



# ProEcoPolyNet Best practice Sheet "Solar District Heating"

## RTD Project Identification

Solar district heating Speyer Alter Schlachthof  
Project No. 032 9604 A

Programme Solarthermie2000plus supported by  
Federal Ministry for the Environment, Nature  
Conservation and Nuclear Safety (BMU)

## Description of technology

On the ground of the former slaughterhouse in  
Speyer, 61 single family houses arise with an  
entire living space of approximately 9.300 m<sup>2</sup>. All  
buildings are designed in a low energy  
construction and are connected to a local  
district-heating-net. The heat supply takes place  
with a 599 kW gas calorific value boiler and a  
545 m<sup>2</sup> thermal solar plant.

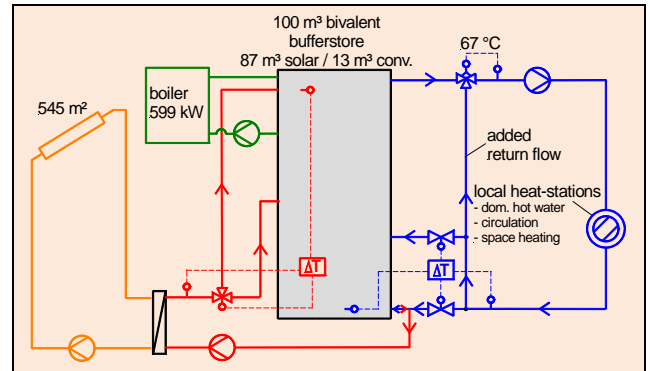


source: Stadtwerke Speyer; EGS-plan

## Operating principle

The collector field heats a 100 m<sup>3</sup> buffer store up  
to a maximum of 95 °C, whereby the 13 m<sup>3</sup>  
upper part of the store is held to minimum-  
temperature of 68 °C by the boiler. The heat  
extraction from the buffer takes place via the  
local district-heating-net. The return-flow of the  
net into the buffer flows at ground level of the  
buffer or at one third of height.

If the buffer is on top warmer than the allowed-  
pre-flow-temperature of the district-heating-net  
(67 °C), the pre-flow get cooled with added  
water from the return flow.



schematic of solar system

## Technical characteristics of installation

- ▶ Type: solar added district heating
- ▶ 545 m<sup>2</sup> flat plate collector
- ▶ 100 m<sup>3</sup> bivalent buffer store  
(13 m<sup>3</sup> conventional / 87 m<sup>3</sup> solar)
- ▶ 599 kW gas-calorific value boiler

## Location and use

- ▶ Speyer, Germany
- ▶ Solar added district heating for family houses



## Capital investment and maintenance costs

- ▶ Cost of solar system incl. planning and VAT: 357.000 € (655 €/m<sup>2</sup>)

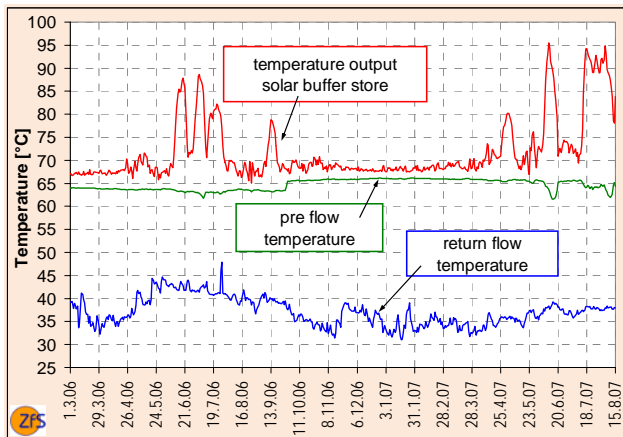
## State of Development/Market implementation

- ▶ *Demonstration project*

## Operational data

- ▶ *Total heat demand (planning): 762 MWh*
- ▶ *Useful solar heat (planning): 164 MWh*
- ▶ *Solar fraction (planning): 21,5 %*
- ▶ *Solar system efficiency (planning): 26,1 %*

For a high solar efficiency, it is important, that the return temperature from the district-heating-net is low. The return temperature varies on a low level between 44 °C in summer and 31 °C in winter.



## CO<sub>2</sub> and primary energy savings

Gas saving 16.000 m<sup>3</sup>/a (planning)  
 avoided CO<sub>2</sub> emission: 36.000 kg/a (planning)

daily average values of system-performance

## Benefits and obstacles

The results of experience gathered are satisfactory: for instance the achieved average return temperature of 40 °C in summer 2006 is sufficiently low for efficient operation, and the efficiency of the collector array is high. The volume of the buffer storage tank of 100 m<sup>2</sup> however is still too large, project monitoring is continuing with the installation of another collector array. After analysis of the measurement results of the final development phase, a conclusive assessment of efficiency can be expected in the year 2008.

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