ASIA-PACIFIC
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Instructions to Abstract Authors

2018 Key Dates

Submission of Abstracts due:	**Monday, 16 July 2018**
Notification of abstract selection to authors:	**Monday, 13 August 2018**
Papers due for peer review:	**Monday, 15 October 2018**
Feedback from reviewers to authors:	**Monday, 12 November 2018**
Final paper submission due from authors:	**Monday, 26 November 2018**

Your contribution will not be formally accepted and scheduled, until you have registered your attendance at the conference.

Please indicate by ticking which stream/s best fits your abstract

	STREAMS (Topics listed are a guideline only. Submissions in related areas are welcome)
☐	**Photovoltaic Devices** *Silicon solar cells* *Inorganic, organic, dye sensitized and perovskites* *Tandem and other solar cells* *Characterisation and quality control* *Modules and manufacturing*
☐	**Deployment & Integration** *Renewables integration, policy and regulation* *Forecasting and Resource assessment* *Minigrids and Community owned Renewables* *Field experience, performance, yield and reliability* *Distributed Energy Resources, EVs and Low emissions transport*
☒	**Solar Heating and Cooling, Low Carbon Living** *Energy Efficiency and Demand Management* *Housing and appliances* *Solar heating and cooling including heat pumps* *Cities and Communities* *Competing with gas in the domestic & commercial market*
☐	**Concentrating Solar Thermal** *Fundamentals and components* *Storage, systems and power cycles* *CSP integration, design and modelling* *CSP and high temperature processing*
☐	**Solar Fuels & Chemistry** *Storage* *Hybrids, complementary solutions and discrete applications* *Fuels and chemicals from electricity and heat* *Energy for heavy industry*
☐	**Solar energy solutions for emerging economies** *Islands and remote regions* *Supergrid and interconnections between countries* *Field Experience, Performance and deployment*

Please tick which best describes you:

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Solar Energy in Industrial Water

"Integration and Decision Support for End User Needs"

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Background

Solar Heat for Industrial Processes (SHIP) has a huge potential, but is still largely untapped. Within the past years of activities in IEA SHC Task 49/ (duration 2012-2015; operating agent Christoph Brunner), several shortcomings that were hindering a successful market deployment could be overcome:

To reach high solar ratios, available area and easy installations are one requirement, but also new technologies will be a decisive research topic to really allow for significant solar shares in industry. Future energy systems in industry will rely on hybrid solutions, and the interactions of solar thermal systems with other energy supply technologies, storage management and industrial heat flows will become of high importance in these thermal energy networks. These networks might also cross boundaries of industrial sites and relate to larger city areas or regions. The development of new process technologies will also have an impact on solar process heat or vice versa, and economic availability of solar process heat might stimulate the use of low exergy technologies in industry.

An important field of **application of solar energy** was identified in the field of **water treatment technologies**.

On the one hand about 20 % of water utilization in the world is devoted to industrial use and is therefore an essential economic good. On the other hand, fresh water is a scarce resource in many regions today while the disposal of waste streams comes along with destructive environmental impact. Additional resources as sea- and brackish water are utilized by means of desalination with exponential growth rates since the 1950s. Theoretically 100 % solar ratio could be envisioned in solar heat supply for water treatment technologies, as it is common to work with large volumes and buffer storages in this sector allowing to some extent production capacity variation along with solar availability.

This Task (Task 62: Solar Energy in Industrial Water and Wastewater Management) will develop and provide the most suitable and accurate information on the technical and economical possibilities for effectively applying solar thermal energy and solar radiation to disinfect, decontaminate and separate industrial process water and waste water. Water shortages in specific regions worldwide as well the need of CO_2 reduction and primary energy savings underline the importance of this research area and specific technological development will be required to develop tecno-economic solutions. This task will support specifically the solar energy industry, the water technology sector and the producing industry in identifying new technologies, innovative fields of application and business opportunities. Victoria University in Melbourne, Australia, is participating in this Task by contributing to Subtask C "System integration and decision support for end user needs"

Subtask C: System integration and decision support for end user needs

The main objective of the subtask is to develop a guideline for decision support, designed purposefully for end users/technology adopters (e.g. solar thermal companies, manufacturer, food producer, water

utility operating a wastewater treatment plant, etc.) to select the optimized combination of water technology in combination with solar thermal supply technology to achieve a certain practical outcome.

Show viable and innovative solutions to particular needs in treating wastewater or capturing valuable products. A key feature of the work will be to connect the process need to a technology solution (e.g. removal of carbon (biological oxygen demand) from a wastewater using solar heat)

- The guideline will refer to water process solutions, with examples, that principally harness solar thermal energy (related to the work of Subtasks A and B).
- Integration and design concepts (solar process heat system concepts) for solar thermal energy will be developed with solar supply as key focus, but industrial excess heat will be also considered (based upon methodologies developed in IEA SHC Task 49, Integration Guideline)
- Where possible, the SHIP Database, which was developed within IEA SHC Task 49, will be utilised and extended with present working examples of processes that are utilising a solar thermal process to meet a treatment need or produce a valuable product
- The practical outcomes of interest will be assessed in the project in consultation with industry experts, which could include needing to deal with matters such as removing contaminants from wastewater prior to environmental/sewer disposal or reuse. This may be achieved by the proposed technologies by contaminant destruction (e.g. organic mineralisation), isolation/purification for potential sale as a valuable product or by reducing its volume to enable more convenient disposal.
- In keeping a narrow focus on solar thermal technologies, acknowledgement of other technologies will be included respecting their benefits such as maturity and/or efficiency.

The work of all subtasks will build on the results of IEA SHC Task 49/IV, looking at available potential studies, integration strategies and design concepts (solar process heat system concepts). This Subtask C will specifically deliver findings to suit end users interested to harness solar thermal energy to achieve a certain water treatment requirement in their industry to pave the way forward to higher solar ratios