

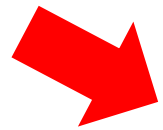


**SOLAR HEATING & COOLING PROGRAMME**  
INTERNATIONAL ENERGY AGENCY

## Solar Heating and Cooling industry and business trends 2020

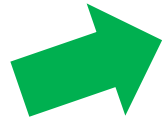
Bärbel Epp, solrico  
[www.solrico.com](http://www.solrico.com)



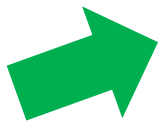


Postponed investment decision by commercial clients, including industries and hotels and delays in installation and commissioning of already contracted C&I solar heat projects

The reduction (-4 %) of the global market was smaller than expected due to the following stabilising factors.



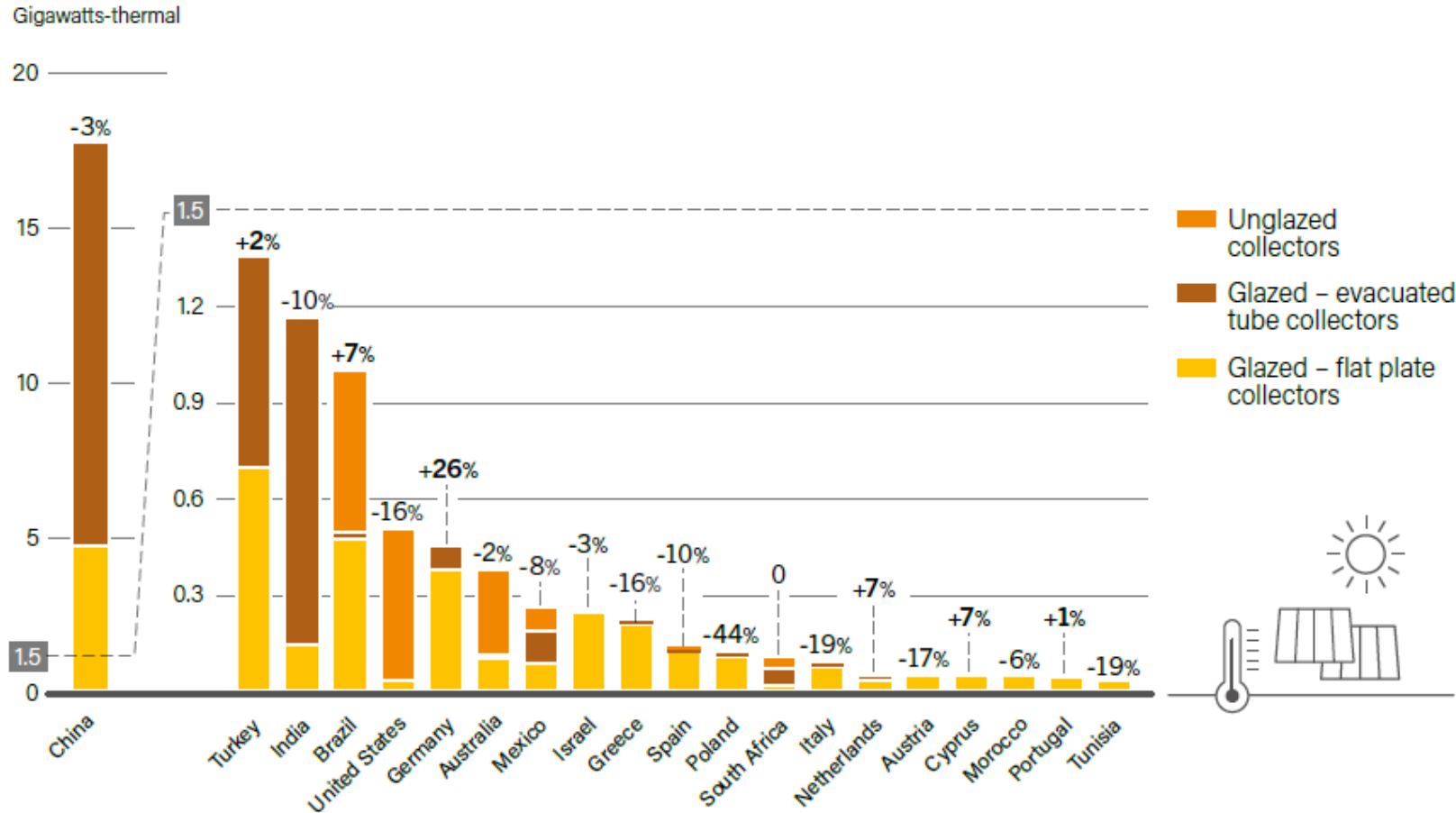
Higher demand from homeowners who spent more time at home and invested in infrastructure improvements (e.g. in Brazil, Turkey, Cyprus)



Changes in policy support had a much greater influence on demand than the pandemic (Germany, Netherlands, China).



**FIGURE 32.**  
Solar Water Heating Collector Additions, Top 20 Countries for Capacity Added, 2020

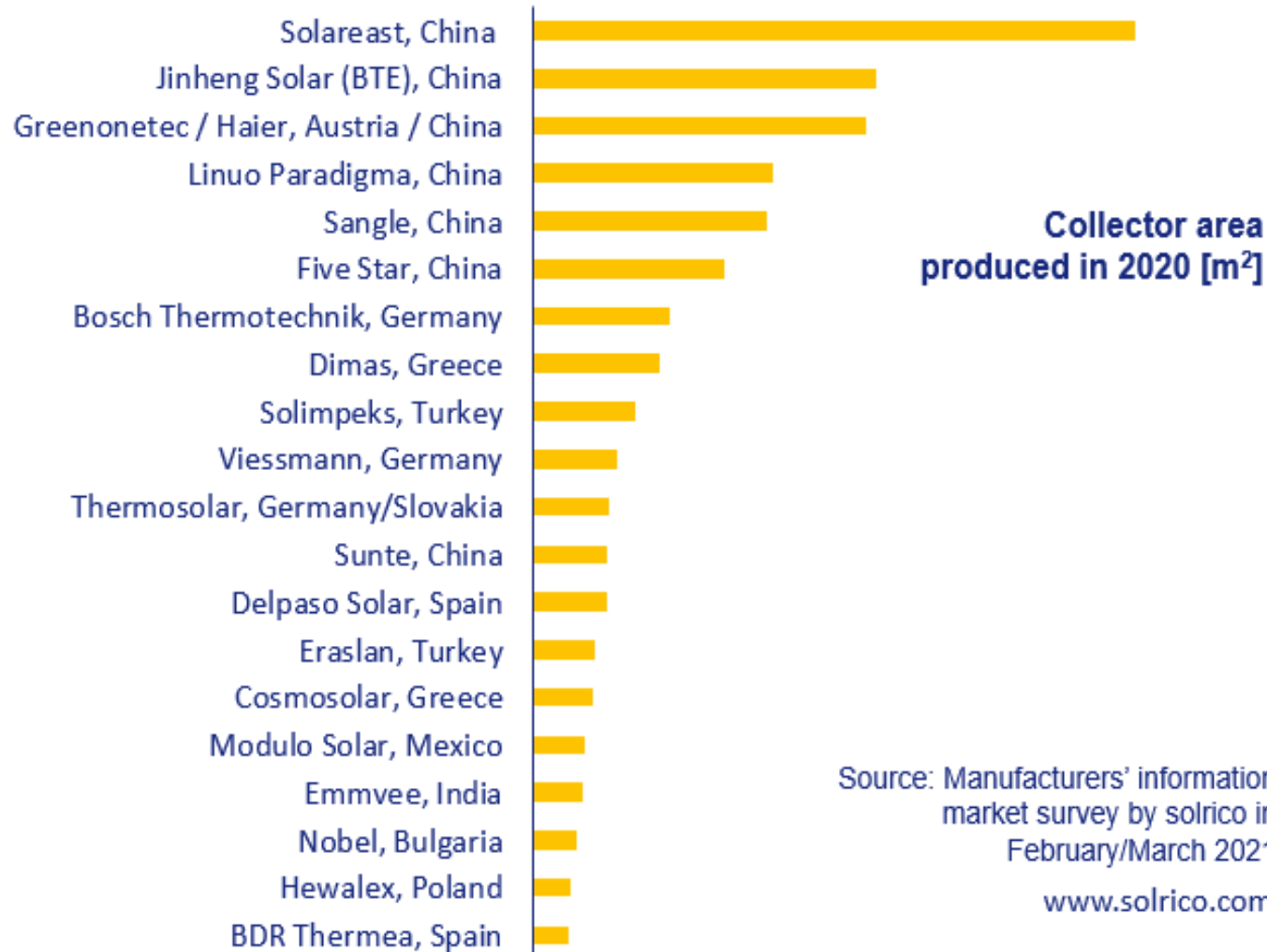


SHC chapter text and the excel file with the figures from the chart for download in the news section of [www.solrico.com](http://www.solrico.com)

Note: Additions represent gross capacity added. For the Netherlands, the shares of flat plate and vacuum tube collectors were estimated based on actual shares in 2019. For Morocco, the share of collector types was not available.

Source: See endnote 10 for this section.

## Ranking of the largest flat plate collector manufacturers worldwide



Gap widens between China and rest of the world

Chinese manufacturers increased production volume by 12 %

Outside China total sales of all manufacturers fell 9 % on average in 2020.

Source: Manufacturers' information market survey by solrico in February/March 2021  
www.solrico.com

**YOU HAVE THREE OPTIONS TO FIND SUPPLIERS IN YOUR REGION:**  
[www.solar-payback.com/suppliers/](http://www.solar-payback.com/suppliers/)

Solar supplier without references *	8
Solar supplier with collector production and without references *	9
Solar supplier with references	17
Solar supplier with collector production and references	41

1. Click *Search* and type in a country.
2. Click on a marker on the world map.
3. Click *Search* and type in a supplier's name.

- The results window lets you see the number of suppliers in each category.
- Choose suppliers based on the level of integration and their experience in SHIP:

\* Supplier which has not yet built a SHIP reference system but has experience in putting up large solar thermal systems for public and private-sector customers.

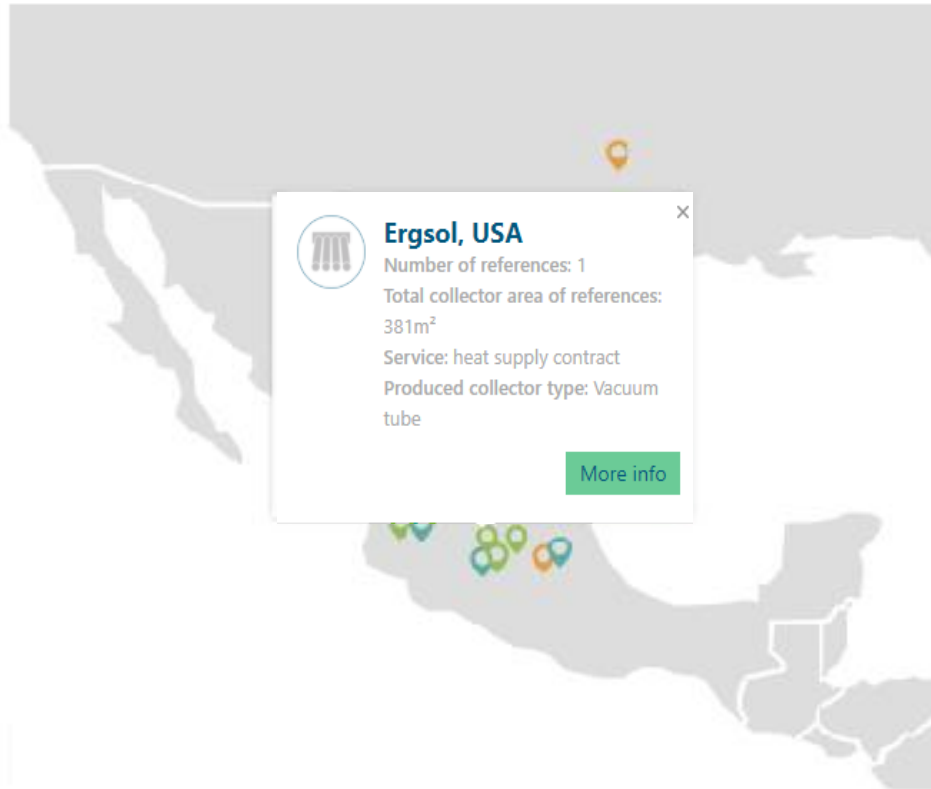
Supported by:



Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety



## CHOOSING A SUPPLIER OPENS A POPUP WINDOW THAT SHOWS MORE DETAILED INFORMATION.



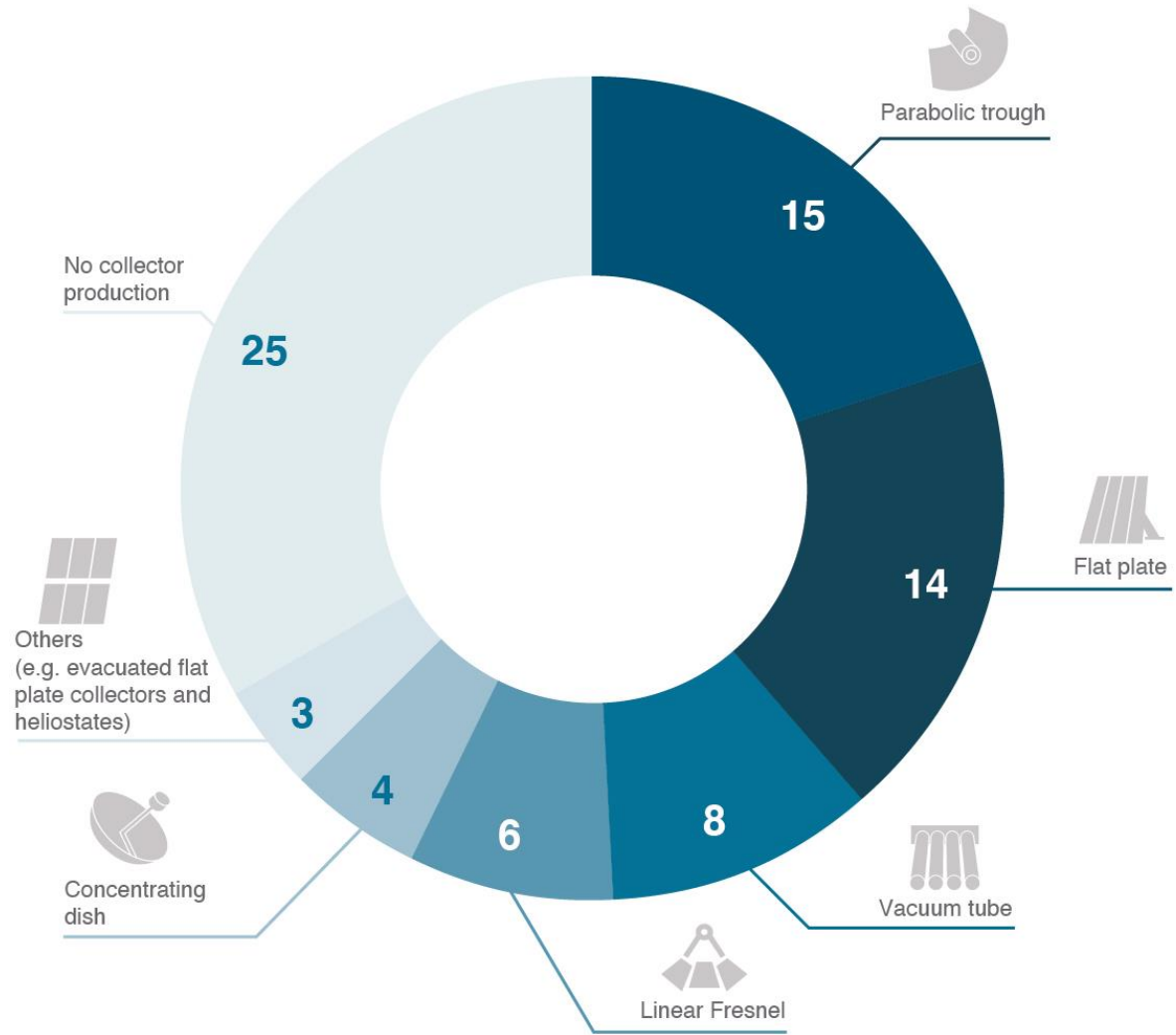
[www.solar-payback.com/suppliers/](http://www.solar-payback.com/suppliers/)

- No. of reference projects by the end of 2020 and corresponding collector area.
- Collector type produced inhouse.
- Option for heat supply contracts.
- Link to reference projects listed on [ship-plants.info](http://ship-plants.info)
- Link to company's website.



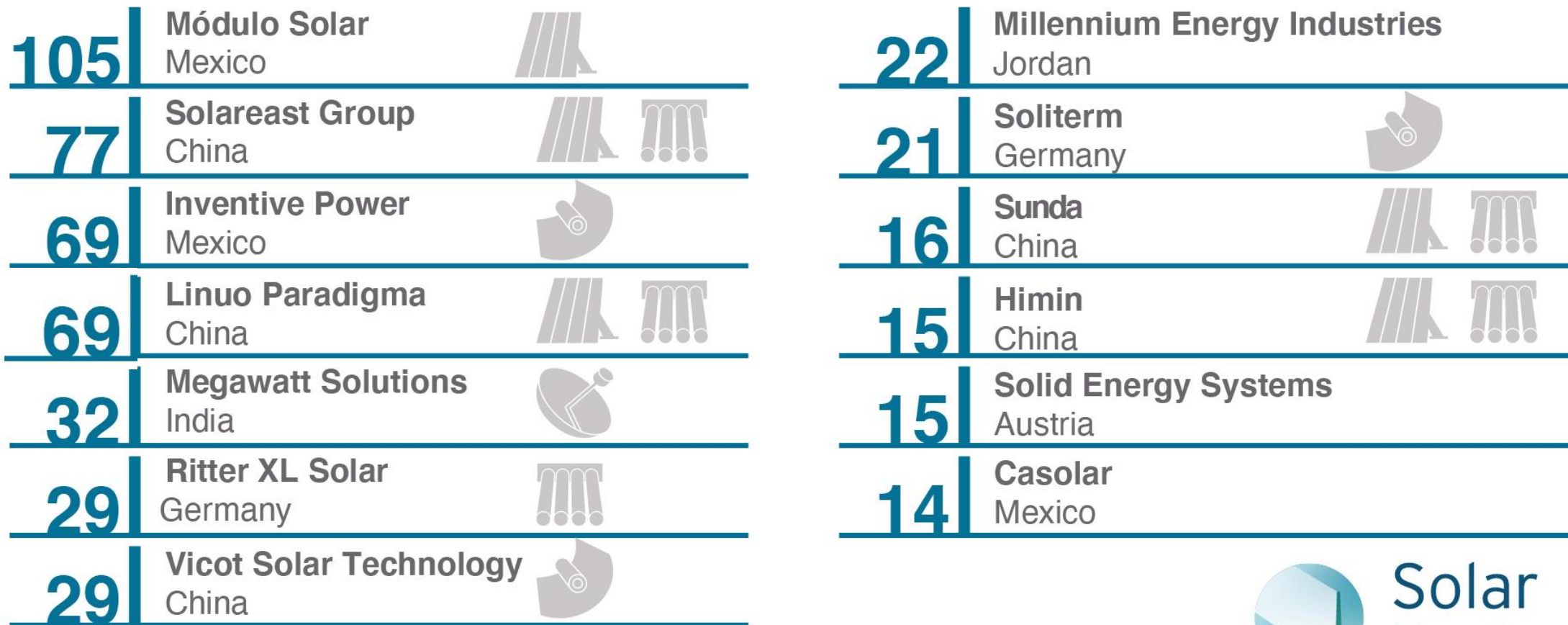
**75 turnkey SHIP suppliers are currently depicted on the world map**

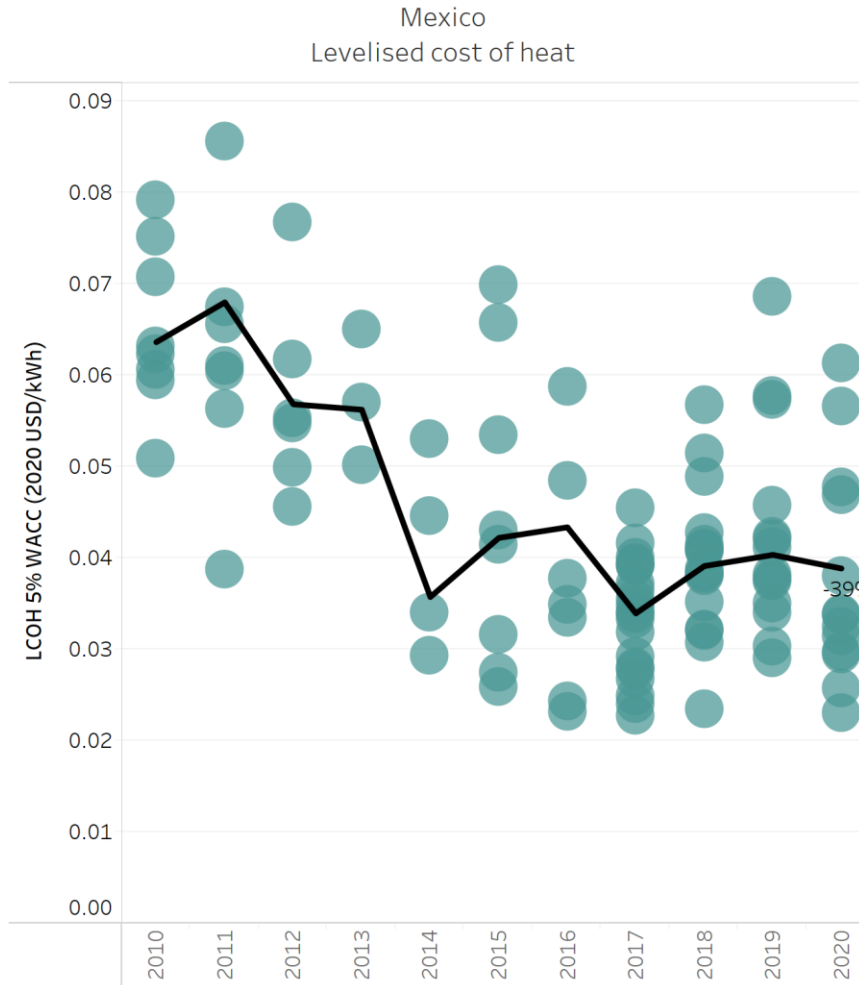
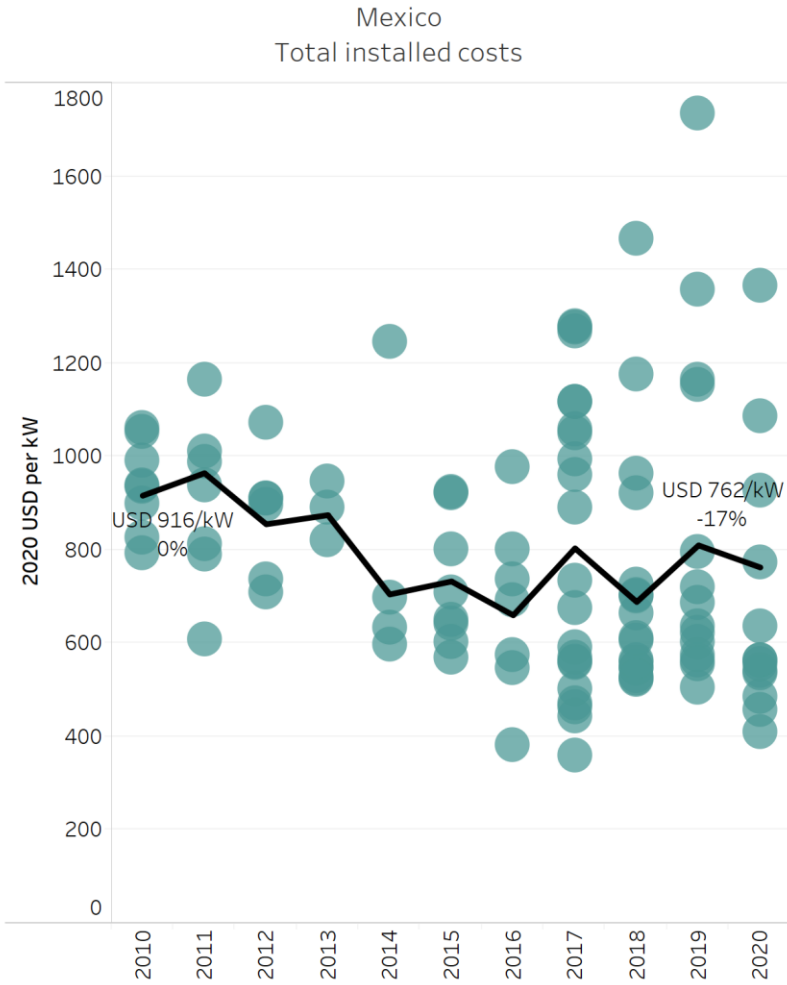
67 % of the listed companies produce collectors in-house or on-site





# Turnkey suppliers with more than 10 reference projects at the end of 2020





Five suppliers with 109 projects of which 74 % are SHIP plants the rest central hot water, including stationary and concentrating collectors

LCOH of **4 US-cent/kWh** due to superior solar resource in Mexico and a mature supply chain

Hardly any economies of scale, average system size 135 kW

Charts created by IRENA

**Preliminary version**



**2017**  
**107 SHIP**  
systems with  
**153 MW<sub>th</sub>**

- **120 MW Miraah in Oman**
- **Mexico (39), India (22), China (19)**

**2018**  
**99 SHIP**  
systems with  
**39 MW<sub>th</sub>**

- **51 SHIP plants in Mexico**
- **Mexico (51), China (15), Germany (9), India (5)**

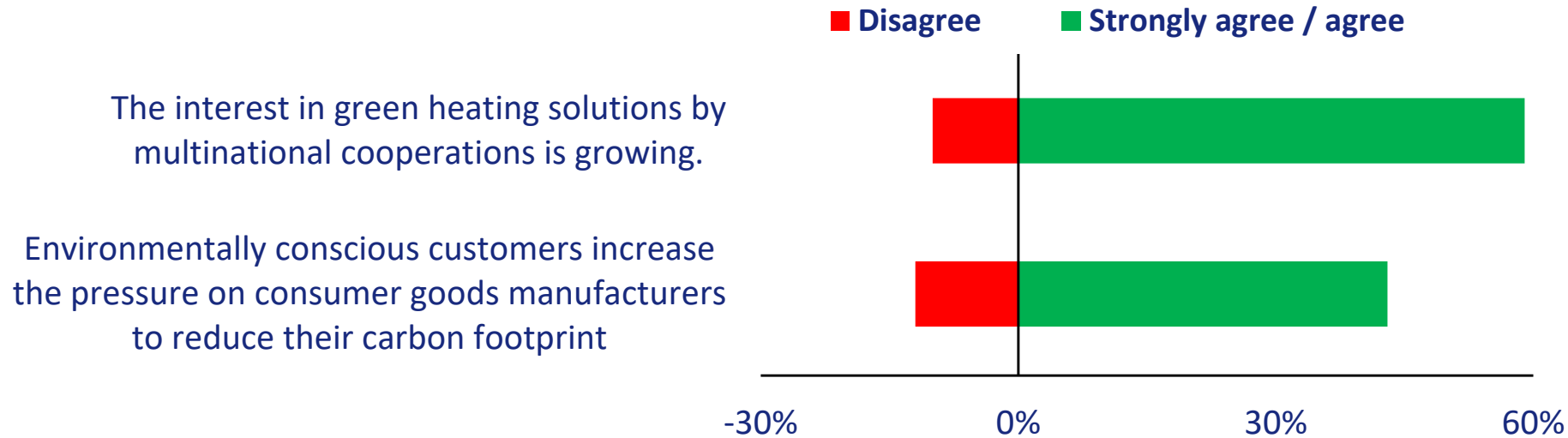
**2019**  
**86 SHIP**  
systems with  
**251 MW<sub>th</sub>**

- **180 MW Miraah**
- **China (26), Mexico (26), Germany (11), India (7)**

**2020**  
**74 SHIP**  
systems with  
**92 MW<sub>th</sub>**

**China (30), Mexico (16), Germany (10), India (3)**

- Only 15 of the 75 suppliers listed completed at least one SHIP project in 2020 (25 companies in 2019). **SHIP still needs a focused policy support to reach higher deployment rates.**
- India has the highest fluctuation of businesses offering SHIP plants, with seven being currently listed and another eight companies used to be part of the former world maps.
- New industry clusters have emerged in United States (6 companies listed). Newcomers: Sunvapor, Solarflux and Skyven.



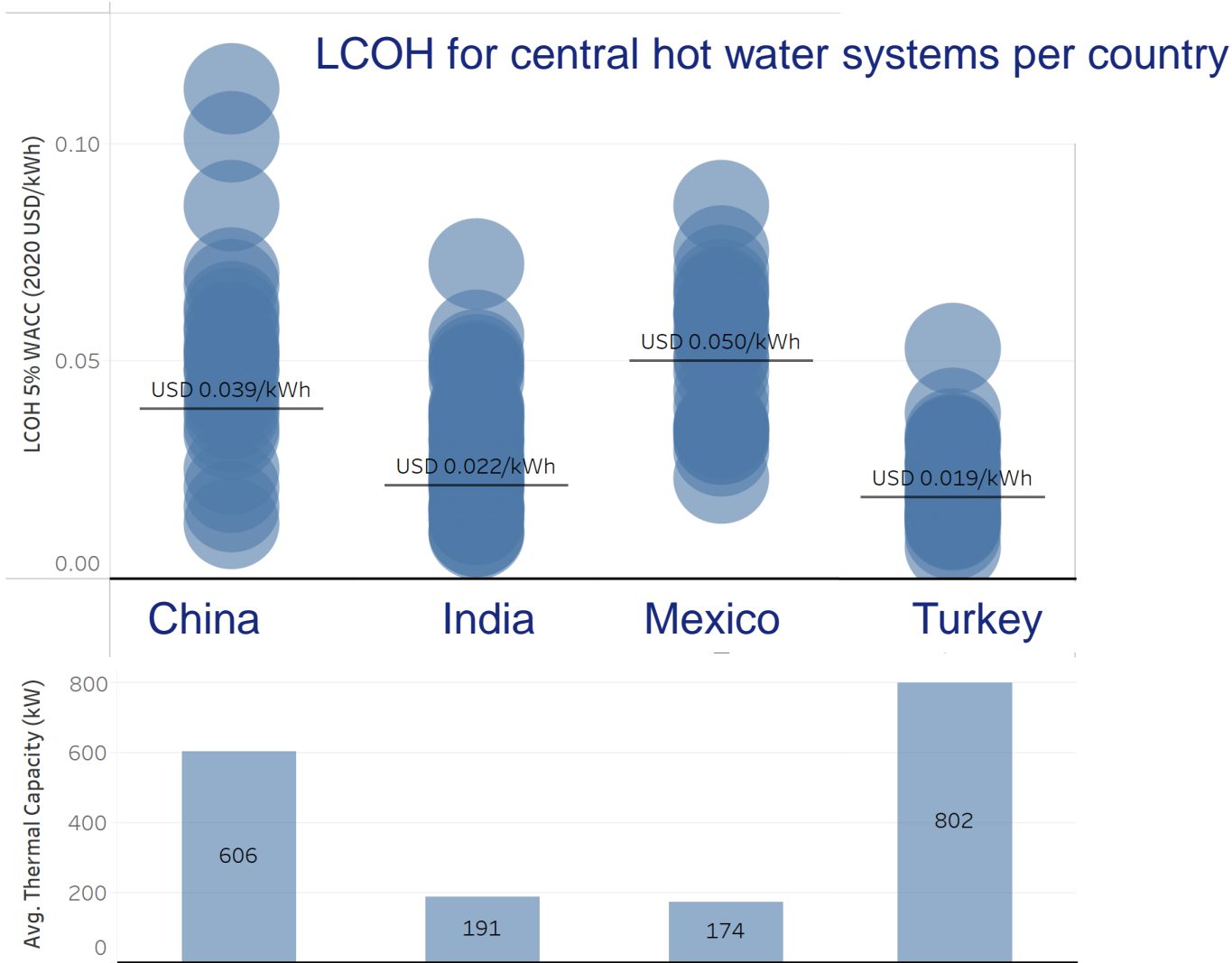
51 answers from SHIP technology suppliers worldwide listed on [www.solar-payback.com/suppliers](http://www.solar-payback.com/suppliers)



Key markets in 2020 for central hot water systems for large buildings in 2020:

China, Brazil, Turkey and Mexico





All central hot water systems are included above 50 m<sup>2</sup> (different collector types)

Lowest LCOH in India and Turkey with around **2 US-ct/kWh**.

Different cost structure (e.g. labor costs) in Mexico and India explains cost differences, while systems have the same size.

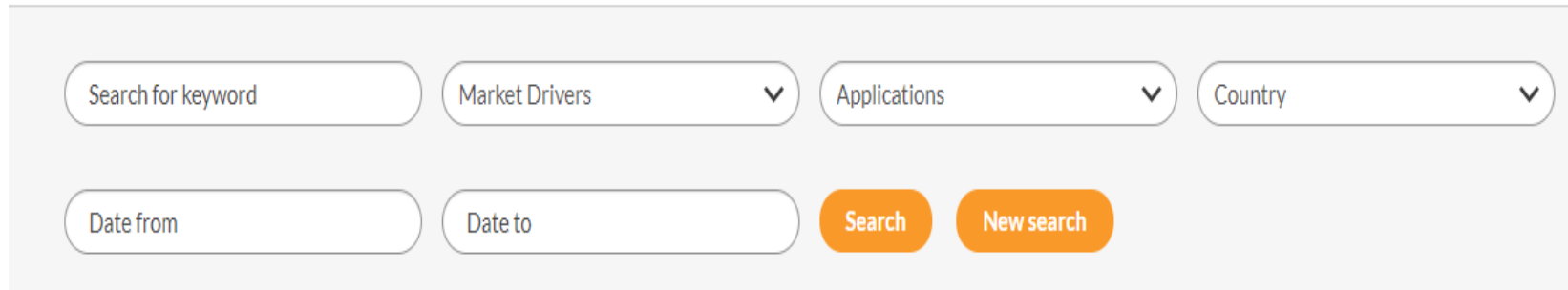
Lower average yields results in a significantly higher LCOH value in China with around 4 US-ct/kWh

Chart created by IRENA

Preliminary version of chart

Number of projects 2010 to 2020	25	53	28	36
Average yield	594 kWh/m <sup>2</sup>	845 kWh/m <sup>2</sup>	908 kWh/m <sup>2</sup>	823 kWh/m <sup>2</sup> (Solar Keymark)

- Solar district heating is the game changer for solar heat in Europe
- High interest of policy makers with generous funding opportunities in an increasing number of countries (Austria, France, Germany, Netherlands, Western Balkan countries e.g. Serbia and Kosovo, Poland) check via filter on [solarthermalworld.org](https://solarthermalworld.org)



The image shows a search interface with the following elements:

- Search for keyword (text input)
- Market Drivers (dropdown menu)
- Applications (dropdown menu)
- Country (dropdown menu)
- Date from (text input)
- Date to (text input)
- Search (orange button)
- New search (orange button)

- Most cost competitive application: Six Danish solar district heating systems commissioned in 2020 in the cost database reached **4.5 US-ct/kWh** (average size 12 MW)
- More concentrating collector solutions will be seen in solar district heating in Europe and China





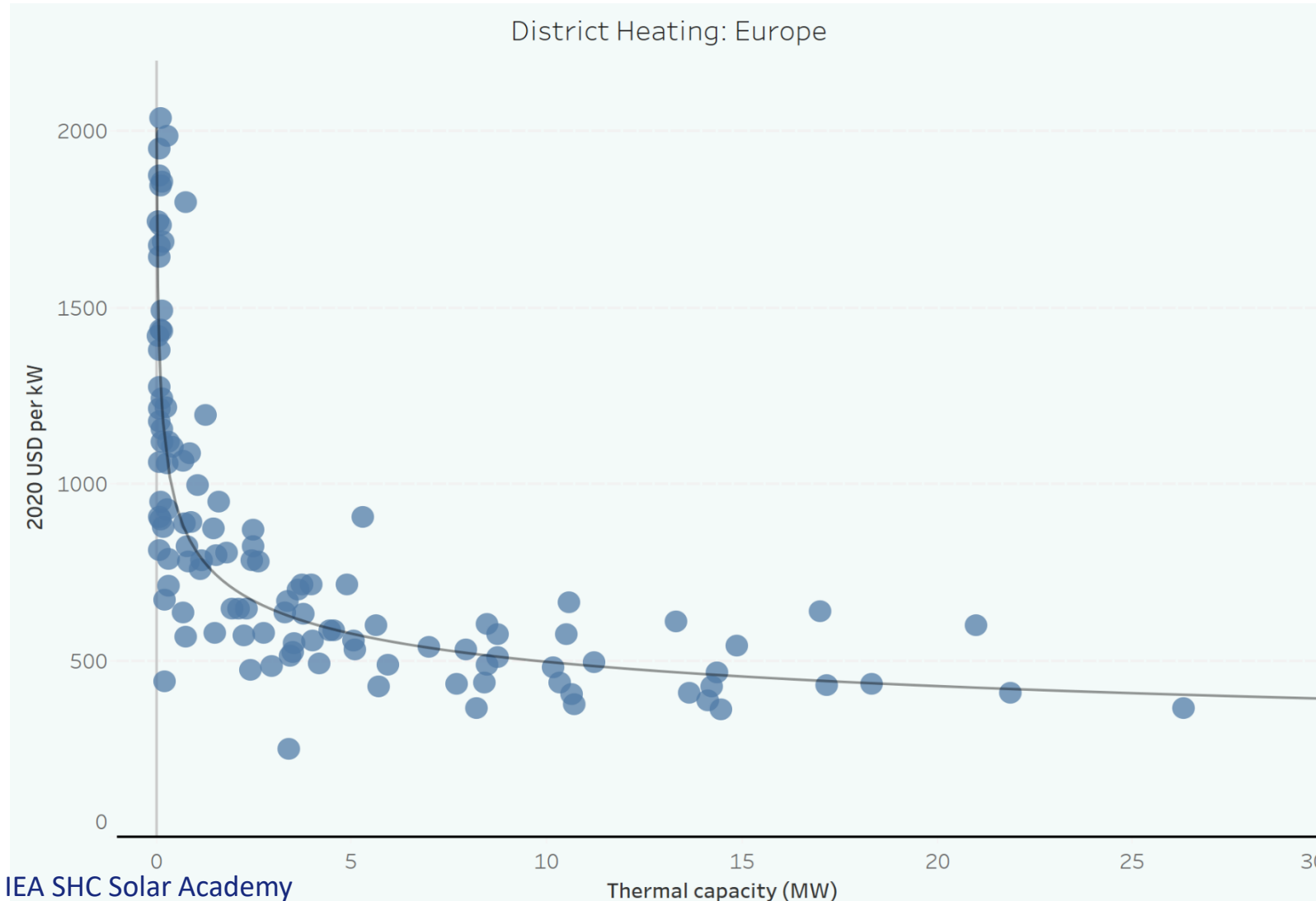
Source: Inner Mongolia XuChen Energy <https://bit.ly/3vqyoYh>  
See also: <https://www.solarthermalworld.org/news/worlds-largest-solar-district-heating-plant-concentrating-collectors>

# 117,000 m<sup>2</sup> (82 MW) parabolic trough field under construction in China



Source: Inner Mongolia XuChen Energy <https://bit.ly/3vqyoYh>  
See also: <https://www.solarthermalworld.org/news/worlds-largest-solar-district-heating-plant-concentrating-collectors>

## Economies of Scale in District Heating Installed Costs



A statistically robust economies of scale curve based on costs of 115 solar district heating projects of which 97 % are in Austria, Germany and Denmark

The 110 MW plant in Silkeborg, Denmark, is included in the curve calculation but outside the chart

Clear evidence of economies of scale in district heating: **14 % per doubling of plant size**

Chart created by IRENA

Preliminary version of chart

Thanks for your attention!

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