SDH
solar district heating

SUPPLYING RENEWABLE ZERO-EMISSION HEAT

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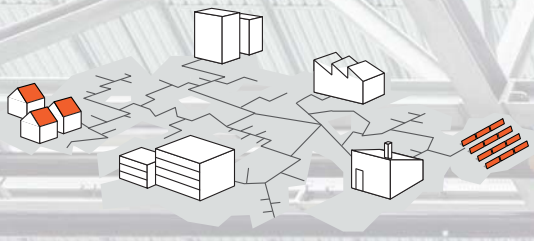
Solar District Heating

District heating and solar thermal energy play an important role in the energy transition of the heat sector in Europe.
District heating is one major approach to increase the overall energy efficiency in urban areas and an important platform to increase the share of renewable energies in the heat supply.



Advantages of solar thermal energy are:

Emission-free

Zero emissions and 100 % renewable energy lead to a maximum sustainability in the heat supply.

Available everywhere

Solar energy is unlimited and can be used in principle at any location in Europe.

Cost stable

Heat generation costs are competitive, stable and known on the first day of operation for the next 25 years.

SDH for districts

In cases of renovation or new construction of urban quarters, local heating networks are a valid option for heat supply. Depending on the building type and equipment such networks can be operated at low temperatures, which are favorable for integrating solar thermal plants.

Such systems usually reach up to 20% solar contribution to the total heat supply. Furthermore, the integration of a seasonal heat storage to the system can increase the solar fraction up to 50%.

Vallda Heberg, Sweden

This building area inaugurated in 2013 is centrally supplied by a district heating system combining biomass and 680 m² of roof-integrated solar thermal collectors. All buildings have been designed according to very high energy standards and have a low specific heat demand. Nevertheless, the central heat distribution system is effective and allows an efficient use of renewable energies.

SDH for small cities, villages and communities

District heating systems supplying heat to small cities and communities in rural areas allow a fast and comprehensive transition of the heat supply to local, renewable resources. For example, the combination of a large-scale solar thermal plant to cover the summer load and a biomass heating plant is an economically interesting concept to supply local networks with renewable heat. In such projects, the involvement and participation of citizens are essential success factors.

In Büsingen the 1 090 m² large-scale evacuated tube collectors provide all the heat supplied by the district heating network in summer, avoiding an uneconomical part-time operation of the biomass boiler. The district heating net, in operation since 2013 provides 100 buildings with 100% renewable heat, and stands as best-practice example for further 'energy villages'.

Büsingen, Germany

SDH for urban areas and cities

Large urban district heating systems are usually operated with heat from combined heat and power plants, heating plants or industrial waste heat. Fuels are often natural gas, coal, waste or biomass.

The integration of large-scale solar thermal plants is one possibility to increase the share of renewable energy sources in such district heating systems.

Graz, Austria

In Graz, more than 13 000 m² solar thermal collectors feed directly into the city's district heating network at three different locations. Further 3 700 m² supply sub-networks connected to 1 000 apartments. The plants are either roof-integrated on residential buildings or public infrastructure, or ground-mounted on free areas in and around the city. Solar heat reduces the use of gas boilers and the dependence on fossil energy prices and there are concrete plans to significantly increase the solar thermal share to approximately 20% of the yearly heat demand of the entire district heating network.

Smart District Heating

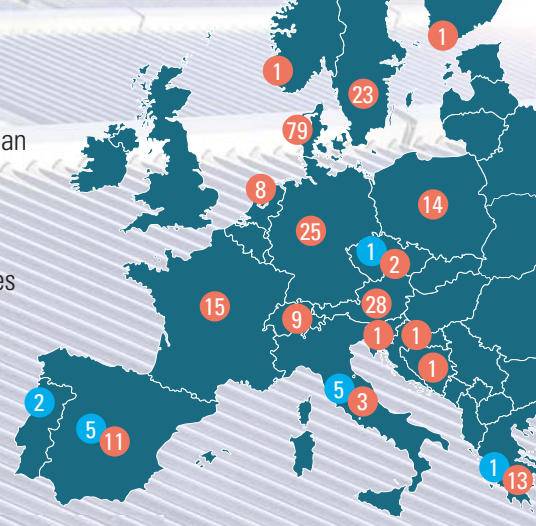
Large scale solar plants can also be combined with other technologies for the production of electricity and heat as well as large heat storages. In Denmark, several "smart district heating" plants are in operation. The key element of this concept is the storage which makes the system flexible and allows an efficient combination of several energy sources: renewable energies, cogeneration plants and heat pumps or electrode boilers as power-to-heat applications. This flexibility allows the plant to be operated in a "smart" way, particularly regarding fluctuating electricity prices.

The supply system of the district heating plant of Gram combines 44 800 m² of solar thermal collectors, a heat pump, gas cogeneration plants, an electrode boiler and several fossil fuel boilers. A pit thermal energy storage of 122 000 m³ allows a flexible operation of these wide range of energy generators. The operation as "smart district heating" plant started in 2015, after the extension of the existing solar thermal plant and the construction of the long-term storage.

Gram, Denmark

Market

At the end of 2015, 252 plants with more than 350 kW_{th} nominal power were in operation in Europe. The technology is booming in Denmark and a dynamic growth can be observed in several other European countries like Sweden, Germany and Austria. The total installed capacity amounts to 750 MW_{th} and the yearly upturn is presently over 30%. Moreover, an increasing number of countries are following this trend and new markets have started to develop, for example in Italy and France.



252 solar thermal plants for the generation of heat and cold each with more than 500 m^2 collector area / 350 kW_{th} nominal capacity.

SDHp2m…from policy to market

Within the Horizon 2020 project SDHp2m, regions and experts cooperate to develop and implement advanced policy and support measures for SDH.
The project involves 15 partners in 9 European regions from 7 countries and aims for a significant market rollout for SDH. Policy and support instruments developed within the project will be available as blueprint for developing SDH in other European regions.
For further information and project results visit the website and don't hesitate to contact us.

Project duration
01/2016 - 12/2018

3 focus regions
Styria (AT)
Thuringia (DE)
Auvergne-Rhône-Alpes (FR)

Partners
15

6 follower regions
Varna (BG)
Veneto (IT)
Valle d'Aosta (IT)
Västra Götaland (SE)
Mazowsze (PL)
Hamburg (DE)

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