



Vakkalämpö co-operative

Toivakka heating plant

A local district wood heating system in Toivakka, a small rural town with 2,400 inhabitants, was initiated by the municipality. Increasing oil prices made the municipal government look for cheaper possibilities to heat their own buildings and provide heat for people living in the town centre. Having plenty of forest owners and forest resources in Toivakka it was natural to opt for wood heating. The municipality made all required investments to build a new heating system, including the boiler and control devices, the boiler house and a connection to an existing distribution network.

The operating of the plant is outsourced to a local co-operative that also provides wood chips. This co-operative consists of three farmers and a forest society. In the beginning the municipality made a three year contract with the co-operative. Nowadays wood fuel supply and heat plant management is annually put out to tender.

Fuel procurement

Feedstock

The Toivakka heating plant uses wood chips made from small wood from clearings and thinnings. Oil is used only during servicing of the main boiler and as a back up fuel if problems occur with feeding or combustion of wood.

Methods and technology of wood chip production

As stated above, a local co-operative is in charge of wood fuel supply. In practice the local forest society (Mhy Päijänne) provides 80% of all wood chips through their normal logging chains. In Finland forest societies usually have a twofold role, on one hand they give advice and practical help to forest owners on to manage their forest well, and on the other they help in timber and other wood sales and organize logging if requested. Forest societies are mainly funded by the government but they also make money on organizing wood sales for forest owners.

The remaining 20% of wood chips is produced by farmers. A vast majority of wood fuel comes from mechanized supply chains illustrated in a case study of Ekowatti. Whole trees are stored at a road side at least over one summer and then chipped there with a mobile chipper. A sample of each chip load is taken and moisture content of chips measured at the delivery of wood chips. The provider is paid based on the energy content of the chips (€/MWh).

Heating plant

The heating plant was built in 2002 by an initiative of the municipality to decrease costs of heating of municipal buildings. The municipality invested in the boiler house and 0.7 MW heating system that was delivered by Tulostekniikka Oy (Ltd.). The existing distribution network was connected to the new plant with a new 400 m outlet.

The plant operates unmanned and is highly automated. Fuzzy logic is used to control the operations and combustion of the boiler. In case of disturbance, fuzzy logic uses original settings and sends a message to the controlling computer and to a mobile phone of the operator. Combustion is controlled by an oxygen sensor. Wood chips are conveyed to the grate with blade dischargers and screws.

Facts

Boiler output	700 kW
Fuel	Wood chips 95 % and heating oil 5 %
Heated building volume	40,000 m ³
Heat production	2,500 MWh
Investment costs	250,000 €
Operation started	2002

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