SOLAR HEATING & COOLING PROGRAMME
INTERNATIONAL ENERGY AGENCY

# 2018 HIGHLIGHTS

## Task 62 - *Solar Energy in Industrial Water & Wastewater Managment*

## THE ISSUE


The change to a sustainable, resource- and energy-efficient industry represents a major challenge in the coming years. The efficient supply of energy, the best possible integration of renewable energy sources and the recovery of resources in the sense of the circular economy must go hand in hand. The use of solar process heat represents a large, but so far mostly unused, potential in industry. Innovative and concrete solutions are needed for the long-term and successful introduction of solar thermal energy. The integration of solar process heat to supply technologies for wastewater treatment represents a new field of application with great technical and economic potential for solar thermal energy. The efficient interaction, the nexus between solar energy, water and industry opens up new and innovative approaches that will be addressed within the new IEA SHC Task 62.

## OUR WORK

SHC Task 62 will develop and provide the most suitable and accurate information on the technical and economic possibilities for effectively applying solar thermal energy and solar radiation to disinfect, decontaminate and separate industrial process water and wastewater. 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.

The main objective of Task 62 is to improve the conditions and increase the applications of solar driven separation and water purification technologies in industrial applications in order to push the solar water treatment market and to solve water problems at locations with abundant solar energy resources. Innovative results are expected in the field of collector technology and the identification of new applications such as municipal and industrial wastewater treatment plants.

**Participating Countries**

*Australia*
*Austria*
*Germany*
*Italy*
*Netherlands*
*Spain*

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| Task Period | 2018 – 2022 |
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# KEY RESULTS IN 2018

## Task 62 kick-off meeting in Graz, Austria

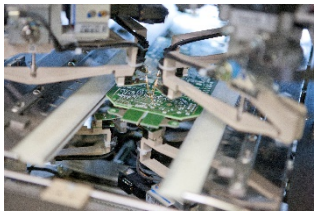
SHC Task 62 started with the kick-off meeting on October 1-2, 2018 in Graz, Austria. Within the kick-off meeting Christoph Brunner, operating agent, presented the main objectives and the challenging goal of Task 62. The kick-off included the presentation and discussion of the three subtasks as well as the discussion of partner and industry involvement in each subtask.

## Final subtask definition

Key result of 2018 was the final definition of each subtask and Task 62 as a whole.

### Subtask A - Thermally driven water separation technologies and recovery of valuable resources

Subtask A is led by Joachim Koschikowski, Fraunhofer-Institute for Solar Energy Systems ISE, Germany. The main objective of this subtask is to foster the development of new solar driven separation technologies for industrial wastewater and process fluid treatment. To achieve this, the subtask will evaluate separation technologies (e.g., membrane distillation) with regard to their suitability to be supplied by solar thermal heat, assess advantages and disadvantages, and identify suitable fields of application for these technologies.



*Project example: Within the H2020 project, "ReWaCEM", the membrane distillation is tested for the recovering of gold and palladium from process baths in a PCB (printed circuit board) company. The necessary process heat for the membrane distillation could be generated by solar heat.* *Photo source: AT&S Austria Technologie & Systemtechnik Aktiengesellschaft*

### Subtask B - Solar Water Decontamination and Disinfection Systems

Subtask B is led by Isabel Oller, Plataforma Solar de Almería-CIEMAT, Spain. The main objective of this subtask is the elaboration of emerging process technologies with increased efficiency that can make process technologies more efficient due to the integration of solar radiation, as it may also affect the quality of the conversion process (e.g., wastewater treatment or chemical processes that could benefit from the direct use of solar radiation). In addition, new solar collector concepts will be defined for reducing manufacture costs while maintaining high efficiency in the collection of UV photons for better performance of chemical oxidation reactions.

*Project example: Within the Spanish national project, "Water4Food", CIEMAT is focusing on the implementation of a solar process for the treatment of wastewater from the production of fresh-cut products using innovative oxidation processes in a pilot plant of PSA for further use for the irrigation of raw vegetables.* *Photo source: CIEMAT-Plataforma Solar de Almería*

### Subtask C - System integrations and decision support for end user needs

Subtask C is led by Mikel Duke, Victoria University, Australia. The main objective is to develop a guideline for decision support, designed purposefully for end-users/technology adopters, who wish to implement solar energy for waste or process water treatment. The guideline will refer to water process solutions with examples that principally harness solar thermal energy.

*Project example: Within IEA SHC Task 49 an integration guideline was developed for solar planners, energy consultants, and process engineers that outlines a general procedure to integrate solar heat into industrial processes by identifying and ranking suitable integration points and solar thermal system concepts.*