Case study : Jesenik (Czech Republic)

Name of the project: Jeseník, New DH system - U Jatek

Location: 50.239325, 17.211484

Name and type of the owner: Municipality of Jeseník. Jeseník is the capital of the Jeseník district which belongs to the Olomouc Region. Jeseník has 11 579 inhabitants. The city owns total of 6 district heating systems which are operated within lease agreement with SATEZA, a.s.

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Context of the study

Based on the spatial energy policy of Jeseník, the possibility of implementation of solar heat systems in selected localities was presented to the city. Considering the fact that the current spatial planning documents do not designate areas for construction of new residential buildings, the locality between the streets Bezručova, U Jatek and Husova was chosen for the study. The selected area is relatively densely built-up by blocks with individual heat supplies. There is also a high school operated by the region administration in the locality. In the city of Jeseník it is a locality with significant potential for construction of new DH.

Current state

In the selected area there are 19 blocks of flats, high school and a kindergarten. The locality is next to a small DH system belonging to the boiling room Husova. The integration of the current system into a newly built DH system will be the best option in case of realisation. The picture below shows the high school area in green, blocks of flats and kindergarten in blue, and small DH system (Husova) in red. The expected heat supplies for the new locality are summarized in the table.

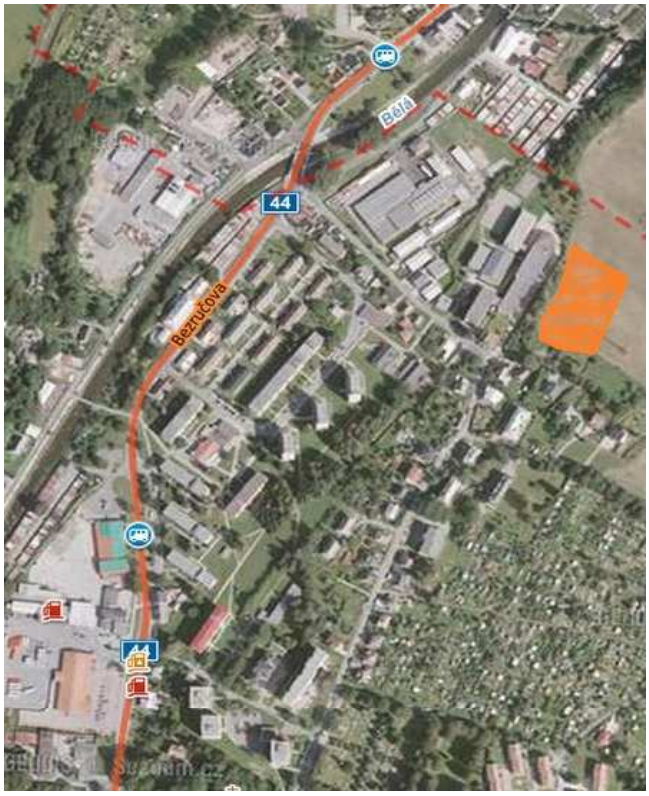
	Number of buildings	MWh/house	MWh
Blocks of flats - large	11	213	2 338
Blocks of flats - small	8	60	480
High school	1	694	694
Kindergarten	1	150	150
Total - new locality	**21**		**3 662**
Connection on DH Husova	4	213	850
Total - DH Husova included			**4 512**

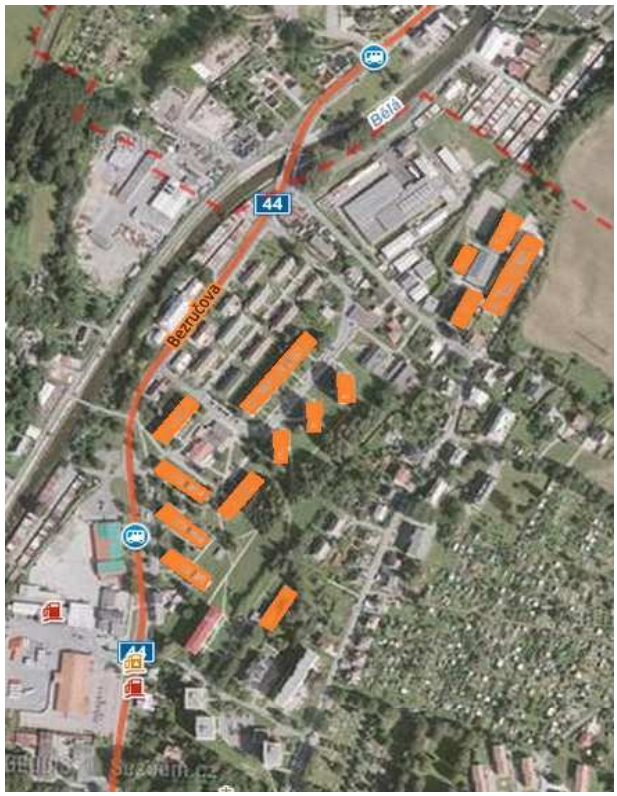
SDH plant

The solar heat system will be evaluated as a supplement to the main heat source which would most likely be biomass or natural gas boiling room.

SDH system concept

Due to space limitations of the locality, the central solar system is considered with placement of the collectors on the agricultural land next to the high school. Alternatively, it is possible to consider realisation of decentralized solar systems on 14 supplied objects with appropriate orientation and construction of the roofs. The central variant with placement of the solar collectors on the objetcs' roofs proved inconvenient due to the required length of the primary distribution system.





SDH technical data

The calculation was performed in the on-line calculator tool (http://www.sdh-online.solites.de). Considering the expected heat consumption in the area, the central solar system with solar share of 10 % was evaluated. That corresponds with solar collector area of 1500 m^2 and storage tank volume of 450 m^3.

SDH energy balance (MWh)

Total heat production	MWh	3 662
Collector area	m^2	1 500
Storage volume	m^3	450
Solar heat production	MWh	432
Solar fraction	%	10
Specific solar gains	kWh/m^2.rok	288
CO_2 reduction	t/rok	2 730
Investment costs	EUR	677 000
Solar heat cost	EUR/MWh	134

SDH economics

The solar heat price in the locality is crucial for presenting the economic results of the solar system. In case of realisation of the new central biomass boiling room, the heat price of 500 Kč/GJ can be expected. The price from the above described solar system is not competitive.

SDH plant opportunities & threats, benefits & limits

The construction of new DH systems will be supported in the 2014-2020 funding period, both through the Operational Programme Environment, and the Operational Programme Enterpreneurship and Innovation for Competitiveness. The potential realisation of solar system as a part of newly built DH system is possible only with receiving of appropriate subsidy for covering the difference between the production heat price. Detailed conditions of particular calls of the new operational programmes are not yet set up. The real co-financing rates in the similar projects vary between 50 and 70 % which would reduce the solar heat production cost to 302 - 503 Kč/GJ. The agreement of connection with the operator of the adjacent industrial site or potential integration of the Husova boliling room system could have positive effects on the operation and economic results. Certain limitations are represented by available roof area of the potentially connectible objects, and property rights in case of construction of solar system on the agricultural land close to the high school.

Authors

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