

German solar district heating systems

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Slide 2

Solar district heating



Shallow geothermal



Simulation



Transfer



Our goal: Energy supply systems with minimised CO₂-emissions

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Online, 08.05.2024

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Solar and Bioenergy-Village Mengsberg

Slide 3



100 % Renewable heat

81 % Wood chips

17 % Solarthermal

2 % Biogas

Collector area: 2,950 m²

Buffer storage: 300 m³

Photo: Mengsberg BEGM
eG
www.begmengsberg.de

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Mengsberg's energy community owns the district heating system

Slide 4



141 participants

4,000 EUR deposit per building for the transfer station and the piping to the house.

112 EUR/MWh heat price (status November 2022). No basic price is charged.

Graphic:
IEA SHC Task 68
Source:
Bioenergiegenossenschaft Mengsberg

Energy communities are an important part of the heat transition

Slide 5



ConnectHeat

- Community engagement for clean heat

The first European initiative to develop heating and cooling communities in Europe

Creating concepts, developing manuals, guidelines and recommendations for application and knowledge transfer

Seven real pilot cases to implement community-led energy projects in different EU countries

More information:

[https://www.linkedin.com/
showcase/connectheat/?
originalSubdomain=de](https://www.linkedin.com/showcase/connectheat/?originalSubdomain=de)
[https://connectheat.ambie
nteitalia.it/](https://connectheat.ambienteitalia.it/)



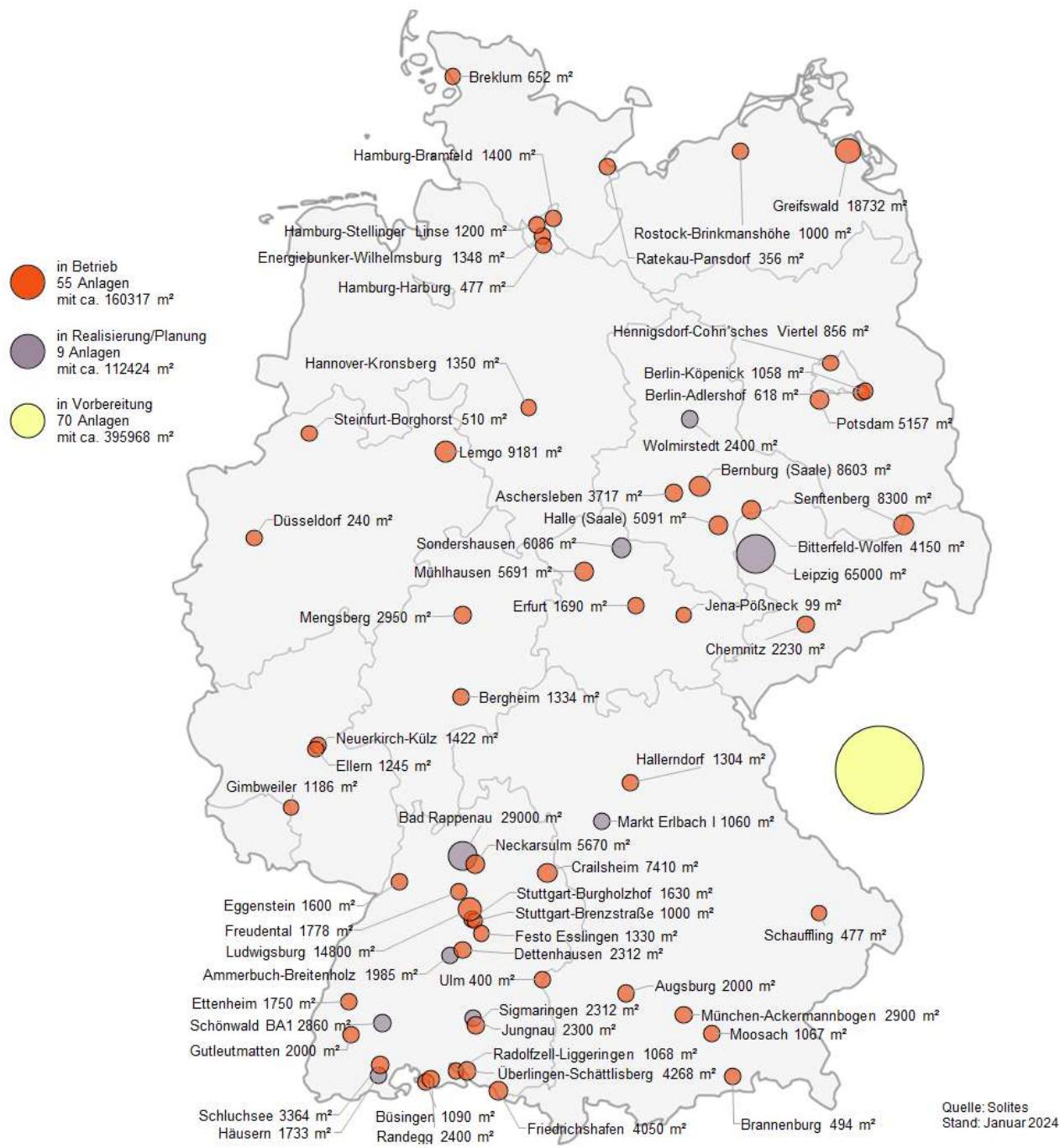
Manual about energy communities (in German): [direct link](#), www.solare-wärmenetze.de



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- bioenergy villages with heat from wood and solar
- Small towns
- Urban SDH
- Collectors on buildings

Information material for various target groups
e.g. www.solare-wärmenetze.de

Supporting laws and funding in Germany

- Climate-neutral building stock 2045
- Local heat planning is mandatory for all cities since 2023
 - Definition of areas for DH and for single house solutions
- New national law „Building Energy Act“:
 - new heating systems of houses has to reach a minimum of 65 % of renewable share or get connected to DH.
 - DH systems have to make a transformation plan for total decarbonisation until 2045 and have to follow this plan.
- Subsidy programme BEW „efficient district heating“ since 2022
 - Funding for invest and operation in sum 50 % of invest possible
 - Includes different technologies for renewable heat supply in DH

Next step in size of Solar District Heating plants



Municipal utility in
Leipzig, Germany
65.000 m² collector field
Collectors deliver heat
with up to 110 °C

Photo: Ritter Solar XL

Research topics: Each temperature level in DH has a suitable collector type



Concentrating collectors (Point Focus Fresnel) deliver heat at around 160 °C in Hørsholm, Denmark (Photo: Heliac)



Combination of flat plate collectors (up to 70 °C) and parabolic trough collectors (operated at 95 °C) in Taars, Denmark (Photo: Aalborg CSP)

IEA SHC Task 68
www.task68.iea-shc.org

Report on 'Analysis of different collector technologies' will soon be published

New German research project: Pro-Sol-Netz

Gefördert durch:



aufgrund eines Beschlusses
des Deutschen Bundestages

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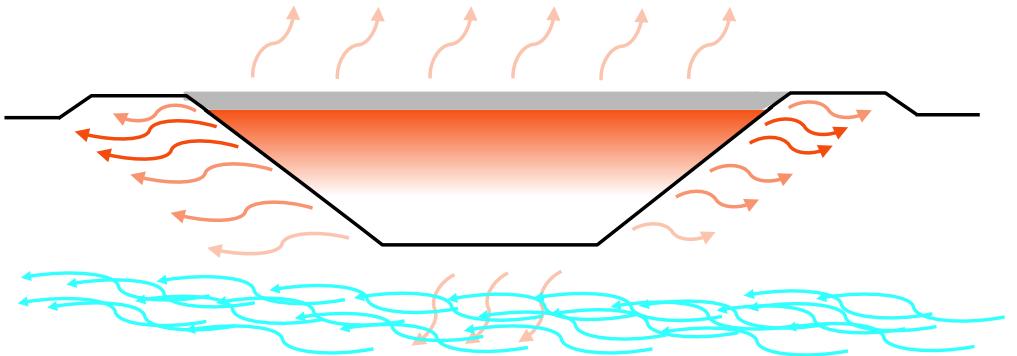
Research topics: Thermal Energy Storages

Slide 10

System integration of heat storages

Construction methods and materials
need to consider:

- Long-time durability of materials
- temperatures of the storage water of up to 95 °C
- Transfer of water vapor
- Outgassing of the storage water
- Rainwater on the cover



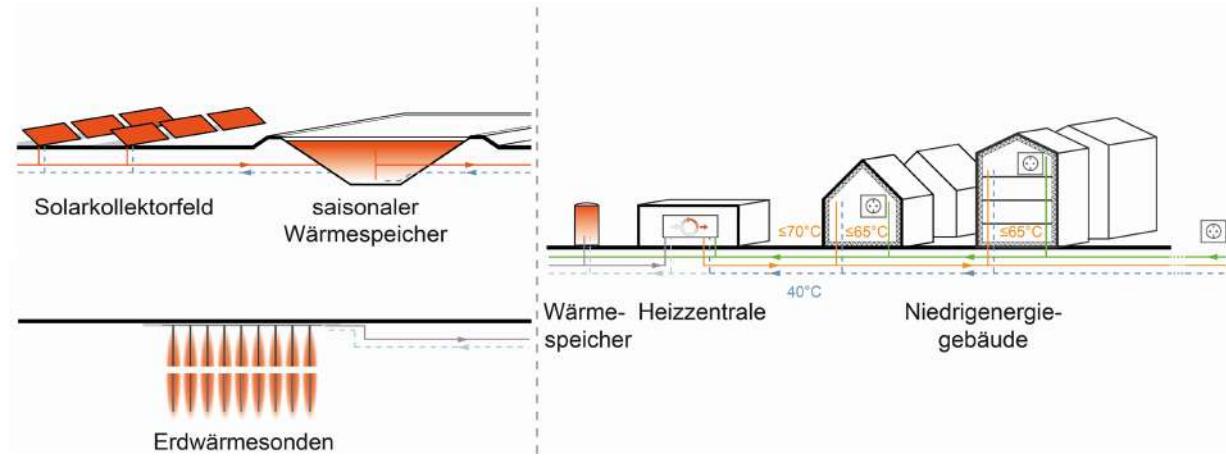
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 Federal Ministry
for Economic Affairs
and Climate Action
on the basis of a decision
by the German Bundestag

Best practice: Energy concept „Killberg IV“ in Hechingen



- New district with 760 apartments
- Heat demand of 4 GWh/a (forecast) in DH with 70°C supply temperature
- 7 000 m² solar thermal system (**70 %** of heat demand)
- 18 000 m³ pit heat storage on earth landfill
- 40 ducts with 180 m depths (25 % of heat demand)
- 2 heat pumps
- **95% fossil free district heating**

Project SolnetPlus

Solnet Plus

Goal: Increasing the development of large solar thermal systems in local DH networks

Duration: 06/2021-05/2024

Partners:

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AGFW

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Newsletter (German):

www.solare-wärmenetze.de/newsletter



LinkedIn: „[Solare Wärmenetze](#)“

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More Information?

IEA SHC Task 68: SDH Info Package for Cities and Towns
<https://task68.iea-shc.org/article?NewsID=459>

IEA SHC Task 55: Brochure Solar Heat for Cities
<https://task55.iea-shc.org/Data/Sites/1/publications/Solar-Heat-for-Cities--The-Sustainable-Solution-for-District-Heating.pdf>

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