

GOOD PRACTICE EXAMPLE

Bučina Zvolen

bučina®



1. General description

The company owns the technology for combined heat and power production, consisting of back-pressure steam turbines of 5 MW and 2 steam boilers with a diagonal movable water-cooled grate with an installed capacity of 24 MW. Electricity is supplied to the public network and heat to wood-processing company Kronospan. Annual fuel consumption in the form of wood chips is from 50 to 60 thousand tons.

For the purpose of fuel supply, another subsidiary company was founded cooperating with producers of wood biomass and transport companies.

As GPE was identified supply chain including contacting and selection of fuel wood biomass suppliers, managing the collection and transport of fuel, its storage, dimensional treatment by crushing process and subsequent transport of fuel into boilers. Suppliers of wood biomass are wood-processing enterprises selling their waste materials, owners of forest and non-forest land and companies carrying out harvesting and wood-chipping.

The above-mentioned parts of the supply chain can be transferable and implemented by industry enterprises owning boiler plants or wood biomass power plants, in particular, the wood-processing industry enterprises with lack of their own resources of fuel wood biomass.



Figure 1: Controll system of power plant Bučina

2. Description of activity in biomass supply chain

The entire supply chain has the following structure:

1. Identification and negotiation with the potential suppliers of fuel wood biomass. Provided by a subsidiary company based on a planned annual consumption of fuel in the company Bučina.
2. Concluding contracts on biomass supplies with suppliers and transport companies. Provided by a subsidiary company that concludes mainly annual contracts with stable biomass suppliers and short-term contracts according to the actual supply need.



Figure 2: Woody residues from wood procesing industry

3. Organization of the concentration and transport of biomass from suppliers. Provided by a subsidiary company based on a time schedule of fuel consumption, possibilities of suppliers, climate conditions and possibilities of transport companies.
4. Storage and treatment of the fuel in the store of the heating plant. Provided by the company Bučina Zvolen using its own technology.

3. Technical characteristic

Information and communication technologies are fully used in managing the system of energy production and supply. Since the energy is expected to be produced the entire year, fuel consumption is relatively high in the individual months. Construction of the boiler allows using fuels with lower quality (moisture, heat value).

Information and communication technologies are also used to identify the potential suppliers of wood biomass. Due to incomplete databases, personal contacts and past experience is dominant.

The determining criteria for selection of suppliers are stability of supply, quality and price of biomass and transport costs.

Organization of the biomass accumulation and its transport is based on direct contacts with suppliers and transport companies. Approximately 70 % of supply consists of waste material generated by the wood-processing industry and municipal wood waste. The rest consists of biomass from forest and non-forest land, which is generally purchased based on short-term contracts.

Fuel is transported to heating plant by trucks of private companies. Storage capacity is approx. 7,000 tons, what creates the 6-week fuel reserves. Biomass that has been transported is then sorted out by front loaders according to its quality. Biomass with lower moisture content is stored in covered part of the store. Dimensionally different biomass is crushed using Klöckner technology consisting of 2 crushers.

Fuel is transported to the boilers by system of conveyors from movable platform using front loaders or system of conveyors directly from crusher.

4. Economic characteristic

Direct costs on purchase of wood waste material from wood-processing industry and municipal waste range from 15 to 25 EUR/t. The subsequent crushing ranges from 8 to 11 EUR/t. Transport costs of waste wood material depend on the transport distance and ranges from 4 to 12 EUR/t. Overhead expenses are 6-7 EUR/t. The total production cost of 1 ton of fuel is 33-55 EUR.

Purchase price of fuel wood chips ranges from 42 to 48 EUR/t including transport costs to heating plant. The average annual costs of fuel are 2 million EUR in all-year operation and profits from energy sale are 5.5 million EUR. Estimated return on investment is 8 years.

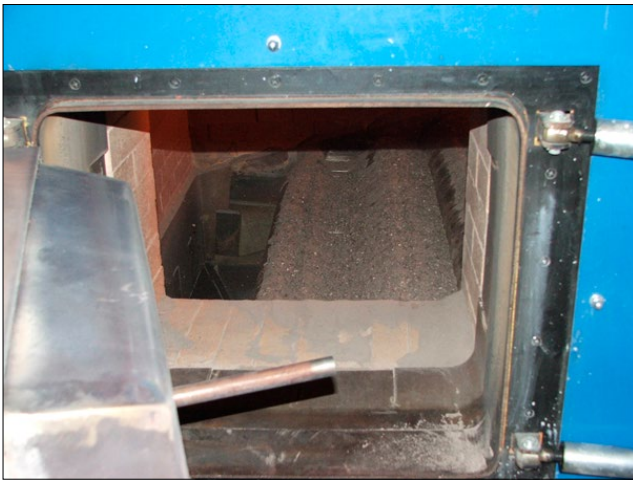


Figure 3: Biomass boiler in power plant Bučina

5. Other characteristic

All companies have to respect law on energy, renewable energy resources, air protection, nature conservation, waste, work safety and transport in the process of biomass energy production and other activities in the supply chain.

An annual consumption of 55 000 tons of wood chips can replace 14.6 million m³ of natural gas or 36.9 thousand tons of brown coal, and make savings of CO₂ emissions and other greenhouse gases (CH₄).

Another economic contribution rests in environmental use of municipal wood waste and waste from wood-processing industry (for example, decreasing dust).

Company Bučina employs 45 people in cooperation with its subsidiary company providing supply of biomass. Private companies providing services (transport, biomass accumulation) employ 75 workers.