

Bioheat Oplotnica

Report of the technical training in Slovenia



Summary

The project „Bioheat Oplotnica“ is in a roughly planning phase for now. For a more exact estimate of the economic situation are no concrete data available, however, from the spatial infrastructure you can start from the premise that the project realization will be economically. In a first working step a detailed elevation of the heating demand for each object is to be carried out. Besides, not only the potential customers should be considered, but the whole objects in the populous catchments area. By the planning of a district heating plants it is essential to keep an eye on the whole project, i.e. the whole catchments area. The present fuel consumption or the size of the object (m²) is adequate information for a first meaningful analysis.

Starting information

Oplotnica is a young commune in the north-eastern part of Slovenia at the foot of the southern slopes of the Pohorje Mountains. At the area of the commune of Oplotnica people lived already 3000 years before Christ, they found many proofs of aboriginals and their settlements. At the time of the Romans, Oplotnica belonged to the province called Norik, actually between two provinces, Norik and Pannonia. The most famous was the so-called White city, the roman settlement between Oplotnica and Čadram. In Čadram the statue of the pagan god Jupiter was found, which stood in the centre of the city. This shows on the importance of the settlement in those days. The commune gets its complete image from its 21 settlements, which are spreading from 370 metres up to 937 metres above sea level. The most developed activities here are agriculture, fruit growing and wine growing, but also stockbreeding and forestry.

Basic data:

Population:	3975
Height above sea level:	370 m
Location:	in the mountains, in the countryside
Climate:	Healthy climate

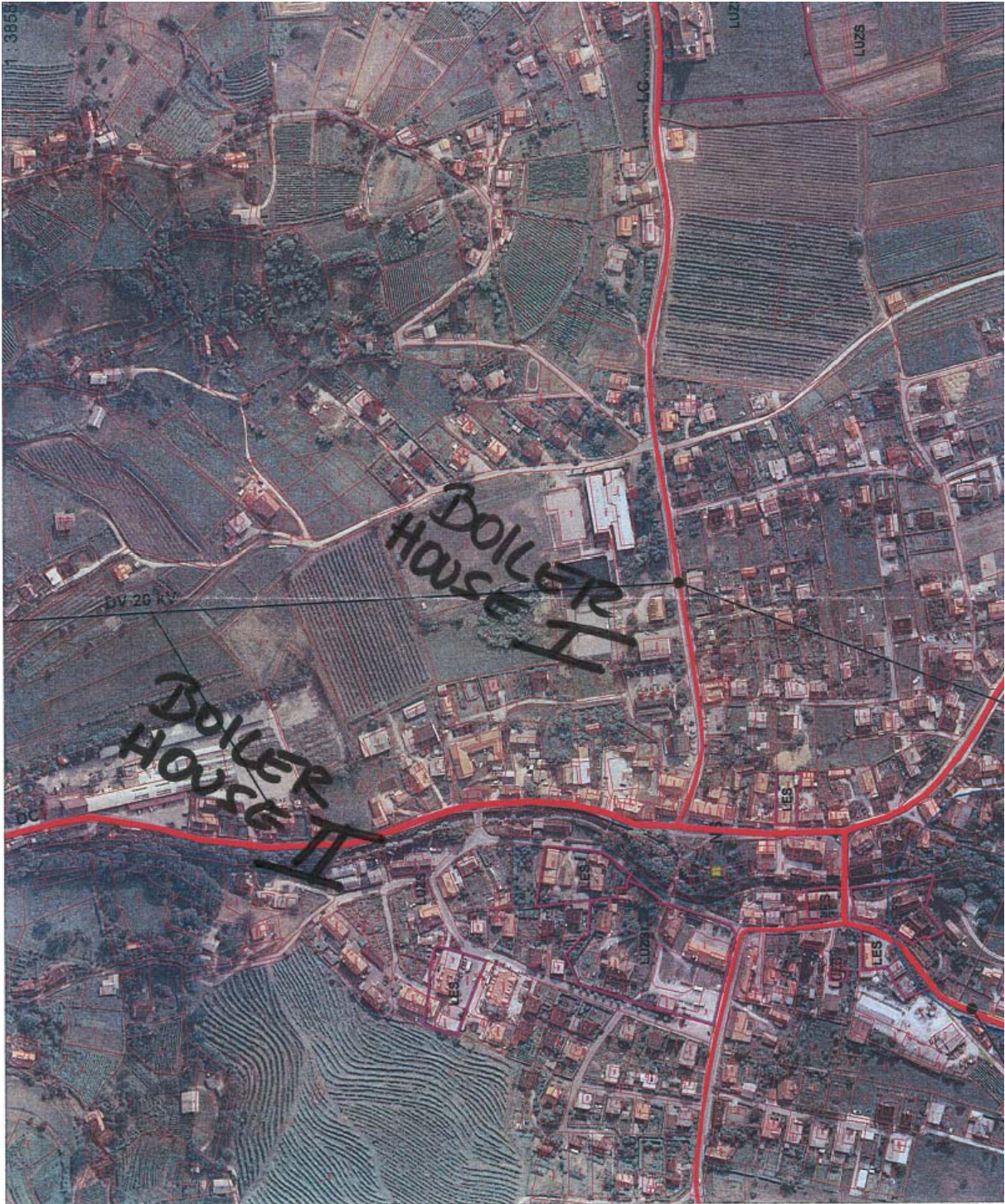
Project description

The project is still at the beginning, so no concrete conclusions can be made. *To further advance the project, it is advisable to do the following tasks:*

- 1) Determination of the heat requirement of the total densely populated catchments area
- 2) Creation of a scale plan, where the individual objects are identified by their heat demand
- 3) Creating a rough study, in terms of economic viability and feasibility of the project
- 4) Discussions with potential investors
- 5) Discussions with potential customers, to inform the public about the concrete project activities (e.g. organize information meetings)

In initial discussions with the community and potential investors, the question of site selection was at the foreground. *There are currently two possible location offers for the realization of the project (see Fig. 1).*

Fig.1: Choice of boiler house location



Question for the location?

In a first stage of expansion it was planned to supply the school centre and the surrounding houses (total consumption: 160,000 litres of fuel oil) As a location for the boiler house the site of "boiler house I" came into question, making the total length of the pipe network very short and e.g. you might have very low heat losses.

In a district heating project you should always have an overall concept in mind, which means you should go out with the rule of a later extension of the district heating network (see Fig. 2). The present infrastructure (densely populated area) in Oplotnica offers very favourable conditions. The extension of the district heating network usually brings advantages not only for customers but also for the heating plant operators. With an increasing heat loss/demand usually the economic profitability increases if it allows the relationship between length of pipes and the heat loss (rough formula: 1.5 – 2 meters length / kW customer demand or 0.5 kW / meters of pipe length)

In a first stage, i.e. school and surrounding houses, would be the need after first estimates for a heating system with a capacity of 1 MW, which brings a certain building infrastructure. For the fuel supply approximately 2,000-3,000 loose cubic meters wood chips are needed, i.e. you also must focus intensively on the logistics.

The fuel storage should include about one third of annual consumption, what means that the storage house alone would have about 200 square meters. Moreover, central fuel storage on the outskirts of the community is of neediness.

In Austria such similar projects (in community centres) have been already implemented. However, you have to consider some basic questions:

- Is there a given acceptance in the population?
- Is an access with heavy machinery possible?
- Is it allowed to chop at the location (noise problem)?

In a further expansion of the heating system or network of pipes, the location could come very quickly to the limits. The place Oplanaica is ideal for a comprehensive coverage of the whole area.

Fig.3: Heat supply area



I: heat service area 1
II: heat service area 2

Since you should always have a full supply in the eye (heat service are 1 and 2) after an initial assessment is more of a location in the periphery eligible.

Site 2 (industrial area of a window manufacturer) would therefore be very suitable as a heating plant site. You could in close proximity of the heating plant store logs for drying and chop it on the ground. This could save transport costs. The transport of timber is significantly less expensive than the transport of wood chips. It would also present an opportunity to build a larger storage, which would require no additional need for an interim storage.

If you assume a total capacity of 3 MW (assumption) then this would correspond to an annual wood chip demand between 6,000 to 9,000 loose cubic meters.

Conclusion

For a full coverage „Site I“ is not optimal. Many heating projects have shown, that a district heating project in most cases starts with an initial solution and in the course of time, in fact of rising demand of the customers, is will be expanded. In many cases the customers decides for the local heat only after his existing heating system no longer works. Rising prices on fossil raw market usually leads to a higher increase of demand.

Contact & Information

Thomas Loibnegger
Energy & Biomass
T: +43 316 8050 1407
thomas.loibnegger@lk-stmk.at

Chamber of Agriculture and Forestry in Styria

Hamerlinggasse 3
8010 Graz
Austria
www.lk-stmk.at



Impressions of Oplotnica



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