Tranås close to zero emissions

Tranås Energi AB, in the city of Tranås in south Sweden, has replaced its oil-fired thermal plant with a woodchip-fired steam boiler and expanded the district heating network. Today more than 95% of the heating needs of Tranås are met by district heating, and CO2 emissions are negligible. A further plus point is that the project is highly cost-effective.

The Tranås district heating project is an example of how a local authority can reduce its CO2 emissions to almost zero. The local authority started building its district heating network in 1968 and installed its first woodchip boiler in 1982. Grants from the local investment programmes (LIP) meant that the last oil-fired boiler could be replaced by a woodchip-fired boiler with flue-gas condensation in 2002 and the district heating network could be expanded. In the autumn of that year a steam turbine and generator were added, so that electricity could be produced from the surplus heat. Today 990 properties are connected to the network, and more than 95% of heating needs in the town are met by district heating.

POSITIVE ENVIRONMENTAL AND ECONOMIC IMPACTS

- Power production in the thermal plant has risen from 3,500 MWh/year to 9,300 MWh/year (2007).
- Around 23 m3 of oil was used in 2007, so that CO2 emissions have fallen from nearly 3,000 tonnes/year to almost zero.
- Around 8,000 MWh of electricity has been replaced by renewable energy.
- Interest in district heating has been strong, with 30–60 households connected annually.
- Cost-effectiveness was better than anticipated, due to higher-than-expected electricity prices, steady demand for district heating and higher power.
PRODUCTION SUCCESSFUL ENERGY SWITCH
The project is a successful example of the switch from oil to biofuel.

Newer and more efficient technology was installed than originally planned. Instead of a hot-water boiler, flashbox and steam turbine, a steam boiler and five-stage turbine were installed. The measures taken maximised electricity production, and the plant produced more power than originally intended. There has since been a trend towards even higher steam pressure and temperature, increasing the proportion of power produced.

The biofuel travels short distances to the plant, the sawmills supplying Tranås with woodchip being located within a radius of 60 km. In the winter around 25 articulated trucks deliver the fuel.

The aim is to further increase electricity production (around 30 GWh) and replace the old woodchip boiler with a new plant. The present-day plant can then be used for peak load and summer production.

POTENTIAL AND FUTURE BENEFIT
District heating systems reduce air pollution locally, make use of waste heat from other activities and allow combined heat and power to be produced. If biofuels are used, there are major climate benefits. As urbanisation advances globally, the prospects for expansion of district heating are improving.

WHY BEST PRACTICE
District heating systems that use biofuels offer major environmental and climate benefits. District heating systems with biofuels also have great market potential in Europe and the rest of the world. Efficient technology with a steam boiler and five-stage turbine is used in this plant. The project has been highly cost-effective. The plant has produced more electricity than expected. It has attracted considerable interest from the public, businesses and industry experts, contributing to the expansion of several similar plants.