



SOLAR HEATING & COOLING PROGRAMME
INTERNATIONAL ENERGY AGENCY

Solar Heat – a team player for decarbonising District heating

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IEA SHC Task 68 - Efficient Solar District Heating Systems

<https://task68.iea-shc.org/>

264 towns and cities in Europe use solar heat

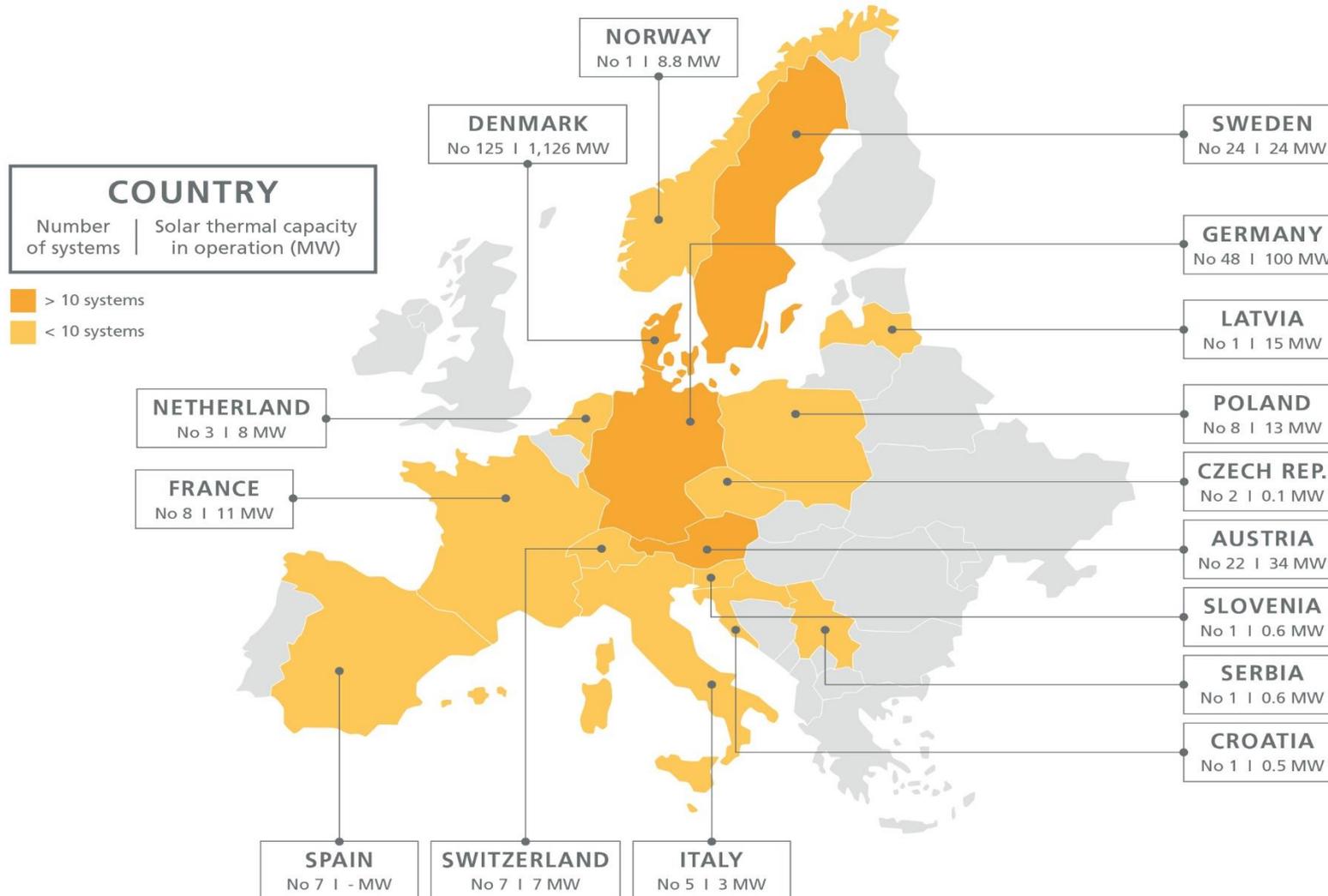


Chart: IEA SHC Task 68
 Source: IEA SHC Solar Heat
 Worldwide Report Ed. 2022 /
 own research

Multi-MW solar district heating plants on the rise across Europe

- ✓ **37 MW** collector field under construction in Groningen, Netherlands. 30 years solar heat delivery contract with utility company Warmtestad. (25 GWh per year)
- ✓ The municipal utility in Leipzig, Germany, placed the order for a **41 MW** collector field in April 2023 (26 GWh per year)
- ✓ Financing is secured for a **41 MW** collector field in Pristina, Kosovo, planned by the local utility Termokos. (43 GWh per year)

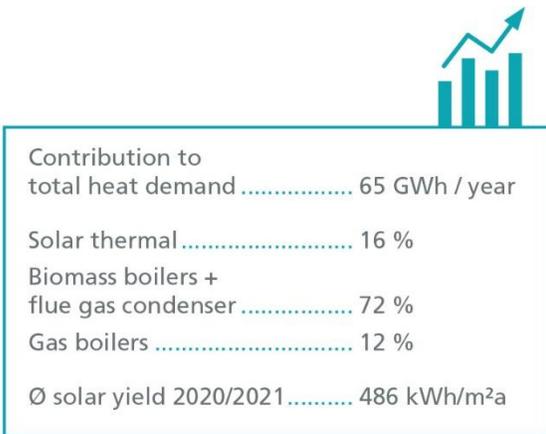


Photo: Ritter Solar XL

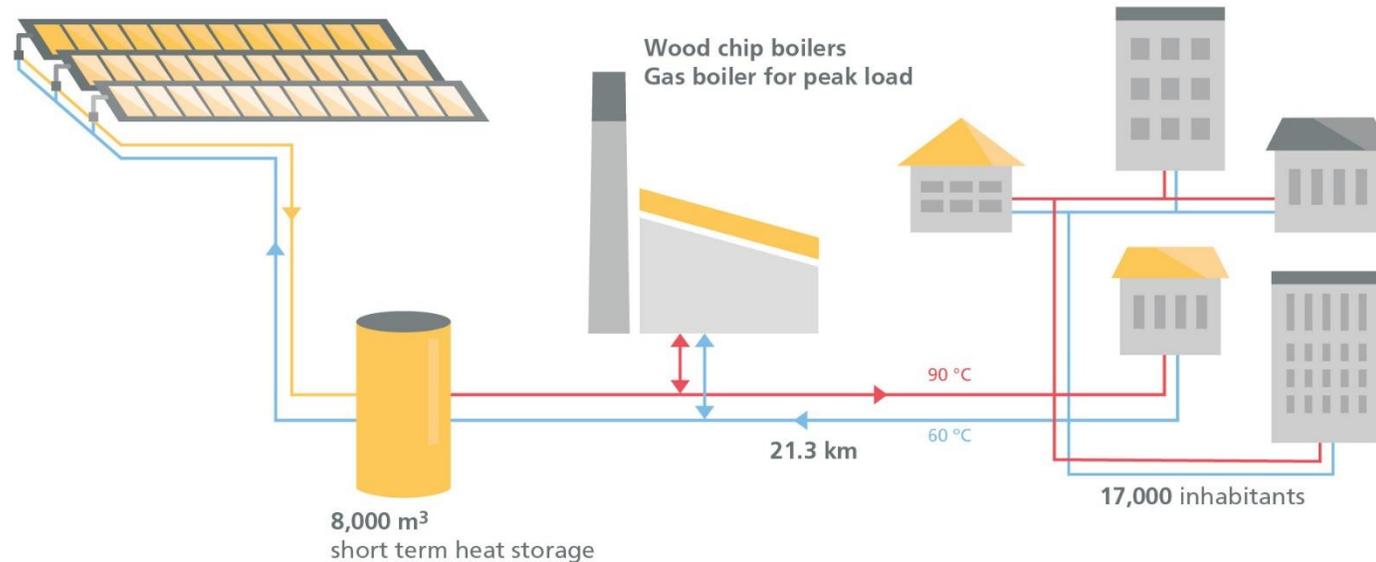
Salaspils, Latvia: 90 % renewable district heat since 2019



Photo: Salaspils Siltums



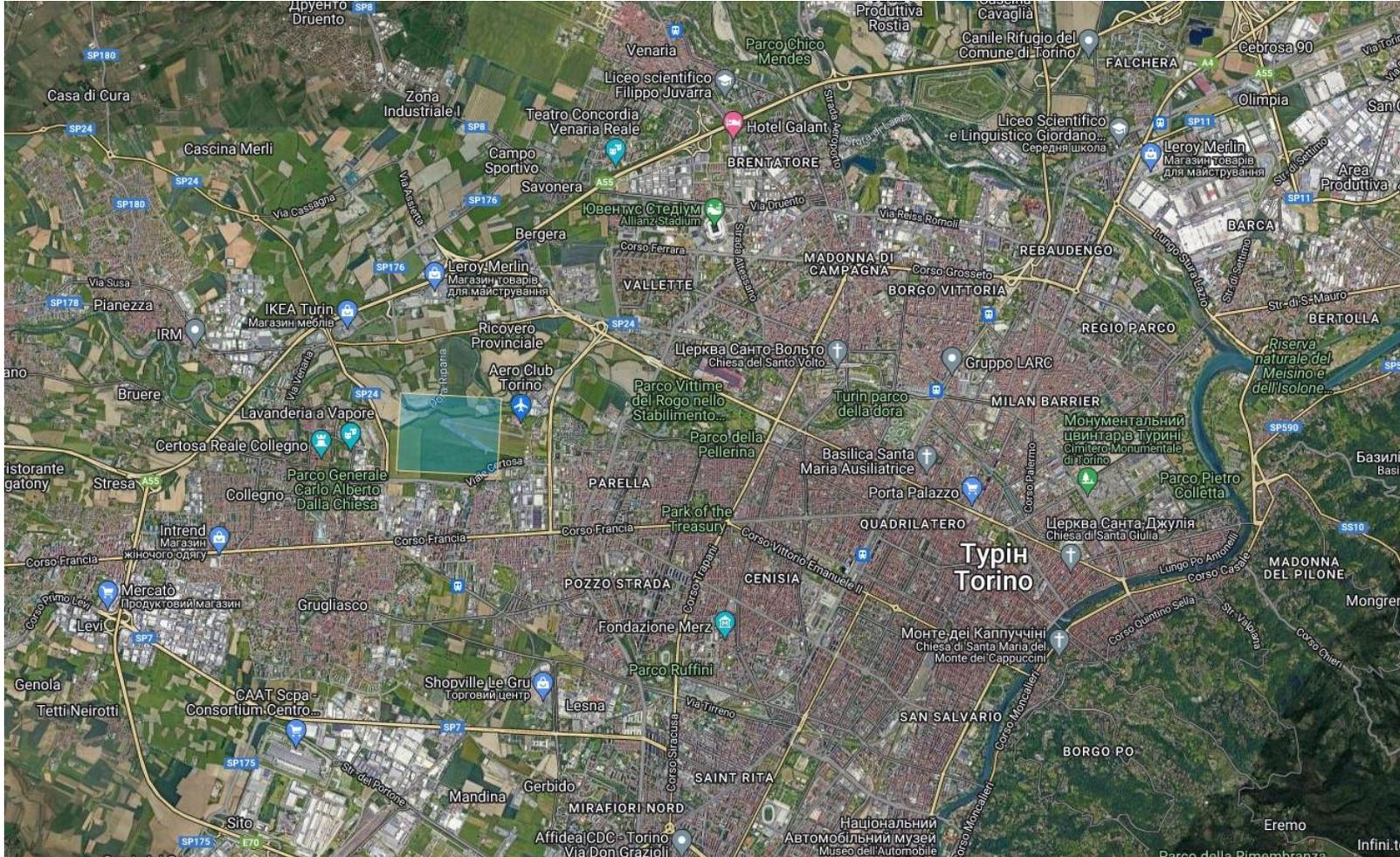
FLAT PLATE
 21,672 m², 15 MW
 MANUFACTURER: Arcon-Sunmark, Denmark
 SUPPLIER: Filter, Latvia



There is space for solar heat even in larger cities



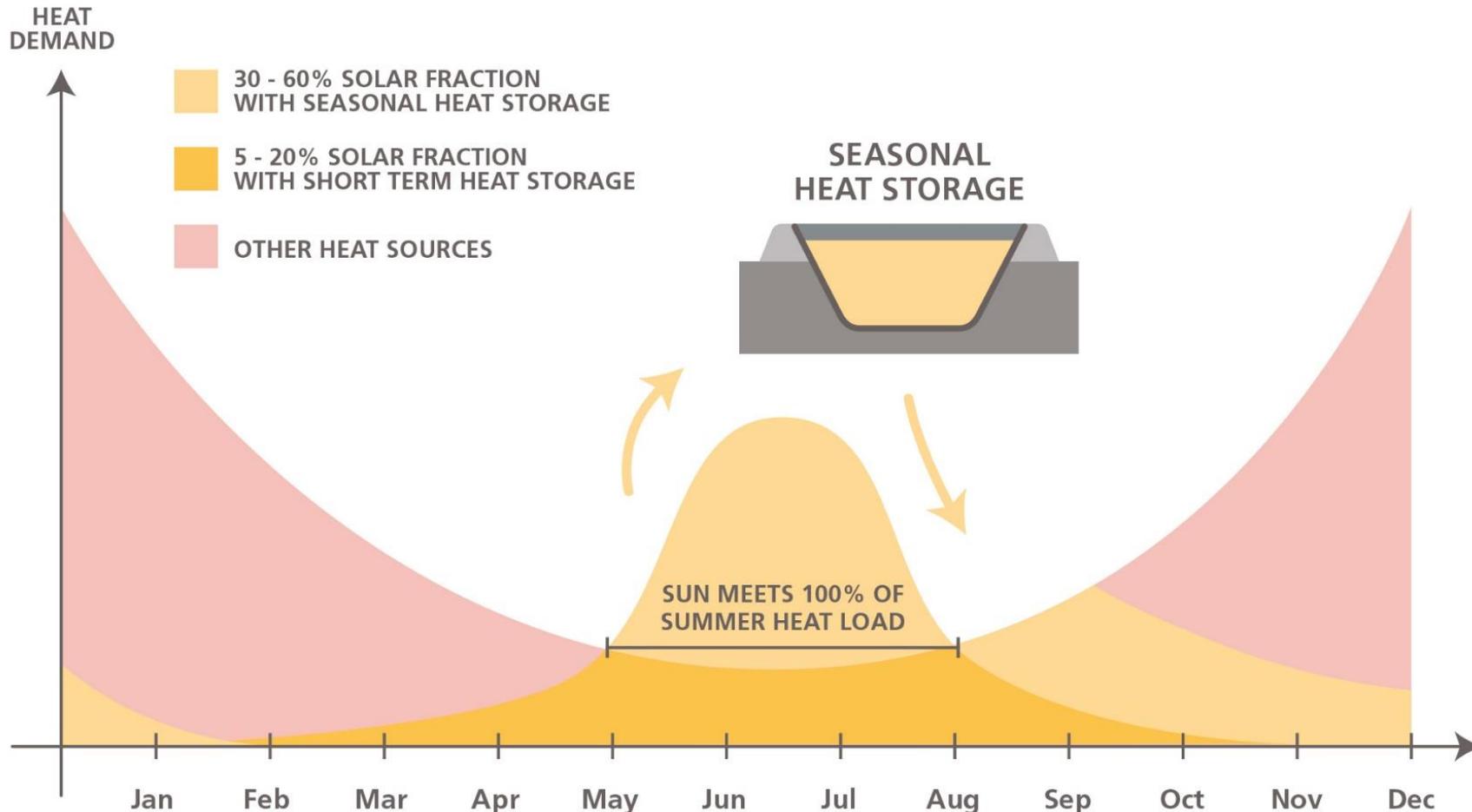
3 to 4 m² pro
kilowatt solar
heat capacity



Site	Turin/Torino, Italy
Inhabitants	847,000
Heat demand in heating grid	1,815 GWh/a
Solar irradiation	1,476 kWh/m ² a
Land size of solar field	129.7 hectares
Capacity of solar field	401 MW
Solar share	20 %

Source: <https://www.absolicon.com/fs/>

Storing solar energy in summer for heating in winter



A pit heat storage tank with more than 50,000 m³ loses 10 to 20 % of the stored energy over the year. The losses depend significantly on the size of the cover.

Chart: IEA SHC Task 55

Construction of a pit heat storage

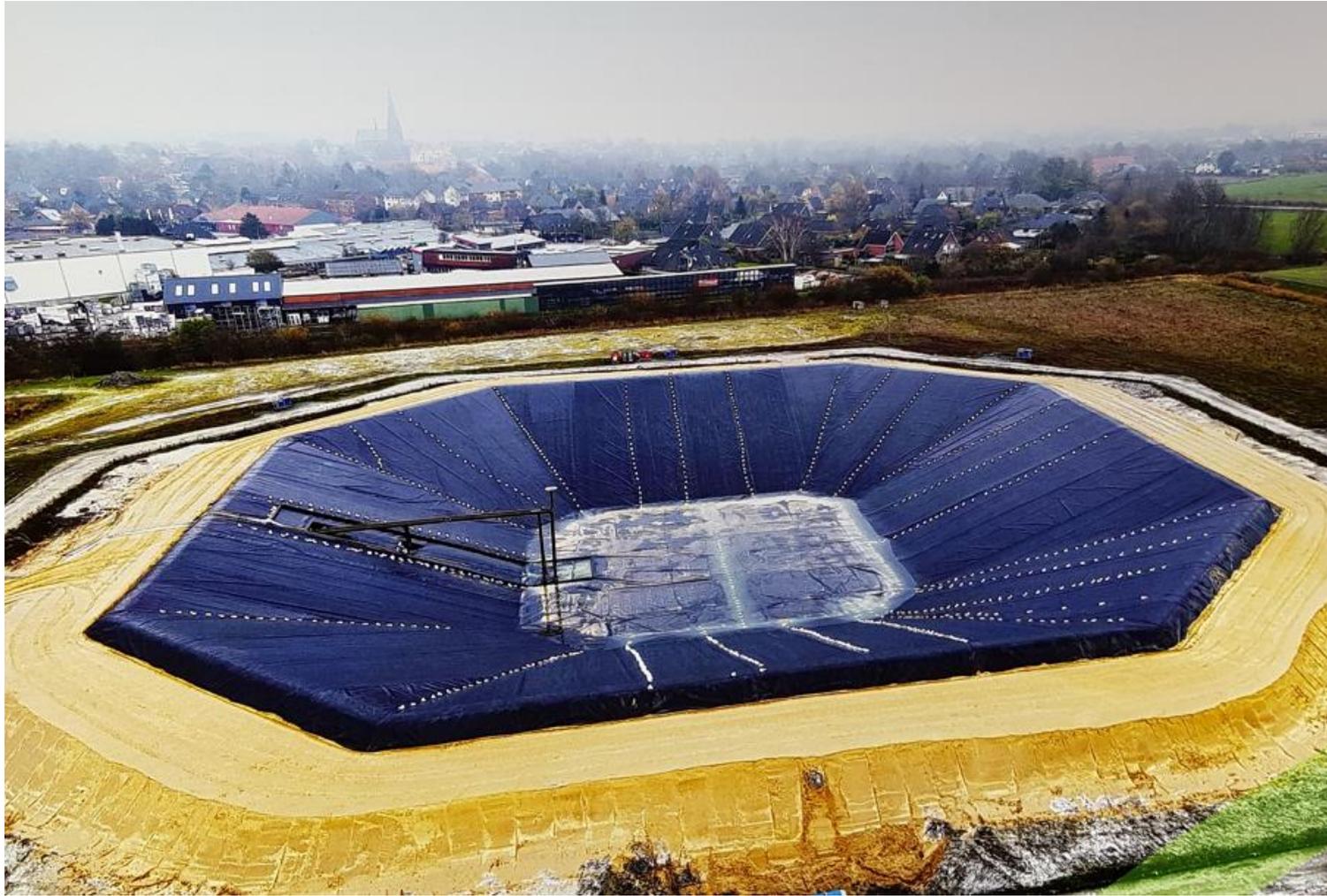
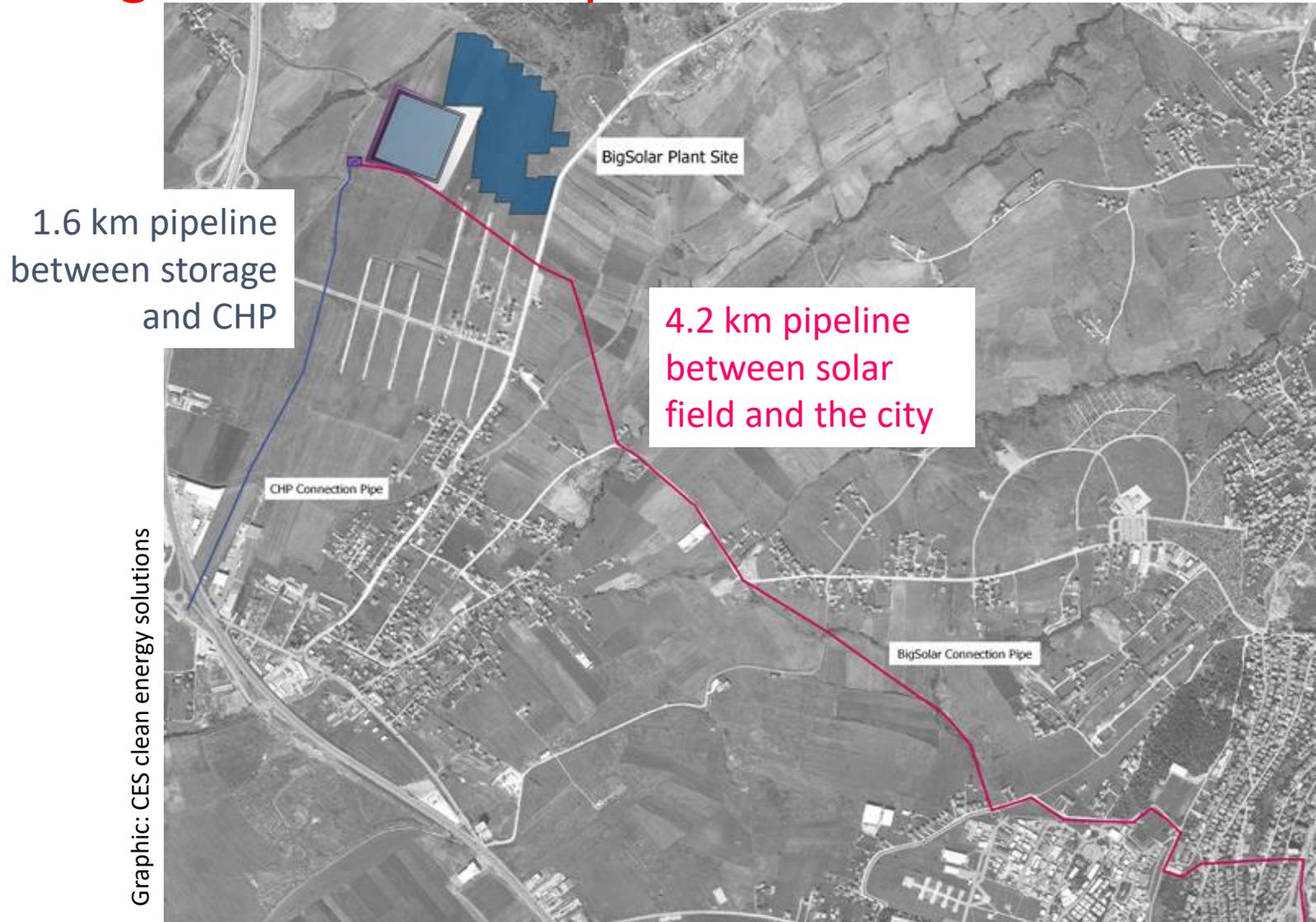


Photo: Bärbel Epp / Solmax

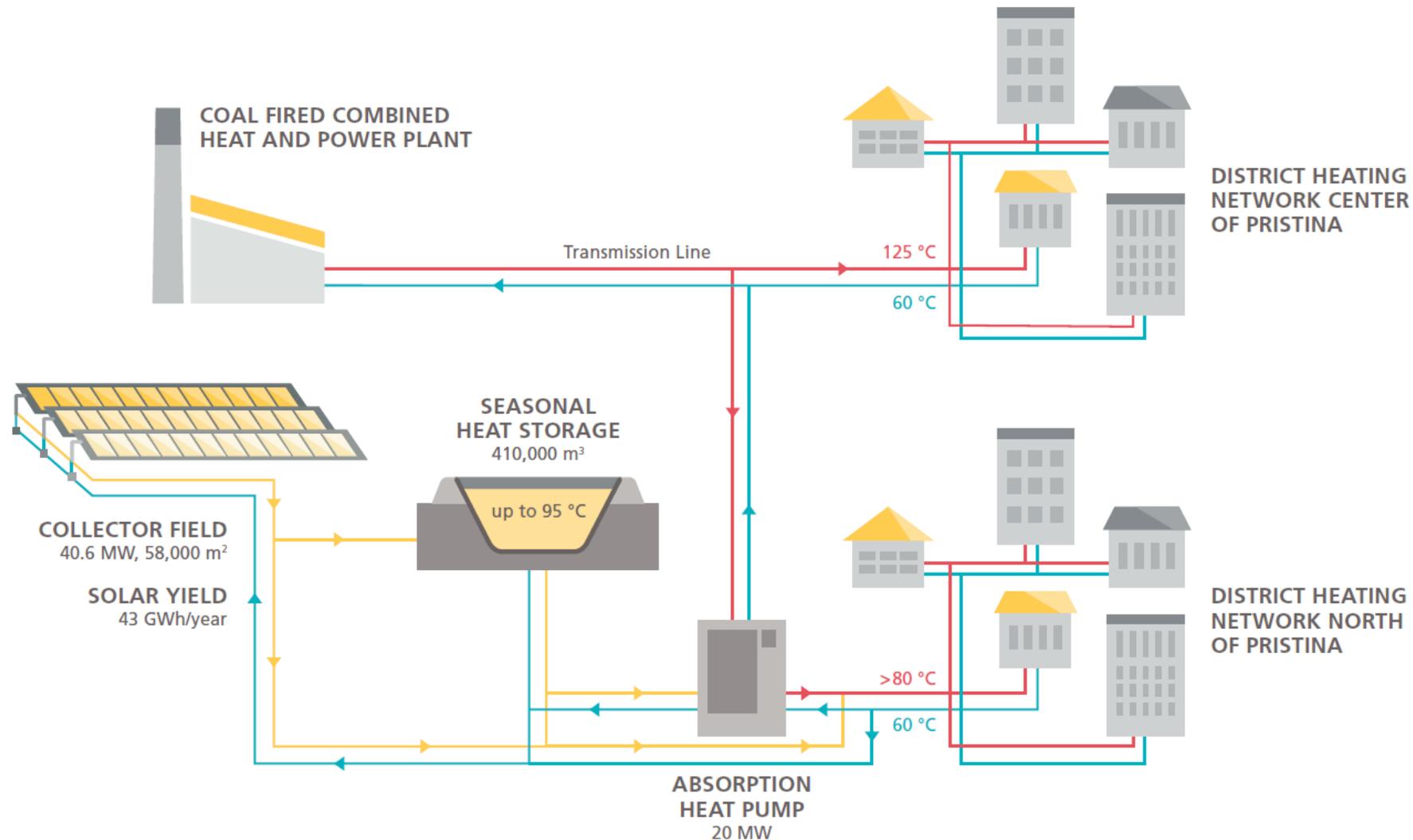
Site	Meldorf, Germany
Storage volume	45,000 m ³
Application	Storing waste heat from printing press
Supply	Space heating of public offices and swimming pool in winter

Big Solar Pristina replaced coal-based electric heating



Site	Pristina, Kosovo
New district heat consumers	38,000
Annual solar share	12 %
Capacity of solar field	41 MW
Seasonal storage	408,000 m ³
Investment costs including extension of DH grid	EUR 80 million
Estimate start of construction	End of 2024

Big Solar Pristina: absorption heat pumps are key



The absorption heat pumps heat up the water from the seasonal storage tank, if it does not meet the demand of the supply line for the heating network.

Each temperature level has a suitable collector type



Photo: TVP Solar

Special high-vacuum flat-plate collectors supplying heat to the heat network in Geneva, Switzerland, at a temperature of **85 °C**, even in winter.



Photo: Viessmann

By adjusting the speed of the pumps in the solar circuit, this vacuum tube collector field delivers the required temperature of **90 °C** constantly.

Each temperature level has a suitable collector type

Photo: Heliac



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

Photo: Aalborg CSP



Combination of flat plate collectors (up to 70 °C) and parabolic trough collectors (**up to 95 °C**) in Taars, Denmark

Summary: Solar heat is a team player

- ✓ Together with biomass boilers → to form a 100 % renewable supply
- ✓ Together with seasonal storages → to form a flexible and efficient energy management system including power to heat
- ✓ Together with heat pumps → to form a decarbonization strategy even for district heating grids with higher temperatures above 100 °C

Where can you get further technical advice?

Research and engineering services:



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



planenergi.eu/ in
Denmark



www.best-research.eu
in Austria



www.solites.de/en/ in
Germany



www.aee-intec.at/ in
Austria

Where can you get further technical advice?

Technology and turnkey suppliers:

Aalborg CSP, Denmark: <https://www.aalborgcsp.com/>

Absolicon, Sweden: <https://www.absolicon.com/>

Greenonetec, Austria: <https://www.greenonetec.com/>

Heliac, Denmark: <https://www.heliac.dk/>

New Heat, France: <https://newheat.com/en/>

Ritter XL Solar, Germany: <https://www.ritter-xl-solar.de/>

Savosolar, Finland: <https://savosolar.com/>

Solarlite CSP Technology, Germany: <https://www.solarlite.de/>

Solid Solar Energy Systems, Austria: <https://www.solid.at/de/home.html>

TVP Solar, Switzerland: <https://www.tvpsolar.com/>

Viessmann, Germany: <https://www.viessmann.de/>





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Thanks for your attention!

IEA SHC Task 68: <https://task68.iea-shc.org/>

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