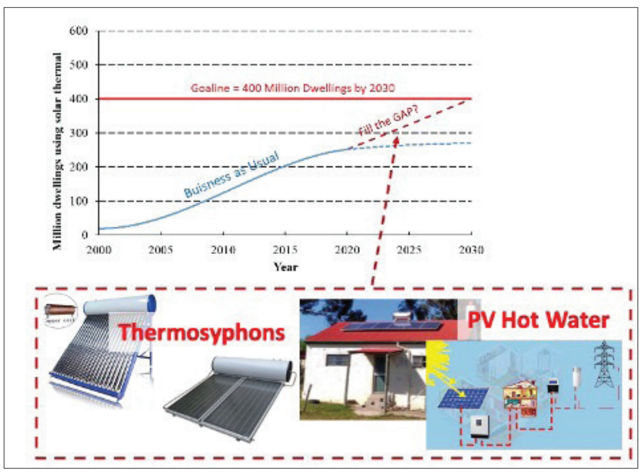
NEW WORK

Solar Hot Water for 2030 Project Kicks Off in July

Worldwide, 250 million dwellings used solar thermal technologies for water heating in 2020. However, to reach carbon neutrality by 2050, as proposed by the IEA in their Net Zero by 2050: A Roadmap for the Global Energy Sector, we estimate that 170 million new conventional solar thermal technologies (e.g., thermosyphons and pumped circulation systems) and 120 million emerging solar systems (e.g., PV-driven systems) are needed.



▲ **Millions of dwellings use solar thermal. The horizontal red line represents the IEA target for 2030, the blue curve represents an S-curve of business as usual, and the dashed lines show future trends. SHC Task 69 aims to help 'fill the gap' through solar hot water systems, both existing thermosyphon and emerging PV solar-derived systems.** Source: Solar Heat Worldwide 2022 and Net Zero by 2050.

In our new SHC Task 69 on Solar Hot Water for 2030, we aim to shape an affordable, reliable path forward for the solar hot water market. The Task starts this July and will run through June 2025.

A team of experts from around the world will collaborate to identify opportunities to improve solar water heaters' performance, cost, and reliability, aiming to accelerate the rollout of best practices for these technologies to help meet national and international 2030 targets. The two technologies expected to play the biggest role in the solar hot water market are solar thermal thermosyphon and solar photovoltaic (PV) derived hot water heating systems. What is unique about these two different technologies is that they do not

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Solar Hot Water for 2030 — Questions to Answer in New Task

The international team of Task experts will work to answer these questions.

- What is the current distribution of hot water technologies installed by region? What are the existing barriers and opportunities?
- Which technologies are expected to be installed in these regions, considering the spectrum of economic development and climatic factors?
- What is the commercial best practice for thermosyphon systems and photovoltaic self-consumption water heaters?
- What are the potential advantages/disadvantages of deploying systems to integrate solar thermal thermosyphon systems and PV self-consumption systems with other energy systems?
- What are the 'most economic' and 'most efficient' options—and potential developments—for thermosyphon systems and photovoltaic self-consumption water heaters (i.e., including PV-powered heat pumps)?
- How much contribution can the 'lowest carbon' options make to emissions reductions (for thermosyphon systems and photovoltaic self-consumption water heaters)? (This is a function of location in terms of solar resource level, seasonal variation, and GHG intensity of backup fuels.)
- What regulatory/policy frameworks exist now/are needed in the future to ensure and/or encourage these two technologies (solar thermal thermosyphon systems and solar photovoltaic self-consumption) to be reliable, affordable, and clean sources of hot water?
- What minimum performance and reliability standards are in place for these technologies? What minimum performance and reliability standards should be recommended?
- What activities (e.g., training, R&D) are needed to facilitate rapid commercial manufacture/supply and deployment of water heaters in different regions across the world?

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rely on pumped circulation, require little maintenance, have relatively low up-front costs, and have the potential for innovative "smart" control systems.

The project's work will be divided into four work streams.

- State-of-the-art and operating environments in different regions (Subtask A leader: Christoph Rohringer, Austria)
- Thermosyphon hot water systems (Subtask B leader: Bojia Li, China)
- Solar Photovoltaic Hot Water (Subtask C joint leaders: Richard Hall (UK) & Dean Clift (AU))
- Training and standards (Subtask D leader: Jianhua Fan (DK), Denmark)

Solar hot water collectors have long been the front-runners for providing clean energy to residential and commercial markets. In the coming decades, they will be relied on to meet the ever-growing heating demand. On average, water heating accounts for ~16% of primary energy use in residential buildings, and buildings consume ~35% of total primary energy. And solar thermal is the preferred renewable technology for water heating, especially where heat demand is low. In the IEA's Net Zero Emissions Scenario, solar thermal meets 35% of demand by 2050, up from 7% today. So stay tuned on how this Task's work and training opportunities for SHW installers and designers will support this target.

To learn more about SHC Task 69 or how to join, contact Robert Taylor of the University of New South Wales – Sydney, robert.taylor@unsw.edu.au, and He Tao of the China Academy of Building Research, iac@vip.sina.com. To follow the activities of this Task, visit the IEA SHC website, https://task69.iea-shc.org/.

"We tend to forget about hot water as a critical part of the energy mix…until we are forced to take a cold shower! We are now in the early stages of a seismic shift in how we make and use energy – so, for me, this new IEA SHC Task 69 on Solar Hot Water for 2030 is all about making sure hot water is not forgotten during our society's transition to a sustainable energy system. I believe that through international collaboration and coordination (within the Task), we can really impact the trajectory and the speed of the rollout of reliable and affordable solar hot water technologies."

ROBERT TAYLOR
Co-Task Manager