



Beuchte: a bioenergy village

Location

Beuchte, part of Schladen-Werla in south-eastern Lower Saxony, Germany

Description of project or activity

A district heating system was established in the small village of Beuchte in 2008. The heat is produced in two 250 kW furnaces using woodchips which are produced in nearby poplar SRPs, mainly on small fields and marginal lands, by a local farmer. Backup heating is supplied by an oil heater.

The first SRPs were established in 2009. Today more than 30 hectares of SRP are grown within a 10km radius of the village. Currently, 65 households in the village, around half of the total households, are supplied with heat from the district heating system. The heating network has been planned so that additional households can easily be connected. The heat is transported to the households in the form of hot water through a network of underground pipes.

Long-term contracts of 12 years exist between the operator of the heating system and the participating households, as well as between the operator and the woodchip producing farmer, enabling stable prices for the whole contract duration.

Background/objectives

The idea behind Beuchte was to establish a district heating system based on the waste heat of a biogas plant. However, although several households had already adapted to this new kind of heat supply, the biogas plant was never built.

The local farmer, Clemens von König, took over responsibility and planned a district heating system for the village based on woodchips. He made contacts with the inhabitants of Beuchte and the local SRP operator, Hans-Georg von Engelbrechten, to further develop this idea. The existing district heating concept was adapted, heat prices were calculated and contracts were formed, all within 16 months of project conception. The project was financially supported by the KfW (Reconstruction Credit Institute – a German government owned development bank).

Successes

The project is working well. The operator of the district heating system, the supplied households and the SRP operating farmer are all happy with the economic and ecological benefits. The operator is getting good returns (see section costs and benefits), the households have 20% reduced heating costs and the SRP farmer profits from his marginal lands.

Challenges

The original plan was to supply the village with the heat from a biogas plant. Problems with the operator of this biogas plant, however, meant that a biomass heating system was implemented instead, which required a large number of adaptations in the system.

The support of various households not participating in the project was necessary as their gardens were required for the underground heat pipe network.



Short rotation plantation for woodchip production

Costs and benefits

With an estimated operating life of 20 years, the annual operation costs of the district heating system are €62,000, including investment costs (€700,000, of which €300,000 were publicly funded), interest costs, operating costs and fuel costs (€80 per oven-dry tonne of woodchips or €16/MWh). These costs correspond to €47.69 per MWh. The contracted price for the energy of 6.5 cents/kWh leads to revenues of €84,500 for the whole district heating system or €65 per MWh, leaving an overall profit of €22,000 per year or €17 per MWh for the operator of the district heating system.

The SRP operating farmer can sell more than 300 tonnes of oven-dry woodchips at €80 per tonne for at least 20 years, leading to a total profit of €1,700 per hectare per year or €34,000 for the required 20 hectares.

The 65 households have savings of 20% on their energy, compared to fossil energy: 10% from the guaranteed reduced energy price and 10% from the saved maintenance costs of the conventional boilers they used before.

Lessons learnt and recommendations for future projects

All projects are different and each project has its own specific challenges and problems. However, there are some rules that apply to every project. The most important thing is a close cooperation between all the participants. If the project manager and the participants all know and trust each other then the basis for success is there.



Contact details and/or further information

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This project is supported by the European Commission
under call FP7-REGIONS-2012-2013-1 "Regions of
Knowledge" of the 7th Framework Programme for
Research and Technological Development.

