

In Wittenberg, Stadtwerke Leipzig is building its second wood-fired power plant. Leipzig has also become the host of the German Biomass Research Centre, turning the region into an important bio-energy hub in Germany.

Leipzig reforms its energy base



Photo: Stefan Schroeter

| by *Stefan Schroeter*

The most passionate debates in Wittenberg, a small town between Leipzig and Berlin, originated from the church. It was here that Martin Luther, the church reformer, nailed his world-famous 95 Theses to a church door in 1517 and rocked the power structure of the time. In 1983, the Church Congress of Wittenberg caused a sensation in then-divided Germany when it re-forged a sword into a plough share during demonstrations against military armaments. The discussions recently held about the environmental sustainability of a new biomass thermal power plant in the suburb of Piesteritz, have attracted much less notice.

There was concern in Wittenberg that the forests of the Dübener Heide will suffer because wood would be harvested for the new power plant. The Dübener Heide is an important nearby regional recreational area. There was also fear for increased pollution from particulates because of wood transport and power plant operations. But the Stadtwerke Leipzig (SWL), commissioner and operator of the power plant, were sensible enough to provide comprehensive information to the public. For example, SWL has said that particulate pollution will remain well within legal limits. It has also promised to take only small amounts of wood from the Dübener Heide from certified forestry operators, and this would only be waste wood resulting from thinning and forest maintenance.

As construction of the €57 million power plant has progressed, more local firms have become involved, and discussions have become more business-like. This summer, the power plant will commence regular operations producing 20 MW of electricity and 15 tons of steam per hour. The power generated will be fed into the grid of the regional provider enviaM and paid for over 20 years at a fixed feed-in tariff totalling 9.1 cents per kWh. This amount is determined by the German Renewable Energy Law (EEG) and made up of a tariff for electricity generated from biomass, a bonus for the use of renewable raw materials, and a

bonus for power cogeneration. The steam will be supplied to an agrochemical plant.

With this steam supply SWL has gone a step further than in its first, almost identical biomass power plant, built in Bischofferode, Thuringia in 2005. In this area there was no industry that could use the steam from the power plant. On the other hand, all the steam from wood combustion is used for power generation in Bischofferode. For this reason, the electricity conversion efficiency rate of this power plant is 37%, higher than that of the power plant in Piesteritz which operates at 32%. However, the total conversion efficiency rate in Piesteritz reaches 50% when the steam capture is included. Because the steam used in the

Research hub |

In more ways than one, Leipzig is turning into one of the most important biomass centres of Europe. The city has been chosen to become the host of the German Biomass Research Centre (DBFZ), which is meant to become the hub of a nationwide research network for the use of energy from biomass. For now, the DBFZ is housed in a rather run-down building in the “energy science park” in the North-East of the city. The building will be upgraded later this year, when there will be some 150 people working for the institute. DBFZ manager Martin Kaltschmitt says he has a sound financial basis to work from. The Federal Ministry of Agriculture provides €4 million annually. The three federal ministries – for the environment,

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agrochemical plant leads to savings of natural gas, Piesteritz actually generates more energy than Bischofferode, using the same amount of wood and with the same carbon emissions.

Additional investment costs for the new power plant were some EUR 1.5 million, which SWL manager Klaus-Joachim Pfeuffer believes can be recouped in 10 years through steam sales. The SWL manager is proud of the high energy conversion efficiency of the power plants in comparison with other wood-fired power plants of similar capacity. ‘We have rigorously transferred large power plant technology to small power plants’, he explains. This includes technical details, such as a boiler with a circulating fluidised bed, and a water-steam-cycle involving reheating and multistage regenerative preheating. However, at this stage Pfeuffer can’t imagine the company building another power plant in Germany using this design. Recently, the German feed-in tariff support scheme has been changed such that in his view only significantly smaller biomass power plants can be operated profitably. ‘A power plant of this size no longer makes any sense under the conditions imposed by the new law.’

transport and research – are contributing a further €3 million over various terms and in relation to different projects. This is topped up by money from the €30 million Federal Environment Ministry fund, which gets its revenues from the sales of carbon certificates, and will be used to finance nationwide biomass research projects over the next five years. ‘The DBFZ will be able to apply for these projects, which will mainly be undertaken in cooperation with other institutions,’ explains Kaltschmitt.

One of the projects the DBFZ is coordinating is the EU project Bio-SNG, designed to produce synthetic natural gas (SNG) from forestry waste wood. The SNG will be used to fill the tanks of cars. In the area of bio-fuels, the DBFZ is planning to establish a fuel laboratory and a motor testing station. The present laboratory and test facilities for biogas technology and biomass combustion will be expanded and upgraded. Kaltschmitt says one important task for DBFZ is to find ways of reducing emissions of particulates in biomass combustion. The production of bio-energy must not only become more economic and efficient, but also more environmentally friendly. ■