Current Market Status of Solar District Heating

19th June 2024, Heat is Half, BSW Solar

Magdalena Berberich

Steinbeis
Research Institute for
Solar and Sustainable
Thermal Energy Systems

Meitnerstr. 8
D-70563 Stuttgart
www.solites.de

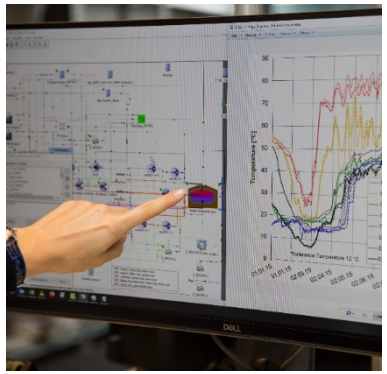
Solites - Steinbeis Research Institute for Solar and Sustainable Thermal Energy Systems

Magdalena Berberich
München, 19.06.2024

Solar district heating

Shallow geothermal

Simulation



Transfer

SOLARE WÄRME NETZE

RES DHC
Renewable Energy Sources for District Heating and Cooling

KomBiNa

saisonalspeicher.de
scfw.de

Our goal: Energy supply systems with minimised CO_2-emissions

solites

Solarthermal to decarbonise District Heating

Picture: Guido Bröer; iKWK-System Lemgo (9 118 m²)

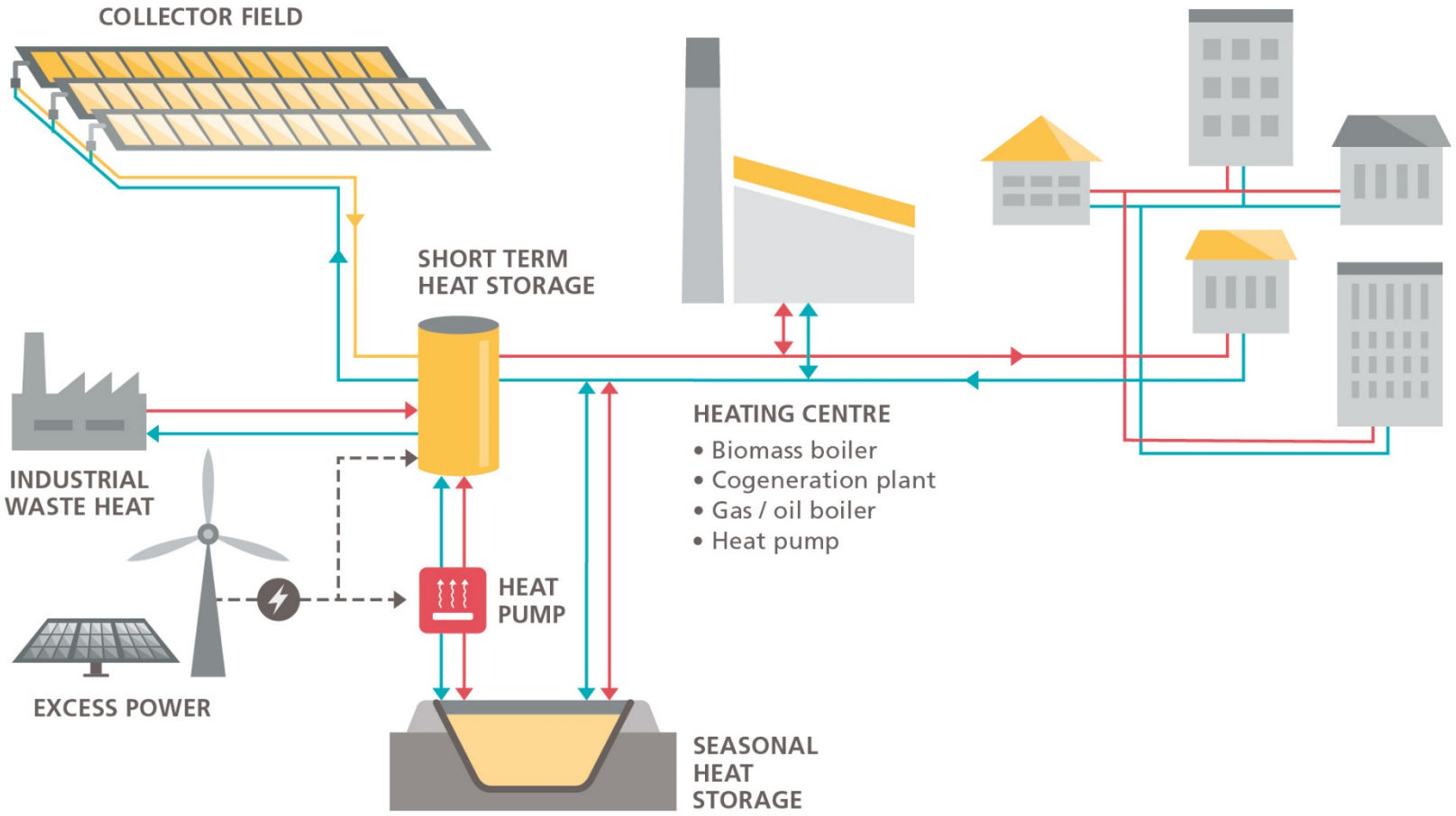
- … decarbonising around 17,000 district heating networks across Europe*.
- … solar heat is one of the proven, available, cost-effective and emission-free measures to help complete this enormous task.
- Stable heat cost of 40-70 €/MWh, before funding!**

*Source: EHP 2023
**In most cases: Solar thermal system to cover the summer heat load; grid temperatures < 100 °C

Magdalena Berberich
München, 19.06.2024

solites

EFFICIENT, COST EFFECTIVE AND FLEXIBLE HEAT DELIVERY



IEA SHC TASK 55

Magdalena Berberich
München, 19.06.2024

solites

Foto: Guido Bröer

Central solar heat: “SolarHeatGrid” Ludwigsburg

Magdalena Berberich
München, 19.06.2024

solites

Decentral solar heat from apartment buildings

Magdalena Berberich
München, 19.06.2024

solites

336 towns and cities use solar district heating

(Status: End of year 2023)

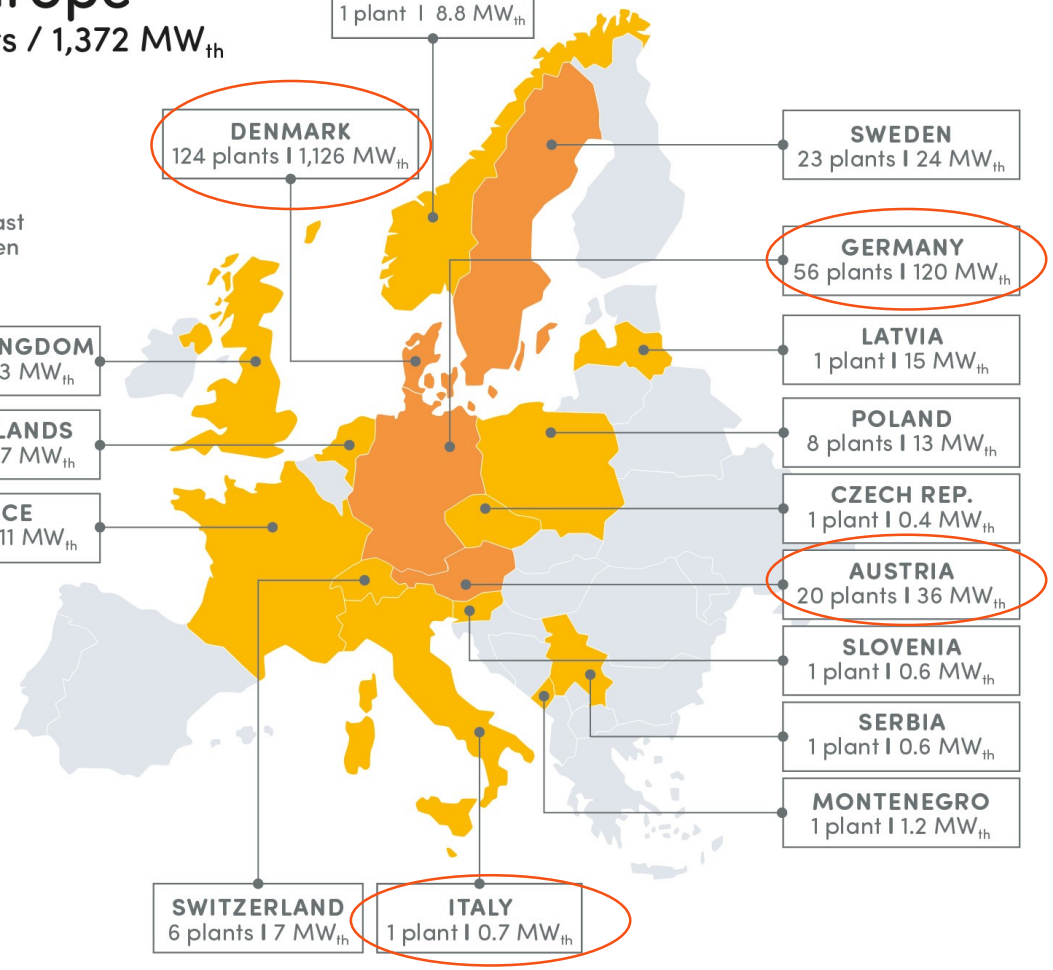
Europe

256 plants / 1,372 MW_{th}

> 10 plants

< 10 plants

Plants with at least 350 kW_{th} are taken into account



Outside Europe

80 plants / 537 MW_{th}

- CHINA: 72 plants I 503 MW_{th}
- SAUDI ARABIA: 1 plant I 25.4 MW_{th}
- SOUTH AFRICA: 2 plants I 0.8 MW_{th}
- CANADA: 1 plant I 1.5 MW_{th}
- JAPAN: 1 plant I 0.9 MW_{th}
- USA: 1 plant I 1.3 MW_{th}
- RUSSIA: 1 plant I 3.1 MW_{th}
- KYRGYZSTAN: 1 plant I 0.5 MW_{th}

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

German research project since May 2024: Pro-Sol-Netz

Gefördert durch:

Bundesministerium für Wirtschaft und Klimaschutz

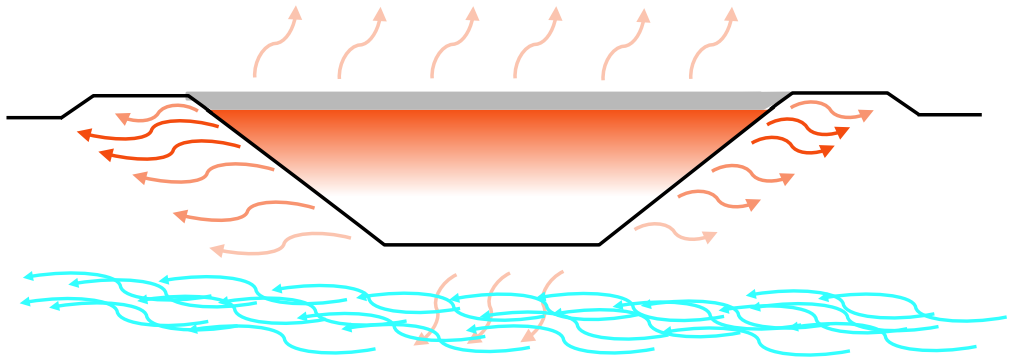
aufgrund eines Beschlusses des Deutschen Bundestages

Research topics: Thermal Energy Storages

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



EfficientPit | SOLMAX | solites

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

Magdalena Berberich
München, 19.06.2024

solites

Energy communities are an important part of the heat transition

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

ConnectHeat
Community engagement for clean heat

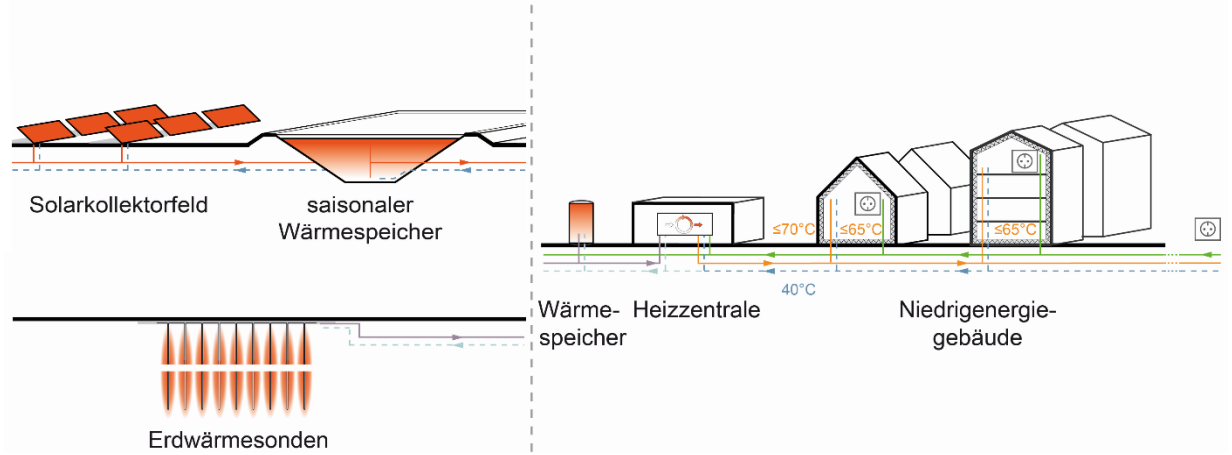
More information:
https://www.linkedin.com/showcase/connectheat/?originalSubdomain=de
https://connectheat.ambienteitalia.it/

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

The LIFE21-CET-ENERCOM-CONNECTHEAT project has received funding from the European Union's LIFE Programme under grant agreement N°101076258
And co-funding from the city of Stuttgart

Magdalena Berberich
München, 19.06.2024

Best practice: Energy concept „Killberg IV“ in Hechingen



- New district with 760 appartments
- 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

Magdalena Berberich
München, 19.06.2024

solites

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

www.solare-wärmenetze.de/newsletter (in German)
LinkedIn: „Solare Wärmenetze“

Magdalena Berberich
Tel.: +49 (0)711 673 2000-55
berberich@solites.de

Steinbeis
Research Institute for
Solar and Sustainable
Thermal Energy Systems

Meitnerstr. 8
D-70563 Stuttgart
www.solites.de