed (CFB) boiler
- natural circulation boiler: 385 MW, 149 kg/s, 115 bar, 550 °C

Turbine plant:

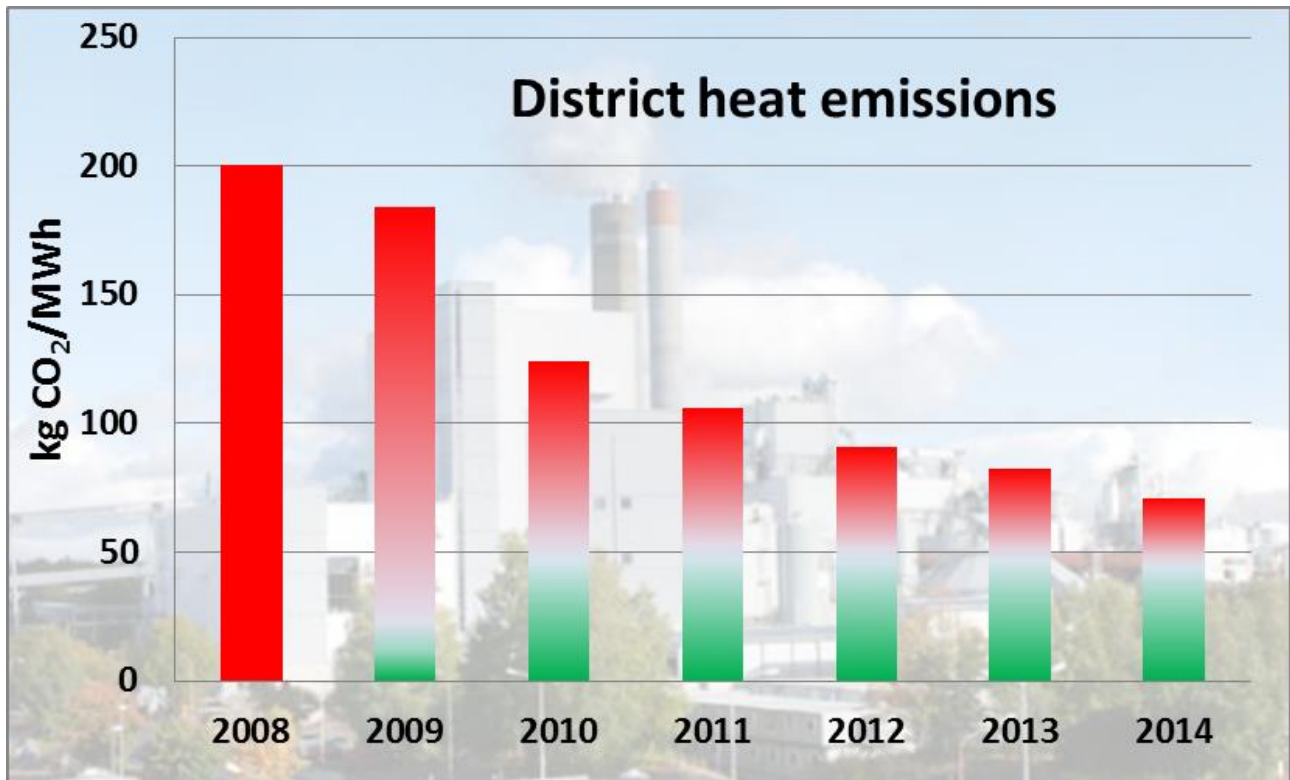
- supplier Siemens AG
- electrical power 125 MW
- process steam capacity 152 MW
- district heating capacity 110 MW
- 100% reduction valves for process steam and district heat production

Environmental technology:

- height of stack 115 metres
- two separate electrostatic precipitators
- ammonia spraying
- lime feeding facility
- continuous emission measurements

Lappeenranta

CHP plant KauVo uses renewable fuels as a prime source of energy i.e. wood originated material. KauVo produces nearly 85 % of municipality's district heat and 28 % of electricity. Emissions from district heat in Lappeenranta have decreased significantly with KauVo (2008: 200 kg CO₂/MWh -> 2014: 82 kg CO₂/MWh). KauVo started in the end of 2009 and after that the amount of peat has decreased year by year. Lappeenranta city owns 46 % of KauVo.



District heat emissions in Lappeenranta

Joutseno is sector of the town, which locates 20 km away from center of Lappeenranta. In Joutseno municipal district heat is produced by burning hydrogen, which is originated from industrial electrolysis. In 2014 this plant produced 103 GWh district heat.



FC Power Oy hydrogen power plant in Joutseno.