SHC Industry and Market Trends

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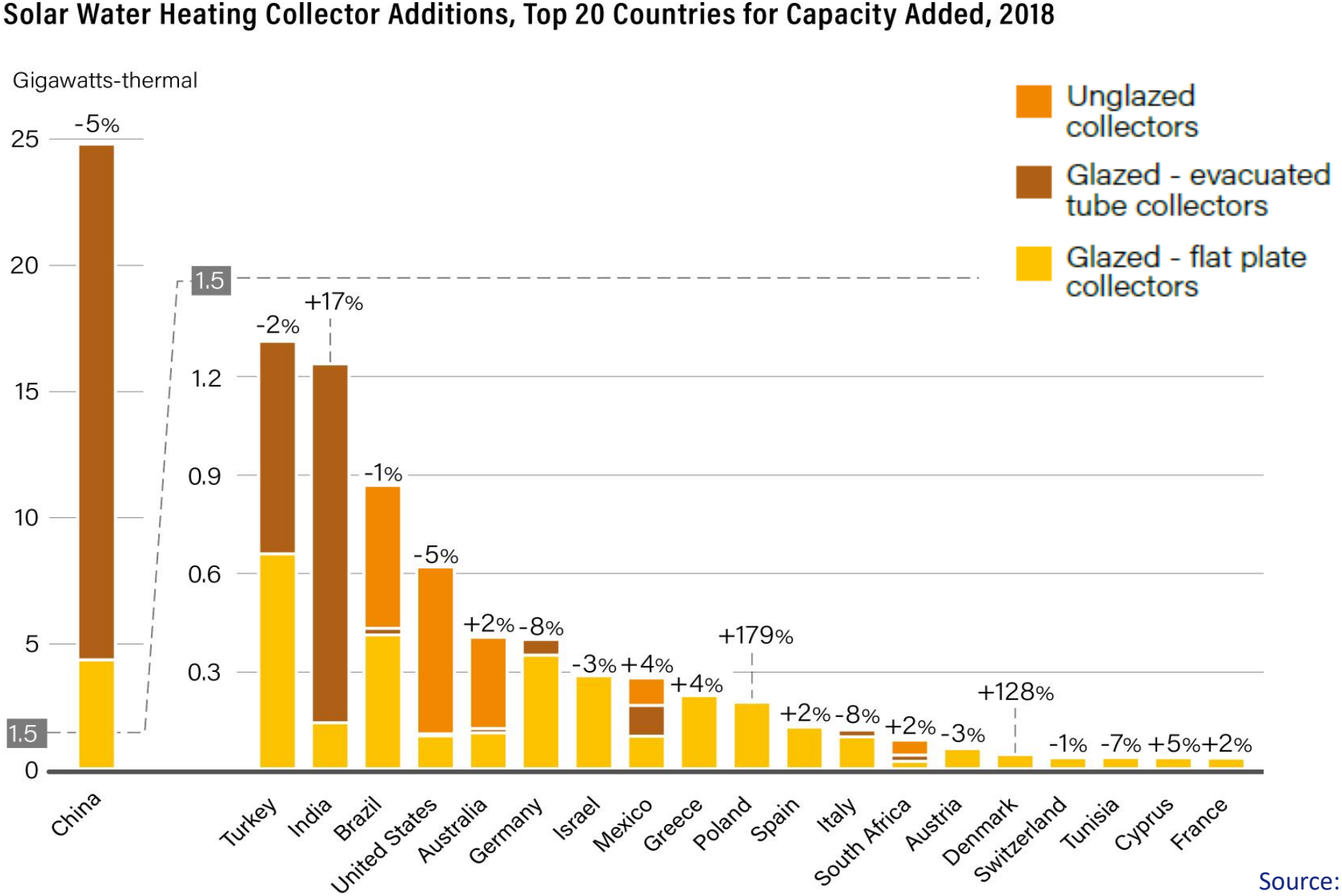
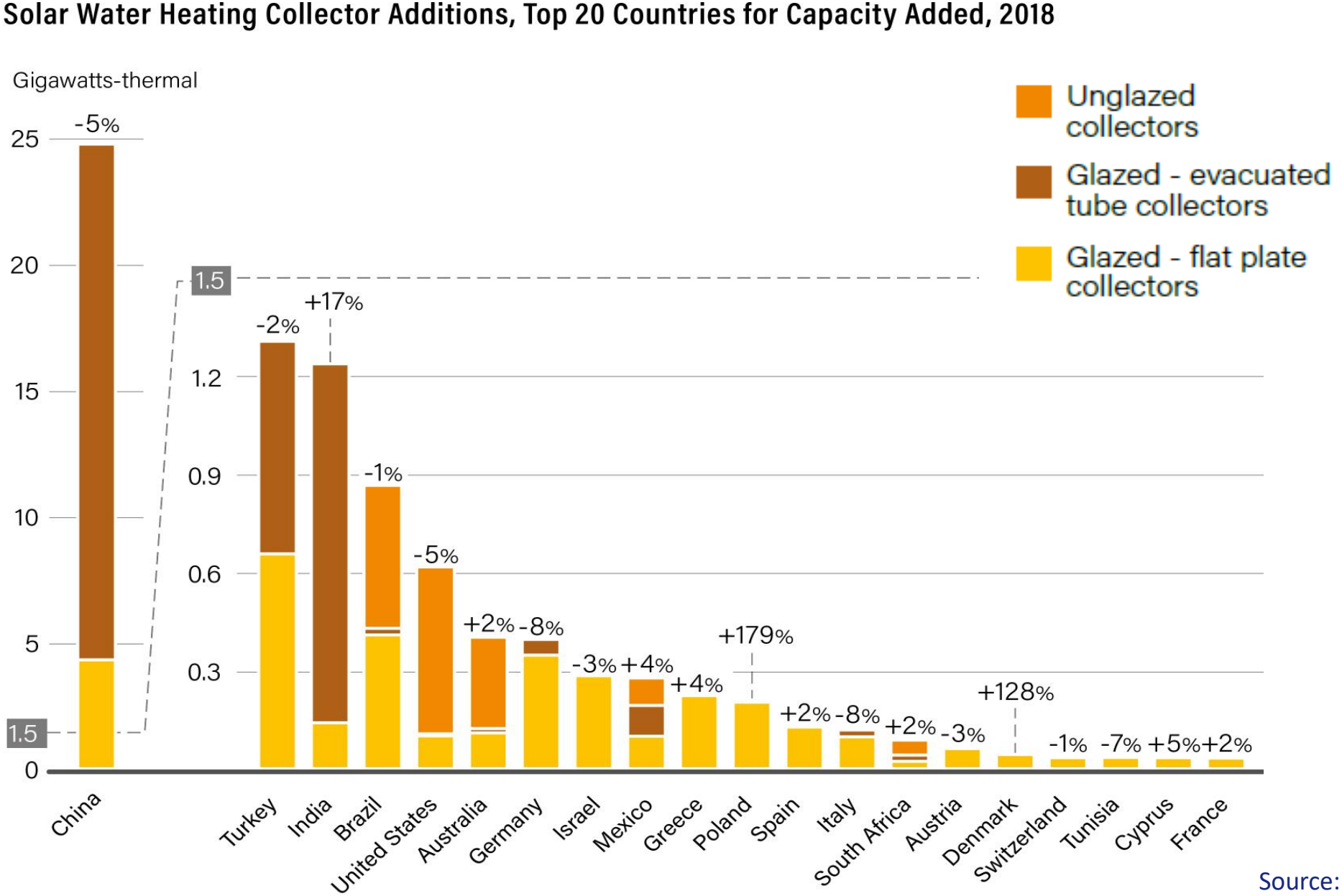
Development 2018 in the largest markets



Source: GSR 2019 of REN21

Development 2018 in the largest markets

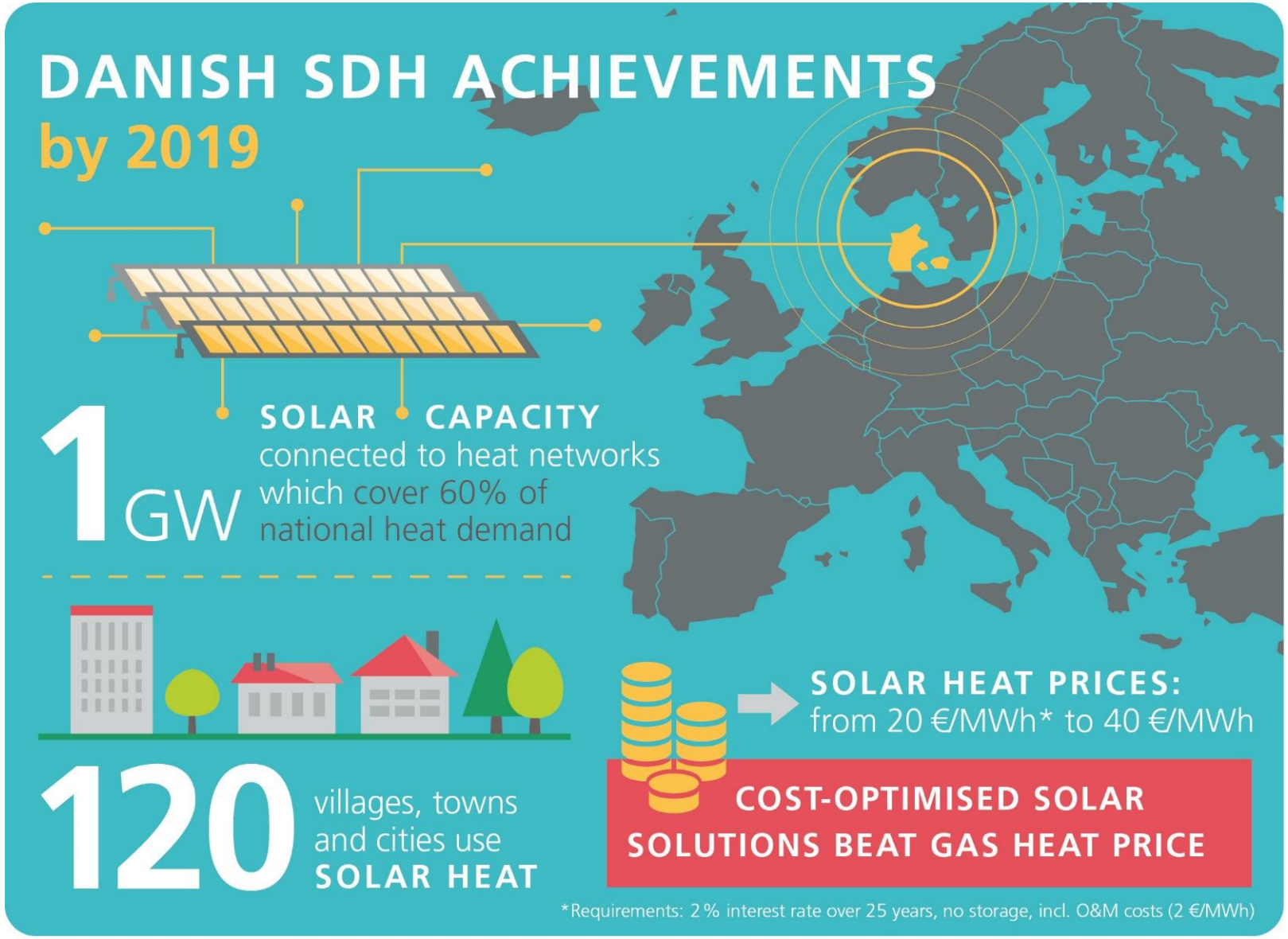


Source: GSR 2019 of REN21

Noticeable increase in flat plate collectors in China

	2015 [m^2]	Share in 2015	Trend	2018 [m^2]	Share in 2018
Newly installed vacuum tube collectors	38 million	87.4 %		29.19 million	82.4 %
Newly installed flat plate collectors	5.5 million	12.7 %		6.24 million	17.6 %
Total newly installed collector area	**43.5 million**			**35.43 million**	
Collector area installed in engineering segment	26.535 million	61%		25.86 million	73%
Collector area installed in retail	16.965 million	39%		9.57 million	27%

Great achievements in SDH 2019



Source: IEA SHC TASK 55

Denmark: Role model for other countries

Latvia: 15 MW SDH plant (21,672 m²) inaugurated at 12 September 2019 (photo: Salaspils Siltums)

Denmark: Role model for other countries

Serbia: Collector field on steal construction (900 m²) will be extended by additional 2,700 m² in stalled on the ground financially supported by USAID (photo: JKP Grejanje)

...augurated ...photo: Salaspils Siltums)

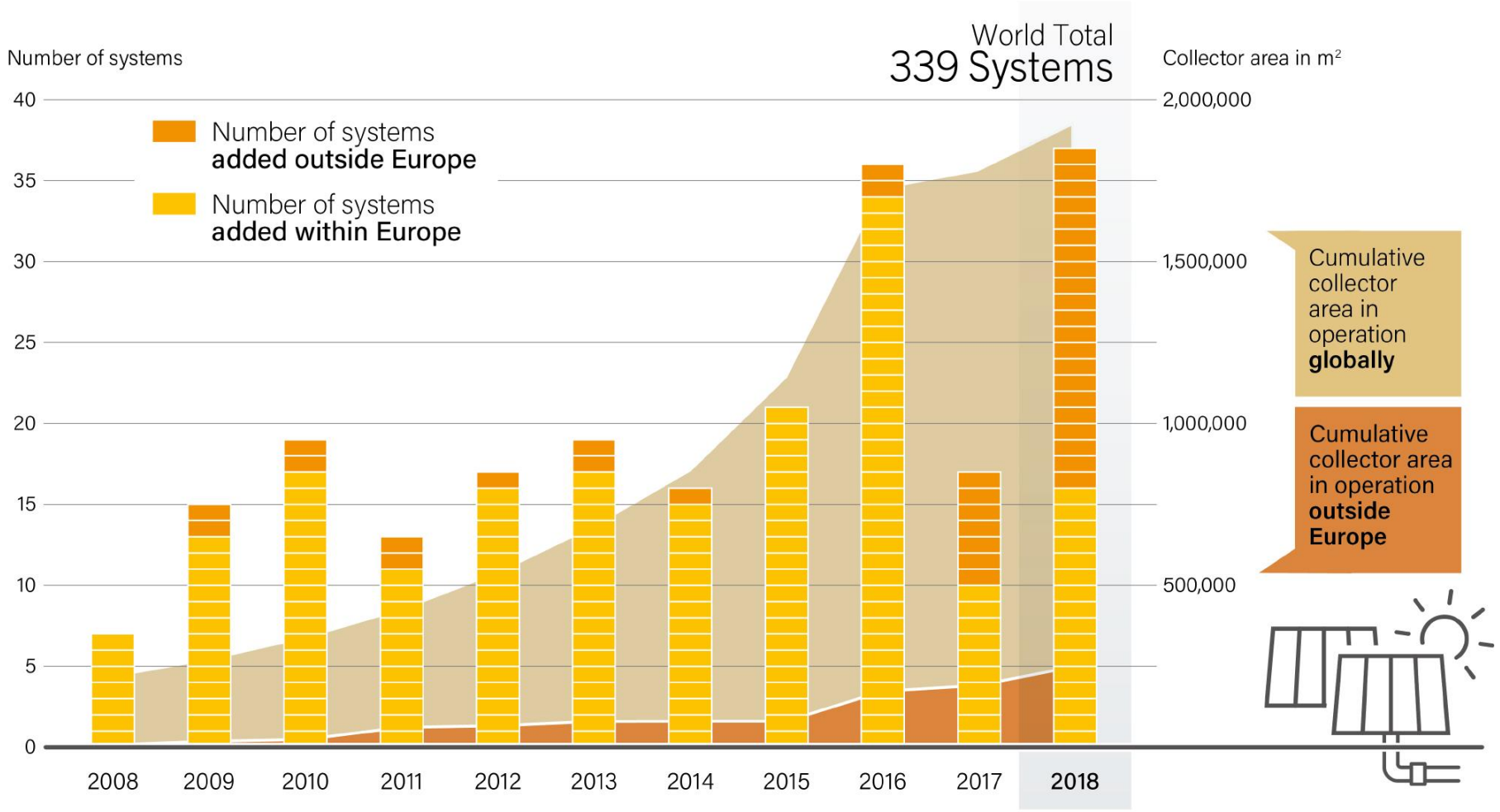
Five new bio-energy villages in Germany added a solar collector field in 2018 (Photo: Mersberg)

Serbi[illegible]
extended by [illegible]
supported by USAID [illegible]

France: 1.6 MW collector field in operation since June 2018 (photo: Amandine LE DENN, Chateaubriant)

SDH & co: only few added systems annually

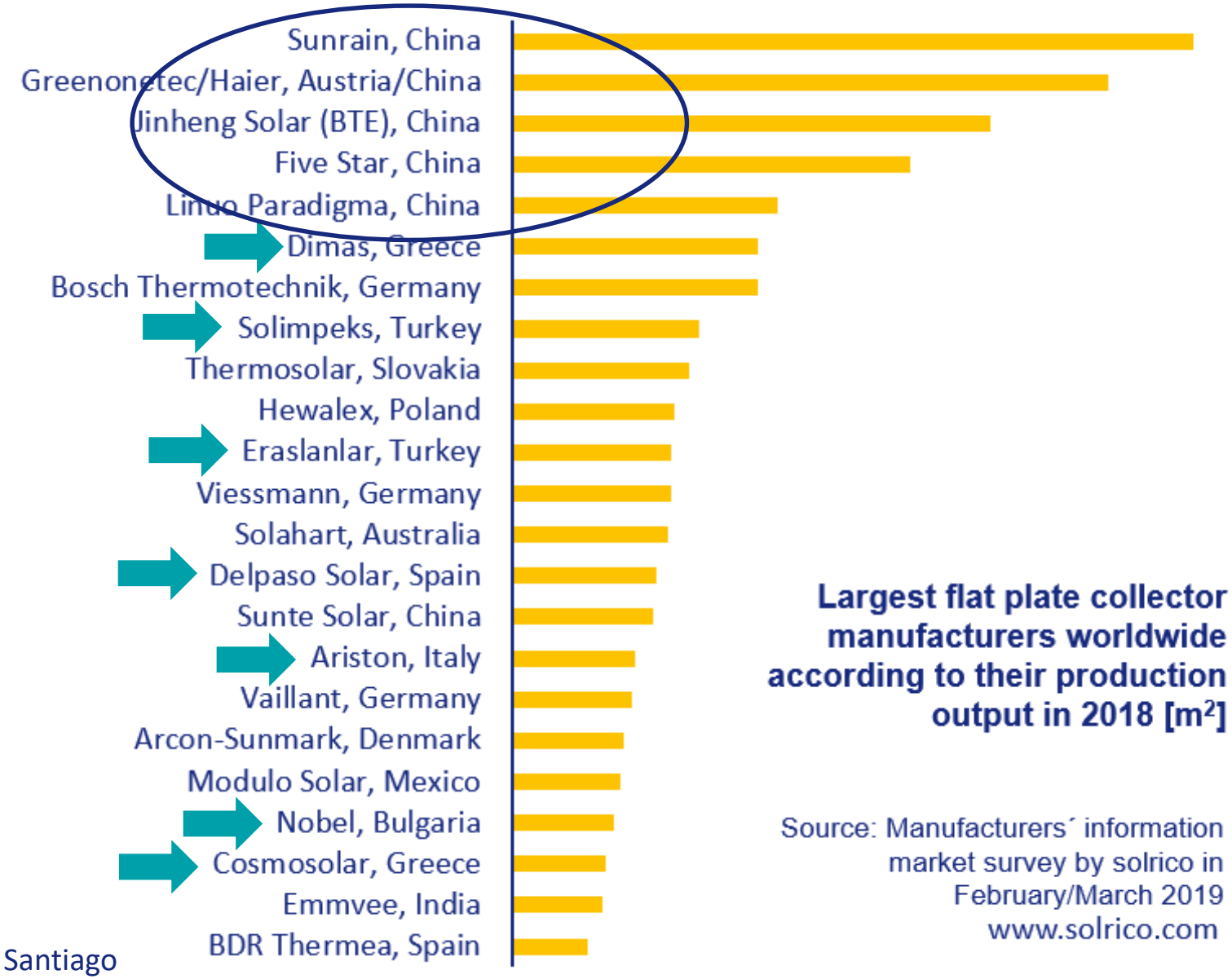
Solar District Heating Systems, Global Annual Additions and Total Area in Operation, 2008-2018



Note: Includes large-scale solar thermal installations for residential, commercial and public buildings. Data are for solar water collectors and concentrating collectors.

Source: IEA SHC.

Increased collector production



Largest flat plate collector manufacturers worldwide according to their production output in 2018 [m²]

Source: Manufacturers´ information market survey by solrico in February/March 2019 www.solrico.com

Fragmented industry with soft voice

- The many small collector and tank manufacturers do not reach the economy of scale and cannot focus on professional sales strategies
- OEM business is not developed enough, too many individual components, no standardisation (costs stay high)
- Too small budget for industry associations and lobbying organisations

➢736 SHIP systems
(end of 2018)

125 SHIP systems
(end of 2012)

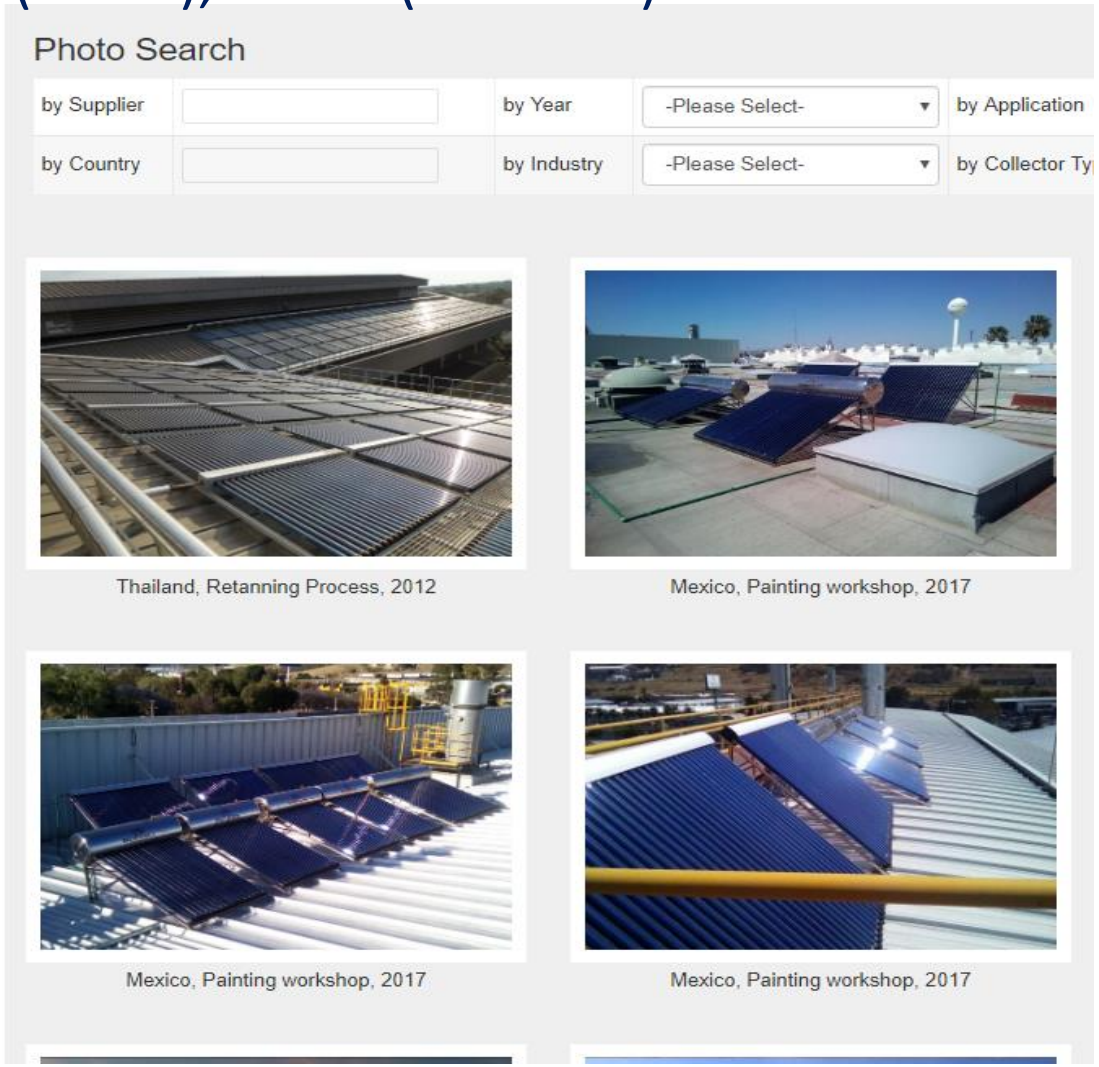
+104 SHIP systems in 2018

Countries with the most systems added in 2018: Mexico (51), China (15), India (10)

Source: Solar-payback.com

Well-known brands use solar heat

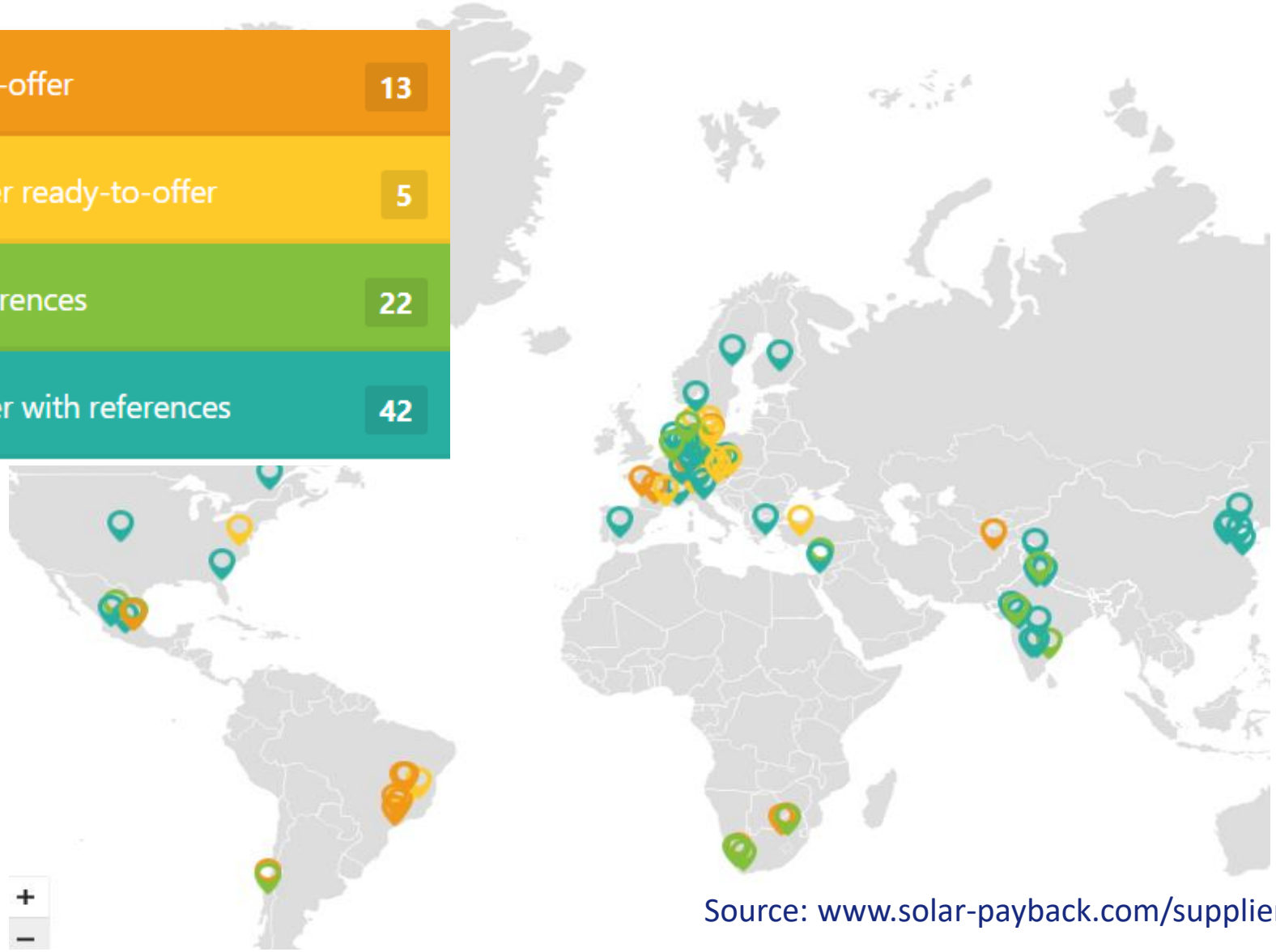
Nestle (Mexico), Heineken (Austria), Philips (Brazil), Unilever (India and Myanmar), Pepsi (USA), P&G (China), ECCO (Thailand)



More than 80 photos free for utilisation if copy right owner is mentioned: https://www.solar-payback.com/gallery/gallone_en.php (available in English, Spanish and Portuguese)

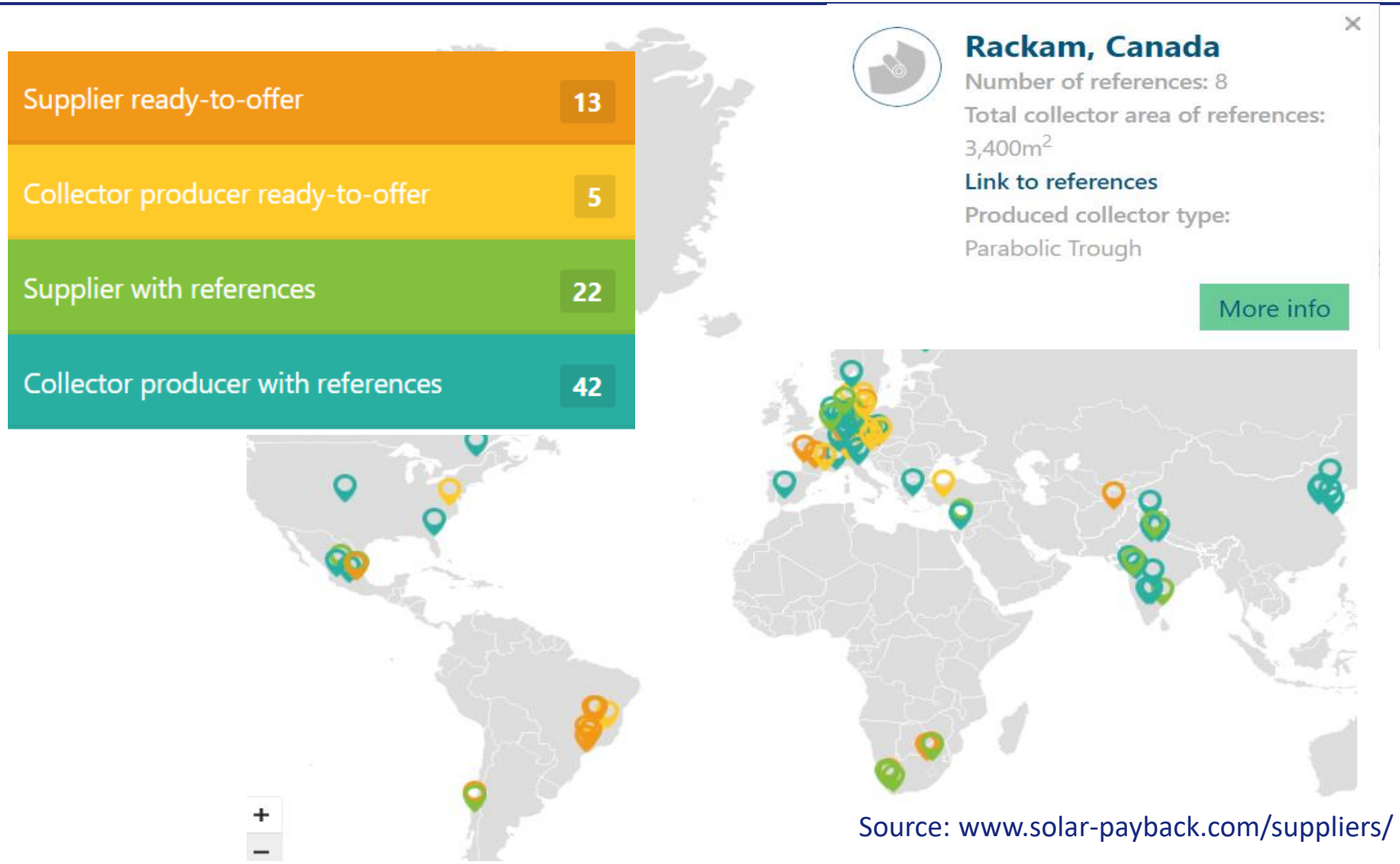
Growing and committed supply chain

Supplier ready-to-offer	13
Collector producer ready-to-offer	5
Supplier with references	22
Collector producer with references	42



Source: www.solar-payback.com/suppliers/

Growing and committed supply chain



Source: www.solar-payback.com/suppliers/

A series of largest SHIP plants in Europe

June 2019: Condat paper mill, 4,213 m² (3.4 MW_{th}), tracked flat plate collectors (photo: NewHeat)

October 2019, 9,300 m² (6.5 MW_{th}) flat plate collectors supply heat to freesias greenhouse farm in Northern Netherlands (photo: G2Energy)

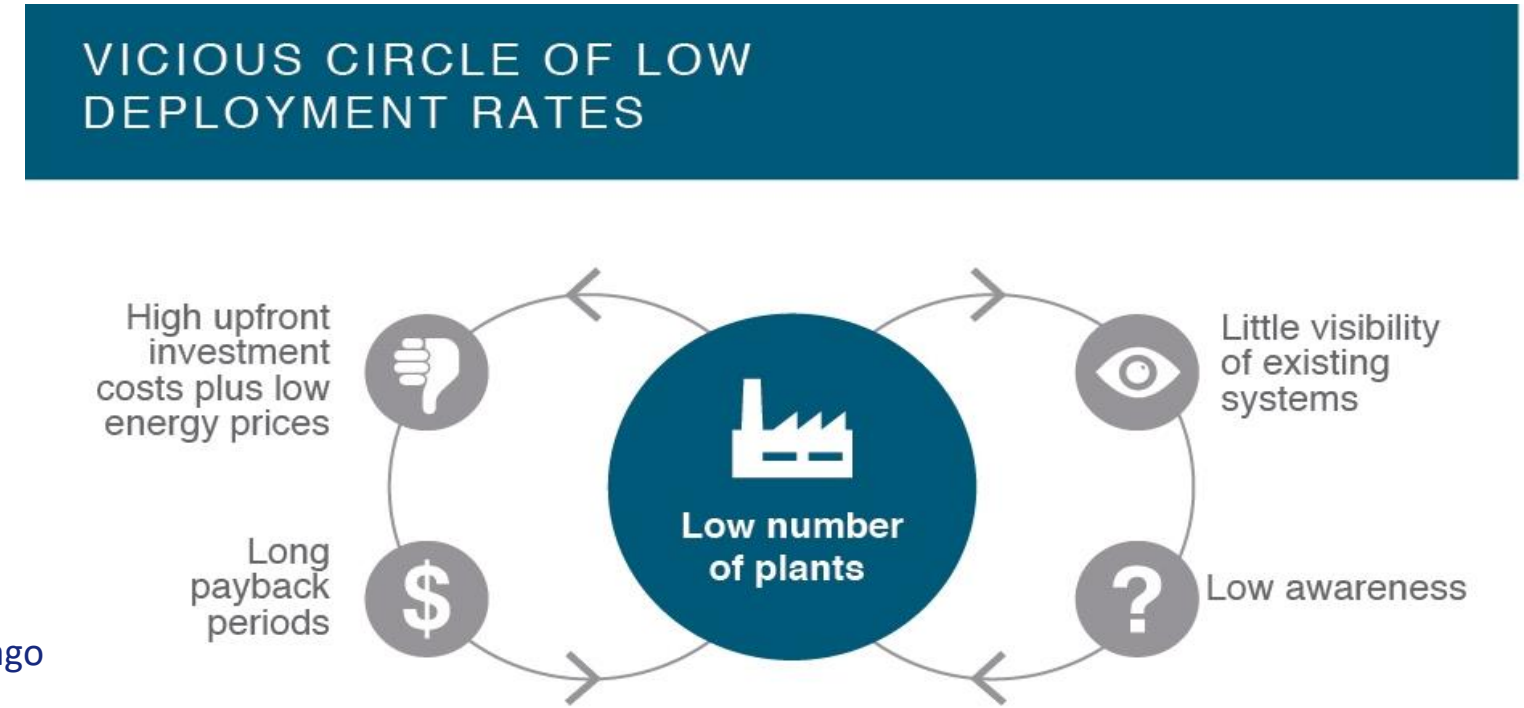
Next largest SHIP plant:
14,000 m² for a malting factory planned to be comissioned in spring 2020 in France

SHIP is a tough business

Survey among 82 SHIP technology suppliers as part of Solar Payback Project:

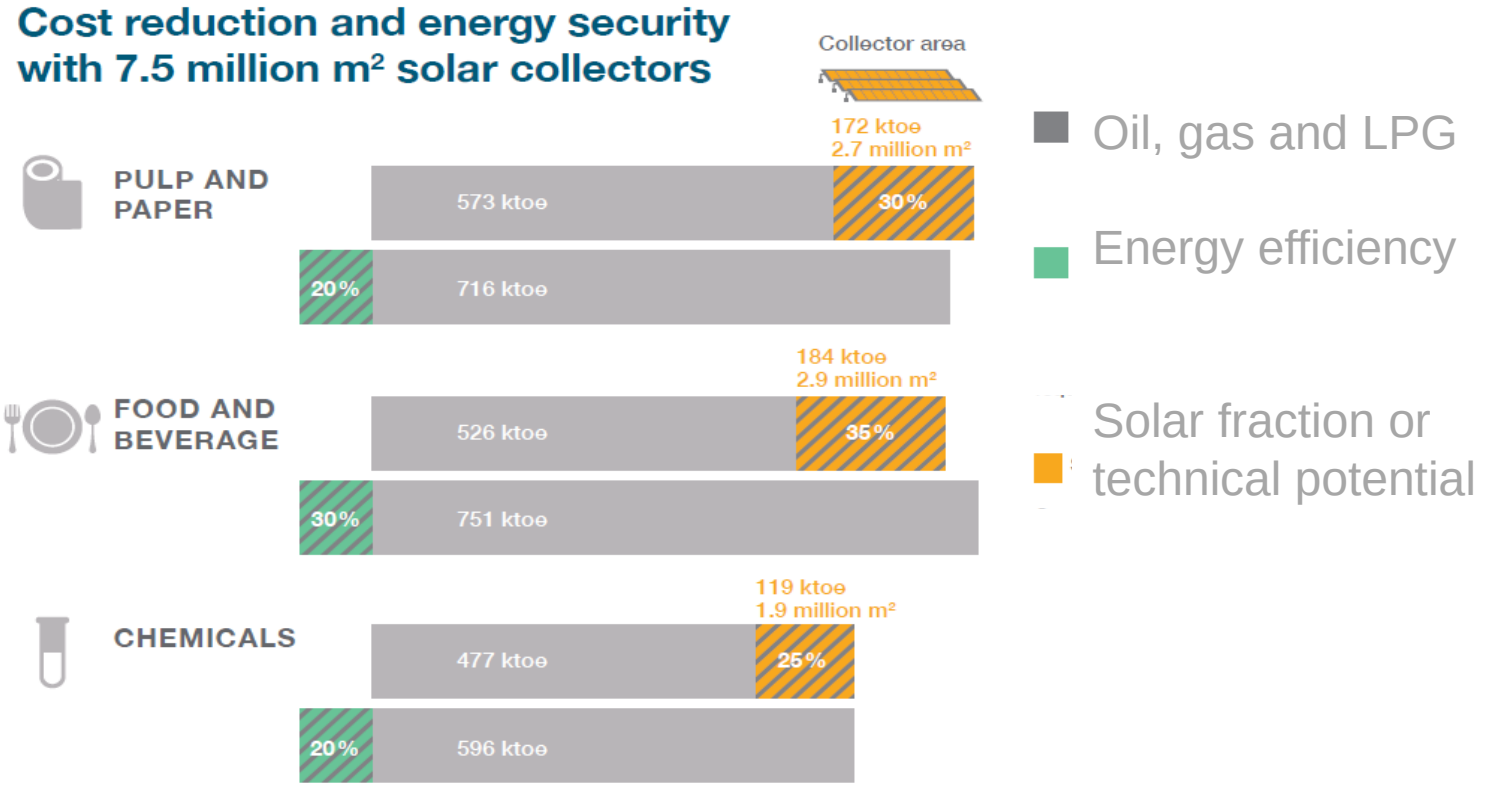
- 93 % were not satisfied with their sales in 2018
- only 32 SHIP suppliers (out of 82) installed one SHIP system or more last year

Source: solar-payback.com/suppliers



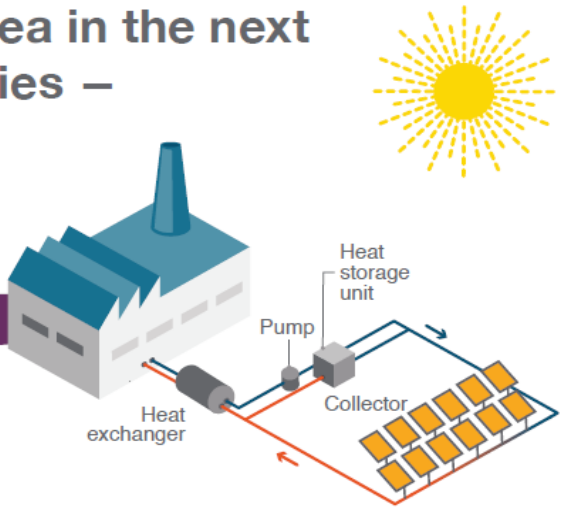
Brazil: huge potential, but only one SHIP system is built

INDUSTRIES	NO. OF BUSINESSES IN THE 10 MOST POWERFUL STATES ECONOMICALLY	HEAT DEMAND MET BY FOSSIL FUELS Low-temp (< 150 °C)
PULP & PAPER	4,960	716 ktoe
FOOD & BEVERAGE	45,865	751 ktoe
CHEMICALS	8,727	596 ktoe



Brazil: Industrial Solar Heat Strategy

Adding 7.5 million m² of collector area in the next five years in the three major industries – pulp and paper, food and beverage, and chemicals



GENERATE private investment of BRL 14.9 billion

DOUBLE the annual solar thermal market volume

CREATE 45,000 new jobs in Brazil's solar thermal industry*

SAVE 1.18 million tonnes of CO_2 emissions

* The annual installation of 1 million m² of collector area creates approximately 30,000 jobs according to Solar Plan of São Paulo 2011.

WHAT IS SHIP?

SHIP is is the acronym for **Solar Heat for Industrial Processes** and describes systems which provide solar heat in a factory.

Source: Solar Payback

SHIP subsidies: small impact on market deployment

- **California** Solar Initiative – Thermal program include SHIP since February 2013: USD 10 million were allocated, so far only one system implemented and one more submitted
- **Germany**'s Market Rebate Programme, or MAP for SHIP since 2013 below expectations, only small systems with an average of 40 and 80 m^2.
- **India**´s Concentrating Solar Heat Rebate programme is mainly used for commercial cooking, last year only a hand full of SHIP systems were realised
- **Australian** Renewable Energy Agency has made SHIP an investment priority in July 2015, but cannot name a single project realised yet within this scheme
- **China**: Clean air policy aims at phasing out coal boilers massively in the northern provinces, but mostly fulfilled by electricity-driven heat pumps

Remarkable business ideas for SHIP

Focus on one application and offer standardised, cost effective modular solutions: GlassPoint, USA

Remarkable business ideas for SHIP

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solu

Selling production line for parabolic trough collectors including project engineering support: Absolicon, Sweden

Crowdfunding solar heating systems that are operated by an ESCO in
[illegible] the sunbelt countries: ecoligo.investments, Germany
solu[illegible]
Selling produc[illegible]
engineering support: [illegible]

Drain-back solutions prefabricated in containers: Sunoptimo, Belgium

Transportable Fresnel-collector for fast installation at industrial SMEs:
Solatom, Spain

[illegible]investments,

Cooperation between collector (Industrial Solar) and boiler manufacturer (Gasco) to offer solar-hybrid industrial heating solutions (Photo: Industrial Solar)

Summary:

To Do List to speed up the transition of the solar heating markets towards commerical clients

- Understand the success factors of the remarkable new business cases and scale them up
- Encourage the technology suppliers to concentrate on selling standardised solutions and not on producing individual components
- Standardise heat purchase agreements / ESCO contracts
- Learn the language of bankers to describe SHC projects in a bankable way

Thanks for your attention!

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www.solrico.com, www.solarthermalworld.org

www.solar-payback.com