

Simplify the availability of area for large-scale solar thermal plants

Subject:	Best-Practice Policy and Legal Framework (Factsheet D3.1)
Description:	Simplify the availability of area for large-scale solar thermal plants
Date:	27.06.2018
Authors:	S. Skalicki, Province of Styria, M. Schubert, SOLID, E. Selvička u. C. Seidnitzer-Gallien AEE INTEC
Document download:	www.solar-district-heating.eu/en/knowledge-database/

Summary description of the instrument

Region: Styria (Austria)

Partners involved: Province of Styria, SOLID, AEE INTEC

Short description of the measure: Locating and demonstrating the provision of suitable land areas for the installation of solar thermal systems for local district heating networks.

Initial situation

In Styria, large district heating plants with a higher heat demand for hot water in summer are installed almost exclusively in urban regions. The municipal utilities or large energy suppliers that operate these plants are faced with the challenge that land areas in and around cities cause relatively high costs if they are used as building land or industrial sites. Landowners who own property for potential solar energy systems are therefore expecting the value of their land to rise in the future and demand relatively high rental or purchase prices, which significantly reduces the profitability of solar energy systems for district heating.

In the past, there have been many efforts to install large solar thermal systems for district heating on roofs. However, implementation has also been quite rare, due to uncertainty about long-term availability, a local discrepancy between suitable feed points and available large connected roof areas, roof statics (wind and snow loads), etc. Therefore, the use of open spaces for future solar thermal heat generation is essential, even in combination with seasonal



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 691624

Simplify the availability of area for large-scale solar thermal plants

storage tanks, which also require land areas.

Objectives

This measure aims at making land available for energy generation. In particular, it focuses on the possibility to identify free areas in the form of "green zones" and "agricultural priority zones" for efficient heat generation and to consider the use of these areas in the planning and expansion of local district heating networks. Together with the municipal decision-makers, the energy priority zones should be fixed in the local energy spatial planning so that future investments do not fail in their implementation due to restrictions in the availability of land.

Measures and actions

For this new approach of reserved areas for energy generation, a broad consensus must first be found on the necessity of future energy supply with regionally available renewable energy sources. This also requires knowledge about the energy demand and this is the reason why spatial energy planning must be the first essential step. To this end, experiences from other countries (e.g. in the federal state of Salzburg) will be exchanged, and the implementation of first pilot projects in Styrian municipalities with a district heating network will be initiated. The integration of solar thermal systems for the provision of renewable heat will be an essential part of the work in the context of the preparation of these first spatial energy planning concepts.

Barriers and opportunities

The necessity of providing renewable energy locally and the associated relief of energy networks is currently seen only by individual energy suppliers in Austria. In some cases, the opinion exists that electricity, heat and gas networks can still be further expanded and that the market will determine which energy source will ultimately be given preference. The fact that an exit from fossil fuels, as demonstrated by the Nordic countries, can hardly be achieved soon, will be consciously or unconsciously overlooked.

If it is possible to help decision-makers at the municipal level to make future investment decisions with the help of spatial energy planning, then technologies such as solar thermal, which is disadvantaged by the current approach due to very high initial investments and hardly any operating costs, will also have a great chance of being implemented.



Simplify the availability of area for large-scale solar thermal plants

Results

In addition to implementing the local energy spatial planning and anchoring the use of open spaces for solar thermal systems, the aim was to gather detailed energy and heat demand data.

In the first step, energy consumption and greenhouse gas emissions were collected at the municipal level to characterise the regional energy balance. This survey, marked as the opening balance, was carried out for all Styrian municipalities.

For the detailed analysis (step 2), the regional building infrastructure and the current renovation standard must be surveyed so that the heat demand for the region can be determined and the current situation of the district heating network can be mapped. The results should be summarised in a regional GIS map showing the local heat density. In addition to the status quo, the future renovation standard of

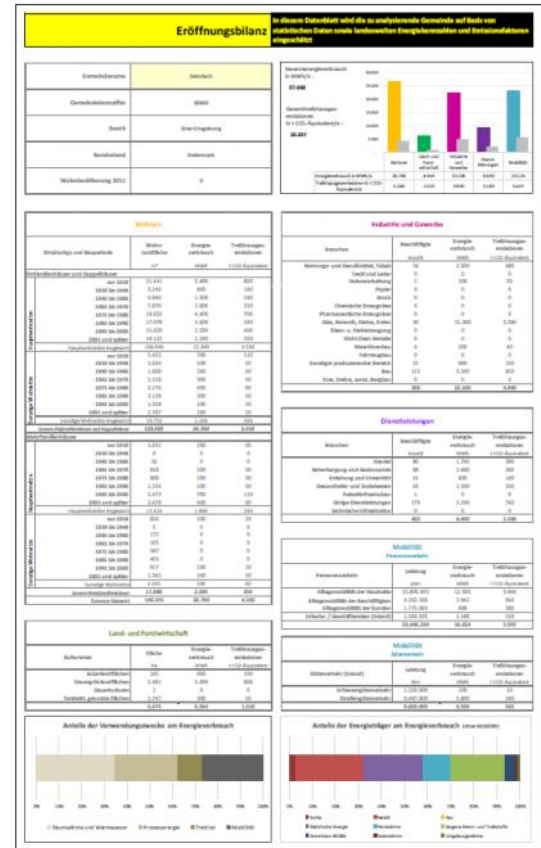


Fig. 2: Presentation of the regional heat density, (Status Quo – Step 2 (Source: AEE INTEC)

the buildings had to be estimated and mapped in various scenarios. The current heat density of the region can thus be compared with future standards and provides certain results for the expansion of a local or district heating network.

The hot spots for the regional and urban heat supply can be identified with this analysis, and the planning and expansion of the heat network can be carried out in a structured manner. The defined heat hot spots form the basis for the definition of priority expansion stages for the regional, local or district heating network. For this purpose, it should be possible to analyse the green zones and agricultural areas neighbouring the existing and future heating network as a priority for solar



Simplify the availability of area for large-scale solar thermal plants

areas (step 3). The available areas must be evaluated depending on the size and distance to the district heating network so that they can be included in the spatial energy planning for future use in cooperation with the municipal decision-makers. These detailed analyses have been carried out for two municipalities (Gleisdorf and Leibnitz) in Styria and will also be carried out for other municipalities in Styria after completion of the project. In addition to the integration of solar thermal systems in existing networks, investments in new district heating networks should also be considered.

Furthermore, the efforts of spatial energy planning have also been supported by a working group, formed by experts from the fields of environmental promotion, regional and supraregional spatial planning, energy technology and air quality as well as environmental protection. The working group identifies opportunities to use free areas ("green zones" and "priority agricultural zones") for efficient local energy supply.

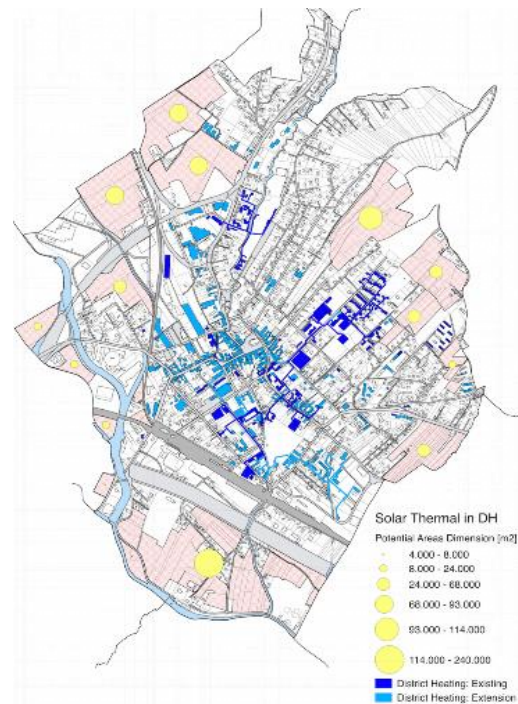


Fig. 3: Presentation of the potential solar thermal areas - Step 3 (Source: AEE INTEC)

Lessons learned

Early cooperation with municipal decision-makers is necessary for the final definition of open spaces and agricultural areas in local spatial planning. Targeted workshops between decision-makers and technical experts are suitable for this purpose to demonstrate advantages for regional spatial planning and to create sustainable energy management. All legal usage details have to be clarified when reserving the relevant areas for solar thermal in the local plan, so that no additional barriers arise for operators and investors.

The establishment of a working group for local spatial energy planning is mainly positive. In this way, the municipal decision-makers also emphasise the importance of the topic.

⌋ *The sole responsibility for the contents of this publication lies with the authors. It does not necessarily reflect the opinion of the European Union. Neither the European Commission nor the authors are responsible for any use that may be made of the information contained therein.* ⌋

