

Cleaner production and energy efficiency measures at Sawmill 25, Arkhangelsk, Russia

One of the main sawmills in Arkhangelsk, Sawmill 25 made significant savings in energy and water use through adoption of new technologies and by converting their boiler house from using fossil fuels to using a renewable energy source (biomass). Thanks to the reduced consumption, the investments are repaid within 3.1 years.

Short site description

JSC-Closed "Sawmill 25" is one of the main sawmills in Arkhangelsk Oblast. The company employs about 1 500 staff, and processes approximately 350 000 m³ of wood per year to produce sawn timber, pulpchips for pulp and paper production and dressed lumber for both the internal market and for export. The Sawmill 25 site is located in Maimaksa District, on the industrial outskirts of the City of Arkhangelsk and the right bank of the Maimaksa river, in a zone of water conservation.

Phase 1 – Installation of the dry sorting line at the Maimaksa site

In the past, incoming logs were sorted using a series of large water filled pools. This sorting technology dates from the beginning of the 20th century, and was



New dry sorting line

therefore very labour intensive and resulted in significant emissions to water. The pools were also significant consumers of thermal energy, as they required warming to prevent freezing during the long winter season. In addition, the significant

quantities of waste wood produced by sorting and barking the logs were too wet to be used as fuel in the sawmill's boilers.

The new dry sorting system, completed at the beginning of April 2004, allows delivery of logs from suppliers all year round according to requirements. The sorting line is equipped with metal detectors and digital electronic measuring cameras, which measure length and diameter of logs thus allowing automatic sorting. The sorted logs are then fed to a debarking machine before proceeding to the log sawing stage. The new log sorting process is a completely dry technology, thereby eliminating the use of water and the production of polluted waste water. The process also results in significant savings in thermal energy, as heating of the water pools is no longer required during the winter. Finally, as the recovered bark is now dry, it can be used as biofuel.



Energy intensive wet sorting line



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Phase 2 – New drying chambers and biofuel boilers at the Tsiglomen site

The second phase of the project involved installation of new efficient drying plants with low energy use for the sawn timber drying. In order to optimize the production the drying chambers were installed close to the sawing department, which reduced the transportation costs and the heat network extension. Phase 2 also included construction of a hot water boiler-house with installed capacity of 5-6 MWT, running on timber waste (bark) on the territory of the “Tsiglomen Sawmill”. The main purpose of the boiler is to provide annual energy supply of the technological needs of the drying chambers, heating of the Enterprise departments during the heating season.



New boiler house at Tsiglomen

Financing

The project was financed through the use of the companies own equity and a loan of € 2.4 M from NEFCO, which is one of the largest single investments in NW Russia from the bank in recent years. The project was prepared by the Arkhangelsk Oblast Energy Efficiency Centre (AOEEC) and the Energy Saving Fund of the Arkhangelsk Region, in cooperation with Norsk Energi. Much emphasis during project development was placed on designing the right financing scheme and security for the loan, which in the end was assured through a guarantee from a large sister company, the Arkhangelsk Pulp and Paper Mill (APPM).

Economic savings and environmental benefits

The project results in significant savings, specifically in resources and wastes, as presented in the following table:

in economic terms, in resources and in emissions to the environment,

Parameter	Unit	Annual savings	
		Phase 1	Phase 2
Electric energy	MWh	500	900
Thermal energy	MWh	34 885	115
Water	m ³	90 000	--
Coal	tonnes	--	1 270
Heavy fuel oil	tonnes	--	4 969
Waste timber	tonnes	--	10 724

In addition to the above, elimination of the pools results in the following reductions in water pollutants:

- Reduction of Biological Oxygen Demand (full) = 2074 tonnes/year
- Reduction of Chemical Oxygen Deman = 3442 tonnes/year
- Reduction of Suspended Solids = 1115 tonnes/year
- Dry sediment = 3967 tonnes/year
- Tannins = 970 kg/year
- Oil products = 13 kg/year
- Phenols = 0.912 kg/year

Elimination of the pools also prevents over 3500 tonnes of silt from being dumped in a landfill.

The profitability of the project as a whole is summarised below:

Profitability parameters		
Total project costs	9 738 000	Euro
Total net savings	3 102 377	Euro/yr
Payback	3,1	Years

More information

For more information of this project and to find out the benefits of Energy Efficiency please contact Norsk Energi,

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