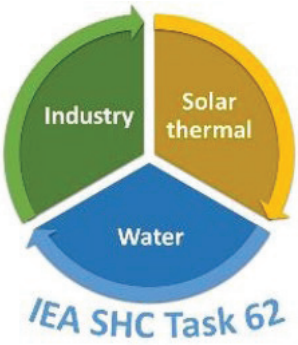
Solar Energy in Industrial Water and Wastewater Management

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 circular economy must go hand in hand. The use of solar process heat represents a significant but so far, mostly unused potential in industry. For the long-term and successful introduction of solar thermal energy, innovative and concrete solutions are needed. 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 and water opens up new and innovative approaches.



The main objective of IEA SHC Task 62 is to increase the use of solar thermal energy in industry, to develop new collector technologies, and to open up industrial and municipal water treatment as a new area of application with high market potential for solar thermal energy. The nexus between solar thermal energy and water treatment enables the development of new and innovative technology combinations and the change to a sustainable, resource- and energy-efficient industry.

Task participants will work in three areas:

- Thermally driven water separation technologies and recovery of valuable resources (Subtask A, led by Joachim Koschikowski of the Fraunhofer Institute for Solar Energy Systems ISE, Germany)
- Solar water decontamination and disinfection systems (Subtask B, led by Isabel Oller Alberola of CIEMAT – P.S.A., Spain)
- System integrations and decision support for end-user needs (Subtask C, led by Mikel Duke of Victoria University, Australia)

To increase activities in Task 62, AEE INTEC (led by Operating Agent Christoph Brunner) together with the Austrian Federal Economic Chamber, hosted a workshop on the topic "Nexus Energy, Water and (Bio) Industry" in Vienna (Austria) in January. The event was supported by the Austrian Federal Ministry for climate protection, environment, energy, mobility, innovation and technology (BMK), and the climate and energy fund (KLIEN). The scheduled program arouse interest and brought together international stakeholders from different fields to present progress in research and development on innovative technologies and integrative approaches towards the efficient use of energy and water in industry.

SHC Task 62 participants from the different Subtasks highlighted the importance of Water and Energy in industrial processes as central thematic areas.

Isabel Oller Alberola from CIEMAT – Plataforma Solar de Almería (leader of Subtask

continued on page 23

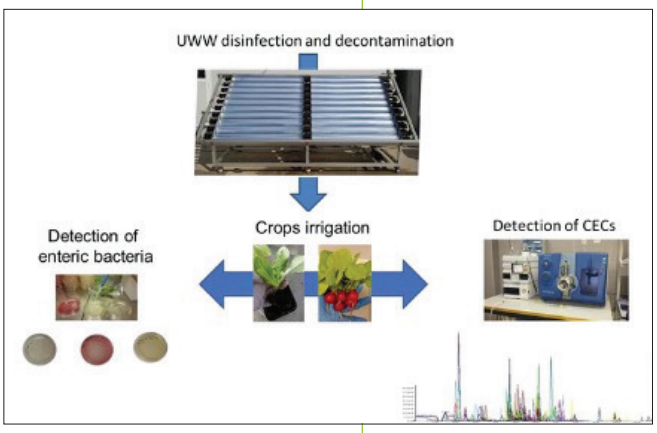
B) presented the developments on solar water decontamination and disinfection as a promising treatment method for improving the quality of wastewater.

Alexander van der Kleij from SolarDew presented their module developments on integrative water production via solar thermal energy.

Wolfgang Gruber-Glatzl from AEE INTEC presented one approach of system integration for thermal separation technologies – specifically Membrane Distillation – in municipal wastewater treatment plants.

Based on these presentations and the interactive discussions, it became clear that optimized and integrated solutions for the Water and Energy Nexus lead to the need for holistic approaches and interdisciplinary networks – like SHC Task 62 – as a platform for exchange.

For more information on this Task, visit https://task62.iea-shc.org/ or contact the Operating Agent, Christoph Brunner, c.brunner@aee.at.



Solar water decontamination and disinfection of wastewater research work at Plataforma Solar de Almería.
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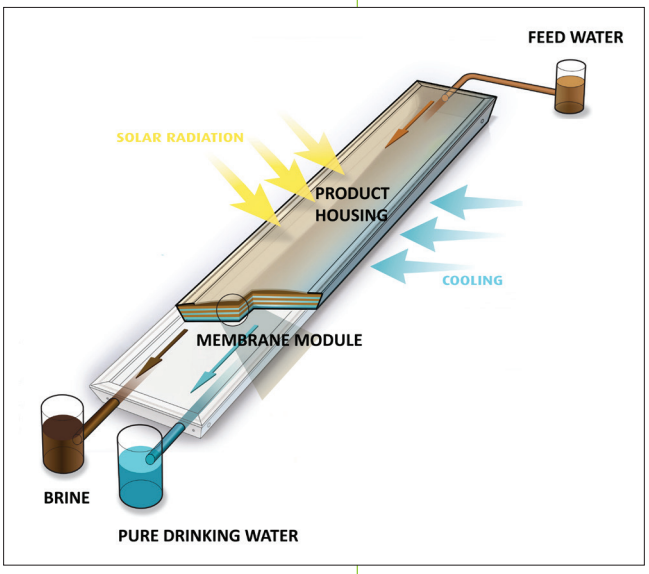

Using solar thermal energy for water production.
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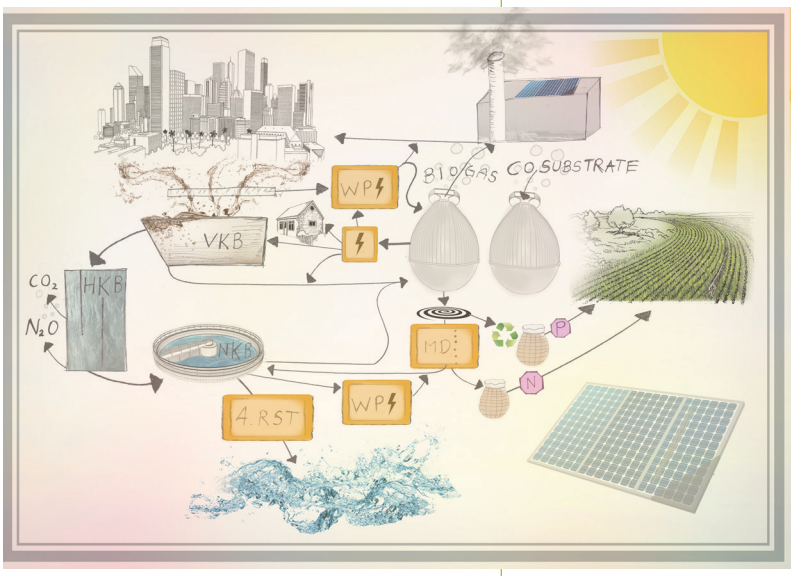

Exploring Membrane Distillation for municipal wastewater treatment plants.
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