

2020 HIGHLIGHTS

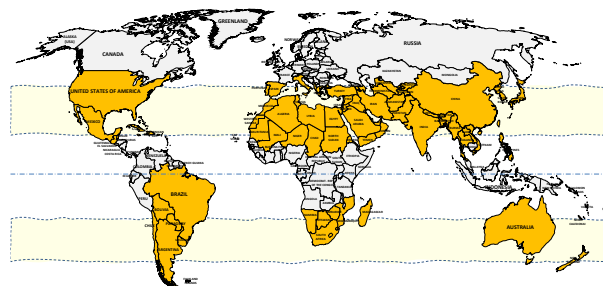
Task 65 – Solar Cooling for the Sunbelt Regions

THE ISSUE

In 2016, air-conditioning accounted for nearly 20% of the total electricity demand in buildings worldwide and consumption is growing faster than any other energy source used in buildings. If measures are not taken to counteract this increase, space cooling demand will almost triple by 2050; the demand could reach 6,200 TWh, or 30% of the total electricity used in buildings. The latest studies are primarily directed at existing conventional technology. However, greater attention should be directed at enhancing components and systems. Solar cooling, either thermal or electrical driven systems, tend to cater mainly to niche markets. To foster affordable, safe and reliable solar cooling systems in the Sunbelt regions a combination of cost reduction, adaptation and system simplification is required. Stimulation of market conditions through policy measures is also necessary. The implementation of revised components and systems that cater to the different boundary conditions should be introduced by cooperation with industry and with support of target countries like UAE through the Mission Innovation (MI) Innovation Challenge, “Affordable Heating and Cooling of Buildings” (IC7).

OUR WORK

SHC Task 65 targets the small to large cooling and air conditioning market (between 2 kW and 5,000 kW). Both solar thermal and PV can be integrated to support a HVAC system. When well designed and boundary conditions are met, these systems are highly competitive when compared with reference systems.



This project focuses on using solar energy across Sunbelt regions where boundary conditions vary (sunny and hot, and humid climates, between 20-40 degrees latitude in the northern and southern hemisphere). Adaptation of existing concepts is key. To utilize solar heat in industry and to support the solar thermal market, the integration of solar thermal systems into existing energy supply structures is paramount.

Participating Countries

Australia

Austria

China

Denmark

France

Germany

Italy

Mozambique

Netherlands

Spain

Sweden

Switzerland

Uganda

United Kingdom

USA

Zimbabwe

Task Period

2020 – 2024

Task Leader

Uli Jakob, Green Chiller / JER, Germany

Email

uli.jakob@drjakobenergyresearch.de

Website

task65.iea-shc.org

KEY RESULTS IN 2020

Collaboration with Mission Innovation IC7

During the Task preparation phase, the Task Organizer received two letters of endorsement from Mission Innovation (MI) Innovation Challenge “Affordable Heating and Cooling of Buildings” (IC7), one from the co-lead UAE in October 2019 and one from the Italian IC7 representative in June 2019. SHC Task 65 welcomes the fact that this collaboration was immediately expressed at the virtual Kick-off meeting in September 2020 through participation and engaging introductory presentations by representatives of the MI initiative:



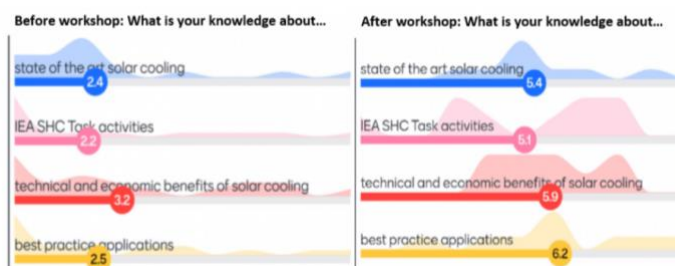
Prof. Graeme Maidment from BEIS (Department for Business, Energy & Industrial Strategy, UK) and co-lead of MI IC7 outlined how cooling demand is expected to grow by 2100 and how the SHC Task 65 on Solar Cooling for the Sunbelt regions could contribute to substitute conventional air-conditioning.

Mrs. Sabine Mitter from the Austrian Federal Ministry of Climate Action (BMK) presented the Austrian R&D policy and highlighted international collaborations. She also outlined why SHC Task 65 is interesting for supporting the development of new global markets for Austrian solar energy companies. The Task’s Kick-off meeting was an excellent starting point for the collaboration between MI IC7 and SHC Task 65, which will be expanded in the future.

SHC Solar Academy Online Training for CCREEE including Solar Cooling

CCREEE (Caribbean Center for Renewable Energy & Energy Efficiency), with its 15 CARICOM member states, and the IEA SHC Solar Academy held an online training on solar heating and cooling on November 9 and 10. Day 1 was dedicated to topics related to market development, system concepts and applications of solar thermal plants, and successful business models.

On Day 2, the focus was on SHC Task 65 and the state of solar cooling. Experts from SHC Task 65 explained the basic functionality, future trends in solar cooling, the state of the art in products and systems, economic and technical assessments, and best practices to raise awareness of the innovative renewable cooling technology. Around 30 consultants, energy efficiency and renewable energy agency representatives, researchers, manufacturers, and grid operators participated in the successful training. More details can be found at solarthermalworld.com



Strong Industrial Involvement

SHC Task 65 aims to strengthen the relationships between stakeholders from research and industry and the public to raise awareness of the cooling markets in the Sunbelt countries for solar cooling in future strategies for energy and CO₂ reduction in buildings and industrial processes. Therefore, the (existing) technologies need to be adapted to the specific boundary conditions, analyzed and optimized in terms of investment and operating cost and their environmental impact (e.g., solar fraction), and compared and benchmarked on a unified level against reference technologies on a life cycle cost basis. The strong interest by industry and business is reflected in the number of SHC Task 65 participants from solar thermal collector manufacturers, sorption chiller manufacturers, system suppliers, consultancies, business developers, and ESCOs – overall, 40% of the Task experts are from industry and SMEs.