European Twinning for research in Solar energy

to (2) water (H20) production and treatment technologies

GA Number: 101079305

European Research Executive Agency REA.C3

Funded by the European Union

Sol2H2O

Fast-Track School # 1
Solar-driven water production & water treatment technologies and brine treatment processes

UNIPA Università degli Studi di Palermo, Palermo, Italia.

10th - 11th January, 2024

On-site and Online attendance

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Gathering the experience of three non-Widening (TOP) partners presenting some of the most outstanding background and Research Infrastructure (RI), at European level, in the development of Solar-driven water production and wastewater treatment technologies (WP&WT), together with brine treatment processes for raw materials recovery and Zero Liquid Discharge (ZLD); Sol2H2O aims at supporting the Coordinator (WIDENING) partner in the development of establishment of high-level research in these fields .

Based on the outstanding WIDENING RI and background in Solar Energy technologies and on its preliminary experiences in the Water-Energy nexus field, Sol2H2O seeks the development and implementation of a common scientific strategy, with a strong focus on an enhanced capacity building of researchers, going beyond purely scientific capacities and strengthening their research management and administration skills.

By means of enhanced cooperation duly framed on a common research strategy aiming at further developing Solar-driven Water-Energy Nexus solutions, **Sol2H20 aims at creating a reference European facility for the development and testing of Circular Solar-driven Water Production & Treatment technologies and brine treatment processes**.

SOL2H2O Fast-Track School

SOL2H2O FTS are meant to provide **evolutive training on scientific, research methodology and result assessment topics** to the Industry, Candidate and Young Researchers, providing support to their respective evolution towards becoming **Young and Leading Researchers in these fields.**

Fast-Track Schools take place on Jan24, Jun24 and Dec24 and will be hosted consecutively by UNIPA, ITC and UEvora. Each edition includes Solar-driven WP&WT technologies and brine treatment processes focused Lectures and Brainstorming Sessions, in **support of Tutoring and Mentoring activities to Candidate and Young Researchers**.

SOL2H2O Fast-Track School editions will focus on:

- FTS #1: **State of the art** (solar-driven water production & water treatment technologies and brine treatment processes, beyond SoA possibilities);
- FTS #2: **Beyond SoA** (implementation, experimental campaigns, monitoring, data assessment).
- FTS #3: Technology **benchmarking and Exploitation** contents.

Fast-Track School #1

Introduction to Solar-driven Water Production & Water Treatment technologies and brine treatment processes

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Sol2H2O FTS #1: Program
Introduction to Solar-driven Water production & Treatment technologies and brine treatment processes. State of the Art.

Day 1		10.01.2024
Audience: Industry, Candidate Young Researchers, Young Researchers		
9.00	Welcome & Introduction	Giorgio Micale (UNIPA)
9.10	Sol2H2O project presentation and Consortium background	Pedro Horta (UEvora)
9.30	Introduction to sustainable desalination strategies	Pedro Horta/ Frederico Felizardo (UEvora)
10.00	Coffee break	
10.30	State of the art of PV-RO (20 min + Q&A)	Toni de la Fuente (ITC)
11.00	SoA of Membrane Distillation (vacuum-enhanced air-gap MD) (20 min + Q&A)	Guillermo Zaragoza (PSA)
11.30	Solar water treatment, integration of technologies for WW regeneration (20 min + Q&A)	Isabel Oller (PSA)
12.00	SoA SWRO desalination brines valorization (DBV) (20 min + Q&A)	Ángel Rivero (ITC)
12.30	SoA of Brine treatment processes for raw materials recovery and Zero Liquid Discharge (ZLD) (20 min + Q&A)	Giorgio Micale (UNIPA)
13.00	Lunch break	
14.30	MF-PFR for selective recovery of Mg and Ca from brines (20 min + Q&A)	Andrea Cipollina (UNIPA)
15.00	Researchers' brainstorming	On-site attendants only.
16.00	Technical visit to UNIPA Brine Valorisation Laboratories	
17.30	End	

Fast-Track School #1
Introduction to Solar-driven Water Production & Water Treatment technologies and brine treatment processes

Day 2		11.01.2024
Audience: Candidate Young Researchers, Young Researchers (on-site attendants only).		
PSA, ITC and UNIPA will propose 1 topic of interest (two in the case of PSA) within their respective research lines (brine concentration and photo catalysis; PV-RO; brine valorization), presented as challenges, and the attendees will be divided into four groups, with a moderator in each group to work on a research plan for the proposed challenge. After the coffee break, the groups are unified and a spokesperson for each group presents (20 min) the proposed research plan for the topic worked.		
09.00	Group 1: "**Reclaimed wastewater as a new source of water**": research topic/challenge to discuss/work in group	Moderator: Isabel Oller
	Group 2: "**Thermal desalination"**: research topic/challenge to discuss/work in group	Moderator: Alba Ruiz Aguirre
	Group 3: **"Photovoltaic Reverse Osmosis"**: Integration of PV energy in large scale desalination plants, challenges to face.	Moderator: Javier Acerete
	Group 4: "**Brine valorization strategies**": Processes to recover minerals from brines, estimate of potential and implementation barriers	Moderator: Andrea Cipollina
10.30	Coffee break	
11.00	Brainstorming	Moderated by 1 partner of each institution (PSA, ITC and UNIPA).
12.30	End	