



Ekowatti Oy

Joutsa heating plant

Joutsan Ekowatti Oy (Ltd.) was established in 2004 driven by a need for a new heating system with a cheaper and predictable fuel price compared to light heating oil. The enterprise was initiated by a small door and window frame manufacturer (Puusepäntiike Tamminen) that, on one hand needed a heat source, and on the other had wood residues for a wood fired heating plant. Suitable business partners were soon found through previous contacts: a forest service company, a real estate management company and an accounting company. Expertise for all necessary operations for running the heating plant is found in the companies involved. There are no paid staff for the heating plant because most of the time it works unmanned.

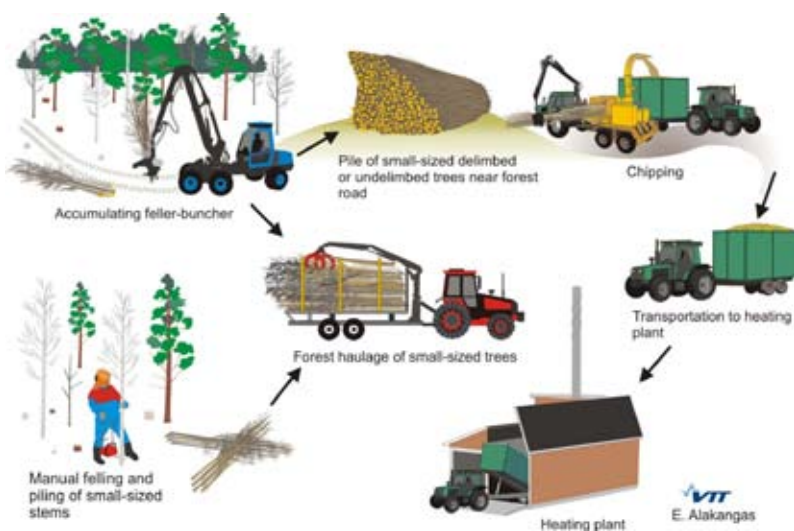
Fuel procurement

Feedstock

The vast majority of wood fuels are procured by Metsäpirkka Ky, one of the owners of the heating company. Metsäpirkka is a forest service company offering services to forest owners from afforestation to logging. Their main emphasis is on manual logging and tending of young forests, so wood fuel from pre-commercial thinnings is easily at hand. Wood residues from the door and window frame factory are also used in the heating plant.

Methods and technology of wood chip production

Typical supply chains of wood chips from small trees are illustrated in the figure. Metsäpirkka employs about 20 timberjacks involved in manual logging and other forest operations, e.g. afforestation. Manual felling methods are mostly used in seedling and young forest tending. A chainsaw with felling frame is a suitable option for small wood felling and bunching.



In order to reduce costs and increase the productivity of small wood harvesting, many different mechanised felling methods have been introduced. The general trend in small wood felling is that several trees are processed simultaneously by using accumulative

felling heads. It is possible to use these felling heads with many different base machines, including farm tractors, excavators and harvesters.

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 wood chip boiler of Ekowatti in the Joutsa industrial park has a capacity of 1 MW thermal. The whole system, including the boiler, controlling devices, screws and boiler house, was delivered by Tulostekniikka Oy.

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	1 MW
Fuel	Wood chips 95% (80% from forest, 15% from wood residues), 5% light heating oil
Heated building volume	25,000 m ³
Heat production	4,000 MWh
Investment costs	500,000 €
Operation started	2004

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