

Key Considerations for the Adoption of PV Water Heaters

Timing: 17:00-19:00 AEST (7:00-9:00 UTC), 5 December 2023

Format: Hybrid (In-person and online as a Solar Academy)

Moderators: Profs. Robert A. Taylor (UNSW-Sydney) & Jianhua Fan (Technical University of Denmark)

Speaker 1: Dean Clift, RMIT University / Rheem Australia
Topic 1: PV water heater overview and key considerations

Speaker 2: Baran Yildiz (UNSW-Sydney).
Topic 2: PV hot water control systems and grid interconnection aspects

Speaker 3: Industry panel
Topic 3: PV hot water policy and grid integration discussion and audience Q&A

This Special Coordinated with the International Energy Agency’s Solar Heating and Cooling Programme’s Task 69, ‘Solar Hot Water for 2030’. The Session will facilitate a timely discussion on key considerations in the adoption and uptake of emerging PV water heating technologies, which includes PV diverters, smart tanks, PV2Heat, and associated control systems (as described in Figure 1). After introducing the core technologies, the discussion will their safety and grid integration issues, relevant regulations/Standards, value creation pathways (including FCAS), and their subsidies & support mechanisms.

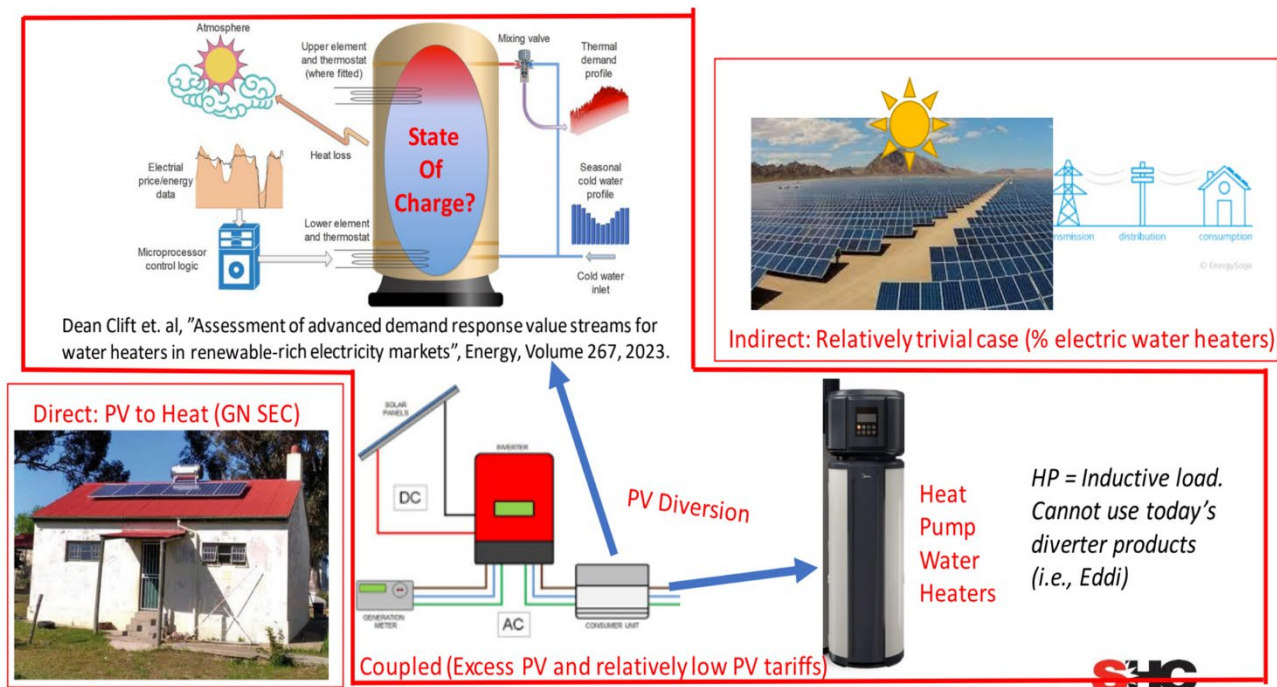


Figure 1. The range of solar PV water heating technologies, which includes direct (DC) PV to Heat, coupled PV diversion/self-consumption, and indirect electric hot water from the grid.

The session will feature presentations from the authors underlined above in the first hour, namely Dean Clift of RMIT & Rheem and Dr Baran Yildiz from UNSW. The second part of the session will include a panel discussion and audience question & answer from industry players. As a globally relevant topic and IEA Task, we expect to welcome in-person and online participants from Australia, China, Africa and Europe, all of whom have different operating environments in terms of the PV water heating technologies currently available on the local market, regulations and Standards, and economic feasibility conditions. The Special Session is a 'hybrid mode' session with the online attendees' access provided as a Solar Academy webinar. As an emerging class of technology, this session aims to discuss and identify best practices and key trends for PV water heating in the Asia Pacific region and globally.

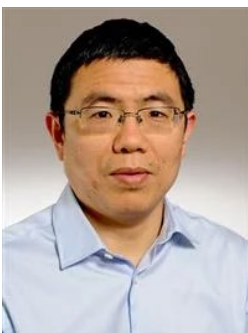
Special Session Author Bios: Key considerations in the adoption of PV Water Heaters

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Contributor Role: Moderator / Conceptualization



Prof. Robert A. Taylor has served as an academic in the School of Mechanical and Manufacturing Engineering since 2011. Prof. Robert A Taylor's main research interest is in the development of 'next generation' solar and thermal energy systems. Drawing on the fields of heat transfer and nanotechnology, he is researching new/novel components, fluids, materials, and systems to increase the utilisation of solar energy in society. As such, his main goal is to provide a more efficient and more economic coupling between solar energy and useful thermal and/or electrical energy. Taylor is the Task Manager for International Energy Agency Solar Heating and Cooling Programmes' Task 69. For more information on Prof. Taylor's research, please have a look at [Google Scholar](#).

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Prof. Jianhua Fan works at Technical University of Denmark, Department of Civil and Mechanical Engineering, in Denmark. He has research interests in Solar Heating and Cooling, Buildings & Other Applications and is the SubTask D leader for the International Energy Agency Solar Heating and Cooling Programmes' Task 69.

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Dean Clift, a Research and Development Technical Specialist at Rheem Australia, has over 10 years industry experience in solar water heating, with the past 5 years focusing on technical developments in PV water heating. Dean represents the Australian Clean Energy Council on the Australian and New Zealand solar heating standards committee CS028 and is a sub-task C leader for IEA SHC Task 69. Dean has recently completed a PhD at RMIT under the lead supervision of Prof. Gary Rosengarten, optimizing interdependent water heater designs and controls in renewable rich electrical networks to assist the voltage and frequency stability of electrical distribution networks.

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Baran is a Senior Research Associate at the School of Photovoltaic and Renewable Energy Engineering (SPREE), UNSW. He completed his PhD in load forecasting & smart home energy systems, M.Sc. in Renewable Energy Engineering, SPREE, UNSW and B.Sc with Honors in Mechanical Engineering, Bogazici University, Istanbul, Turkey. Baran is currently leading two major projects on the control and coordination of domestic electric water heating systems to soak-up excess solar generation in electricity networks: SolarShift (RACE for 2030) and Flexible demand trial (ARENA). Baran previously led Cooperative Research Centre (CRC) and RACE for 2030 projects focusing on the development of integrated smart home energy management systems and integration of distributed energy resources. Baran's research is multi-disciplinary and involves collaboration with leading industry partners of

Australia's energy market. His research has been translated into real-world products benefiting energy users and made policy impact by leading a rule change in Australian Energy Market Commission (AEMC)'s recent determination report. Baran's research outputs have been featured in reports by AEMC, Energy Security Board (ESB), CRC and other prime media outlets such as ABC, The Conversation and RenewEconomy.