

# Outcomes of Winter 2020/2021 ODAK<sub>TR</sub> Concentrating Solar Thermal (CST) Webinar Series

## Summary and Links to Recorded Webinars

**About ODAK<sub>TR</sub>:** ODAK<sub>TR</sub> is a national CST initiative led by METU-GÜNAM with objectives to

1. Support Turkey's energy transition through the development & commercialization of CST technologies;
2. Catalyze domestic CST economic activity by supporting growth in markets, industrial capacities, and industrial activities;
3. Strengthen Turkey's CST Research and Innovation (R&I) capacities, including by creating globally competitive CST research opportunities at Turkish universities.

One of ODAK<sub>TR</sub>'s main strategies to achieve these objectives is by strengthening and exploiting synergies created by METU-GÜNAM's role as Turkey's National Node for EU-SOLARIS ERIC and participation in 5 EU Horizon 2020 (H2020) projects: 1. SolarTwins; 2. HORIZON-STE; 3. SFERA-III; 4. INSHIP; and 5. GeoSmart.

**About the ODAK<sub>TR</sub> Webinar Series:** Through the ODAK<sub>TR</sub> Webinar Series, leading CST experts primarily from METU-GÜNAM's strategic European CST partners CIEMAT-PSA (Spain) and DLR (Germany) gave webinars tailored to support realization of ODAK<sub>TR</sub>'s objectives and targeting the Turkish CST community. In total 257 people attended the live webinars. The ODAK<sub>TR</sub> Webinar Series is being executed within the framework of the H2020 Project SolarTwins.

**About the SolarTwins Deliverable (D1.2) 1<sup>st</sup> Year Summary and Assessment of External & Open Trainings:** The ODAK<sub>TR</sub> Webinar Series is executed through the SolarTwins Task 1.2 *External and Open Trainings to Strengthen METU, Regional and National R&I Capacities*. This document *Outcomes of Winter 2020/2021 ODAK<sub>TR</sub> Concentrating Solar Thermal (CST) Webinar Series: Summary and Links to Recorded Webinars* will be included as an Appendix to this Deliverable. D1.2 will report additional statistics on the registrants.

**Winter 2020/2021 ODAK<sub>TR</sub> Webinar Series Organizing and Funding Institutions:**



**Funding:** The project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 856619.

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**About CST:** CST is an umbrella term that includes Concentrating Solar Thermal technologies for electricity generation, industrial process heat, and solar fuels. CST is a generalization of the historically more common acronyms CSP (Concentrated Solar Power) and STE (Solar Thermal Electricity) that narrowly refer to CST technologies for electricity generation. The use of solar thermal technologies specifically for industrial process heat is referred to as Solar Heat for Industrial Processes (SHIP), or equivalently Solar Industrial Process Heat (SIPH), and includes solar-thermal driven water treatment and desalination processes.

#### Summary of Webinar Speakers, Titles, and Links to Recorded Webinar

Date	Speaker, Institution	Webinar Title	Recorded Webinar Links
18 Dec. 2020	<b>Prof. Dr. Eduardo Zarza</b> CIEMAT-PSA, Spain	An Introduction to Concentrating Solar Thermal (CST) Technologies and Applications	Not Recorded
08 Jan. 2021	<b>Dr. Yelda Erden-Topal</b> UPM & CIEMAT, Spain, and METU TEKPOL, Turkey	CST in Turkey: Current State and National Strategies to Exploit Opportunities	<a href="#">Link</a>
15 Jan. 2021	<b>Dr. Florian Wiesinger</b> DLR - Institute of Solar Research, Germany	Quality Assessment and Accelerated Aging Experiments of Optical Components for CSP Plants	<a href="#">Link</a>
22 Jan. 2021	<b>PhDc. Gkiokchan Moumin</b> DLR - Institute of Future Fuels, Germany	Calcination of Cement Raw Meal in a Solar Rotary Kiln and Heat Transfer Challenges	<a href="#">Link</a>
5 Feb. 2021	<b>Dr. Inmaculada Polo</b> CIEMAT-PSA, Spain	Antibiotic Resistant Bacteria: occurrence and removal from urban wastewater	<a href="#">Link</a>
12 Feb. 2021	<b>Dr. Reiner Buck</b> DLR - Institute of Solar Research, Germany	Solar Particle Technology for Dispatchable Power and Heat Generation	<a href="#">Link</a>
19 Feb. 2021	<b>Marcel Bial</b> ESTELA- The European Solar Thermal Electricity Association	First learnings from a multifold stakeholders position review regarding the deployment of CSP in Europe	<a href="#">Link</a>
26 Feb. 2021	<b>Dr. Isabel Oller</b> CIEMAT-PSA, Spain	Water-Energy-Food nexus in industrial and urban wastewater recovery	<a href="#">Link</a>

**Abbreviated Webinar Announcements:** Starts on next page.



## An Introduction to Concentrating Solar Thermal (CST) Technologies and Applications

**Prof. Dr. Eduardo Zarza Moya**  
R+D Technical Coordinator  
CIEMAT-PSA (Plataforma Solar de Almeria)

**Live Webinar Time and Date:** 12:00-13:00 (Turkish time / GMT + 3)  
Friday, 18 Dec. 2020

**Recorded Webinar:** Not Recorded

**Moderator:** Prof. Dr. Derek Baker  
METU GUNAM and METU Mechanical Engineering

**Abstract:** In this Webinar an introduction to Concentrating Solar Thermal (CST) technologies and applications will be given as follows: 1) Basic aspects of CST systems; 2) CST technologies (description, different plant configurations, different working fluids); 3) Main applications for CST technologies (electricity generation and industrial process heat); and 4) Brief overview of current high-priority CST Research and Development (R+D) topics.

**Short Bio:** Eduardo Zarza is the R+D Technical Coordinator at Plataforma Solar de Almería (PSA), which is part of Spain's Center for Energy, Environment and Technological Research (CIEMAT). He has been working for 35 years on CST systems. His expertise is in the technology of parabolic trough collectors, including development of components, investigation of new working fluids for solar receivers (direct steam generation, sCO<sub>2</sub>, etc.) and solar thermal systems applications. He is member of the Scientific Committee of ESTELA, and the Spanish representative for the SolarPACES's Executive Committee. He is presently collaborating or previously collaborated with METU-GUNAM on the following EU H2020 and FP7 Projects: 1) SolarTwins; 2) HORIZON-STE; 3) SFERA-III; 4) INSHIP; and 5) EU-SOLARIS.

**About CIEMAT-PSA:** CIEMAT-PSA is the largest CST research, development and test center in Europe and is the headquarters for the CST European Research Infrastructure Consortium (ERIC) EU-SOLARIS currently being created.

**About the SOLTERCO Project:** SOLTERCO is a Spanish Strategic Network promoting the commercial development of CST systems. SOLTERCO members participate in national and international entities that have a significant role in this development.



## CST in Turkey: Current State and National Strategies to Exploit Opportunities

**Dr. Yelda Erden Topal**

Post-Doctoral Researcher

UPM INNOPRO & CIEMAT and METU TEKPOL

**Live Webinar Time and Date:** 12:00-13:00 (Turkish time / GMT + 3)  
Friday, Jan. 8, 2021

**Recorded Webinar:** [Link](#)

**Moderator:** Prof. Dr. Derek Baker  
METU GUNAM and METU Mechanical Engineering

**Abstract:** This second ODAK<sub>TR</sub> Webinar builds-on the global perspective of Concentrating Solar Thermal (CST) given in the 1<sup>st</sup> Webinar by providing an overview of the state of and opportunities for CST in Turkey. As part of the Horizon 2020 (H2020) CST *SolarTwins* project, METU is developing several Joint Research Lines (JRLs) with its strategic EU partners CIEMAT (Spain) and DLR (Germany). In this Webinar the METU-CIEMAT JRL *Social Aspects of Sustainable Energy Transitions* is presented. This JRL aims to exploit synergies from a larger cluster of pan-European activities in which METU-GÜNAM is involved to catalyze and grow Turkey's CST activities and markets. The current state of and opportunities for CST in Turkey identified through the aligned H2020 CST *Horizon-STE* project are presented, including results from Interviews and a Bibliometric Analysis. Lessons learnt from Spain's CST Experience and policy implications to promote development and diffusion of CST Technologies in Turkey are discussed based-on the presenter's on-going Post-Doctoral research at CIEMAT. A comparative case study of Spain and Turkey for CST is presented. Finally, Policy Implications to support CST Technologies in Turkey within an EU Context are discussed.

**Short Bio:** Yelda Erden Topal is a postdoctoral researcher in the Polytechnical University of Madrid (UPM), Spain, and collaborating with CIEMAT as a TUBITAK 2219 (International Postdoctoral Research Fellowship Program for Turkish Citizens) Scholar since March 2020. She is a researcher in H2020 SolarTwins and HORIZON-STE projects, and one of the contributors for Turkey membership in the European Research Infrastructure Consortium (ERIC) *EU-SOLARIS* on CST. She is Dr. Research Assistant and Postdoctoral Researcher in Science and Technology Policies Research Center (METU TEKPOL) and Vice Presidency Office at Middle East Technical University since 2009. She has research experience in the EU Projects of SolarTwins, Horizon STE, Turkey-ICT RTD Technological Audit, and National Projects such as TUBITAK, Min. of Development (now SBB), Development Agencies, Associations and NGOs.

**About UPM INNOPRO:** The Innovation, Industrial Property and Technology Policy (INNOPRO) Research Group, officially recognized by Universidad Politécnica de Madrid in 2004, acknowledges and contributes to the growing significance of the knowledge economy. In this respect, INNOPRO as a facilitator, carrier and innovation source, supports technology intensive services and activities as a part of the innovation process to promote the growth of innovative activities in industry, and to improve competitiveness in Spain & EU. To implement these activities work is done in research areas of Innovation, Industrial Property Rights, Technology Policy, Digital Transformation, e-Learning and learning analytics, and Social Innovation. INNOPRO Activities are Participation in national and international tender projects, Participation in research projects with companies, Technological services (audits, strategy, planning...), R&D and Innovation projects evaluation, Training courses and Webinars. For further information: <https://www.innopro.upm.es/>

**About METU TEKPOL:** Science and Technology Policy Studies (STPS) program was founded in 1997 at METU with the explicit objective to conduct research in science, technology and innovation policy issues. It has organic relations with the Research Center for Science and Technology Policies (METU TEKPOL). TEKPOL is the only academic unit in Turkey that concurrently coordinates education and research activities. It operates M.Sc. and Ph.D. programs in science technology policy studies at the Graduate School of Social Sciences. TEKPOL also conducts research on science and technology policy issues with the aim of addressing societal challenges. TEKPOL has an interdisciplinary approach to the analysis of the economic, social and political factors that drive technological change and innovation. TEKPOL deals with recent policy questions concerning national and international regulations of science, technology and innovation in various areas of ICT, economic development, creative industries, social innovation, interdisciplinary collaborative science, artificial intelligence, energy, sustainability and climate change, data science, informatics, network building, science communication, innovation systems, technology development and diffusion, labor dynamics, etc. with qualitative and quantitative tools of data collection and analysis. For more information see <https://stps.metu.edu.tr/en>

**About the Horizon-STE Project:** The aim of Horizon-STE project is to provide scientific and industrial support to the Implementation of the European Initiative for Global Leadership in Solar Thermal Electricity (STE) as part of the European Integrated SET-Plan (Strategic Energy Technology Plan). The project is coordinated by ESTELA (Belgium) and CIEMAT, DLR, ENEA (Italy), and METU are partners. METU's main contributions are to support the Work Package to Maximize the Research and Innovation Impact, to Lead the Task to Evaluate the Implementation of this Initiative, and to support the analysis of Turkish CST Stakeholders.

**About the TUBITAK 2219 (International Postdoctoral Research Fellowship Program for Turkish Citizens) Scholarship:** The Scientific and Technological Research Council of Turkey grants fellowships for scientists/researchers to do research abroad. Yelda is one of the fellows of TUBITAK 2219 - 2018 (II) Term, and she would like to thank TUBITAK 2219 Fellowship for financing the research in Spain since March 02, 2020.



Quality Assessment and Accelerated Aging  
Experiments of Optical Components for CSP Plants

Dr. Florian Wiesinger  
Post-Doctoral Researcher  
German Aerospace Center (DLR)

**Live Webinar Time and Date:** 12:00-13:00 (Turkish time / GMT + 3)  
Friday, Jan. 15, 2021

**Recorded Webinar:** [Link](#)

**Moderator:** Prof. Dr. Tuba Okutucu Özyurt  
Istanbul Technical University-Energy Institute

**Abstract:** The webinar will give an introduction of the optical components of concentrating solar thermal (CST) technologies and some state of the art quality assessment tools are explained. The typical effects of outdoor exposure on the components will be shown and consequently a summary of accelerated aging experiments, which are used to simulated the natural effects under controlled conditions, is given. A special focus is laid on the reproduction of erosion effects caused by sandstorm events.

**Short Bio:** Florian Wiesinger is a postdoctoral researcher at the institute of solar research of the German Aerospace Center (DLR), located in Almeria/Spain and working in close collaboration with Spanish Center for Energy, Environment and Technological Research (CIEMAT). After receiving his M.Sc. degree in physics at the Technical University in Munich he started working at the Plataforma Solar de Almería (PSA) with a focus on component reliability and quality assessment. In 2018 he finished his dissertation about sandstorm effects on solar mirrors.

**About DLR's Institute of Solar Research:** DLR's Institute of Solar Research develops concentrating solar systems for the generation of heat, power and fuel. These technologies are used, for example, in Solar power plants in Spain, the United States and many other countries with high levels of direct solar radiation. The Institute is represented at the DLR sites in Cologne, Jülich and Stuttgart. In southern Spain, scientists from the Institute are conducting research at the Plataforma Solar de Almería (owned and operated by Spanish research centre CIEMAT), Europe's largest research facility for concentrating solar systems. Jülich is home to the Institute's two large-scale facilities: Germany's only solar tower and Synlight, the world's largest facility for the production of artificial sunlight. In addition, the Institute operates a solar furnace at its headquarters in Cologne and a small high-flux solar simulator.



## Calcination of Cement Raw Meal in a Solar Rotary Kiln and Heat Transfer Challenges

PhDc. Gkiokchan Moumin,  
Researcher  
DLR - Institute of Future Fuels

**Live Webinar Time and Date:** 12:00-13:00 (Turkish time / GMT + 3)  
Friday, Jan. 22, 2021

**Recorded Webinar:** [Link](#)

**Moderator:** Prof. Dr. Burcu Akata Kurç  
METU Micro and Nanotechnology and METU Central Laboratory

**Abstract:** Concentrated solar energy can readily provide the temperatures needed for the calcination of cement raw meal, which requires about 900 °C. This step in the cement production alone is responsible for about 4 % of global CO<sub>2</sub> emissions. Previous solar thermal studies dealt with the reaction itself but did not utilize the particle size employed in the industrial cement production. The particle size is an important parameter though, which affects the particle motion, heat uptake and thus, the degree of calcination. Altogether, this affects the suitable reactors for such an application. The experimental calcination of industrial size cement raw meal in a solar heated rotary kiln was assessed in the EU-project SOLPART. Results will be shown from this work, together with the technical challenges, limiting factors and future potentials. The heat transfer into the cement raw meal is a key aspect which will be discussed based on experiments on the heat transfer analysis.

**Short Bio:** Gkiokchan Moumin is a researcher at the Institute of Future Fuels, formerly part of the Institute of Solar Research, which belongs to the German Aerospace Center (DLR). He studied chemical engineering at the Karlsruhe Institute of Technology (KIT) and is performing his PhD at the Institute of Solar Research in combination with the TU Dresden. The topic of his thesis was the solar calcination of cement raw meal in a rotary kiln and the heat transfer into cohesive particles, which was embedded in the EU-project SOLPART.

**About DLR's Institute of Future Fuels:** DLR's Institute of Future Fuels is recently founded from the Solar Process Engineering Department of the Institute of Solar Research, and develops concentrating solar systems for the generation of process heat and fuels. With the founding, the DLR is supplementing and strengthening its research into solar energy production, hydrogen storage and other resources for the production of renewable fuels. The institute is represented at the DLR sites in Cologne and Jülich. Jülich is home to the Institute's large-scale facility: Synlight, the world's largest facility for the production of artificial sunlight. In addition, the institute operates a solar furnace at its headquarters in Cologne and a small high-flux solar simulator.

**Co-Sponsored by the SOLPART Project:** The Horizon 2020 project SOLPART dealt in the years 2016-2020 with the development of a solar process, for a high temperature (800-1000 °C), 24 h/day particle treatment in energy intensive non-metallic minerals' industries. The consortium consisted of 11 partners from research and industry, among others CNRS, ABENGOA Research and Cemex. The DLR focused on one of the solar reactors as well as the handling and storage.



**Antibiotic Resistant Bacteria:  
Occurrence and removal from Urban Wastewater**

**Dr. Inmaculada Polo**  
Researcher  
CIEMAT-PSA (Plataforma Solar de Almeria)

**Live Webinar Time and Date:** 12:00-13:00 (Turkish time / GMT + 3)  
Friday, Feb. 5, 2021

**Recorded Webinar:** [Link](#)

**Moderator:** Asst. Prof. Dr. Zöhre Kurt  
METU Environmental Engineering

**Abstract:** The webinar 'Antibiotic Resistant Bacteria: Occurrence and Removal from Urban Wastewater' is related with the topic of urban wastewater (UWW) reclamation and reuse with especial focus on the occurrence and treatment of antibiotic resistant bacteria (ARB) and antibiotic resistant genes (ARG). The presence and spread of ARB is one of the major global health concern of this century's, and in this context, UWW treatment plants are today considered as hotspots for the spreading of antibiotic resistance (AR). This is due to the presence of antibiotics (at ng-mg/L range) that may act as selective pressure for the microbial adaptation and selection of ARB. Therefore, along the presentation, the following contents will be discoursed: i) a brief description of main antibiotic's mechanisms to inactivate microorganisms; ii) the different ways of bacteria to develop and acquire the resistance to antibiotics; iii) the occurrence of ARB/ARG on UWW and finally, iv) the efficiency of conventional and non-conventional (including solar technologies) tertiary treatments for the removal of ARB and ARG from secondary effluents.



**Short Bio:** Dr. María Inmaculada Polo-López is senior researcher in the group of Solar Treatment of Water in the Plataforma Solar de Almería-CIEMAT, Spain. She obtained her PhD in 2012 from University of Almeria. Her main expertise is solar photocatalytic disinfection of water and wastewater for drinking and reuse. She is author/co-author of 72 publications, 2 books and 12 book chapters (H-index: 30). She has been involved in 15 research projects (National and International) and supervised/co-supervised 2 PhD and another 2 PhD currently under development. She is also co-Leader of Advanced Technologies for Water Reclamation Research

Unit in the Joint Research Center (Univ. Almería-CIEMAT) in Solar Energy (CIESOL).



**About the National (Spain R&D) Project NAVIA:** The general objective of the NAVIA project is the development of novel photocatalysts and new technologies based on solar advanced oxidation processes operated in continuous flow mode for urban wastewater reclamation. In this collaborative project, CIEMAT-PSA, CIESOL-University of Almeria and Universitat politècnica de València are involved. The expected impact of NAVIA is to obtain treated effluents with solar-based technologies at pre-industrial scale, operating the system by a developed decision-making tool for proper operation control, ensuring its final safe reuse in crops' irrigation.



**About the ENI CBC MED Project AQUACYCLE:** Its main objective is set to bring an eco-innovative wastewater treatment technology that will consist of anaerobic digestion, constructed wetlands and solar treatment for the cost-effective treatment of urban wastewater with minimal costs of operation and maximum environmental benefits.



Three local action and investment plans (demonstration plants) will be established in Tunisia, Lebanon and Spain targeting a combined reuse potential of 900,000 m<sup>3</sup> of treated effluent, being this action the higher expected impact of this project. CIEMAT-PSA (Spain) is partner of this project jointly with another six institutions from five countries (Greece, Spain, Malta, Lebanon, and Tunisia).

## Solar Particle Technology for Dispatchable Power and Heat Generation

**Dr. Reiner Buck**

Head of Solar High Temperature Technologies  
German Aerospace Center (DLR) - Institute of Solar Research

**Live Webinar Time and Date:** 12:00-13:00 (Turkish time / GMT + 3)  
Friday, Feb. 12, 2021

**Recorded Webinar:** [Link](#)

**Moderator:** Prof. Dr. İlker Tari  
METU Mechanical Engineering and ICHMT

**Abstract:** Solid ceramic particles are considered a promising new heat transfer and storage medium for concentrating solar power applications. The use of such particles has several advantages: operation temperatures up to 1000°C are possible, and there is no danger of freezing like in molten salt systems. Particle systems can operate at a high temperature spread, yielding much higher storage densities than state-of-the-art technologies. In consequence a significant cost reduction is predicted for solar particle systems. The presentation will report mainly on two ongoing projects that rely on solar particle technology. In the HIFLEX project a complete solar subsystem will be built in Italy, consisting of a particle receiver, a thermal storage system and a steam generator. Process heat will be delivered to a pasta plant for pasta drying. The PreMa project will demonstrate the use of solar high temperature process heat in a metallurgic process, the production of manganese. The solar heat will be used to preheat the ore and to perform a prereduction step, thus reducing the greenhouse gas footprint.



**Short Bio:** Dr.-Ing. Reiner Buck is Mechanical Engineer and has received his PhD in 2000 from the University of Stuttgart on "Mass Flow Instabilities in Volumetric Receiver-Reactors". He has worked with DLR since 1986 on different solar thermal technologies, with focus on solar tower systems. Since 2011 he is leading the department "Point Focusing Systems" within the DLR Institute of Solar Research, which in 2020 became the department "Solar High Temperature Technologies". His expertise is on solar thermal systems including receivers, heliostats and simulation tools. He developed several simulation tools for solar power systems (ray-tracing tools for heliostat fields, thermal performance analysis for various types of receivers). He also has a sound experience in testing of receivers and innovative concentrators. He also led and participated in numerous national and international collaboration projects on CSP.



## Co-Sponsoring Projects:

The logo for the HiFlex project, featuring the word "HiFlex" in a red, sans-serif font. The "i" and "F" are slightly larger and more prominent than the other letters.

**HIFLEX:** In the HiFlex project, a pre-commercial power plant based on Concentrating Solar Power will be developed, built and tested at a pasta plant in Italy. The EU co-funded project will demonstrate, that it is possible to run the plant 24/7 and continuously generate renewable energy. The plant will use a particle receiver with 2.5 MWt thermal power to provide hot particles at up to 1000°C. A high-density thermal storage system and a steam generator for 620°C will be demonstrated. In the pre-commercial plant the collected solar energy will be transferred to the pasta plant to support the pasta drying process. This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No. 857768. <http://hiflex-project.eu/>

The logo for the PREMA project, featuring the word "PREMA" in a bold, orange, sans-serif font. The "E" has a small yellow accent above it.

**PreMa:** PREMA is a H2020 project aimed at demonstrating an innovative suite of technologies, involving utilization of industrial off-gases and solar thermal energy to reduce energy consumption and CO<sub>2</sub> emissions from manganese production as a means to obtain sustainable production of Mn-alloys and steel. The main concept of PREMA is to increase energy flexibility and allow the use of sustainable energy sources and reduce the overall energy consumption and CO<sub>2</sub> emission in Mn-alloy production. This will be done by dividing the Mn-alloy production, today done in submerged arc furnaces (SAF), into two separate units as illustrated below. A pretreatment unit will be added before the existing furnace. Within the project various pretreatment technologies using different energy sources like: CO-rich industrial off-gas, bio-carbon and solar thermal energy will be developed and demonstrated.

Integration of the novel PREMA pretreatment technologies with the process currently used by smelters will lead to a better flexibility in terms of raw materials leading to a 20% reduction in the consumption of fossil carbon, more energy efficient production processes giving a potential for a 20% reduction in overall energy consumption and a global reduction of operation costs by at least 10%. The ultimate ambition of PREMA is to scale the technology up to use in industrial manganese alloy production both in Europe and South Africa. This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No 820561. <https://www.spire2030.eu/PREMA>.

## First Learnings from a Multifold Stakeholders Position Review Regarding the Deployment of CSP in Europe

**Marcel Bial**

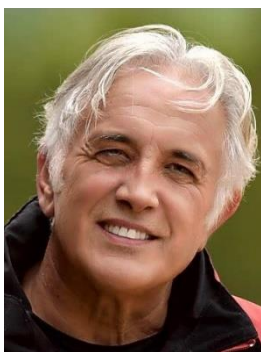
**Secretary General of  
European Solar Thermal Electricity Association (ESTELA)**

**Live Webinar Time and Date:** 12:00-13:00 (Turkish time / GMT + 3)  
Friday, Feb. 19, 2021

**Recorded Webinar:** [Link](#)

**Moderator:** Prof. Dr. Erkan Erdil  
METU Economics and METU TEKPOL

**Abstract:** The EC supports a project (HORIZON-STE or short H-STE) that aims at investigating in several countries in the EuroMed zone the potential development of CSP in the wider context of their respective national energy policies. H-STE analyses the positions of major actors (ministries, regulators, system operators, industry companies as well as research entities), and will provide to the European Commission pathways to a better integration of perspectives and strategies. The first results of this exercise will be reported in the webinar.



**Short Bio:** Marcel Bial is since May 2013 Secretary General of ESTELA, the European Solar Thermal Electricity Association. The main focus of ESTELA is to support the deployment of CSP solutions in Europe and the Euro-Mediterranean zone as a part of the global efforts of the Renewable Energy System (RES) sector to decarbonize the European power sector, and to ensure a sustainable energy supply. Prior to joining ESTELA, Marcel served as head of System Development at the European Network of Transmission System Operators (ENTSO-E), following his position as Secretary General of the Union for the Coordination of Transmission of Electricity (UCTE) in Brussels from 2002 to 2009. He has an in-depth experience with the Brussels-based energy associations and stakeholders' engagement across EU and non-EU countries. He also worked as consultant to EU-funded projects outside Europe, and looks back on a 25-year of experience in the power industry with Verbund Group in Vienna (main utility in Austria).



**About ESTELA:** ESTELA, the European Solar Thermal Electricity Association, is a European Industry Association created in 2007 to support the emerging European solar thermal electricity industry for the generation of green power in Europe and abroad, mainly in the Mediterranean region. ESTELA involves and is open to all main actors in Europe and abroad: promoters, developers, manufacturers, utilities, engineering companies, research institutions to promote high and mid temperature solar technologies for the production of thermal electricity to move towards sustainable energy systems, to support research and innovation, including vocational training, and favoring equal opportunities, to promote excellence in the planning, design, construction and operating of thermal electricity plants, to promote thermal electricity at international level, mainly in the Mediterranean area and developing countries, to cooperate at international level to contribute to combat climate change, to represent the solar thermal electricity sector at European and world level. ESTELA closely collaborates with EU and international institutions in the fields of sustainable energy, climate change, environment, research and economic growth based on innovation

**Webinar Co-Sponsored by HORIZON-STE Project:**



The aim of the Horizon-STE project is to provide scientific and industrial support to the Implementation of the European Initiative for Global Leadership in Solar Thermal Electricity (STE) as part of the European Integrated SET-Plan (Strategic Energy Technology Plan). The project is coordinated by ESTELA (Belgium) and CIEMAT, DLR, ENEA (Italy), and METU are partners. METU's main contributions are to support the Work Package to Maximize the Research and Innovation Impact, to Lead the Task to Evaluate the Implementation of this Initiative, and to support the analysis of European CST Stakeholders.

<https://www.horizon-ste.eu/>

## Water-Energy-Food nexus in industrial and urban wastewater recovery

**Dr. Isabel Oller**

Head of Solar Treatment of Water Unit  
CIEMAT-PSA (Plataforma Solar de Almería)

**Live Webinar Time and Date:** 12:00-13:00 (Turkish time / GMT + 3)  
Friday, Feb. 16, 2021

**Recorded Webinar:** [Link](#)

**Moderator:** Assoc. Prof. Dr. Zeynep Çulfaz Emecen  
METU Chemical Engineering

**Abstract:** The webinar 'Water-Energy-Food nexus in industrial and urban wastewater recovery' will be focused on the links and sustainability of different tertiary treatment technologies for wastewater treatment and recovery for food applications and energy saving. Elimination of contaminants of emerging concern and inactivation of pathogens to fulfil nowadays European and National regulations will be considered and experimental procedures to be followed for their monitoring and evaluation will be explained in detail. The presence of contaminants of emerging concern and pathogens is one of the major threatens and challenges to be overcome by treatment technologies for a safe reuse of wastewater in different applications, even more in those related with food production and agriculture. Along the webinar, the following contents will be discussed: i) a brief description of the climate change effects and the importance on the actions to be taken against it; ii) detail explanation on the experimental protocols to be followed for the correct evaluation of contaminants elimination and pathogens inactivation; iii) introduction on solar photoreactors for wastewater treatment applications, iv) some actual case studies (industrial and urban wastewater treatment).



**Short Bio:** Isabel Oller holds a PhD in Chemical Engineering from the University of Almeria (2008). She is Head of the Solar Treatment of Water Unit at the Plataforma Solar de Almeria (CIEMAT). She has more than 15 years of experience in the field of industrial and urban wastewater treatment, disinfection and reuse by using advanced oxidation processes (with and without solar energy) and their combination with physic-chemical pre-treatment systems, advanced biological treatments, membrane systems and other conventional technologies. She has developed this activity under her participation in more than 20 R+D national and European Projects. She is co-author of 129 publications in SCI Journals and more than 150 contributions to different International Congresses and Symposiums. H-index: 40.



**Co-Sponsored by the National (Spain R&D) Project NAVIA:** The general objective of the NAVIA project is the development of novel photocatalysts and new technologies based on solar advanced oxidation processes operated in continuous flow mode for urban wastewater reclamation. In this collaborative project, CIEMAT-PSA, CIESOL-University of Almeria and Universitat politècnica de València are involved. The expected impact of NAVIA is to obtain treated effluents with solar-based technologies at pre-industrial scale, operating the system by a developed decision-making tool for proper operation control, ensuring its final safe reuse in crops' irrigation.



## SolarTwins Project Summary

Short Name: SolarTwins

Long Name: Solar Twinning to Create Solar Research Twins

Grant Number: 856619

Start & End Dates: 1 January 2020 – 31 December 2022

Overall Budget: € 799 446

Coordinator Derek Baker  
(Promising Institution): Center for Solar Energy Research & Application (GÜNAM),  
Middle East Technical University (METU), Turkey

Participants Plataforma Solar de Almería (PSA), Institute of Solar Research,  
(Leading Institutions) Centro de Investigaciones Energéticas, German Aerospace Center (DLR),  
Mediaambientales y Tecnológicas (CIEMAT), Spain Germany

Project Webpage: <http://solartwins.metu.edu.tr/>

EU Cordis Webpage: <https://cordis.europa.eu/project/rcn/224223/factsheet/en>

Concentrating Solar Thermal (CST) Technologies offer promising solutions to many societal challenges that lead to a sustainable and low-carbon energy future: 1) Solar Thermal Electricity (STE) coupled to low-cost Thermal Energy Storage (TES) for high-value solar derived electricity at night; 2) Solar derived fuels for transportation; 3) Solar Heat for Industrial Processes (SHIP); and 4) Solar thermal driven processes to create Clean and Fresh Water. Currently Europe is a global leader in CST technologies, but this leading position is increasingly being challenged by large investments by other countries. SolarTwins is designed to respond to this challenge to European Technological Leadership by Twinning CIEMAT's CST research centre Plataforma Solar de Almería (PSA-CIEMAT) and DLR's Institute for Solar Research to the CST research laboratory at METU's Center for Solar Energy Research and Applications (METU-GÜNAM-ODAK). PSA-CIEMAT and DLR are leading institutions and METU-GÜNAM is a promising institution in several elite EU CST Research and Innovation (R&I) Networks. SolarTwins uses a comprehensive set of Twinning measures to 1) build-on and strengthen METU-GÜNAM's synergistic integration into these existing EU CST R&I networks containing PSA-CIEMAT and DLR; 2) Strengthen the Scientific Profiles of METU-GÜNAM and its researchers; 3) train a large, diverse and promising pool of METU Early Stage Researchers (ESRs); 4) formulate joint research lines that target large funding opportunities to increase research funds to all partners; and 5) disseminate institutional outcomes through trainings to strengthen GÜNAM, METU, regional and national R&I capacities. The project name *SolarTwins* reflects the careful formulation and execution of Individual Twinning in which an expert from PSA-CIEMAT or DLR is Twinned to a researcher at METU-GÜNAM to create a Solar Research Twin.

SolarTwins' Work Plan consists of three Twinning Work Packages (WPs 1-3), one Impact WP that includes Communication, Outreach, Dissemination, and Exploitation (CODE) Activities (WP4), one Project Management WP (WP5), and one Ethics WP (WP6). WP1 contains cross-cutting activities including Joint Kick-Off Activities targeting stakeholders and External Training to strengthen local, regional and national R&I capacities. WP2 is dedicated to ESRs and contains 2 summer schools at METU taught by experts from PSA-CIEMAT and DLR, and exchange of METU ESRs to PSA-CIEMAT and DLR for training and research mentoring. WP3 is dedicated to developing joint research lines between METU-GÜNAM and each of PSA-CIEMAT and DLR. WP3 includes activities for METU-GÜNAM personnel at each of PSA-CIEMAT and DLR to formulate joint research lines, and METU-GÜNAM staff exchange to each of PSA-CIEMAT and DLR to develop joint research proposals. WP4 is dedicated to maximising the Impacts of SolarTwins and includes Exploitation, Dissemination, and Communication tasks, and a Final Conference. WP5 is dedicated to project management and WP6 to fulfilling EC Ethics Requirements. SolarTwins is specifically formulated to lead to Joint Research Proposals that target large joint funding opportunities to increase competitive research funds to all partners, and result in more effective use of public research funds.





**About METU-GÜNAM's CST Research Division ODAK:** ODAK includes a diverse set of academics and post-doctoral researchers who are actively contributing to METU-GÜNAM's National and European CST activities:

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## EU Projects and Activities Showcased by ODAK<sub>TR</sub>



HORIZON  
STE

EU SOLARIS



GEO SMART

## ODAK<sub>TR</sub> Organizing Institutions



## Funding Agencies Supporting Projects Showcased by ODAK<sub>TR</sub>



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