Case study : n°2 (Austria)

Context of the study

S.O.L.I.D. contacts "Stadtwerke xxxxx" due high subsidy rate in Austria for solar district heating plants. The company was interested in savings and asked for quotation and payback period. Now the company is still recalculating and considers a larger area to install a bigger solar plant, which should be minimal 4,000m².

Support

In Austria a funding program **exists, which is called "Solar Thermal – Large-scale solar plants"** of the Austrian climate fund: It promotes the design and construction of innovative solar systems and integration into the system in four areas:

1) Solar process heat for manufacturing plants

2) Solar feed-in grid-connected heat supply systems (micro-networks, local and district heating networks)

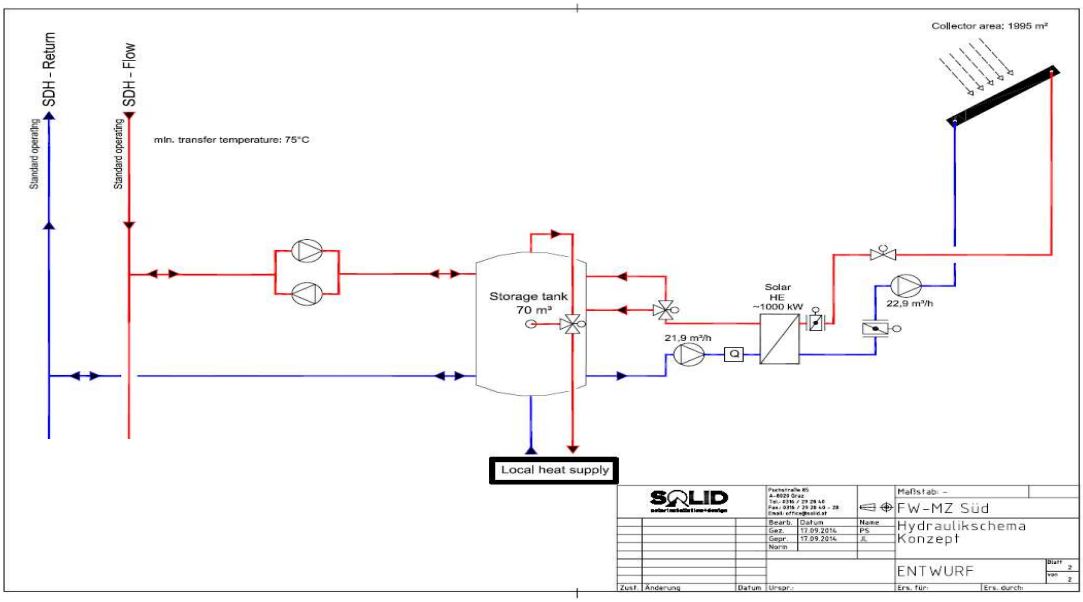
3) High solar fraction (over 20% of the total heat demand) in commercial and service enterprises

4) Solar-assisted air-conditioning plants and its combination with solar hot water heating and cooling demand duri

The **subsidy rate** in all four subject areas is max. 5**0%** of the environmentally relevant additional needed invest

SDH plant

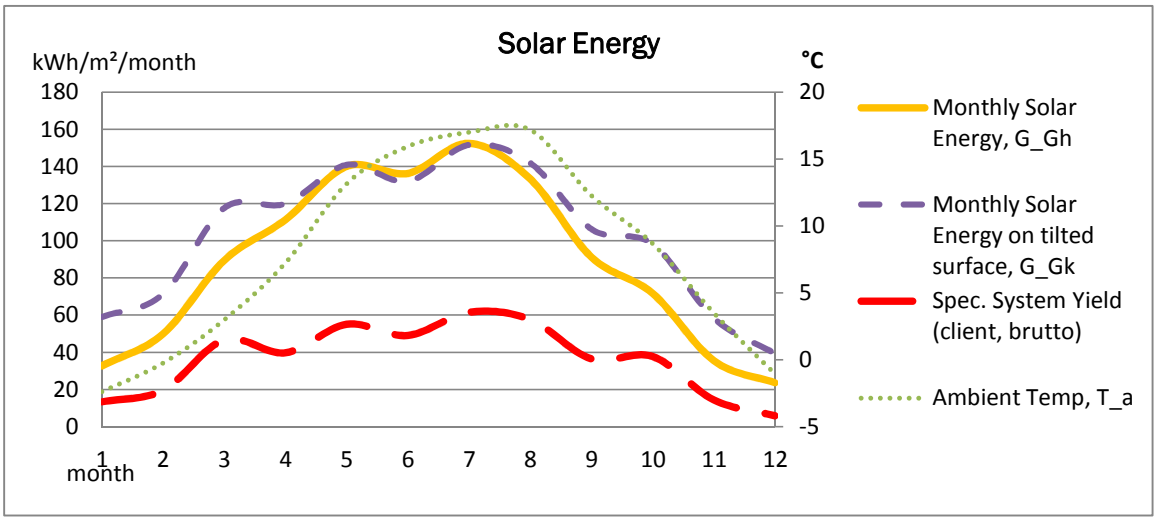
SDH system concept



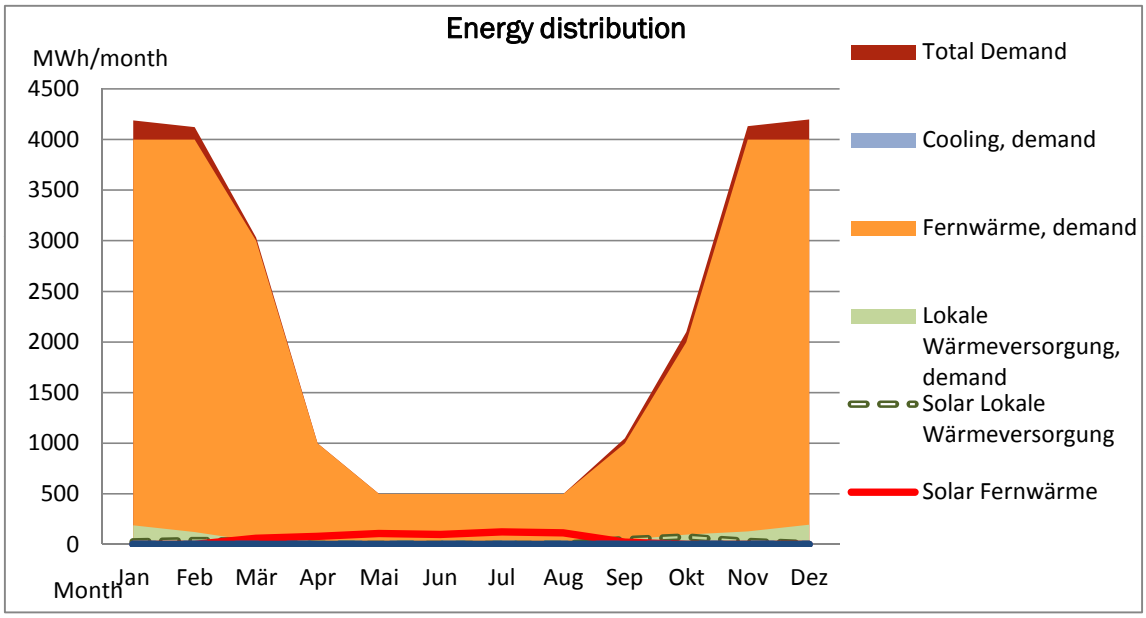
SDH technical data

The collector field is about 2,000m² and ensures a daily need of hot water from May to August. Summer demand is calculated with a solar ratio of 25%. On clear summer days a solar ratio of 35% can be reached. For this situation one storage tank with a volume over 70m³ is designed to store 3 MWh. Expansion unit and heat exchanger is needed in the solar circuit due to cold weather condition in winter. Solid assumes a solar energy yield of 871 MWh per year.

SDH energy balance (kWh)



Solar plant is designed to produce 35% of energy demand in summertime. In shoulder season March to April and September to October we will use the existing gas boiler to ensure a constant energy supply with low losses of boiler. From mid of October till mid of March the plant switch to biomass operation. The customers need about 25,000 MWh per year. Most of them is needed between November and March. In this time the plant is in biomass operation. The solar energy yield is only a small fraction of the entire demand. About 2 to 3% of energy demand is produced by solar plant which causes savings of high energy losses in the big boilers.



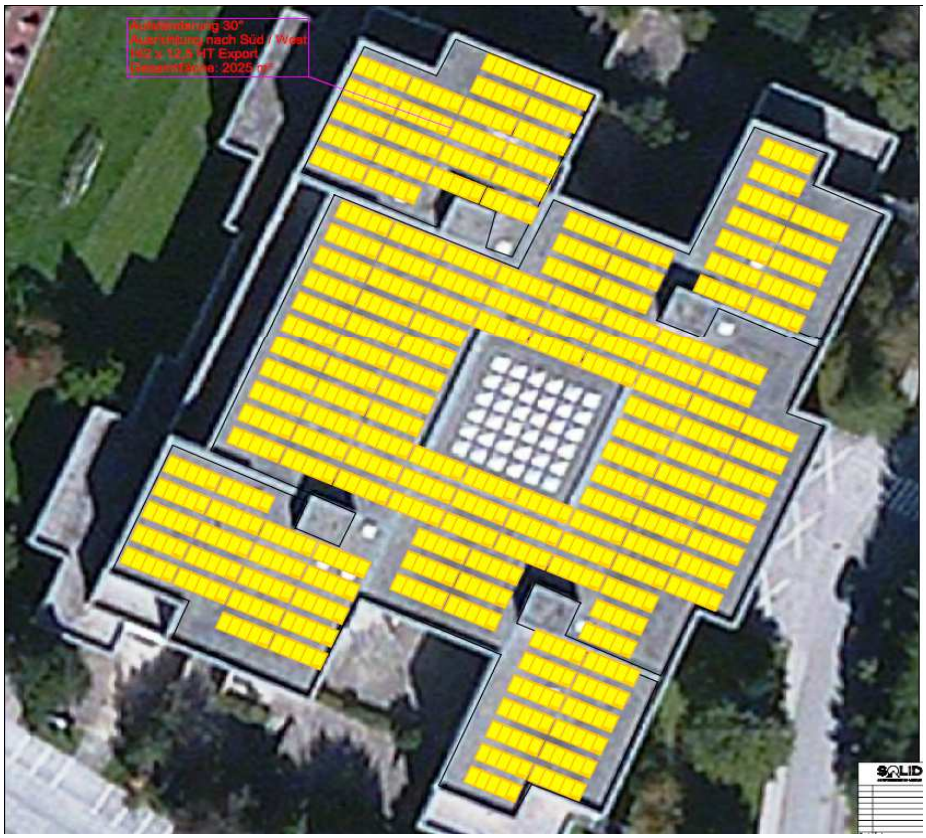
SDH economics

Refunding of Solar Plant		
Investment / m² [€]		**380,0 €**
Subsidy [%]	**42%**	
Solar Field [m²]	**1995**	
Costs of Solar Plant		758.100 €
Subsidy	-	318.402 €
Investment		**439.698 €**
earnings per m²/a		420
earnings each year [MWh]		837,9
price of saved primary energy/MWh		45,00 €
annual savings primary energy		37.705,50 €
annual operating costs	-	4.000,00 €
amount of refunding		33.705,50 €
annual interest payment		3%
refunding (years)		16,8

SDH plant opportunities & threats, benefits & limits

General benefits: 1) Energy solution with a minimum of maintenance work 2) Greater independence from conventional energy sources; Stable energy prices for the next 25 years; Annual energy (electricity, gas) savings due to solar system; Reduction of carbon emissions

Photos



Authors

This factsheet was prepared by Robert Söll

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