

Newsletter of the  
International Energy  
Agency Solar Heating  
and Cooling Programme



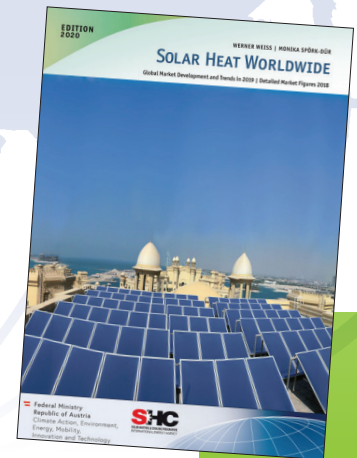
- #SolarHeat
- #SolarThermal
- #SolarProcessHeat
- #SolarCooling
- #SolarDistrictHeating

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## Solar Heat Worldwide 2020 Megawatt Installations on the Rise

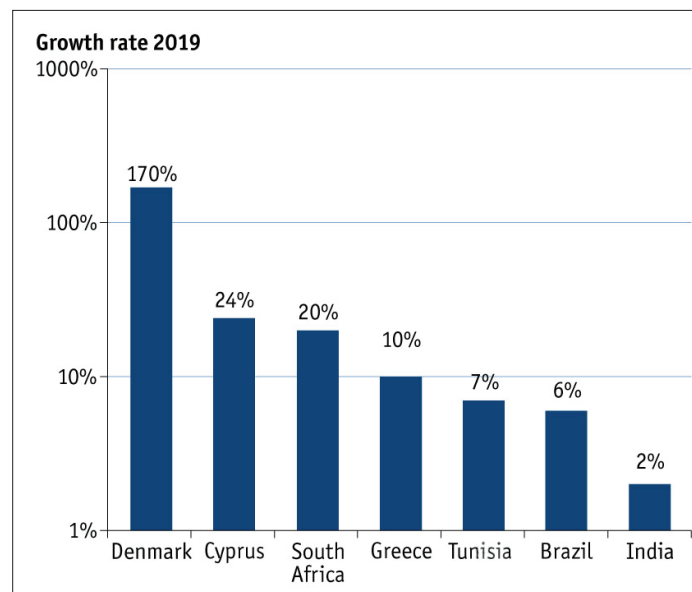
Solar thermal for district heating is on the rise worldwide. In Denmark, where the market grew by about 170% in 2019, and other countries like China and Germany, this rise is primarily due to advances in cost competitiveness. Also, driving this growth is the rising demand for industrial and agricultural applications. While residential water heating systems, the largest market sector, were under pressure in China and Central Europe from competing technologies, residential sales increased significantly in South Africa, Greece, Cyprus, and Brazil.



Highlighted below are some findings from this year's report, [Solar Heat Worldwide 2020](#). You can download the full report for free on our website.

### Shifting Global Markets

The market for new installations once again varied by country, with shrinking volumes in large markets like China, the USA, Germany, and Australia. Driven by the decline in new collector installations of about 8% in China, the worldwide market shrank approximately 6% in 2019 compared to 2018. On the flip side, Denmark reported another banner year with a 170% growth rate, followed by Cyprus, South Africa, Greece, Tunisia, Brazil, and India.



▲ Positive trend: Increasing sales in major solar thermal markets in 2019.

Source: Solar Heat Worldwide 2020

### SHC Members

- AUSTRALIA
- AUSTRIA
- BELGIUM
- CANADA
- CCREEE
- CHINA
- DENMARK
- EACREEE
- ECI
- ECREEE
- EUROPEAN COMMISSION
- FRANCE
- GERMANY
- ISES
- ITALY
- NETHERLANDS
- NORWAY
- PORTUGAL
- RCREEE
- SACREEE
- SLOVAKIA
- SOUTH AFRICA
- SPAIN
- SWEDEN
- SWITZERLAND
- TURKEY
- UNITED KINGDOM

## Large-scale Solar Systems

Megawatt installations are on the rise. In 2019, a record number – 74 new large-scale systems (>350 kWth, 500 m<sup>2</sup>) – was commissioned for district heating networks and large buildings. Bringing the total number of installations to 400 large solar thermal systems in operation with a total capacity equal to 1.62 GWth and 2.3 million m<sup>2</sup> of installed collectors.

## Solar Heat for Industrial Processes

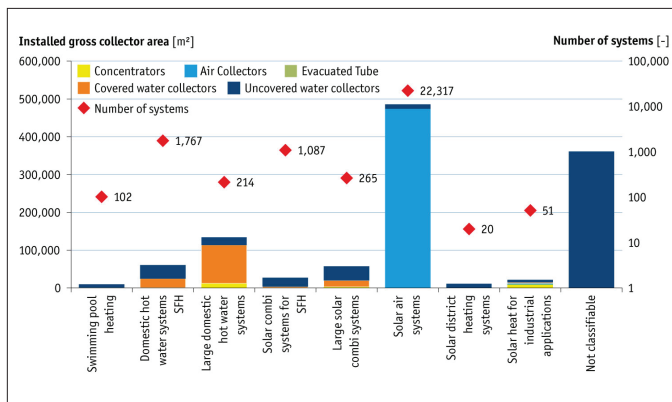
As of early 2020, 800 solar process heat plants with a collector area of 1 million m<sup>2</sup> were installed worldwide.

Two new applications in this sector worth highlighting are solar heated greenhouses, which include systems ranging from 126 m<sup>2</sup> collector area to just over 14,000 m<sup>2</sup>, and solar heated gas pressure control systems, which use solar to heat natural gas at gas pressure regulation stations during pipeline transportation, an interesting niche application being used in several systems in Germany.

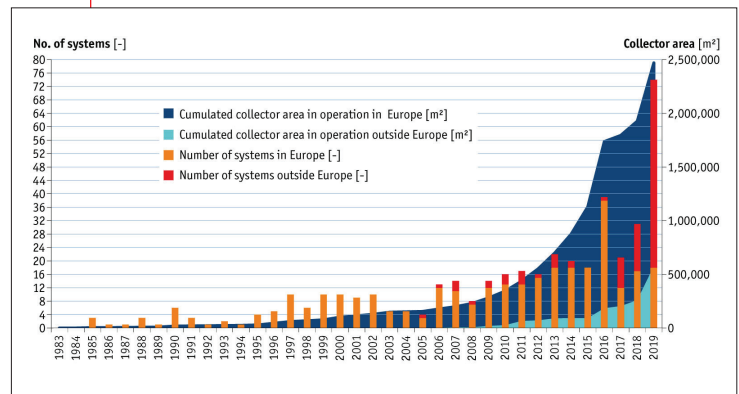
## Heat and Electricity from the Same Roof

For the second time, Solar Heat Worldwide carried out a market survey among PV-Thermal (PVT) collector manufacturers. A PVT system is unique in that it combines the production of both types of solar energy – solar heat and solar electricity, thus reaching higher yields per area. This application is particularly valuable when the available roof area is limited, but a climate-neutral energy supply is wanted.

The PVT market is gaining momentum in several European countries and represents 58% of the global installations, of which 41% are in France. Asia, excluding China, follows with 24% of the installations and then China with 11%. Total PVT capacity by the end of 2019 reached 606 MWth, and the PV power was 208 MW<sub>peak</sub> worldwide, an increase of 9% compared to the end of 2018.



▲ PVT systems in operation by application, collector type and collector area at the end of 2019. (Source: SHC Task 60 survey, AEE INTEC)



▲ Large-scale systems for solar district heating and large residential, commercial and public buildings worldwide – annual installations and cumulative area. (Data Source: Daniel Trier (PlanEnergi, Denmark), Jan-Olof Dalenbäck (Chalmers University of Technology, Sweden), Sabine Putz (SHC Task 55, Austria), Bärbel Epp (solarthermalworld.org, Germany)



▲ The world's largest solar process heat plant Miraah in Oman was significantly enlarged in 2019 and now has an installed capacity of 300 MWth. Photo: GlassPoint Solar, Inc.



▲ A 6.5 MWth collector field heats a greenhouse in Heerhugowaard, the Netherlands. Photo: G2 Energy

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## Small-scale Solar Thermal Heating Systems

Systems that provide hot water and heating in residential and public buildings, as well as hotels and hospitals and public buildings, represent around 60% of the newly added systems. A key point to note is that significant market growth occurred mostly only in those countries with market sales dominated by small-scale systems (in particular thermosiphon systems). The report shows that national social housing programs linked with the installation of solar water heating systems have a very positive impact on market development.



▲ Brazil's Minha Casa, Minha Vida social housing programmes included installing around 400,000 thermosiphon systems. Photo: Tuma

## Quick Stats

### Total Capacity

- 479 GWth (684 million square meters of collectors) = cumulated solar thermal capacity in operation at the end of 2019.
- 389 TWh = solar thermal energy supplied in 2019.

### Market Growth

- Top markets in 2019 = Denmark (170%), Cyprus (24%), South Africa 20%, Greece 10%, Tunisia (7%), Brazil (6%), and India (2%)

### New Capacity

- 33.5 GWth = new installed capacity in 2018. Once again, led by China (24.8 GWth) and Europe (2.9 GWth), which together accounted for 83% of the total new collector installations.

### Environment

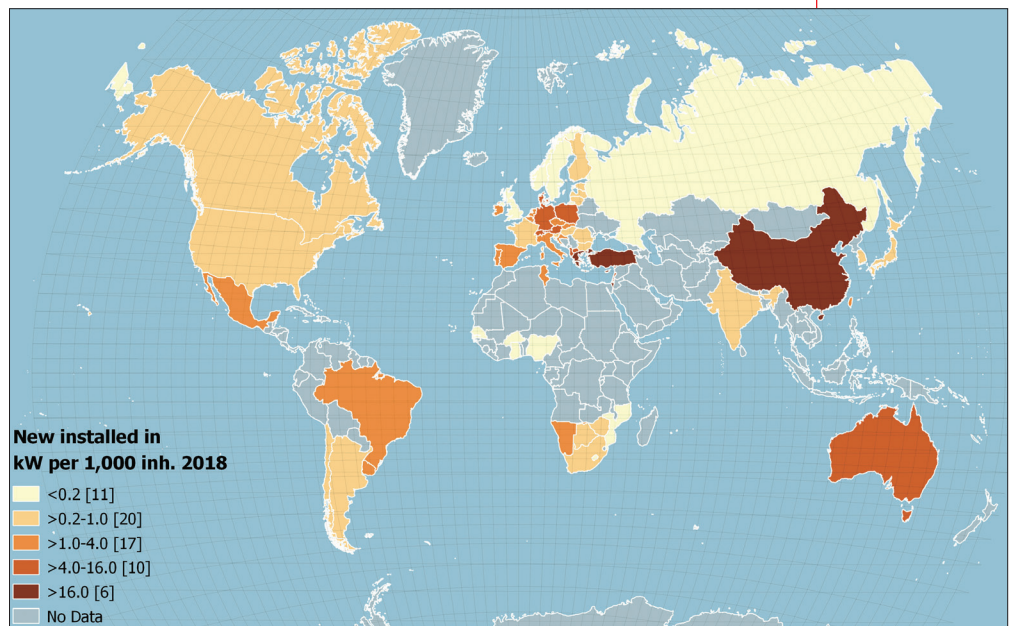
- 389 TWh solar thermal energy yield correlates to a savings of 41.9 million tons of oil and 135.1 million tons of CO<sub>2</sub>. Fun fact: the CO<sub>2</sub> savings are 3.5 times the annual CO<sub>2</sub> emissions of Switzerland.

### Jobs

- 650,000 = estimated number of jobs (production, installation, and maintenance) in 2018
- 15.4 billion (US\$16.9 billion) = worldwide turnover of the solar thermal industry in 2018

### Applications

- Domestic hot water systems = most common application at 53% of total capacity and 33% of new installations in 2018 – a downward trend.
- Large-scale domestic hot water applications = 37% of total capacity and 60% of new installed capacity – an upward trend. The reason for this uptick is attributed to it taking over some of the market shares for swimming pool heating and domestic hot water heating in single-family houses.
- Two other applications to note are solar district heating and solar process heat, both of which are steadily increasing although still only represent 3% of the global market.



▲ New installed capacity in kWth per 1,000 inhabitants in 2018.

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“It’s true that solar thermal is going through challenging times, but it is important to note that this is mainly due to declines in the Chinese market. But despite this trend, solar thermal is experiencing steady growth in two key sectors – district heating and industrial processes. Plus, solar heating and cooling technologies will always have a positive impact on climate protection,”

DANIEL MUGNIER, IEA SHC Chairman

## Top 10

Top 10 Markets in 2018 (in MWth)	Top 10 Markets per 1,000 inhabitants in 2018 (in kWth)
China 24,801	Israel 35
Turkey 1,316	Cyprus 32 ^
India 1,252 ^	Barbados 29 ^
Brazil 875	Greece 22 ^
United States 623	China 18
Australia 408	Australia 17
Germany 401	Turkey 16
Israel 291	Denmark 9 ^ *
Mexico 284 ^	Austria 8
Greece 230 ^	Palestinian Territories 7

^ denotes increase from 2017

\* not on the list in 2017

## Top 10

Total Installations in 2018 (in MWth)	Total Installation per 1,000 inhabitants in 2018 (in kWth)
China 337,816 ^	Barbados 565 ^
United States 17,935 ^	Cyprus 446 ^
Turkey 17,596 ^	Austria 408
Germany 13,877 ^	Israel 398 ^
Brazil 11,258 ^	Greece 309 ^
India 9,457 ^	Palestinian Territories 271 ^
Australia 6,451 ^	Australia 261
Austria 3,583	China 244 ^
Israel 3,351 ^	Turkey 217 ^
Italy 3,305 ^*	Denmark 202 ^

^ denotes increase from 2017

\* not on the list in 2017

You can read the full report on the IEA SHC website, <http://www.iea-shc.org/solar-heat-worldwide>.