SOLAR HEATING & COOLING PROGRAMME
INTERNATIONAL ENERGY AGENCY

2024 HIGHLIGHTS

Task 69 – SOLAR HOT WATER FOR 2030

THE ISSUE

Hot water demand is continuously growing globally, and many IEA SHC member countries have 2030 commitments/targets to achieve a higher solar fraction of their economies. At present, ~16% of residential energy consumption in IEA countries goes to water heating (according to 2018 IEA data). However, the 'solar share' of low temperature heating is still relatively low—only 2.1% of space and water heat demand was being met by solar thermal in 2018, and this mainly come from evacuated tube systems installed in China. This same report states, "to be in line with the Sustainable Development Scenario (SDS), the share of clean energy technologies needs to exceed 50% of new heating equipment sales by 2030." To investigate the best way to fill this gap for solar hot water, Task 69 is focusing on two technologies which are expected to play the biggest role in the solar hot water market in 2030: solar thermal thermosyphon and solar photovoltaic (PV) derived hot water heating systems.

OUR WORK

Task 69 is investigating the global market status, core technical issues, and the trainings/standards needed for these two cost-effective and reliable solar water heater technologies (thermosyphon and PV solar hot water heating systems). The Task relies on international knowledge among participants from the different IEA SHC member country regions to consider differences in economic development, solar resources, regulations, and other factors (i.e., GN SEC vs. Europe). A key part of the scope is to investigate 'smart' systems for thermosyphons and 'integrated' systems for PV-driven systems, including how to overcome barriers to further deployment in different climates and markets. As such, the Task has been working identify opportunities to improve the performance, cost, and reliability of solar water heaters, aiming to accelerate the rollout of best practices for these technologies.

Participating Countries

Australia
Austria
Canada
China
Denmark
Greece
Italy
Norway
Portugal
Switzerland
GN SEC (Zimbabwe
Botswana
Lesotho
Namibia
South Africa
Zimbabwe)
UK

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TASK 69
Solar Hot Water For 2030

KEY 2024 RESULTS

Sustainable Solar Building & Industry (SSBI) 2024

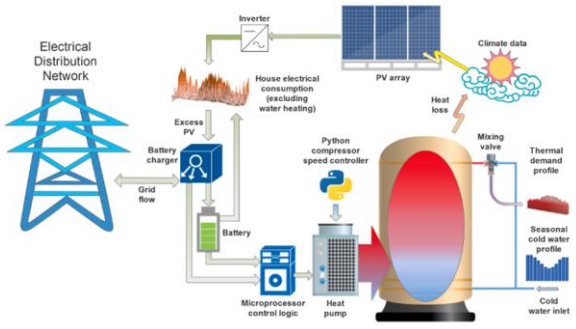
Together with our 5th Task meeting, the SSBI 2024 was held in Lianyungang, China on Oct 12th-13th. Hosted by CABR & SolarEast. Supported by China Renewable Energy Society (CRES), China PV Industry Association (CPIA), Lianyungang Association for S & T, IEA SHC TCP and Task 69, UNSW, and the Australian Photovoltaics Institute (APVI). The event was well-received and well-attended with more than **160** experts from IEA SHC Task 69, universities, research institutes, industries attended on-site and >**8000** online attendees.

More than 8000 attendees from Live Stream.

Solar Hot Water GHG Reduction Testing & New GHG Analysis Tool for China

A large-scale outdoor test was completed in collaboration with the Chinese manufacturer, SolarEast Group (pictured to the right). These comparative tests served as validation inputs to for a new tool which estimates the performance, greenhouse gas emissions reductions (GHG), and reliability of several key unpressurized evacuated tube and pressurized flat plate thermosyphon system designs in the real operating environment in China. The new tool was released in 2024.

Adopting PV Solar Water Heaters



The Task conducted analysis and developed a report on PV hot water systems, which can range in complexity from simple resistance heaters (including repurposing controlled load water heaters, which were historically used to consume nighttime fossil fuel electricity) to complex systems which include batteries, controllers, and heat pumps (pictured to the right). According to the Sub Task C leader Dean Clift's recent work, heat pump water heaters combined with smart meters represent a cost effective and efficient solution for both homeowners and grid operators [see: Maximising the benefit of variable speed heat-pump water heater with rooftop PV and intelligent battery charging - ScienceDirect]. In most countries, hot water tanks represent a massive—underutilized—energy storage capacity. To unlock this capacity for daytime solar electricity, we just need cost-effective mechanisms for collective control of our humble water heaters.