

# Towards efficient district heating and cooling in Europe

Best practice projects across Europe: example of large-scale solar thermal

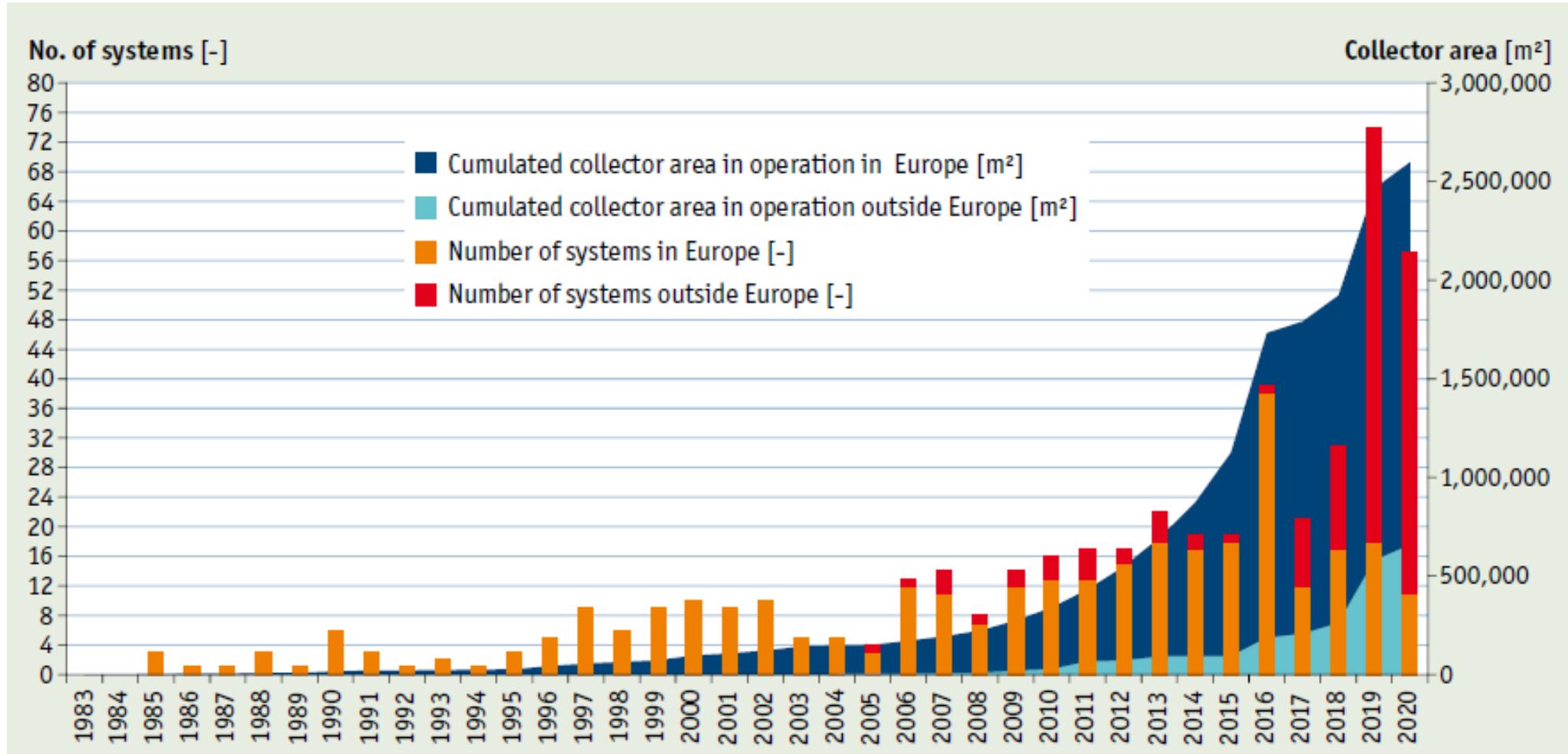
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# Large-scale solar thermal in Europe



Source: Solar Heat Worldwide 2021

Large-scale systems (<350 kW<sub>th</sub>, 500 m<sup>2</sup>) for solar district heating and large residential, commercial and public buildings worldwide – annual achievements and cumulated area in operation in 2020.

# Solar district heating

- Mature technology and market
- Power up to 100 MW, solar fraction up to 50 %
- Demand and interest is growing
- Emission-free and 100 % renewable
- Available everywhere, however need for areas
- Stable heat costs under 30-50 €/MWh\*

\*Solar district heating for summer loads, flow temperature >100°C, Germany



Source: Marstal Fjernvarme

# Ludwigsburg, Germany



Source: Stadtwerke Ludwigsburg-Kornwestheim GmbH

- Urban district heating
- 14,800 m<sup>2</sup> collector area, 9 MW<sub>th</sub>
- 5,500 kWh/a ~ 10 % solar fraction
- 2,000 m<sup>3</sup> buffer storage

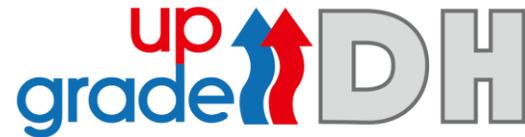
# Dronninglund, Denmark



- Rural SDH
- 37,573 m<sup>2</sup> collector area, 26 MW<sub>th</sub>
- ~ 40 % solar fraction
- 61,700 m<sup>3</sup> multifunctional heat storage

Thank you for your attention!

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 785014. The sole responsibility for the content of this report lies with the authors. It does not necessarily reflect the opinion of the European Union nor of the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the CINEA nor the European Commission are responsible for any use that may be made of the information contained therein.