

## Subsidy model concerning a facility check and an onsite analysis for district heating plants based on renewable energies

Subject:	Subsidy model concerning a facility check and an onsite analysis for district heating plants based on renewable energies
Description:	Questionnaires and offer of subsidised consulting for district heating operators
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### Summary description of the instrument

Region: Styria (Austria)

Partners involved: AEE INTEC, Land Steiermark, SOLID

In the region of Styria, there are around 600 district heating plants. Some of them are operated by large companies, but the majority is owned and operated by small entities, e.g. farmer cooperatives. The latter don't have own engineering departments or employees who have know-how about planning of solar thermal plants. Therefore a cost free consultancy on integration of solar thermal plants was offered. In order to advertise for this offer in a target-oriented way, project partner Regional Government of Styria sent out a questionnaire to all heating plants and heating grid operators.

### Initial situation

Most Styrian district heating operators are aware of the theoretical option of solar district heating for their grids but they lack knowledge about practical steps towards implementation.

Also, winters were quite warm in recent years and heat sales decreased. This impaired the willingness and ability of heating plant operators to invest in new facilities like solar plants.



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*Fig. 1: Eibiswald district heating plant, a solar thermal frontrunner in Styria*

### Objectives

The objective was twofold: to increase the knowledge about solar district heating both in technical and economic terms (e.g. funding opportunities) as well as to stimulate new investments by DH operators in SDH plants.

### Measures and actions

A survey among district heating operators was conducted including technical specifications of the plants. Moreover, a broader and deeper consulting on solar thermal integration was offered.

Thus the questionnaire raises the knowledge about solar thermal district heating among all recipients and those who answer and make use of the consulting offer may even end up with installing a solar thermal district heating system.

The questionnaire was elaborated and, after a test trial with some persons, it was sent out in September 2017.

A pre-feasibility study was offered to all those who were interested in a solar thermal plant. The results were explained in personal consultation. Also the investment subsidy of climate and energy funds was explained.

In addition there was a mailing to district heating operators and planners in cooperation with Austrian federal solar thermal industry association "Austriasolar" for promoting the subsidy scheme "Large scale solar thermal plants" of Austrian climate fund in order to increase knowledge about the possibilities and procedures among heating plant operators. There were also information events on solar district heating and the federal funding scheme of climate fund by "Austriasolar", Austrian district heating association "fgw" and by climate fund in the cities of Linz and Klagenfurt in November 2018.



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The subsidy scheme is also promoted via magazines and postings in order to inform about the possibility to install solar thermal plants for district heating.

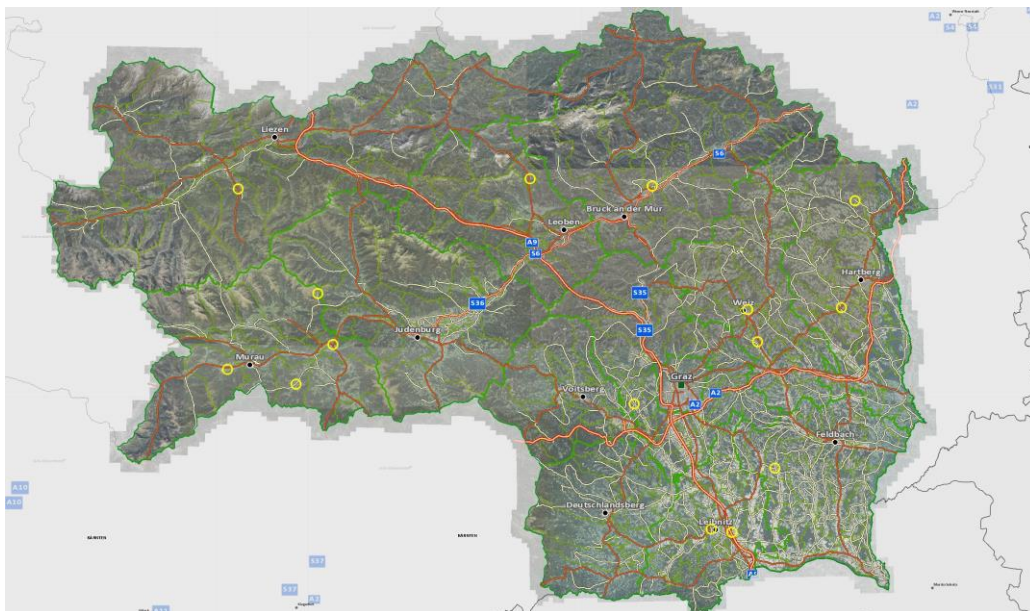
### Barriers and opportunities

The willingness of DH operators to answer questionnaires was limited as there was another survey already conducted some month before by Austrian biomass federation.

In most cases, the areas on the covers of the heating plants were not sufficient for installation of the proposed solar thermal solution. It was also difficult to find suitable land area around the heating plants.

### Results

15 DH operators applied for the feasibility studies, 7 cooperative associations and 8 limited companies, located all over the region of Styria (yellow circles):

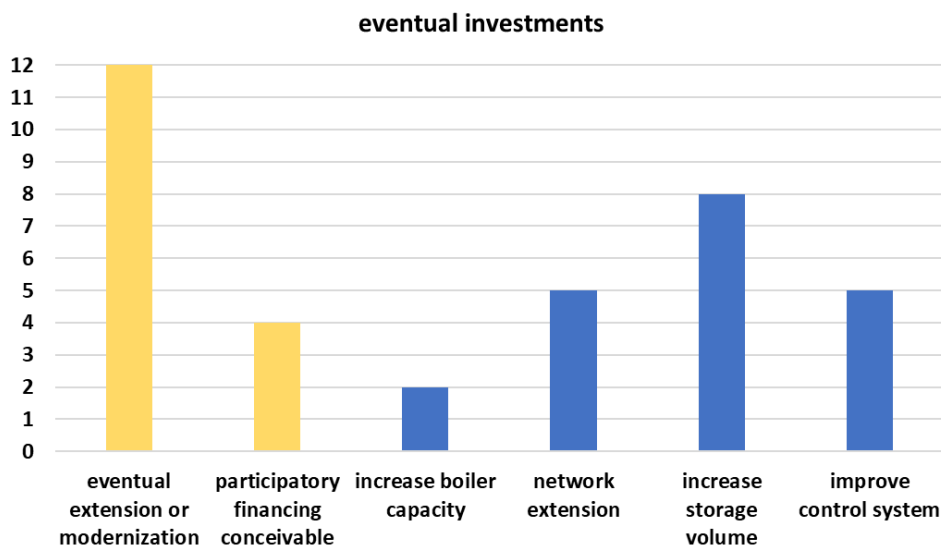


Regarding technical design, five out of the 15 systems were without heat storage. Nine were single boiler plants (excl. back up boilers). No DH plant utilizes waste heat.



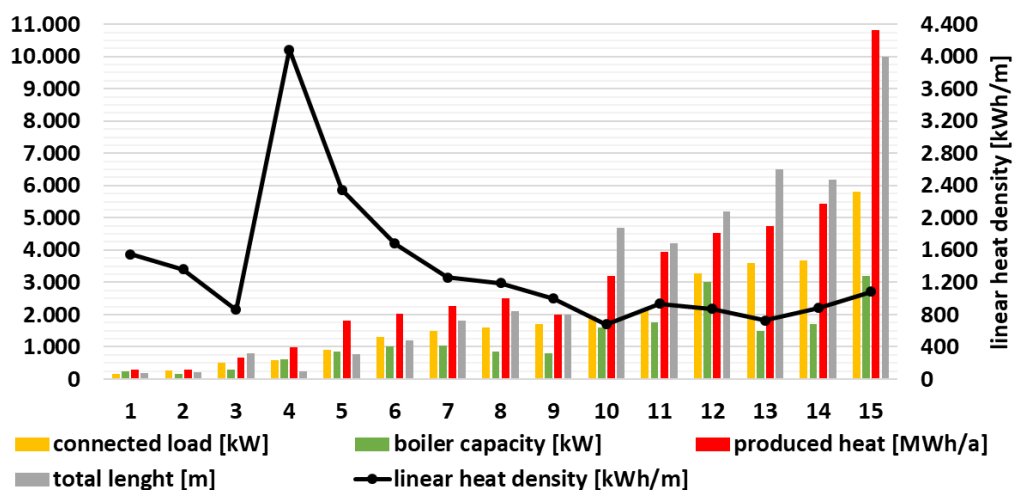
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Also the plans and considerations for investment were asked for:



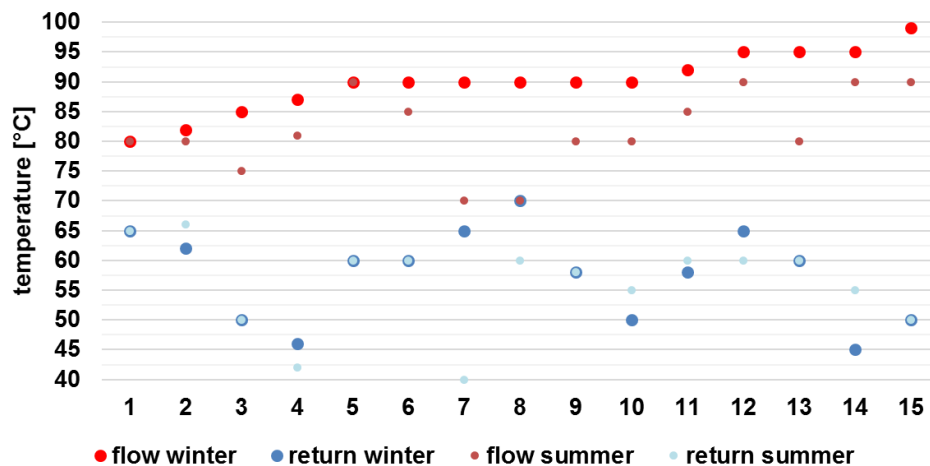
It is interesting that eight operators consider increasing their heat storage volume. This is beneficial, as solar thermal plants also need thermal storages.

Sizes of DH networks:



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Grid temperatures, the lower the better for solar thermal integration:



For economics calculation, a subsidy rate of 43 % (from Austrian climate fund) was assumed. Also estimated operation and maintenance expenses were considered. A cash flow calculation was performed over 15 and 25 years calculation period for obtaining heat generation prices. The resulting heat generation prices, at a consideration period of 25 years, including subsidy, were in the range of 40-50 EUR/MWh. Heat generation prices of the existing systems are in a similar range, but for some operators a payback time of over 15 years is too long. Thus an additional subsidy, e.g. from the province, would be very desirable.

### Lessons learned

Previous knowledge about SDH was mostly poor among district heating operators. Cooperative associations are harder to convince, as members often supply the cooperatives with wood and don't want their supply to be replaced by solar thermal.

For small system, below 2000 MWh/a total heat demand, it is quite difficult to benefit from economies of scale of a large scale solar thermal plant.

Only few grids have return temperatures below 50 °C and thus there is still potential for improvement, which would also benefit solar thermal integration.

There was a big range of DH networks consulted, both in terms of size and also technical and organisational setup.

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