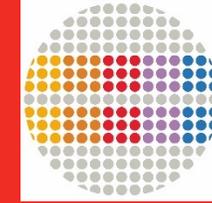




SOLAR HEATING & COOLING PROGRAMME
INTERNATIONAL ENERGY AGENCY



SOLARCOOLING®
SUNBELT REGIONS
TASK65

Solar Cooling for the Sunbelt Regions

Highlights from Task 65 activities

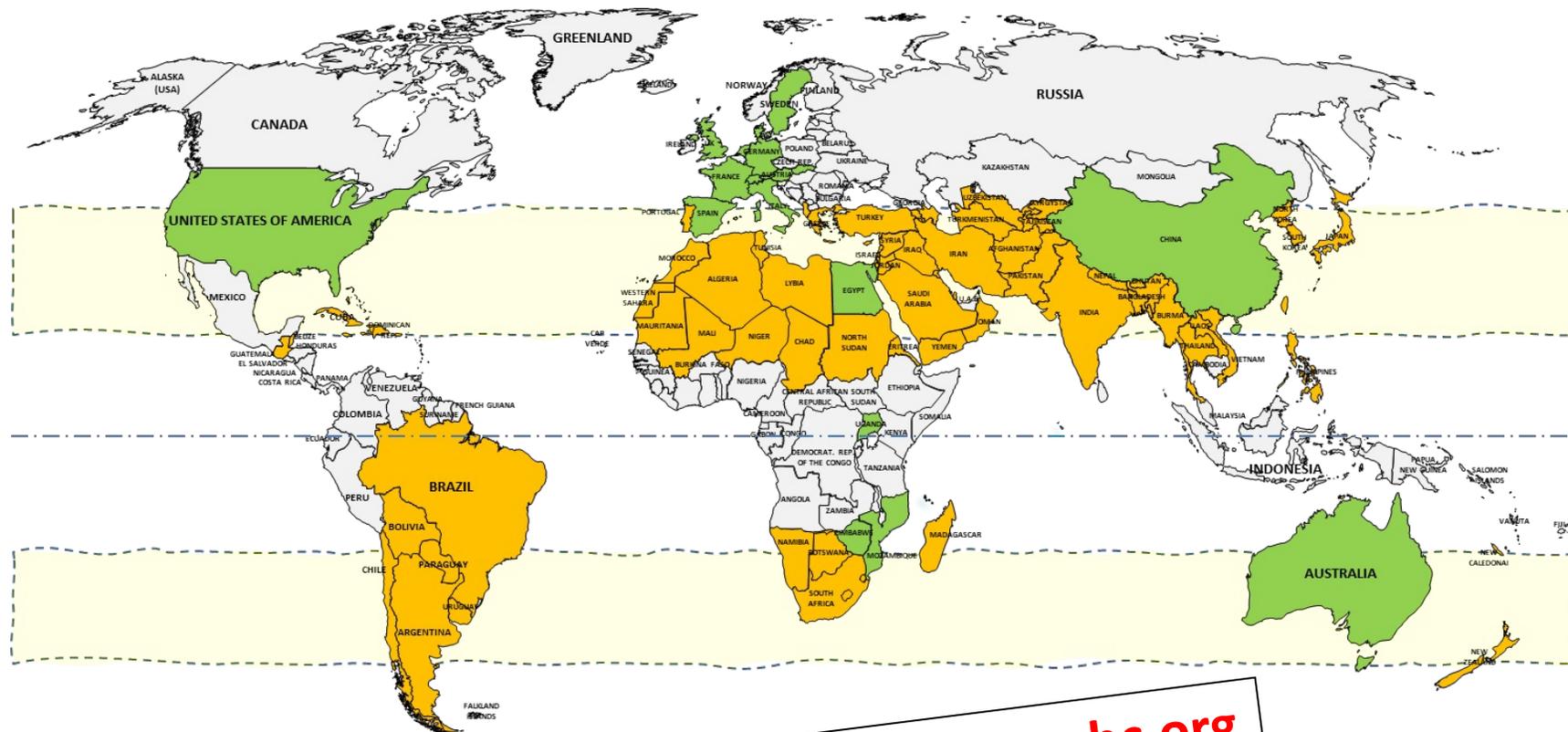
Uli Jakob^{1,2}, Daniel Neyer^{1,3}, Manuel Ostheimer^{1,3}

¹ UIBK, ² JER, ³ Neyer Brainworks

ISEC 2024 conference, Graz, Austria, 10th-11th April 2024

IEA SHC Task 65

Solar Cooling for the Sunbelt Regions



Collaborative Research

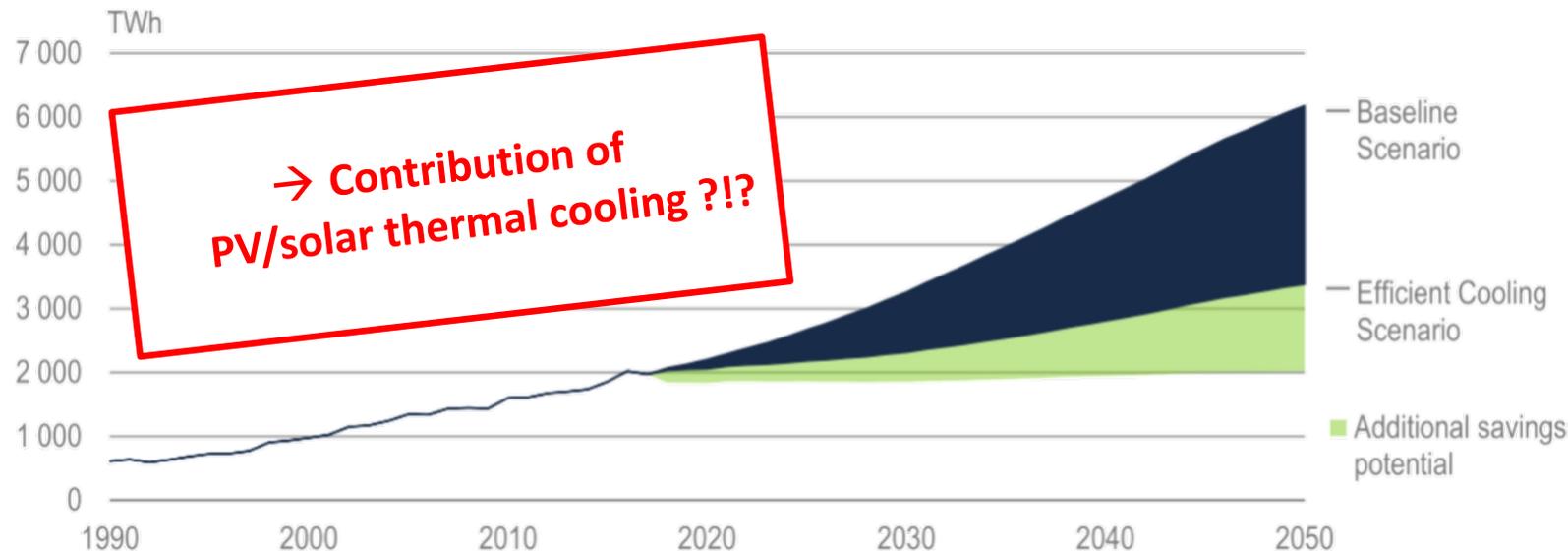
- 83 Experts
- 18 Countries
- 24 Companies
- 24 Institutes



<https://task65.iea-shc.org>

What are the challenges?

- The current trend shows, that **energy needs for space cooling** – almost entirely in the form of electricity – will **more than triple between 2016 and 2050**, driven mainly by the residential sector (2,000 TWh => 6,000 TWh)
- Most of the **projected growth in energy use for cooling is set to come from India, China and other emerging economies**
- Space cooling is set to overtake appliances and plug loads **to become the single largest user of electricity in buildings** (2015: 10%; 2050: 30%)



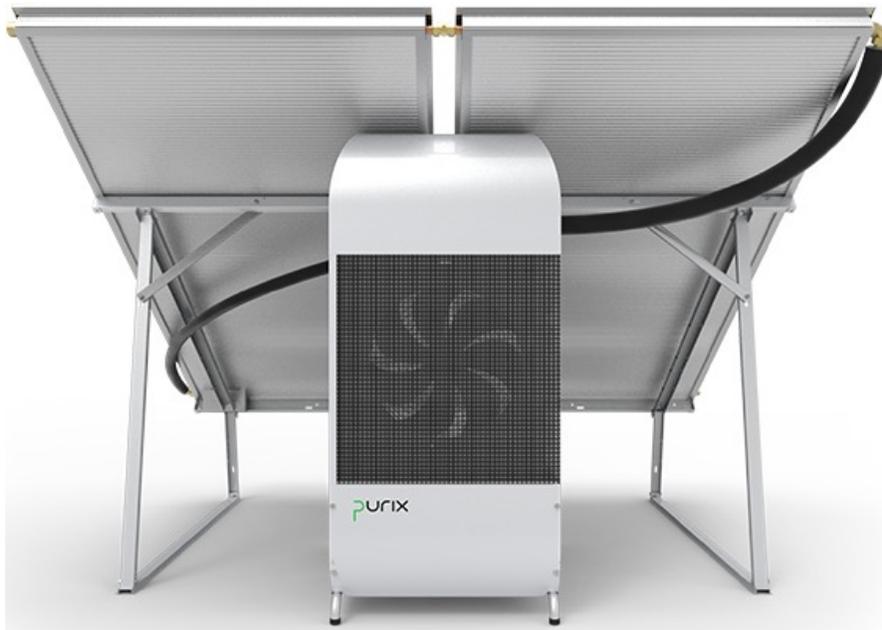
Current trends

- **Compact** (small scale) solar air conditioning units with **air-cooled ab- and adsorption chillers**
- Small scale and large multi stage **desiccant systems** with solar thermal collectors or desiccant coated components
- **x.N stage chillers** (half, single, 1.N, double, triple) with (new) medium temperature collectors
- Thermally driven **heat pump systems for heating and cooling**, also in **hybrid operation** with vapor compression chillers
- **PV combined** with inverter controlled **split units**
- (Small size) PV driven components with **new heat pumps/chillers** with **natural refrigerants**

Solar cooling kits

Purix (Denmark)

Solar Cooling System A25s



Source: Purix

ARES (The Netherlands)

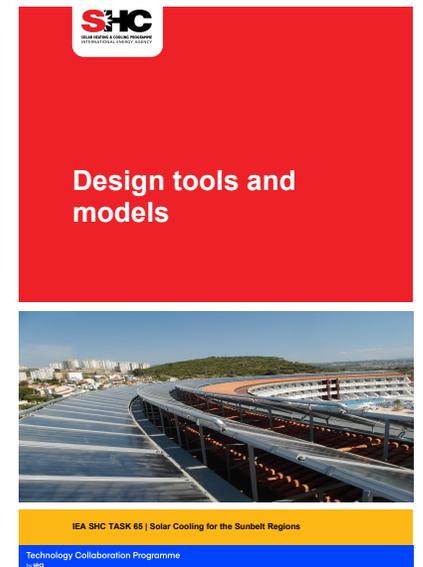
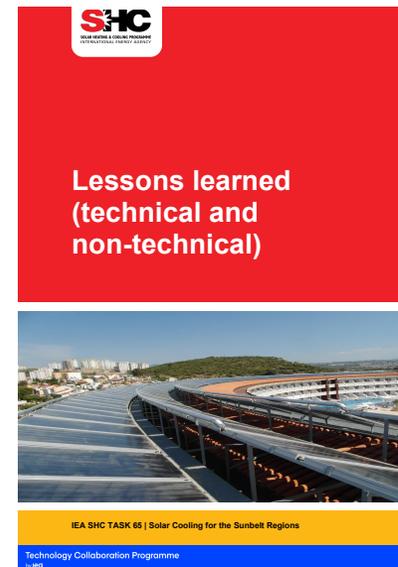
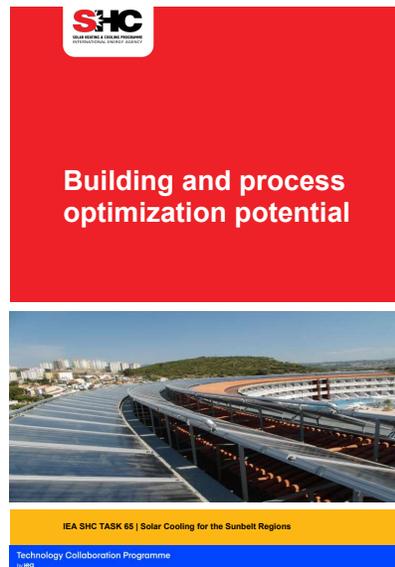
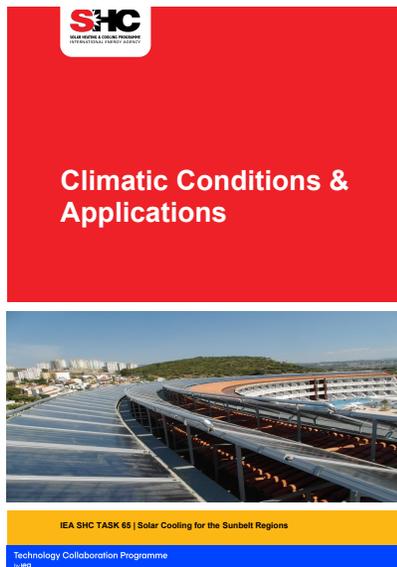
SolabChiller 4.5



Source: ARES

Task 65 Final Reports published

- D-A1, D-A4, D-B2, D-B5 & D-C1, published
- D-B1-A2, to be published in April 2024



Summary

- Several **component developments** are ongoing
 - Already promising solutions
 - ST in **large scale** applications / **hybrid operation**
 - PV in **small scale** with vapor compression chillers & natural refrigerants
- **Innovation** should focus on
 - **system improvement** including building's/loads
 - reduction of specific costs of components (€/kW)

Thank you



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 IEA Solar Heating and Cooling Programme
(group 4230381)