

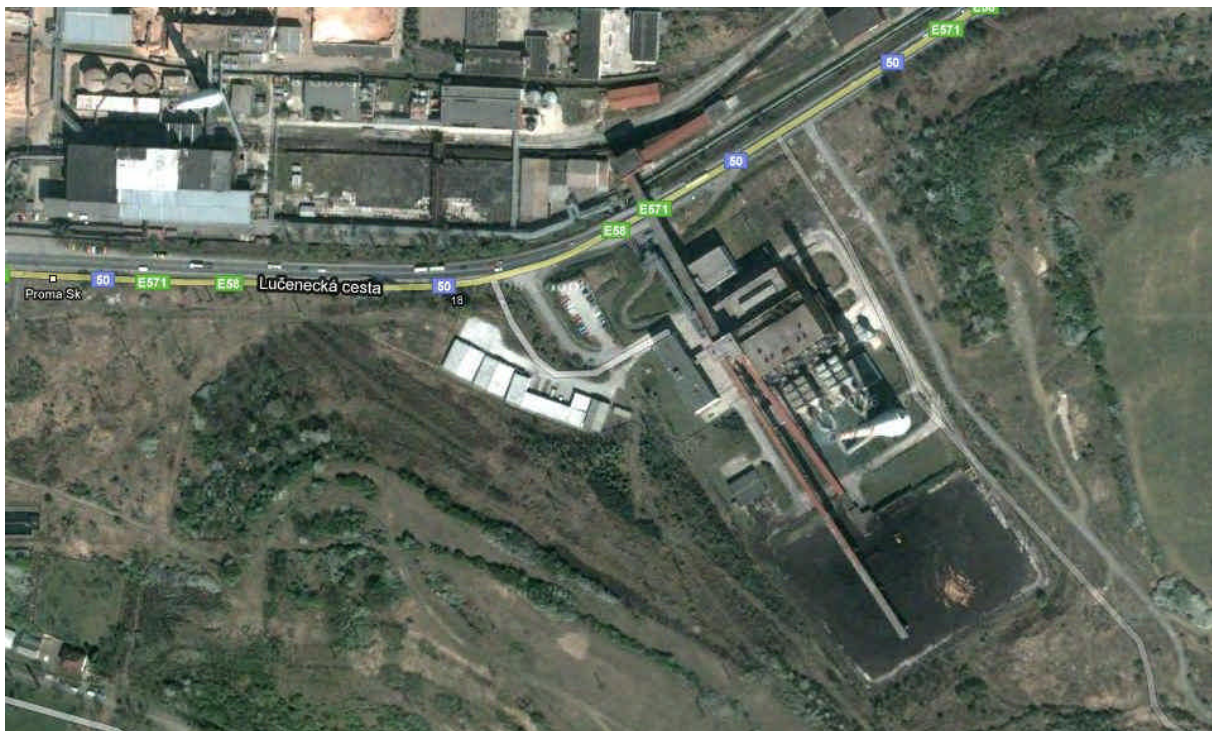
1st study tour Zvolen, Slovakia (04.11.2009)

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1 Location

Name: Zvolenska Teplarenska inc.
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2 Aim of the study tour

In the Application form the partners of 4biomass stated that one of the main objective of the project is to foster the sustainable exploitation of biomass by exchanging experiences and best practices between the partners and other stakeholders. Through this an equal level of knowledge regarding available technologies, investment possibilities and operation of bioenergy system can be reached.

The second 4biomass project partner meeting held in Zvolen, Slovakia was combined with a site visit. Thanks to our Slovakian partner we had the opportunity to visit a cogeneration (combined heat and power production) plant in the area, where a typical example of co-firing (combustion of two different types of materials at the same time) was examined.

First the management of the plant gave a presentation about the plant. The representative gave a short historical overview and then explained the technical details and operation of the plant. The improving emission trends were highlighted during the presentation. Some time was also allocated for discussion, where raw material use and sustainability questions were raised. After having all the necessary information the group was ready to see the whole plant. During the tour the project partners examined the burners, the two reconstructed generators and the control room among others. We have also seen the newly developed depot for woodchips.

3 Description of the plant

The biggest share (80%) of heat supply in the city of Zvolen belongs to the Zvolen Heating and Power Plant (Zvolenská teplárenská, a.s.). Heat supply is the main activity for this company. It has two basic consumer spheres – industrial and community – which involve local apartments. Heat supply of industrial and other organizations is mainly used for heating of manufacturing plants.

In the plant, a maximum of 30% of biomass can be co-fired to the brown-coal.



3.1 History

The establishment of the plant dates back to 1949. The main purpose was to supply the citizens with district heat and domestic hot water. Only later on they have installed combined heat and power generator fed by coal and heating oil.

The brown coal fired plant had two boilers generating 216 MW heat and 34 MW electricity (25 MW by counterpressure turbogenerator+ 9 MW condensation turbogenerator), but it has not fulfilled the emission standards. Therefore a reconstruction work has started in 2006 with EU and governmental subsidy to redesign to burners. Since 2008 the whole plant is fed by a mixture of low-sulphur brown energetic coal and wood chips. They are using 70-85% coal and 15-30% wood. A modern control and automatic emission monitoring system was also installed. Additionally, 5% of natural gas is burned to cope with varying biomass-quality and for startup of the burner.

3.2 Technical description

• **Thermal production** – enforced, combined and depended on heat supply. Electric power produced this way is fully economically effective with low cost of fuel. From the technological point of view, the power is produced by a counter pressure turbo generator. Transformation effectiveness during such production reaches more than 90%.

• **Electric power production** – condensing production of electric power was activated in 1996. It is realized by a condensing turbo generator. The turbo generator was designed for additional production of electric power, i.e. as a low-pressure part of counter pressure generator. This technical solution was realized with a goal to improve effectiveness of heat production.

- Installed heat output: 312 MW
- Installed electric power output: 45 MW
- Output medium: steam 1,0 MPa, 260 °C
- hot water 150/70 °C
- Number of distribution station: 32
- Heat production: 1 820 000 GJ
- Heat supply for central heat supply system: 800 000 GJ
- Electricity energy production: 100 000 MWh
- Distribution length: 31km

3.3 Motivation, problems

One motivation for the installation of the plant was to reduce emissions of SO₂ resulting from coal-combustion – biomass is a fuel free of sulphur. The forthcoming (2016) emission-limits of 200 mg/m³ of SO₂ will, however, not be met with the current plant-design. Additionally, this plant supports Slovak Republic in meeting her renewables-requirements and increasing the share of renewables in a relatively simple way by using available and running fossil-based infrastructure.

Due to the process, the ash from biomass-combustion is mixed with coal-based ash, so it cannot be treated separately and has to be dumped in landfills. Other problems arise from carbon-blackening of the heat-exchangers, the still needed optimization of secondary-air vans, operational handling by the operators of the plant, and the adaptation of the plant to the different qualities of the biomass-fuel.



4Biomass partners at the Study Tour at Zvolenská teplárenská; 04.11.2009