

## CASE HISTORY

SEMICONDUCTOR

SOLAR

PHARMA

**POWER GENERATION**

FOOD & BEVERAGE

PULP AND PAPER

CHEMICAL

OIL AND GAS

MINING

AEROSPACE AND TRANSPORT

METAL FINISHING

MUNICIPAL



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# Toveko Filters

Falun Energy, Sweden



Falun received recognition as a city in 1641, making it one of the oldest cities in Sweden. At the beginning of the 1200-century, copper mining began in Falun. The oldest share holding company in Sweden, Stora AB, was founded and is still located in the city. Falun has grown somewhat since that time and now has a population of about 23,000 people.

Falun is situated in a valley surrounded by mountains and consequently the city and its outdoor sports stadium host's competitions in Cross Country Skiing and Ski Jumping. Due to its geographical location, the city is very sensitive to any potential sources of environmental pollution. For this reason, district heating of housing areas is very common within the city.



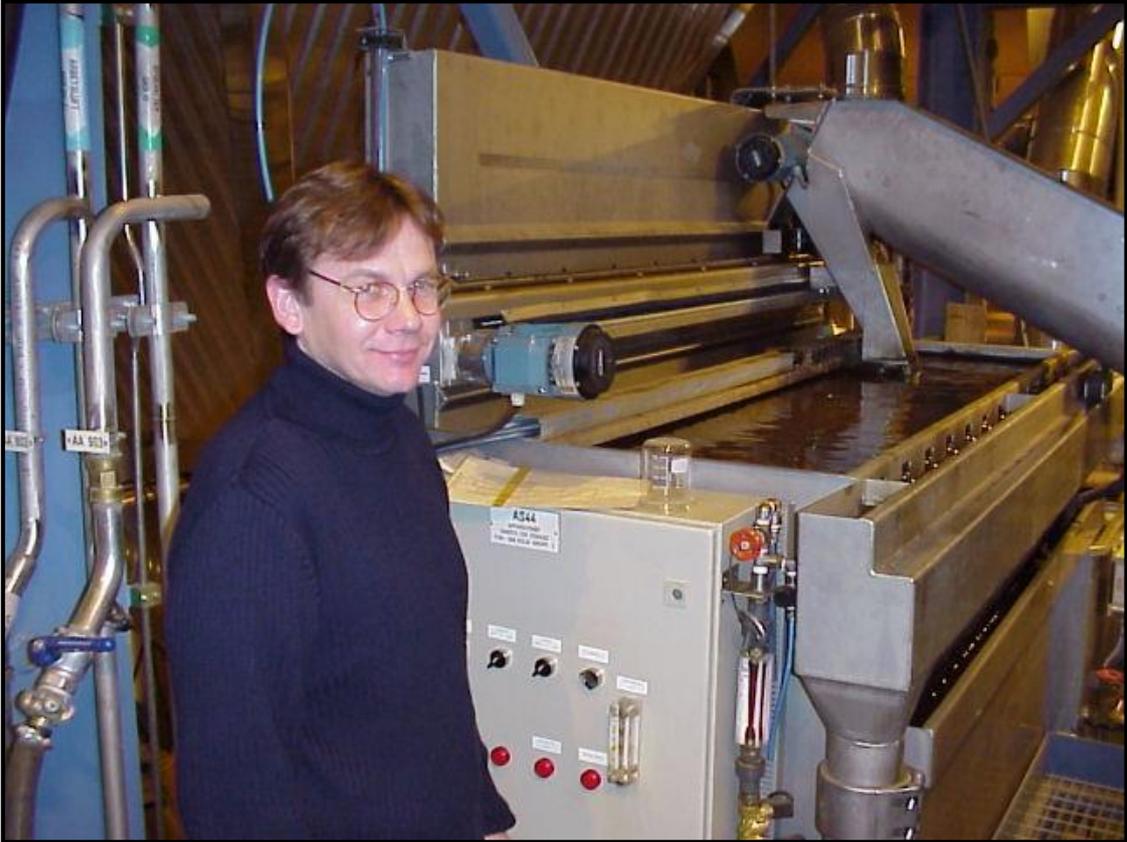
**Västermalmsverket in Falun**

This energy production and heating plant runs mainly on wood waste. The plant uses a fluidised bed boiler. Fuel and air are fed into the furnace continuously. The furnace operates at a relatively low temperature that minimizes nitrogen oxide production.

The plant operates from mid September to the beginning of June. For reasons of cost, during the summer period, heating requirements are provided by LP gas or electricity. At peak times, fuel consumption is 50m<sup>3</sup> per hour. The fuel is collected within a radius of 50 kilometres around Falun.

The fuel contains about 50% water that produces steam during combustion. The humid flue gas is led to an exhaust gas cooler for condensing. The condensate participates in the washing of the flue gas. Only a small amount of condensate is left in the outgoing gas that appears from the chimney as a white steam plume.

However, the condensate contains suspended solids such as particles of soot and has therefore to be purified before it can be discharged. The suspended solid concentration varies from 50-100 mg/l. This water is pumped directly to a TOVEKO CX filter, in this particular case an S-150 filter. The flow varies between 13-15 m<sup>3</sup>/h depending on the fuel consumption at the time.



**Per Andersson, Operation and Maintenance Manager at the Toveko CX filter**

Treated water discharged from the filter is required to have a suspended solids content less than 10 mg/l. In normal operation this figure is less than 5 mg/l that is the lower limit of analysis limit for the method used. The treated water temperature is always elevated and can rise to above 60°C. This energy is recovered via a heat exchanger and utilized for heating the plant's own premises. Since the treated water is very clean, fouling of the heating system is virtually eliminated, thus maintaining high heat exchanger efficiency. This resulted in a payback of the installation costs in about two years.

Before the TOVEKO filter	After the TOVEKO filter
50-100 mg/l SS	less than 5 mg/l SS

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