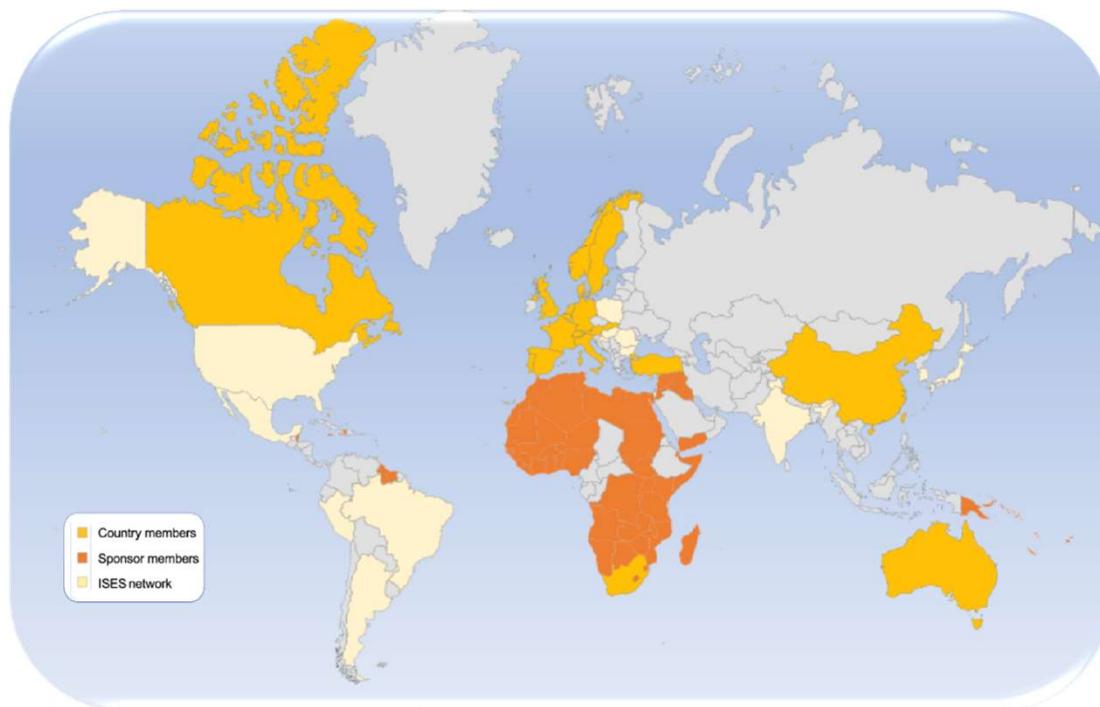


# IEA Solar Heating & Cooling Technology Collaboration Programme (IEA SHC)



19 Countries + EC

8 Sponsors

European Copper Institute, ISES + 6  
UNIDO GN-SECs: CCREEE, EACREEE,  
ECREEE, RCREEE, SACREEE,  
SICREEE (PCREEE in process of  
joining)

- **Project-focused international R&D collaboration since 1977**
- **19 member countries, EC, and 8 international organizations**
- **300+ experts**
- **8 running solar projects:** renovating historic buildings, solar neighborhoods, solar wastewater management, solar process heat, solar cooling for sunbelt regions, solar energy buildings, large-scale solar district heating, daylight & electric lighting

# What the Solar Academy has to offer

- **Webinars** – held quarterly and hosted by ISES
  - Today's webinar will be on  
***Solar Heating and Cooling Markets and Industry Trends***  
<http://www.iea-shc.org/solar-academy/webinars>
- **Videos** – interviews with solar experts and past Solar Academy webinars  
[www.iea-shc.org/videos](http://www.iea-shc.org/videos) or [IEA SHC YouTube channel](#)
- **Onsite & Online Training** – training workshops on specific solar thermal topics by IEA SHC experts. Available upon request by IEA SHC members
  - Past trainings: CCREEE, China, South Africa, UK



# Where to find more information

- Visit our website, [www.iea-shc.org](http://www.iea-shc.org)

- Follow us on social media



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[IEA Solar Heating and Cooling Programme  
\(group 4230381\)](https://www.linkedin.com/groups/4230381)

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- Ask questions, [secretariat@iea-shc.org](mailto:secretariat@iea-shc.org)



## Solar Academy Webinar Series

# Solar Heating and Cooling Markets and Industry Trends

Launch of Solar Heat Worldwide



# Solar Heat Worldwide Edition 2021



**Werner Weiss**, Monika Spörk-Dür  
AEE – Institute for Sustainable Technologies

Technology Collaboration Programme  
by IEA

# Solar Heat Worldwide

Global Market Development and Trends in 2020

Detailed Market Figures 2019



Werner Weiss, Monika Spörk-Dür

AEE - Institute for Sustainable Technologies  
8200 Gleisdorf, Austria

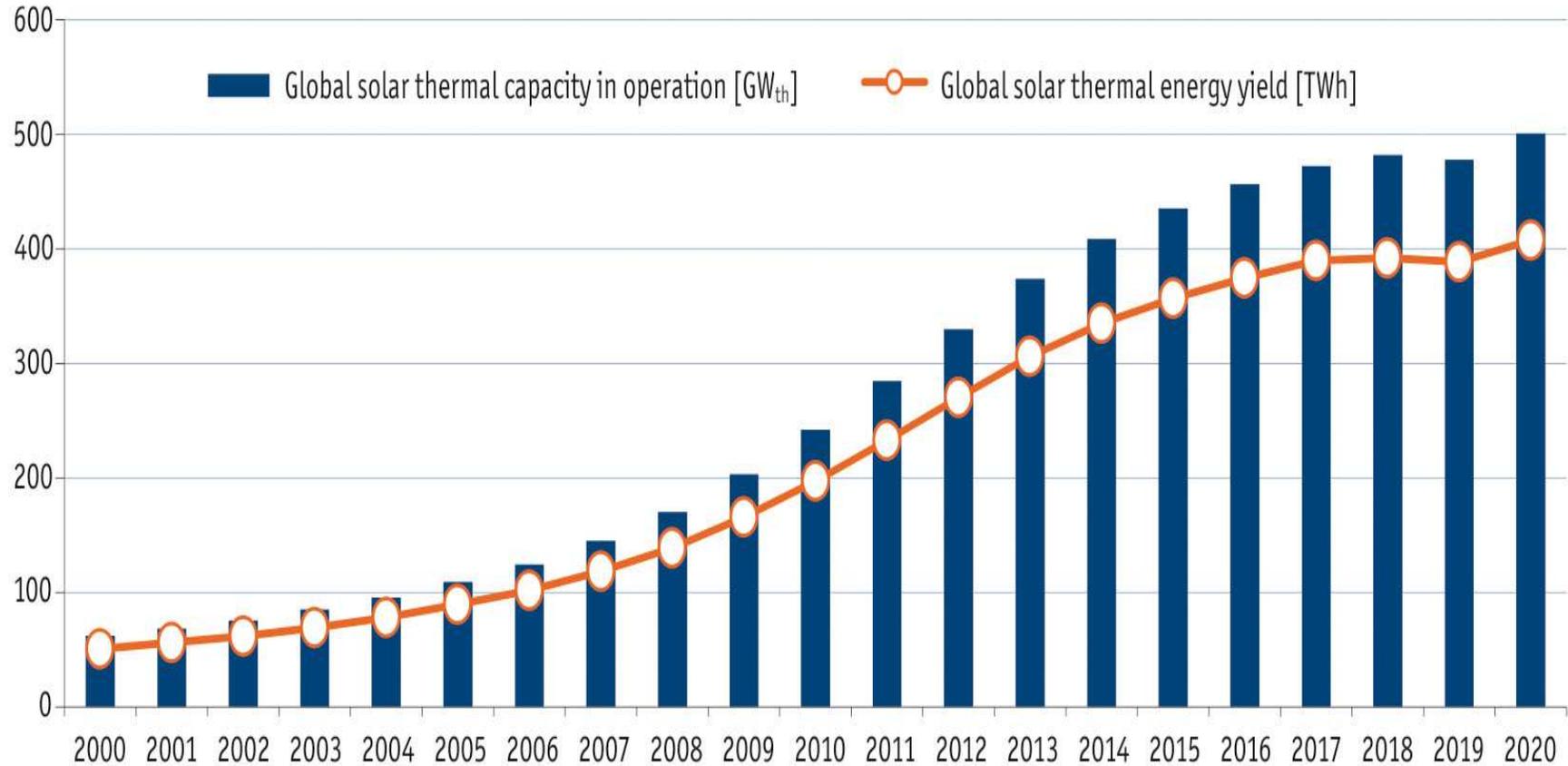
<http://www.iea-shc.org/publications-new>



# Global solar thermal capacity in operation and annual energy yields 2000-2020



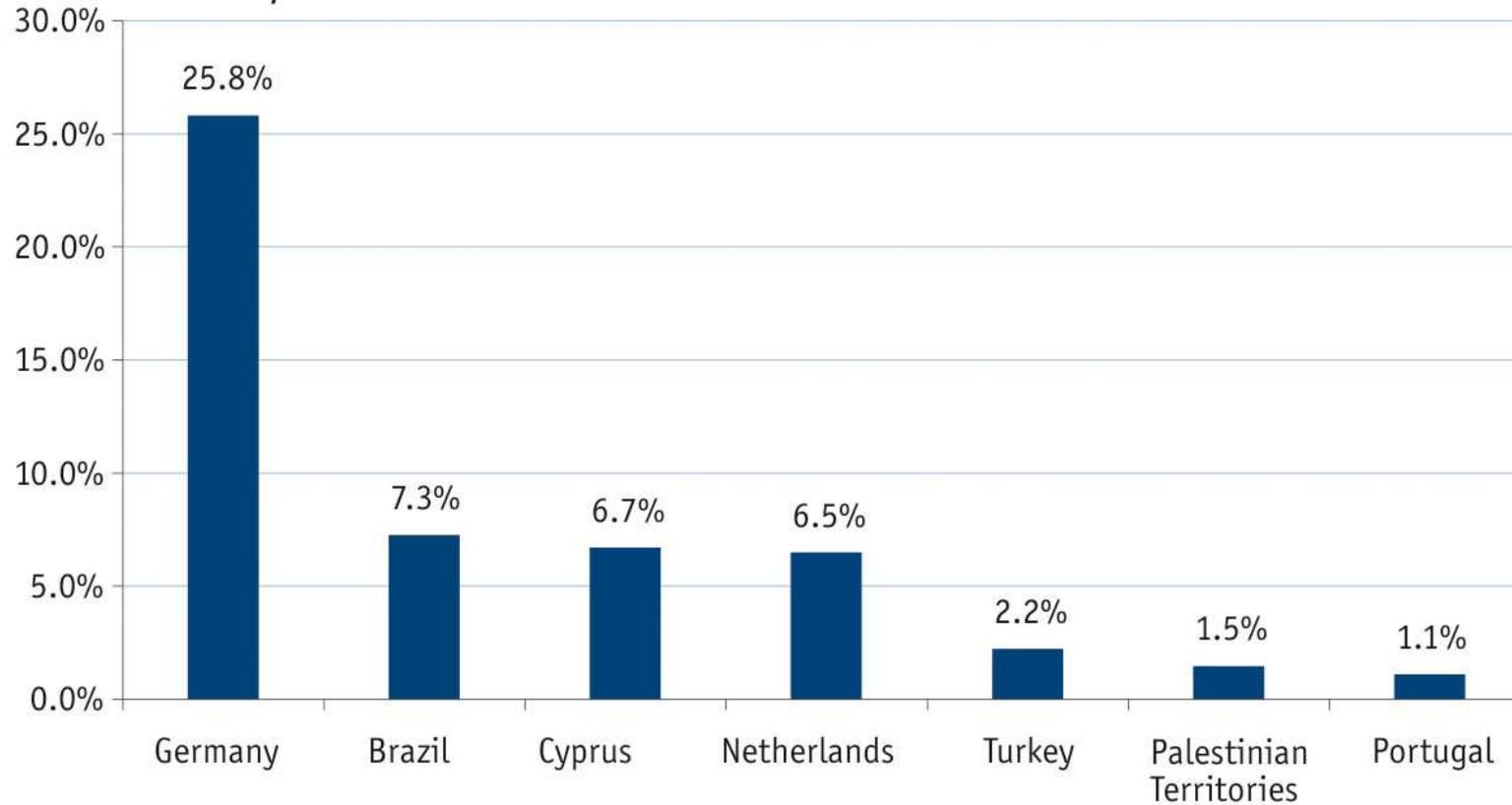
Capacity [GW<sub>th</sub>], Energy [TWh]



# Good news: Countries with highest growth rates 2020



Growth rate 2019/20



# Top three markets for different applications



## Three top markets

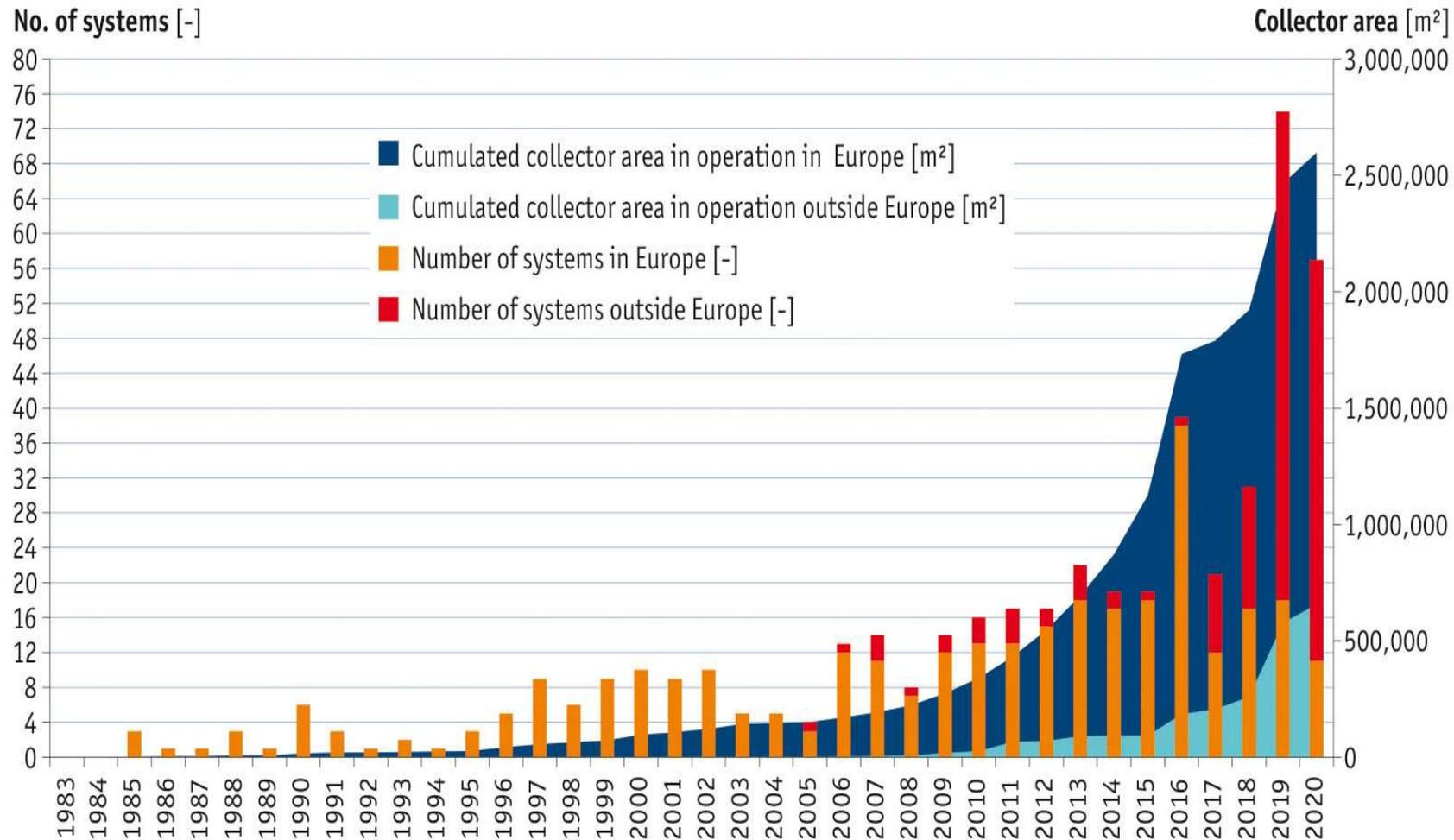
		1	2	3
<b>Solar district heating</b> new additions in 2020		Germany	Denmark	China
<b>Solar industrial heat</b> new additions in 2020		China	Mexico	Germany
<b>Swimming pool heating</b> new additions in 2019		USA	Brazil	Australia
<b>Solar air heating systems</b> total in operation at end of 2019		Canada	Australia	Japan
<b>Hybrid systems for heat and electricity (PVT)</b> total in operation at the end of 2020		France	South Korea	China

Photos: SOLID Solar Energy Systems, Solareast Holding Company, SolarWall, PA-ID Process, Sunbather

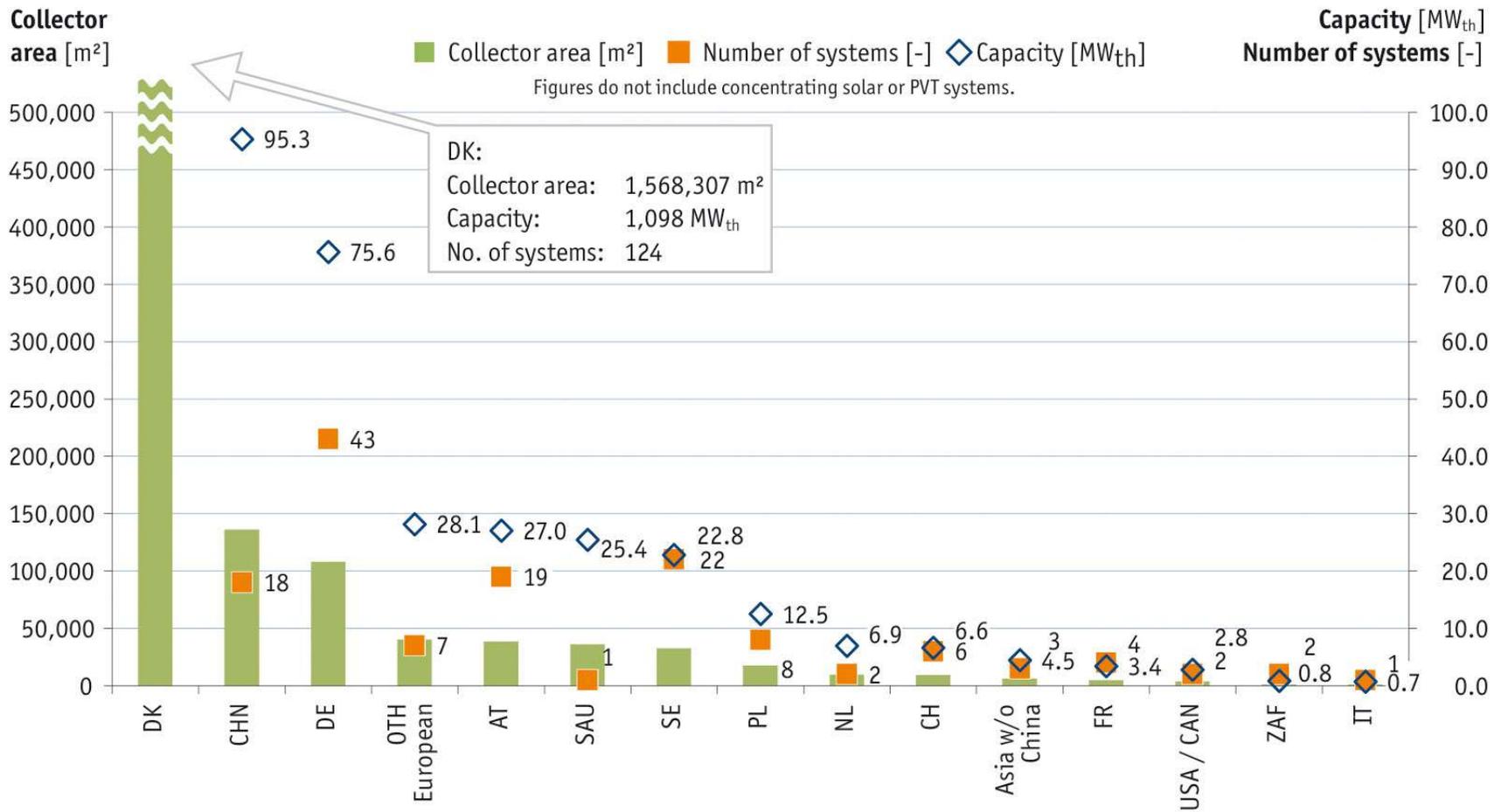
# Small-scale solar water heating systems



# Large-scale solar thermal heating systems



# Large-scale systems for solar district heating



Germany's largest solar district heating system in Ludwigsburg with a capacity of 10 MW<sub>th</sub> was put into operation in early 2020.



Photo: Arcon/Sunmark

# Swiss solar district heating system in Geneva, with a capacity of 0.5 MW<sub>th</sub>



Photo: Magali Girardin / SIG

# Lasha solar district heating system in Tibet, China with 11,000 m<sup>2</sup> collector area (9.1 MW<sub>th</sub>).

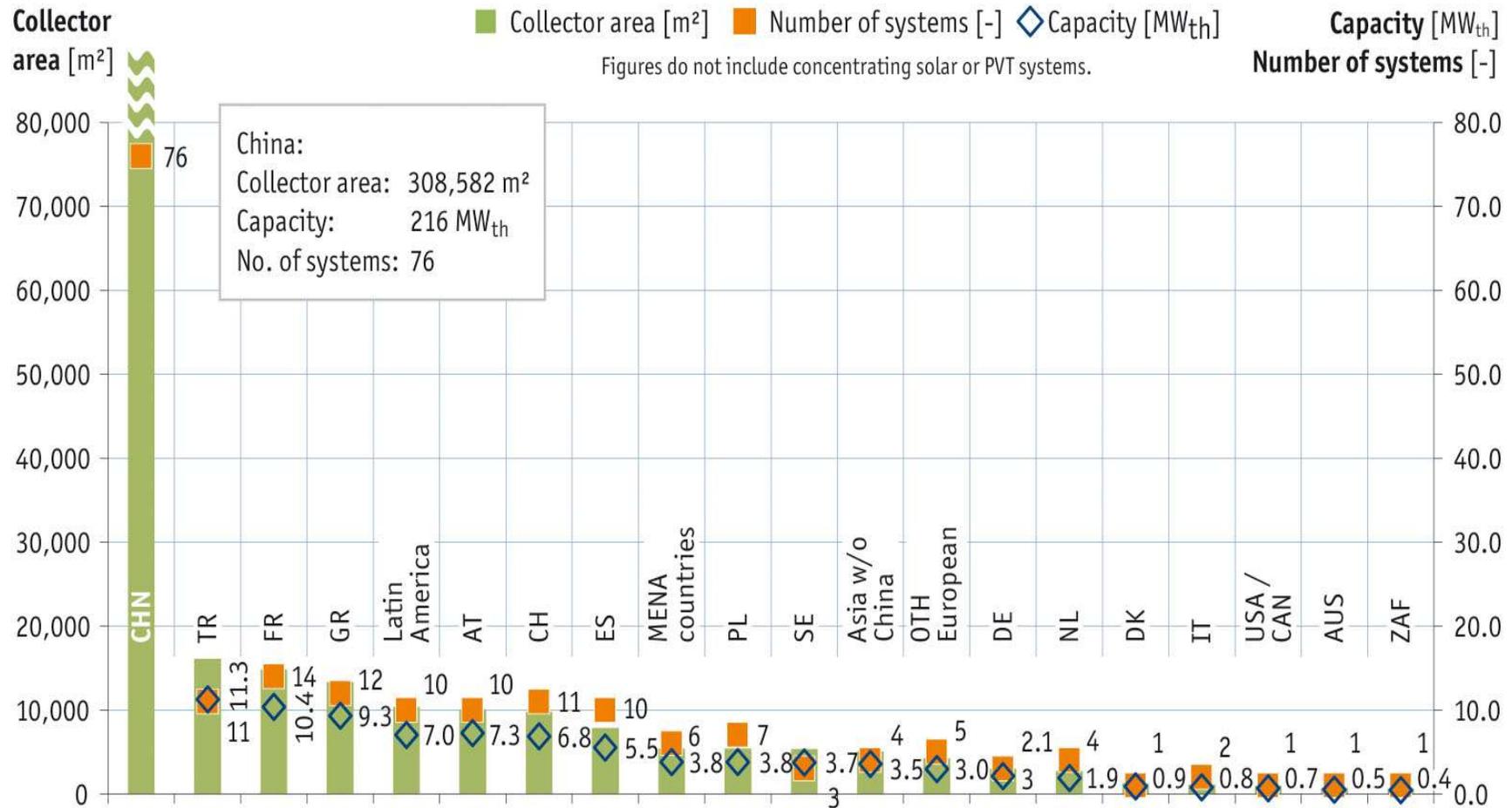


Photo: Solareast Holding Company Ltd.

# Large-scale systems for residential, commercial and public buildings



# Large-scale systems for residential, commercial and public buildings



# Solar heat for industrial processes

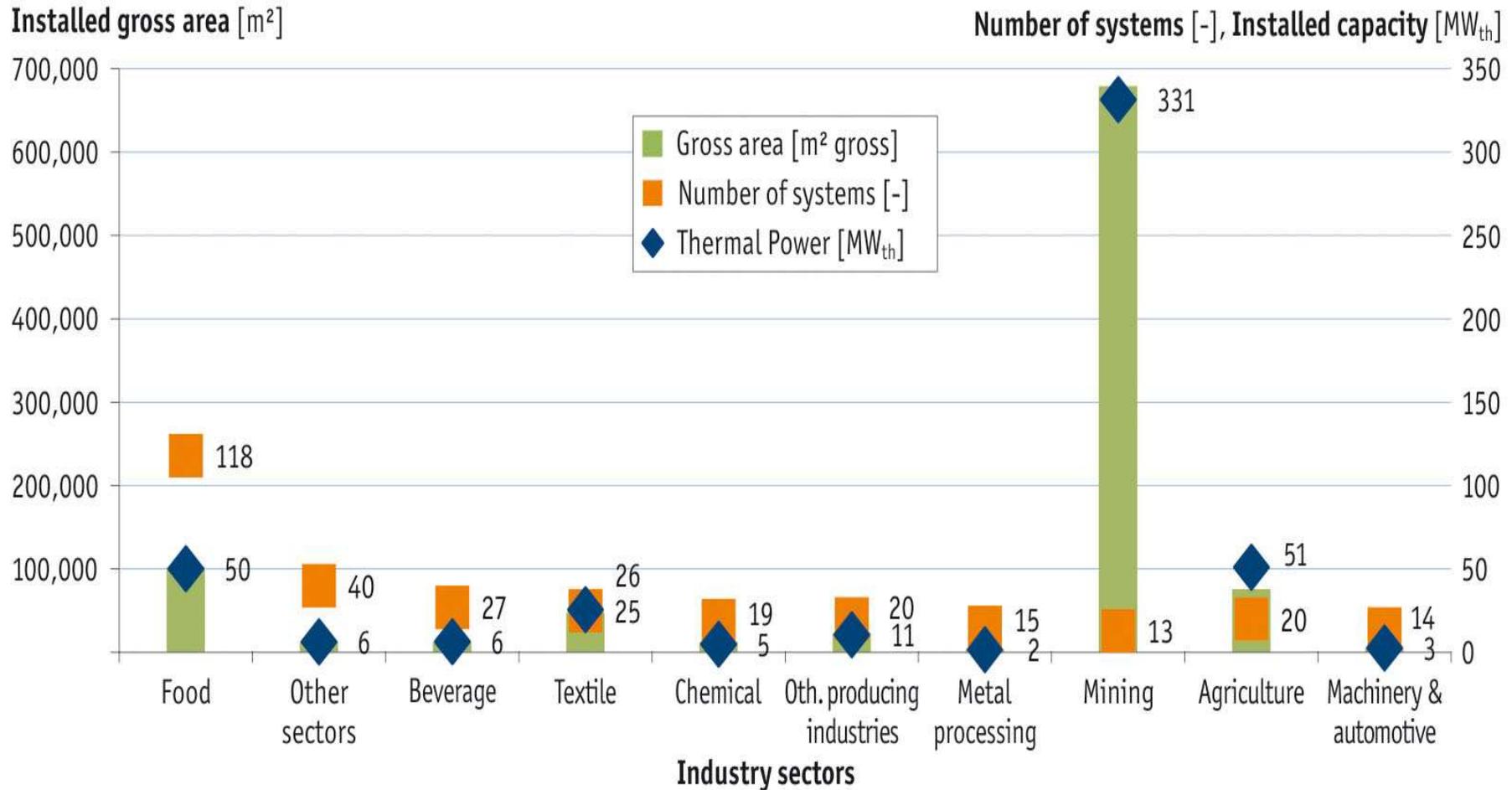


890 SHIP systems with about 1.13 million m<sup>2</sup> are documented and in operation, ranging from small systems to the 100 MW<sub>th</sub> sector

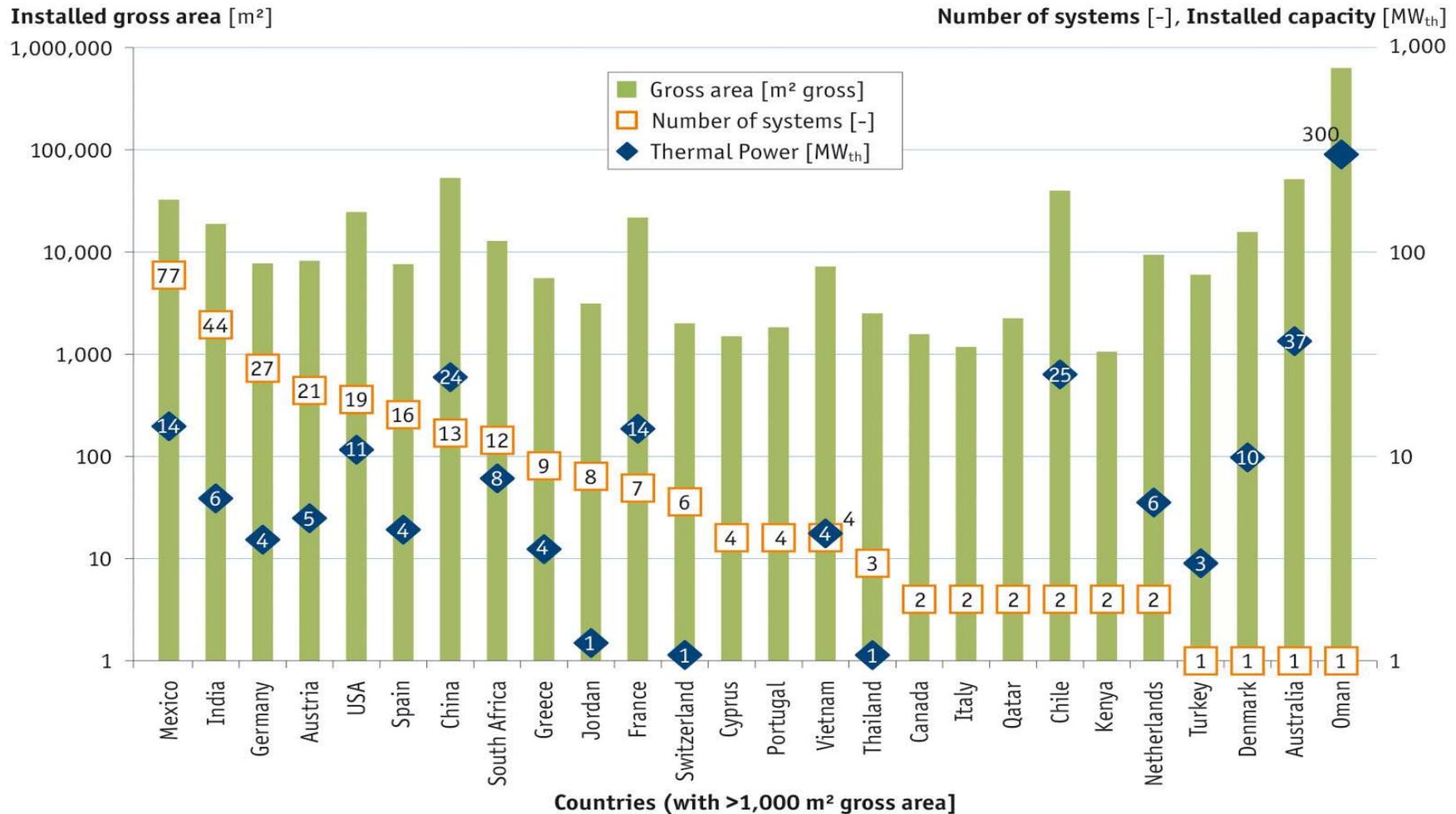
For 311 of these systems detailed information is available: See: <http://ship-plants.info/>

The world's largest solar process heat application Miraah in Oman has a thermal capacity of 300 MW<sub>th</sub>

# Solar process heat applications in operation worldwide end of March 2021 by industry sector



# Solar process heat applications in operation worldwide end of March 2021 by country



# 4200 m<sup>2</sup> flat plate collectors on trackers provide heat for the CONDAT Paper Mill in France



Source: Newheat-ADEME



# PVT - Photovoltaic-Thermal Systems



Photo: Solarus Smart Energy Solutions

# PVT - Photovoltaic-Thermal Systems



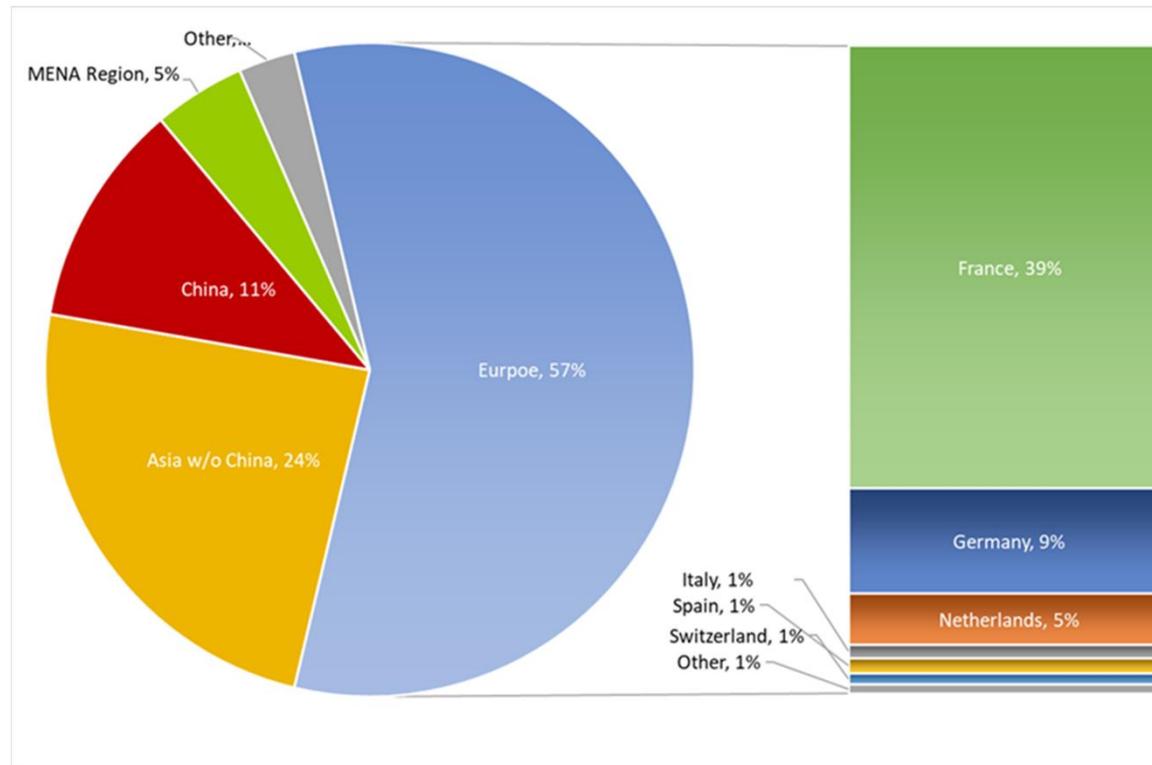
Photo: [www.2Power.de](http://www.2Power.de)

# PVT - Photovoltaic-Thermal Systems

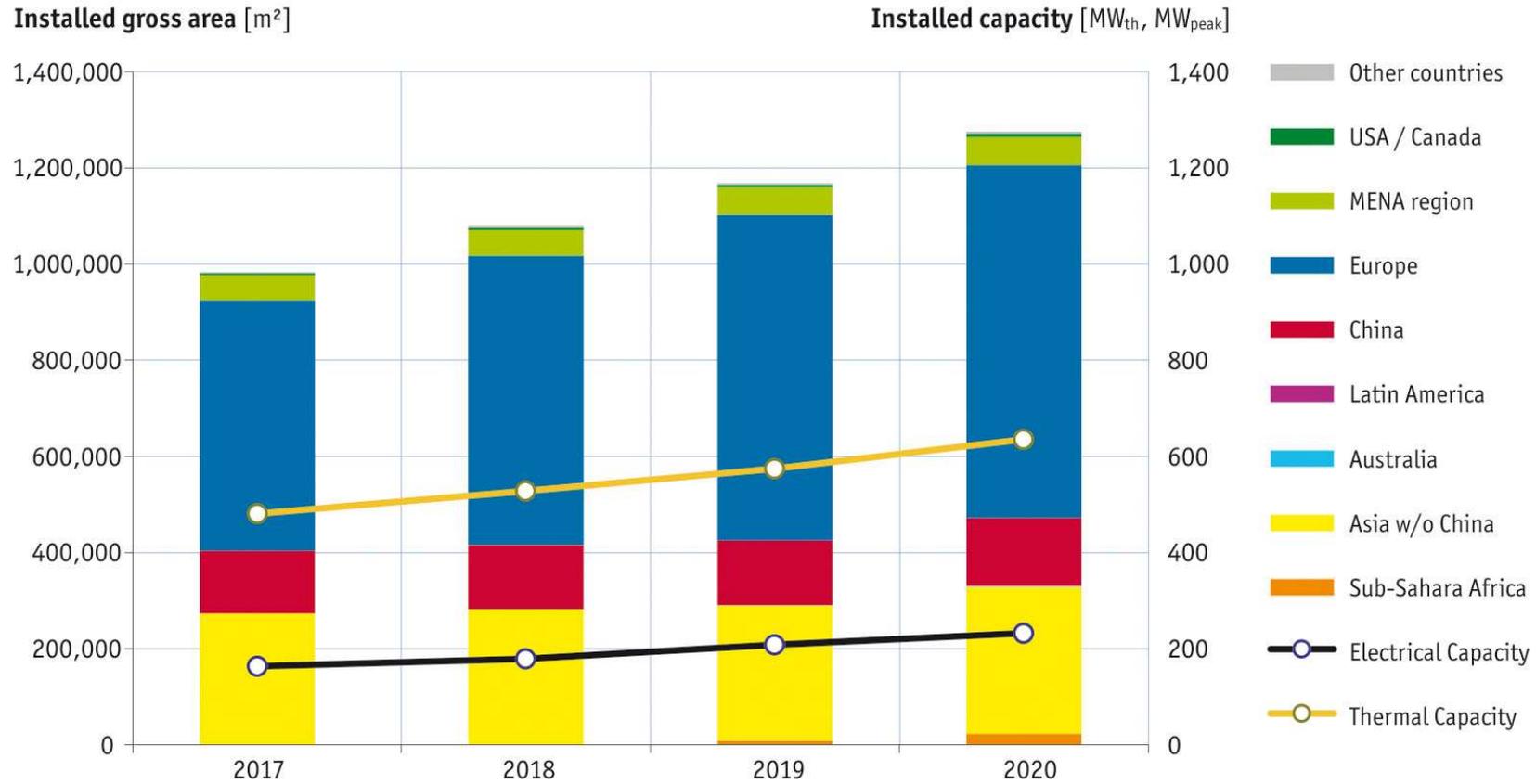


2020, the total installed PVT collector area was 1,275,431 m<sup>2</sup>, with the capacity divided into 712 MW<sub>th</sub> (thermal) and 232 MW<sub>peak</sub> (electric).

The vast majority of this collector area was installed in Europe (732,955 m<sup>2</sup>)



# Global market development of PVT collectors

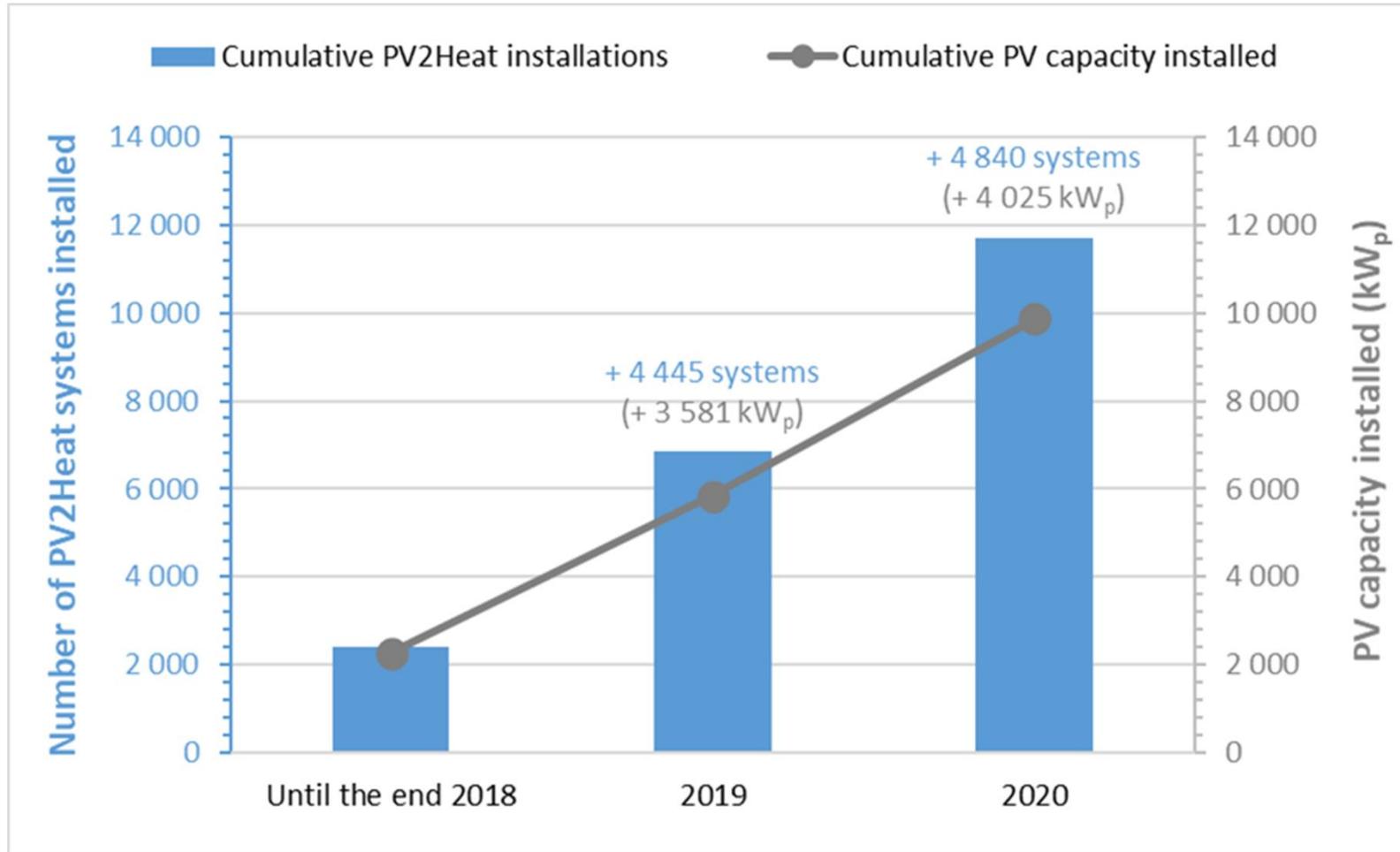


# PV2heat Systems

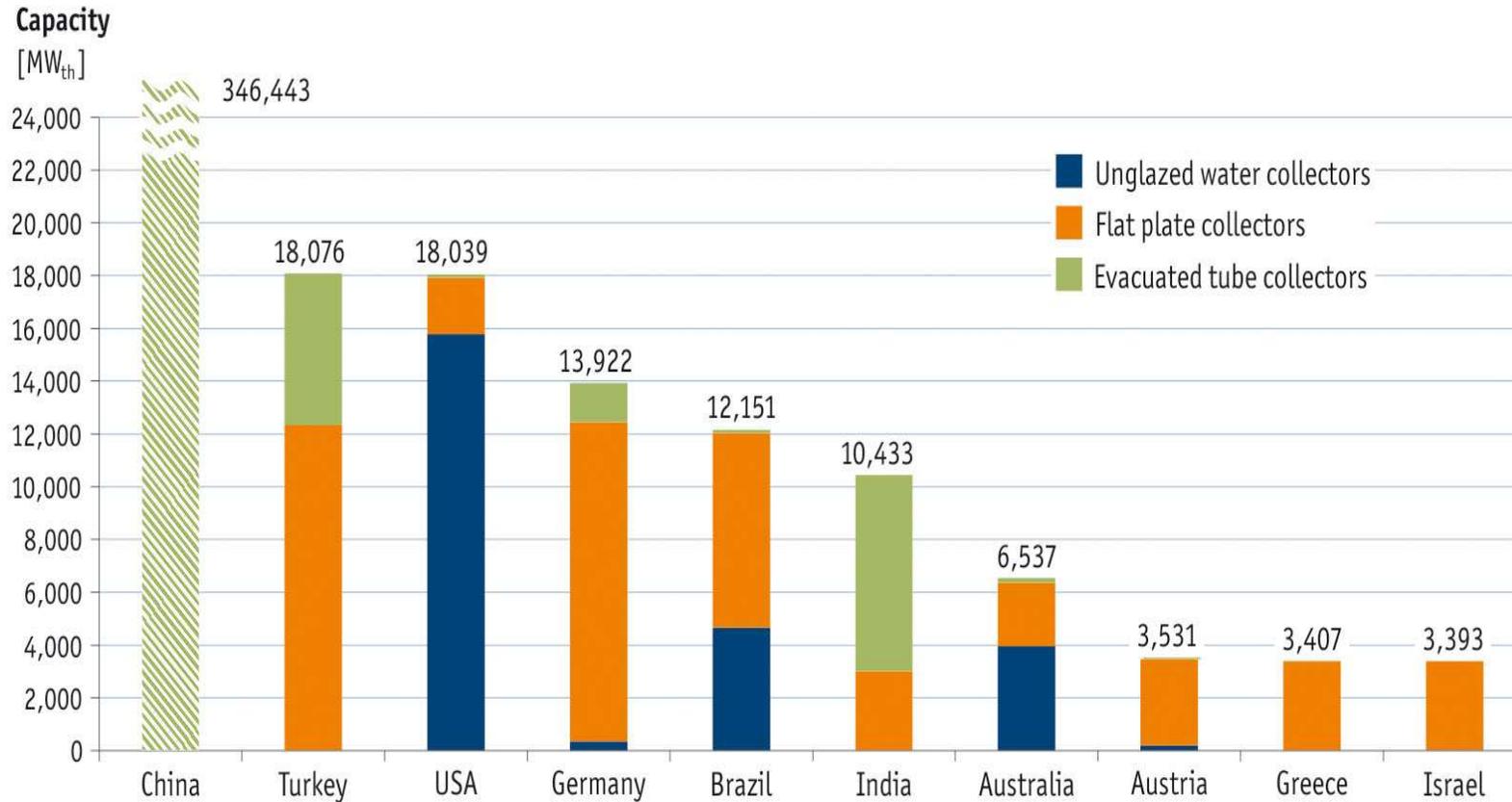


Photo: SOLTRAIN, AEE INTEC

# PV2heat Systems



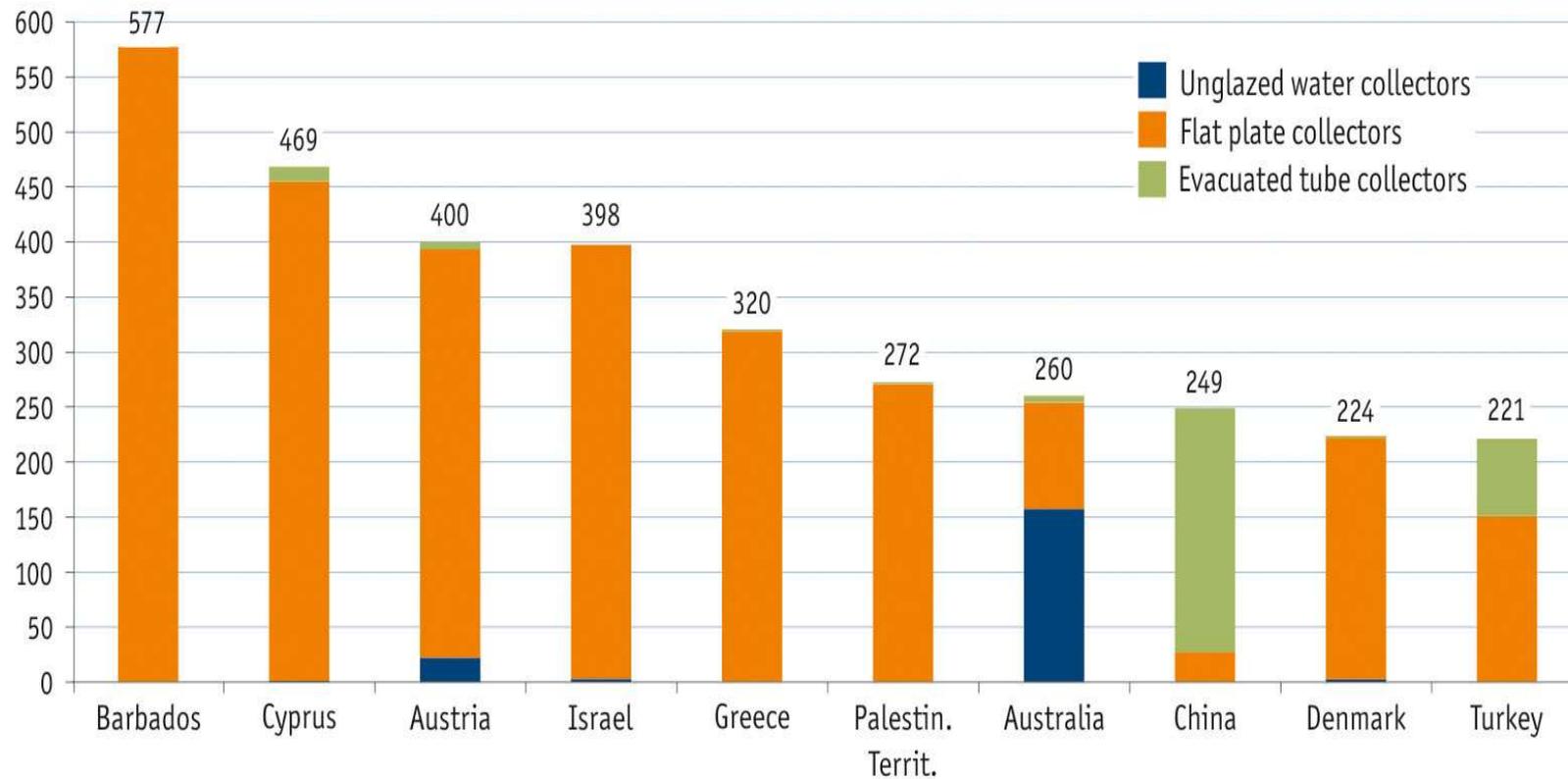
# Top 10 countries of cumulated water collector installations in 2019



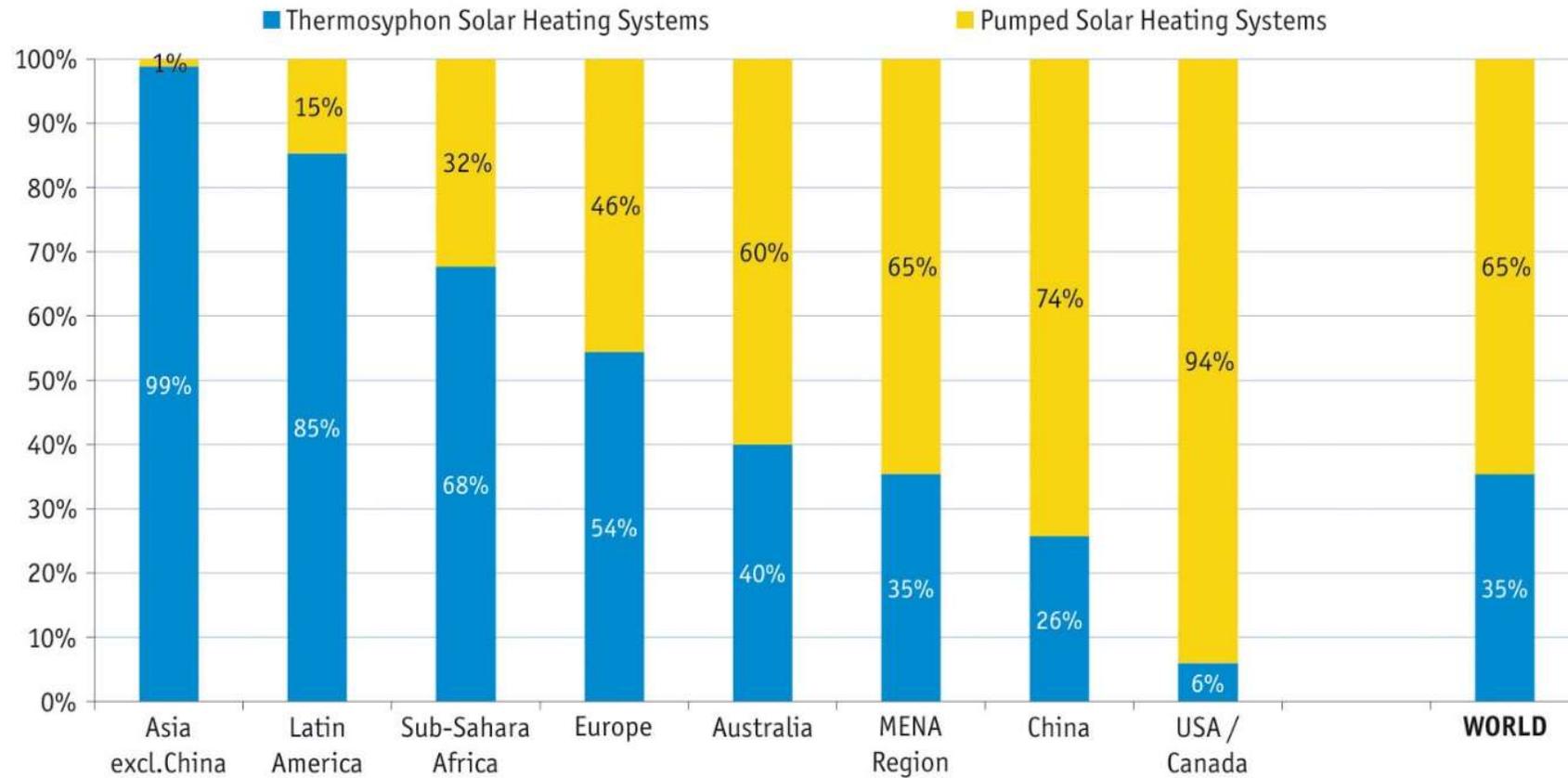
# Top 10 countries of cumulated water collector installations per 1,000 inhabitants in 2019



Capacity [ $\text{kW}_{\text{th}}$  per 1,000 inh.]



# Distribution by type of system for the newly installed glazed water collector capacity in 2019



# Environmental Effects and Contribution to the Climate Goals

**Solar thermal energy yields amounted 407 TWh in 2019**

**141.3 million tons of CO<sub>2</sub> avoided**

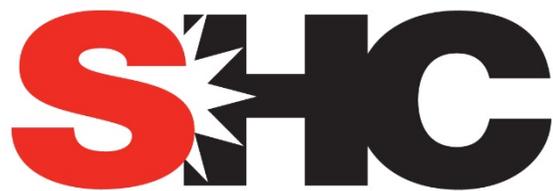
The CO<sub>2</sub> emissions saved by the thermal solar systems in operation in 2018 correspond to 3.8 times the total CO<sub>2</sub> emissions in Switzerland.

Interested in more details?



<http://www.iea-shc.org/publications-new>

[www.iea-shc.org](http://www.iea-shc.org)



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