

Project structure

Subtask A: ADAPTATION

- A1: Climatic conditions & applications
- A2: Adapted components
- A3: Adapted systems
- A4: Building and process optimization potential
- A5: Standardization activities

Subtask B: DEMONSTRATION

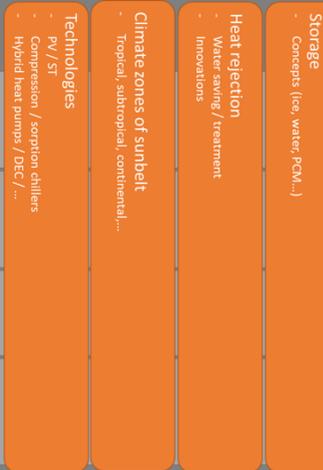
- B1: Show cases on system and component level
- B2: Design guidelines
- B3: KPI definitions
- B4: Standardized solar cooling kits
- B5: Lessons learned (technical and non-technical)

Subtask C: ASSESSMENT & TOOLS

- C1: Design tools and models
- C2: Database for technical and economic assessment
- C3: Assessment mechanism
- C4: Benchmarking and sensitivity analysis

Subtask D: DISSEMINATION

- D1: Homepage / publications
- D2: Policy advice & financing models
- D3: Guideline / roadmaps for sunbelt countries
- D4: Book or booklet
- D5: Workshops
- D6: Stakeholder engagement



Coordination

Subtask A: Adaptation

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Subtask B: Demonstration

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Subtask D: Dissemination

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Contact us, get involved, share your ideas with us.

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Task 65 Solar Cooling for the Sunbelt Regions

Focuses on innovations for affordable, safe and reliable solar cooling systems



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About the project

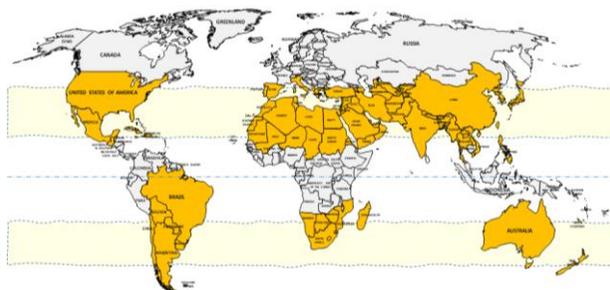


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Objectives

The goal of IEA SHC Task 65 is to focus on innovations for **affordable, safe and reliable solar cooling systems for the Sunbelt regions worldwide**. This will require a combination of cost reduction, system simplification and stimulation of market conditions through policies.

The implementation and adaptation of components and systems for the different boundary conditions are **triggered by cooperation with industry** and the support of target countries like India and UAE through Mission Innovation IC7. The innovation driver and the keyword is **adaptation** of existing concepts/technologies to the Sunbelt regions using solar energy, either solar thermal (ST) or photovoltaics (PV).

Scope

The work of IEA SHC Task 65 covers **small to large size cooling and air conditioning systems** (between 2 kW and 5 MW) using both Solar Thermal (ST) and Photovoltaics (PV).

These two technologies, ST and PV, can be integrated to support an HVAC system and competitive with reference systems when they are well designed, and boundary conditions are favourable.

Project pitch



Challenges

In 2016, air conditioning accounted for nearly 20% of the total electricity demand in buildings worldwide and is growing faster than any other energy consumption in buildings. Most of the **projected growth in energy use for cooling is set to come from India, China and other emerging economies**.

If measures are not taken to counteract this increase, **cooling demand will almost triple by 2050**; the demand could reach 6,200 TWh, or 30% of the total electricity use in buildings.

Solutions

- Innovative ST and PV cooling systems, such as **hybrid chillers** and **new concepts** for hot and humid climates.
- **Chillers that use 75% less electricity consumption** than conventional vapor compression chillers (VCC). This leads to a significant **CO₂ reduction**.
- Systems that use **natural refrigerants** like water, ammonia (for sorption technologies) or propane, butane (for VCC) rather than harmful F-Gas refrigerants. This also means that there is no or very low Global Warming Potential (**no GWP**).



Actions

IEA SHC Task 65 is working to:

- **Support the development of solar cooling technologies** on component and system levels adapted for the boundary conditions of the Sunbelt regions (tropical, arid, etc.).
- **Adapt existing technology, economic and financial analysis tools** to assess and compare economic and financial viability of different cooling options with a life-cycle cost-benefit analyses (LCCBA) model.
- **Find boundary conditions** (technical/economic) under which solar cooling is competitive against fossil-driven systems and different renewable solutions.
- **Establish a technical and economic database** to provide a standardized assessment of demo use cases.
- **Accelerate market creation and development** through communication and dissemination activities, including roadmaps with policy measures.
- **Provide policy advice** on relevant information to decision-makers, including the current state of the art.

Participating countries: Australia, Austria, China, Denmark, Egypt, France, Germany, Italy, Mozambique, Netherlands, Slovakia, Spain, Sweden, Switzerland, Uganda, United Kingdom, USA and Zimbabwe.