

Biomass Power Plant, Vienna

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After the elections in Vienna at community level in 2001 the Social Democratic Party and the Green Party agreed to build a biomass power plant in Vienna as one of several projects to mitigate climate change. In summer 2002 the federal law on power production based on renewable energy sources came into force, which provided for the necessary legal framework for feed-in tariffs.

In 2003 three companies (one with a linkage to the federal level, two with a linkage to the community level) founded the operating company and in 2005 the construction of the biomass power plant (size ~ 66 MW_{th}) started. Regular operation of the plant began in October 2006. Due to rising steel prices and other factors the actual construction costs exceeded the calculations (estimated at 52 Mio €) by 20 %.

The plant is located on a site (Simmering), where already two fossil fuel fired power plants have been in operation. Thus, parts of the existing infrastructure could be used, e.g. the heat delivery system for district heating, the connection to the power grid and the feed water preparation system. The pre-treatment of biomass (i.e. chipping) takes place at a nearby Danube port.

Apart from round timber also waste wood fractions like bark, wood wool and garden waste are fed to the boiler at an annual consumption rate of almost 200.000 t/a, equivalent to 520.000 MWh. The federal Austrian forest holding and some private forest enterprises deliver the biomass with a moisture content of 30-50 %. The fuel comes from within a distance of 100 km, but – contrary to the original intention – it is almost completely delivered by truck.

The engineering consists of a fuel bunker, a separator, a fuel silo, the circulating fluidised bed incinerator, the flue gas cleaning system and the extraction condensing turbine.

Apart from primary measures a catalyst for NO_x removal (SCR) and a bag filter combined with the addition of lime hydrate and, if necessary, activated coke provide for the effective removal of pollutants. While there are currently no data available of actual emissions, the emission limit values set in the permit are comparably low, particularly for dust (< 10 mg/Nm³, HMV, 13 % O₂) and NO_x emissions (<100 mg/Nm³, HMV, 13 % O₂).

In winter, when there is high demand for heat, the plant (rated thermal input: 65.7 MW) achieves a total efficiency of almost 80 % with an electrical gross efficiency of 23 %. However, during summer and in transient periods the power plant will be operated in the condensing mode only, with an electrical gross efficiency of 37 %. That means, that from total 8,000 operating hours per year the plant will be operated in the combined-heat-and-power mode for only 2,500 hours per year. Thus, the annual fuel use efficiency is well below 50 % and the plant provides for only 2 % of district heat in Vienna, while it could deliver three times more.

In sum, this biomass plant is designed as a highly efficient power plant as regards emissions control and energy efficiency. However, due to its location this potential cannot be fully used (in Vienna, the supply of heat outweighs the demand in transient periods and during summer).