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SolarPACES 2013

# Proceedings of the SolarPACES 2013 International Conference

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## Preface

From its origin at the International Energy Agency's (IEA) Small Solar Power Systems (SSPS) demonstration project in Almeria, Spain at the end of the 1970s, SolarPACES (Solar Power and Chemical Energy Systems) has evolved over the years, under the umbrella of the IEA, into a prestigious international network committed to advancing the state-of-the-art and to increasing the market penetration of concentrating solar power (CSP) and chemical energy systems. Since 2009, the annual SolarPACES International Conference has teamed up with ESTELA, the European Solar Thermal Electricity Association—a partnership that enabled this year's conference as well.

The SolarPACES 2013 International Conference was held September 17–20, 2013 in Las Vegas, Nevada, USA, and brought together about 700 attendees from 36 countries. This year's theme was ***Towards Cost-competitive CSP***, and the event highlighted the latest advances in research, development and deployment at the forefront of concentrating solar power (CSP) technologies across the globe, with a focus on reducing costs while increasing performance. In the United States, the U.S. Department of Energy's SunShot Initiative has set an aggressive cost reduction goal for CSP-generated electricity to achieve grid parity without subsidy by the end of the decade. A concerted national effort involving industry, national laboratories, and universities is underway toward this goal. Worldwide, it is an exciting time for CSP, with tremendous momentum building up as many countries invest in CSP systems as part of their sustainable energy infrastructure.

The conference program featured 20 plenary speakers, 3 technical keynote talks, and over 40 technical sessions pertaining to CSP technologies, policy and markets, and commercial projects. Plenary sessions included presentations and panel discussions that offered broad perspectives on: quantifying the value of CSP and thermal energy storage, presented through grid integration analysis as well as from the vantage of the utility industry and the energy commission; global CSP initiatives in research, development and deployment; and a conference thematic plenary on cost reduction opportunities in CSP, discussed by an industry panel. Complementing the plenary sessions were technical keynote talks on solar thermochemistry, CSP systems, and high-efficiency, dry cooled power cycles based on supercritical carbon dioxide as the working fluid. Technical oral and poster sessions, comprising over 320 presentations organized into topical areas, offered opportunities for deep dives into specific research and development advances from around the world. The program schedule as well as video recordings of

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the plenary sessions are available at the conference website [www.solarpaces2013.solarpaces.org](http://www.solarpaces2013.solarpaces.org) at the time of this publication.

Several large-scale commercial CSP plants are being commissioned in the United States beginning in 2013, that will collectively more than triple the current capacity. Following the formal technical program, SolarPACES 2013 attendees had a unique opportunity to witness this resurgence of CSP through tours of BrightSource Energy's Ivanpah Solar Electric Generating Station, a 377 megawatt (MW) direct steam power tower plant, which will be the largest solar power system in the world upon completion and SolarReserve's Crescent Dunes Solar Energy Project, a 110 MW power tower plant utilizing advanced molten salt technology with 10 hours of integrated thermal storage.

SolarPACES 2013 presents, for the first time, this open access edited proceedings volume of 264 peer-reviewed full-length articles of selected papers presented at the conference. The open access to the articles in this volume provides for a broader dissemination of information among the global community. It is hoped that this compendium of recent progress in the field of concentrating solar power and chemical systems will serve as the basis for continued advancements addressing the fundamental and application challenges.

In closing, I want to thank my colleagues on the conference organizing and scientific committees listed below for enabling the foremost international CSP forum of 2013!

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 Manuel Blanco, Spain  
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