SOLAR HEATING & COOLING PROGRAMME
INTERNATIONAL ENERGY AGENCY

Solar Heating and Cooling Technology Collaboration Programme

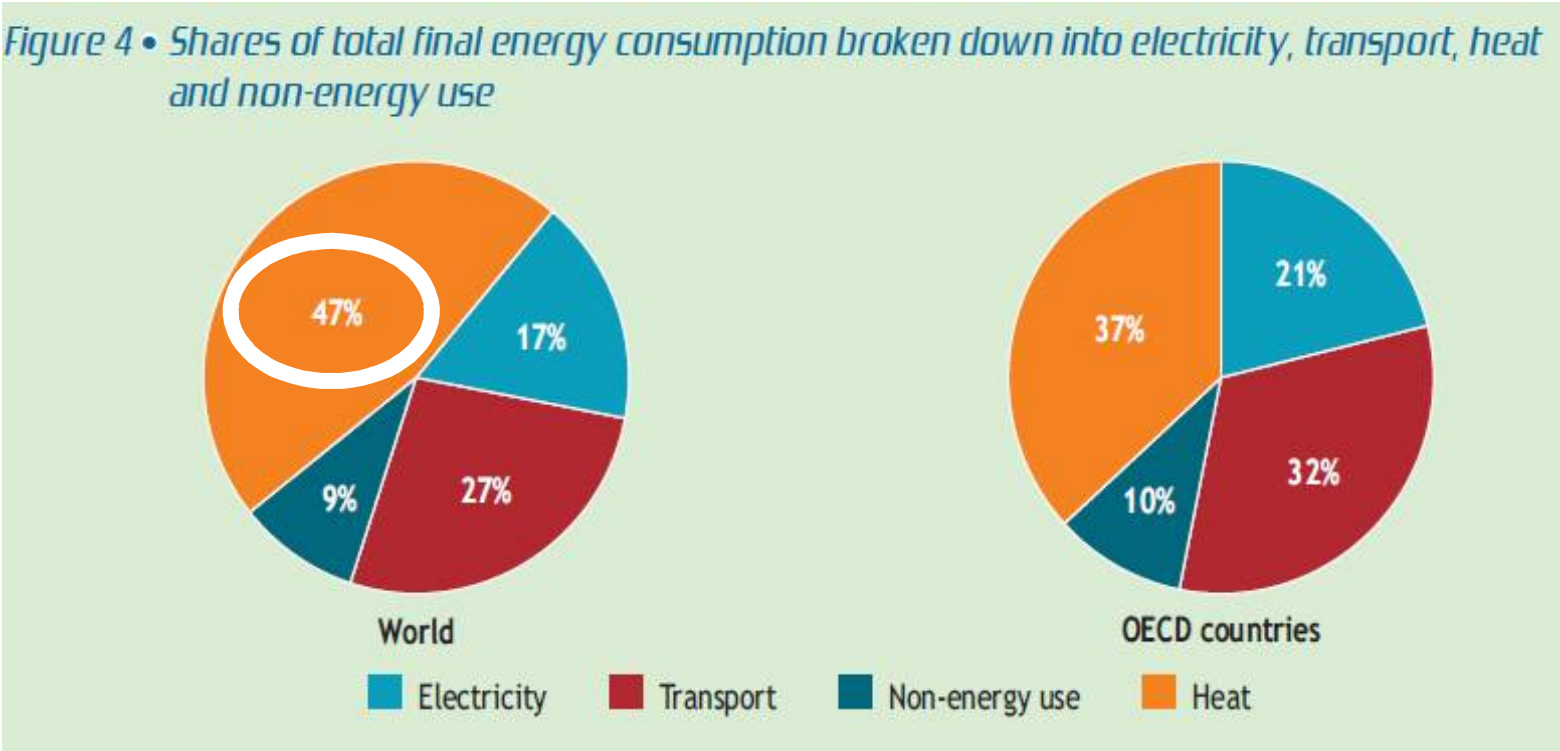
TCPs National Coordination Day, Prague, Czech Republic

October 2, 2018

Artur Bobovnicky, Slovakia's SHC ExCo member

Why Heat Is So Important

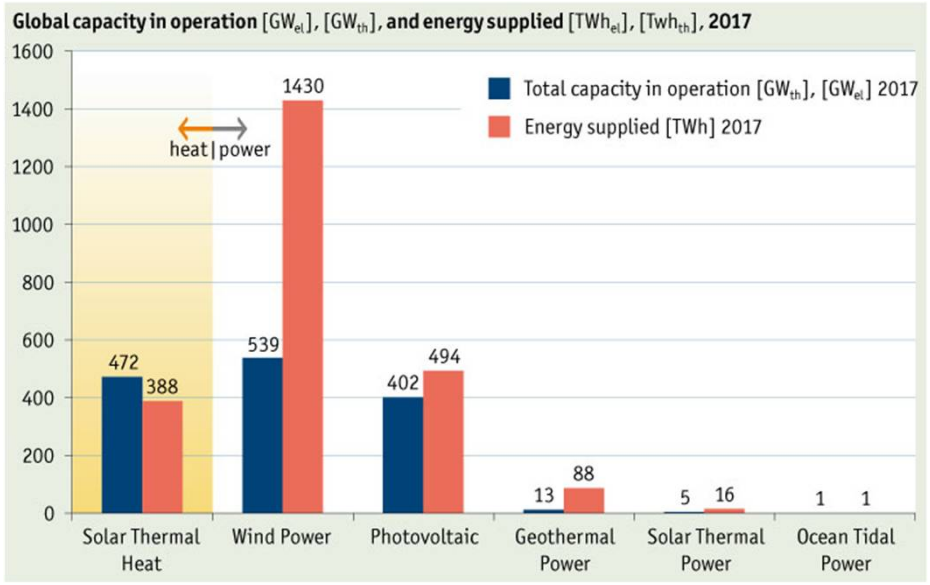
Global Energy Consumption

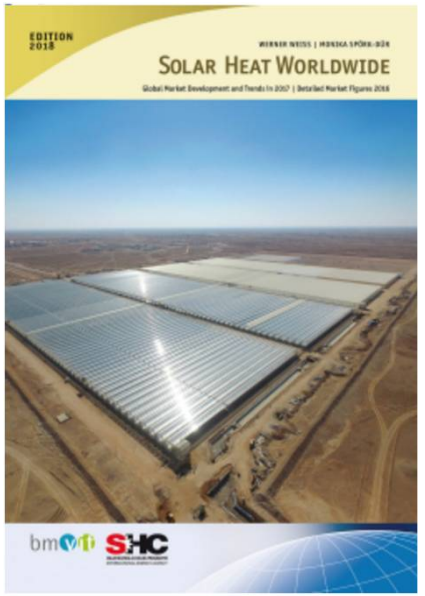


Source: IEA Cogeneration and Renewables 2011

Notes: "Non-energy use" covers those fuels that are used as raw materials in the different sectors and are not consumed as a fuel or transformed into another fuel. Heat generated by auto producers for their own use will not be reported or registered, and therefore is not represented. ***Data on electricity use for heating in the industry sector and other sectors are unavailable, and therefore have not been taken into account***

Why Solar Heat is Needed in the Energy Mix



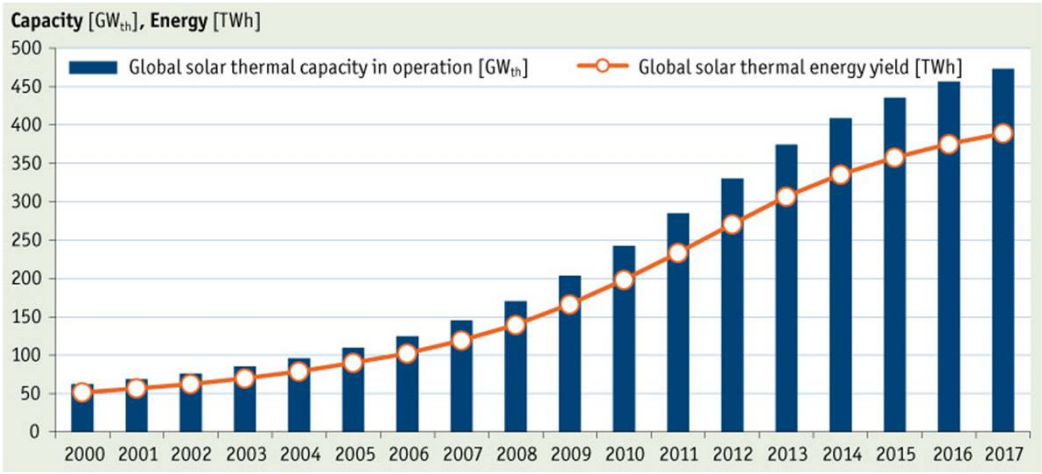


THE Reference: Solar Heat Worldwide

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

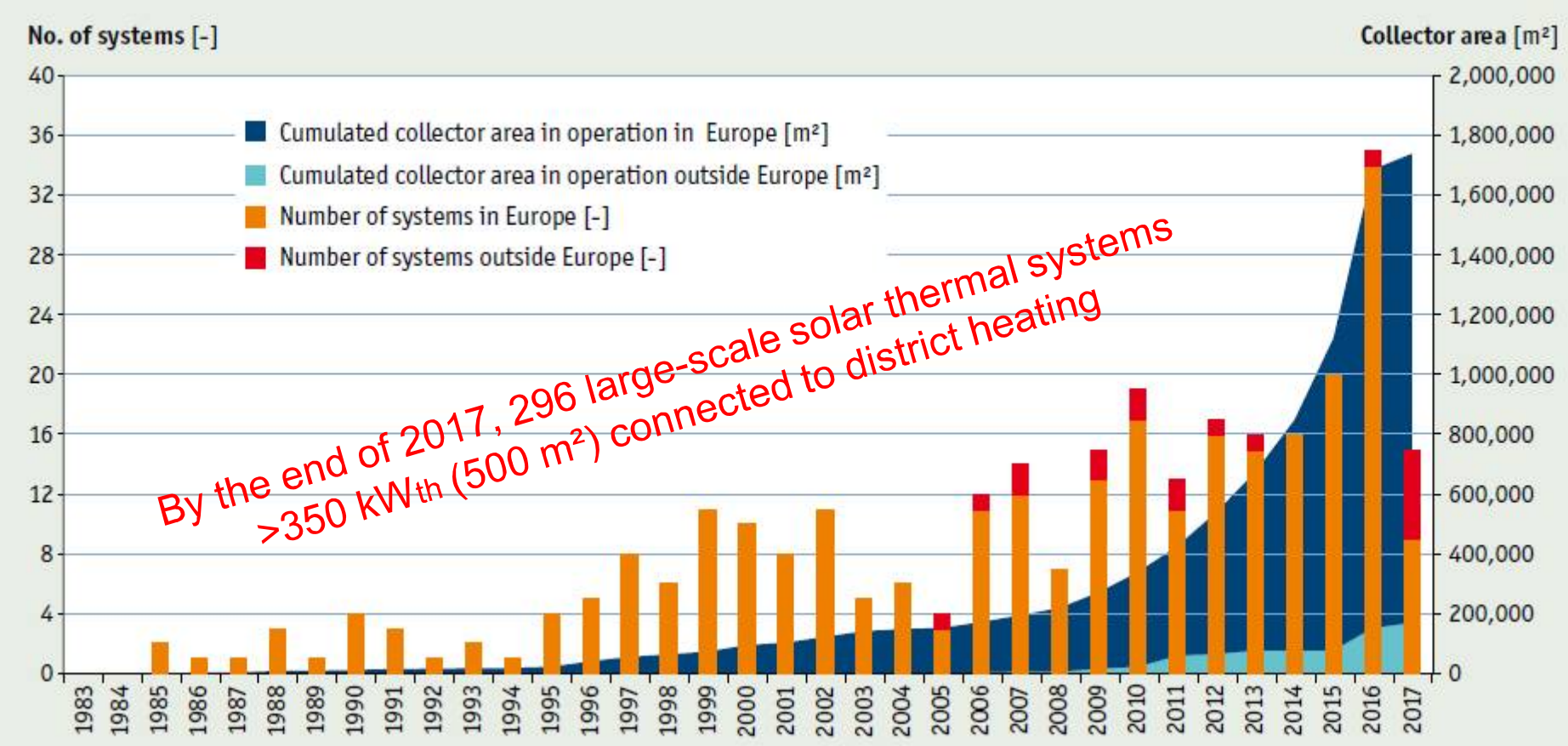
An important RE at the global level

A steadly growing market

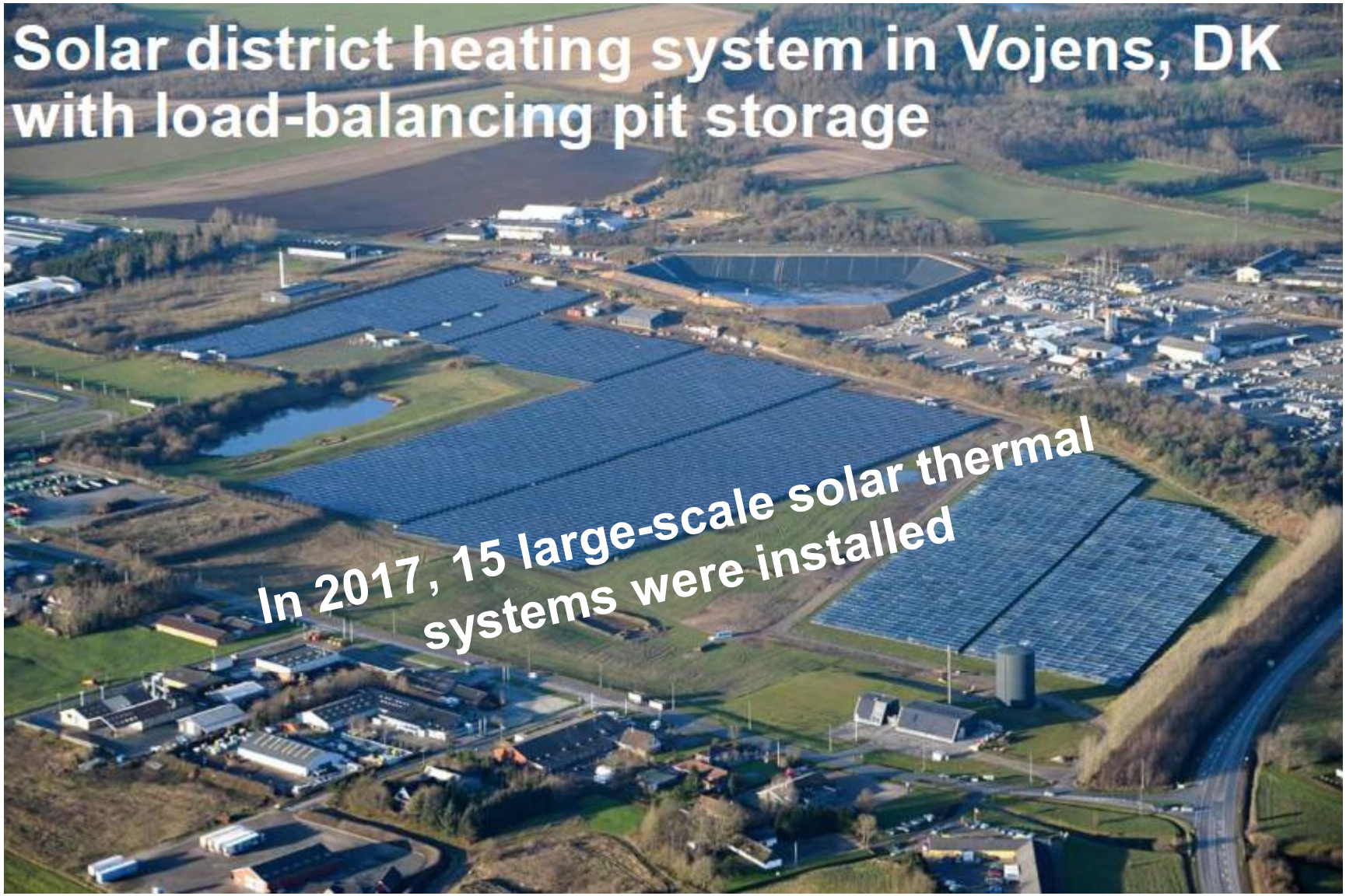


Looking Forward

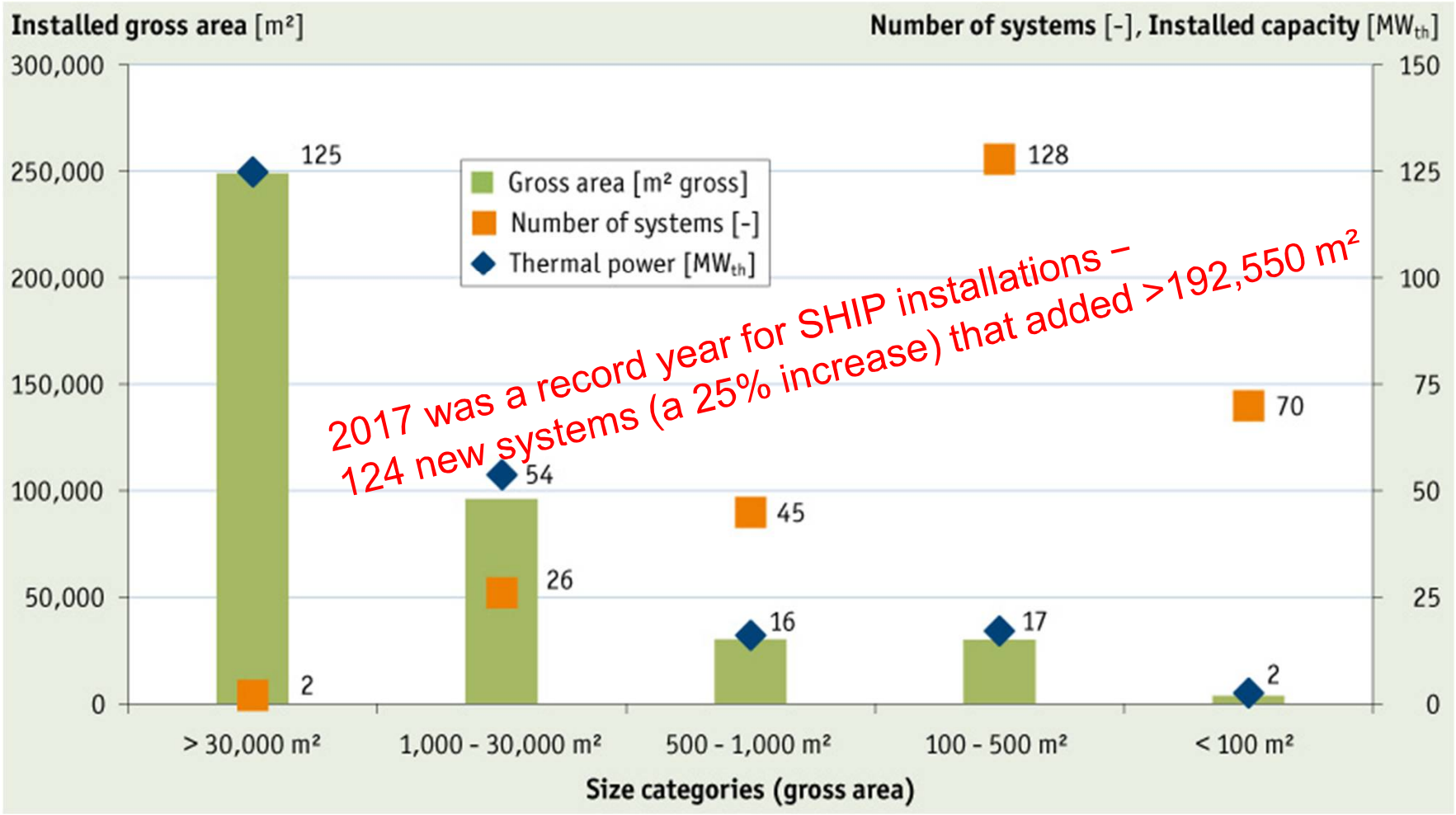
Large-Scale Systems for Solar District Heating



Data sources: Jan-Olof Dalenbäck – Chalmers University of Technology, SE and Sabine Putz – IEA SHC Task 55, Bärbel Epp solarthermalworld.org


Solar district heating system in Vojens, DK
with load-balancing pit storage
In 2017, 15 large-scale solar thermal
systems were installed

Solar Heat for Industrial Processes (SHIP)



Data sources: Jan-Olof Dalenbäck – Chalmers University of Technology, SE and Sabine Putz – IEA SHC Task 55, Bärbel Epp solarthermalworld.org

Process heat plant at Goess Brewery in Austria,1 MW_{th} installed capacity

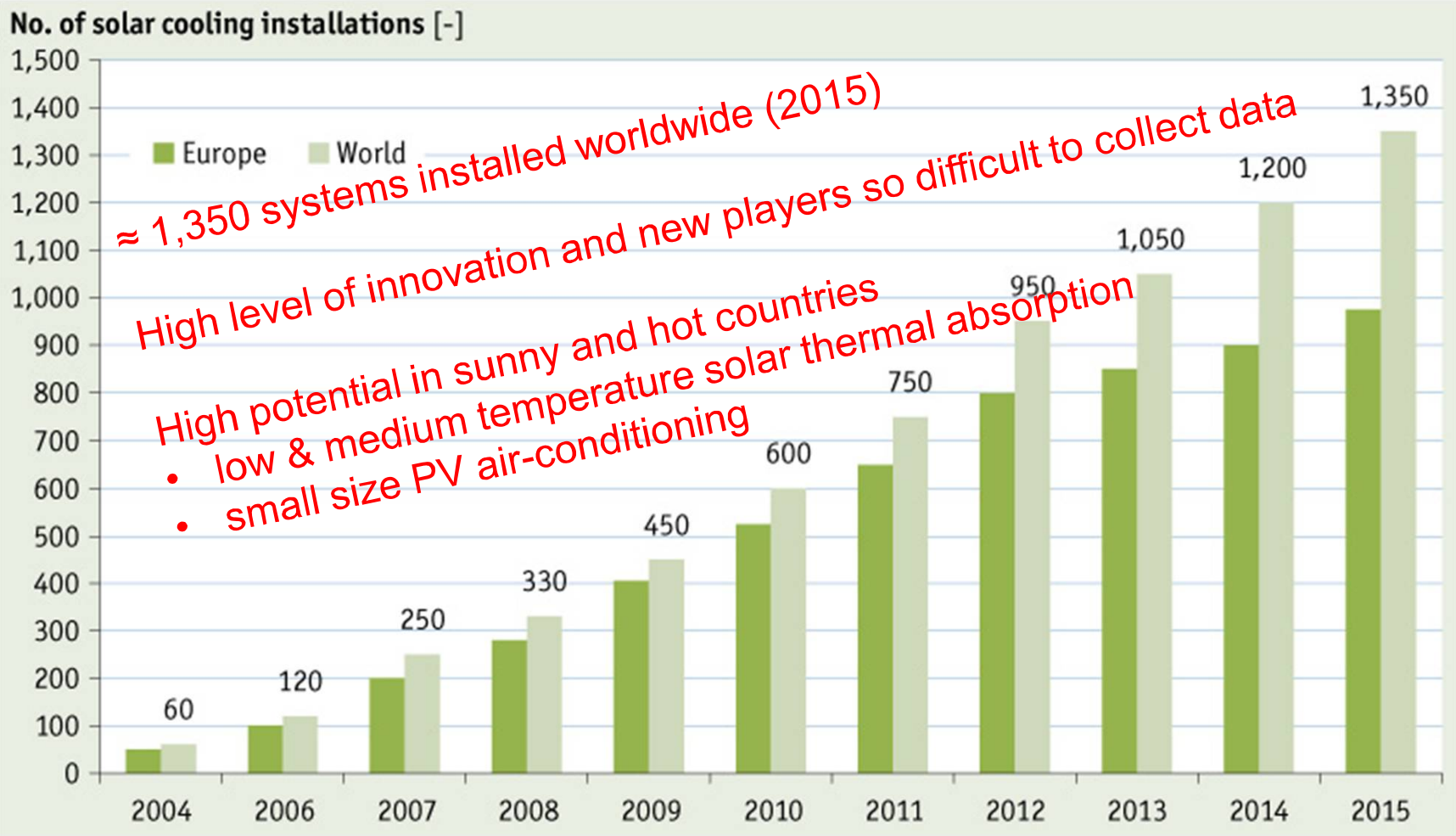
Solar plant for enhanced oil recovery in Oman, 100 MW_{th} installed capacity

Photo: Barbara Soldera, GlassPoint Solar, Inc.

The plant delivers 660 tons of steam per day to the Amal oil field

Photo: Barbara Soldera, GlassPoint Solar, Inc.

Solar Air-Conditioning and Cooling



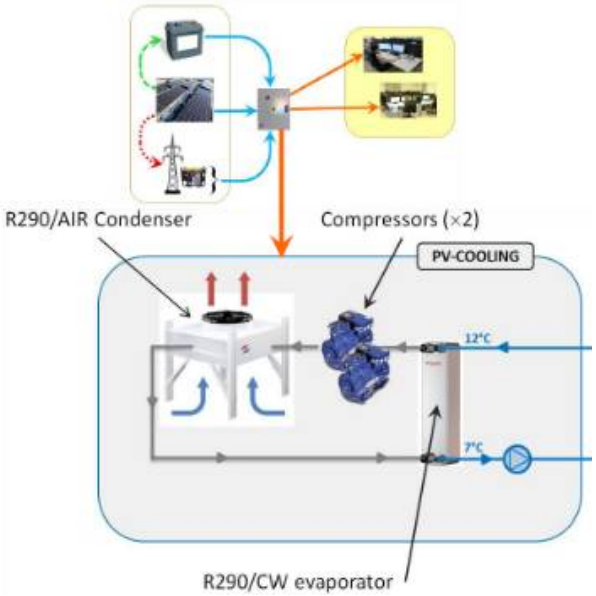
Solar Air-Conditioning and Cooling

Solar air conditioners (CN) : Splits

PV COOLING CONCEPT (FR)

PV + INVERTER - R290 « clean » chiller

Ready for the mar via demos..

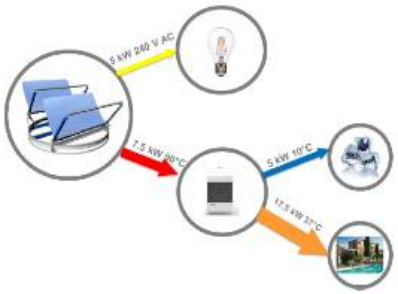


ATISYS Concept

Solar PV cooling

SOLABCOOL (NL)
4,5 kWc

SOLID (AT)
1730 kWc

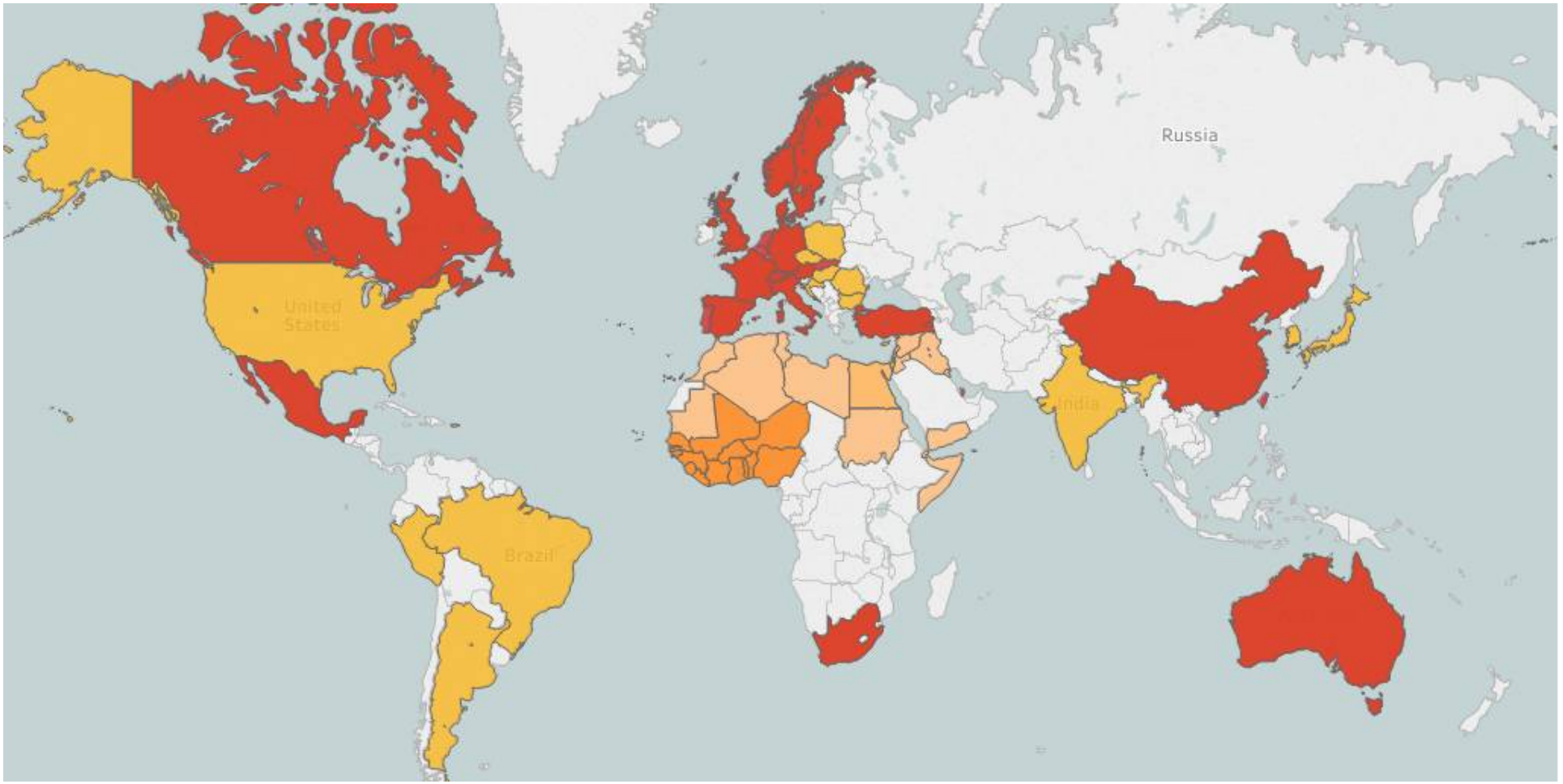


SUNOYSTER (GE)
15 kWc

Solar Thermal cooling

SHC Technology Collaboration Program

Who We Are – Our Members & Reach



20 Member Countries + EC
+ 5 Sponsor Organizations

Sponsors – 47 additional Countries

RCREEE ECREEE ISES

Map is without prejudice to status of or sovereignty over any territory, to delimitation of international frontiers/boundaries and to name of any territory/area.

Who We Are – A Snapshot

- 20 member countries, EC and 5 Sponsors (ECREEE, RCREEE, ISES, ECI)

- 9 Tasks (Task shared) focused on:
  - Solar heating and cooling technologies for residential, commercial and industrial end-use
  - Capacity building projects for all solar technologies
  - Market information and projects to support global market deployment

- Experts participating in Tasks:

  - **Formally participating**
    - Total approx. 600
    - 28% from Industry

  - **Informally engaged**
    - Total approx. 1,700
    - 35% from Industry

SHC SOLAR HEATING & COOLING PROGRAMME INTERNATIONAL ENERGY AGENCY

Our Vision & Mission

Vision

Solar energy technologies will provide **more than 50% of low temperature heating and cooling demand for buildings in 2050** and contribute a **significant share to the heat supply for the agricultural and industrial sectors**.

Thus, solar heating and cooling will contribute significantly to lowering CO_2 emissions worldwide and reaching the Paris Agreement goal.

Mission

Through multi-disciplinary international collaborative research and knowledge exchange, as well as market and policy recommendations, the SHC TCP will **work to increase the deployment rate of solar heating and cooling systems by breaking down the technical and non-technical barriers to increase deployment.**

Our Strategic Goals 2019-2024

- **Collaborate, create networks** with RE and EE TCPs, intermediary industries, end users, and research, international and standards organizations
- Seek **increased participation** from Africa, South America and MENA region
- Continue to produce and be the “go to” organization for **high quality data** and **research results**
- Support the acceleration of **market penetration** and **improved cost effectiveness** of solar designs, components and systems
- Analyze and evaluate the use of **PV for heating and cooling applications**
- Disseminate **our results** in a variety of formats and for different audiences (from policy makers to architects)

Our Current Targeted R&D Work

Task 54: **Price Reduction of Solar Thermal Systems**
Price reduction up to 40% through research along the value chain

Task 55: **Towards the Integration of Large SHC Systems into DHC Networks**
Assess integration of large scale solar thermal installations and combination with hybrid technologies

Task 56**:** **Building Integrated Solar Envelope Systems for HVAC and Lighting**
Analyze multifunctional envelopes that use solar to deliver renewable thermal/electric energy to buildings to reduce heating and cooling uses and control daylight

Task 57: **International Standards & Global Certification**
Support the international standardization of test procedures and harmonization of certification schemes

Task 58: **Material and Component Development for Thermal Energy Storage**
Further understanding of better materials, characterization techniques, components and system integration of compact thermal energy storage

Task 59: **Renovating Historic Buildings To Zero Energy**
Find conservation compatible energy retrofit approaches and solutions for preservation of the building's historic and aesthetic values

Task 60: **Application of PVT Collectors and New Solutions with PVT Systems**
Assess solutions for PVT technology over side by side installations

Task 61: **Integrated Solutions for Daylight and Electric Lighting**
Foster integration of daylight and electric lighting solutions to increase user satisfaction and energy savings.

Task 62: **Solar Energy in Industrial Water and Wastewater Management**
Improve and increase solar driven separation and water purification technologies

Working Group: **Life Cycle Assessment for Solar Heating and Cooling Technologies**
Access different SHC technologies and detect trade-offs between energy yield and environmental impacts

Our Other Activities

- **SHC International Conference on Solar Heating and Cooling for Buildings and Industry –** 6th conference (SHC 2019) will be held together with ISES Solar World Congress (SWC 2019) in Santiago, Chile on November 4-7
- **Collaboration with Solar Trade Associations** – hold regular meetings together, the 11th meeting was held during SHC 2017 in Abu Dhabi
- **SHC Solar Award** – a reward that celebrates the work of those committed to increasing the expansion of this renewable energy source. 2017 award winner: Austria's Climate and Energy Fund, presented at SHC 2017 in Abu Dhabi
- **Solar Academy** – webinars, videos, national days and onsite training
- **Solar Heat Worldwide** – annual statistics report
- **Task publications/databases/info sheets/newsletters**
- **SHC book series** with Wiley Publishers, https://www.wiley.com/en-us/Solar+Heating+and+Cooling-c-3097
- **Programme newsletter, *Solar Update*** – 2 per year
- **Social Media** @IEASHC
  IEA Solar Heating and Cooling Programme (group 4230381)

www.iea-shc.org

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