

# PRESS RELEASE

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## 2nd Terawatt Workshop International Workshop Sees Central Role for Solar in Transforming the World Energy Economy

**Global experts in solar power believe the world will reach 1 terawatt (TW) of installed solar photovoltaic (PV) capacity within the next five years. That is the opinion voiced by 95 percent of the approximately 70 authorities who gathered in Golden, Colorado, USA for the second Terawatt Workshop held by the Global Alliance of Solar Energy Research Institutes (GA-SERI). The alliance was formed in 2012 and includes the three world leading solar research institutes, the National Renewable Energy Laboratory, NREL (USA), the National Institute of Advanced Industrial Science and Technology AIST (Japan) and the Fraunhofer Institute for Solar Energy Systems ISE (Germany).**

Since the first workshop two years ago, the amount of photovoltaic (PV) electricity generating capacity installed worldwide nearly doubled to a cumulative 400 gigawatts from 230 gigawatts.

“Due to significant advances in research and manufacturing, solar PV electricity is now cost-competitive in many locations worldwide. Significantly more PV has been installed in the past few years worldwide than we had anticipated. Most of the experts who gathered at the GA-SERI meeting predict that the terawatt goal will be reached by the end of 2023 or even sooner,” says Dr. Andreas Bett, Director of the Fraunhofer Institute for Solar Energy Systems ISE.

With a compound annual growth rate in installations of 25 percent, the current trajectory suggests the world could reach about 7 TW from PV by 2030. For the second workshop, experts from Germany, Japan, the United States, and seven other countries gathered in Golden for two days to discuss the future of PV.

Solar PV is on a trajectory to provide a majority of the world’s electricity, reach multi-terawatt scale, and address broader global needs for clean air and economic development. With transportation and other energy sectors beginning the move toward electrification, workshop participants discussed analyses indicating that solar PV will be able to supply a majority of primary energy needs and play a critical role in stabilizing the grid.

**FRAUNHOFER INSTITUTE FOR SOLAR ENERGY SYSTEMS ISE**

A key element of solar's success will be a partnership with wind, hydropower and bioenergy and a range of storage and load-shifting technologies that are also showing dramatic progress.

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GA-SERI members concluded a fully integrated research program among institutes, universities and industry, spanning both near- and long-term needs, can address challenges to further reduce cost of solar electricity and enable solar's enhanced roles in stabilizing the grid and powering other sectors of energy demand. Representatives from the three research institutions and other workshop attendees will collaborate to better define the opportunities for solar and address the barriers that need to be overcome. Just as was done after the first Terawatt Workshop, the group intends to publish its conclusions and supporting analyses.

**About NREL (National Renewable Energy Laboratory)**

NREL is a national laboratory managed and operated by the Alliance for Sustainable Energy, LLC for the United States Department of Energy. Integral to its mission for the U.S. Department of Energy, NREL conducts research and development in renewable energy and energy efficiency technologies and practices, advances related science and engineering, and transfers knowledge and innovation to address the United States' energy and environmental goals. NREL is supported by funding from the U.S. Department of Energy (DOE) Office of Energy Efficiency and Renewable Energy (EERE). Within the PV programs, researchers support the development of new designs and manufacturing processes for solar materials, components, and systems with an emphasis on improved performance, reliability and service life. Long-term research and development is an essential element for cost reduction, improved reliability, and improved performance of technologies currently supported by the Solar Energy Technologies Program at DOE. NREL's long-term R&D activities include the development of advanced materials and designs for new generation solar PV devices. Collaborative activities among the world's foremost players in the field of solar energy research from Germany, Japan, and the US will lead to a significant acceleration of progress in these fields.

[www.nrel.gov](http://www.nrel.gov)

**About AIST/RCPV (Research Center for Photovoltaics (RCPV))**

RCPV is a research unit of the National Institute of Advanced Industrial Science and Technology (AIST). It is focused on the dynamic development of photovoltaic technologies to realize national energy security, a low carbon society, and sustainable economic growth and job creation through a comprehensive and systematic approach. To this end, AIST/RCPV conducts research on a variety of photovoltaic materials and devices, such as Si, compound semiconductors, organic materials and novel concept materials. It develops calibration, measurement and system technologies together with industries, universities, research institutes and certification bodies. AIST/RCPV consists of about 200 researchers including permanent staff, temporary staff and visiting staff from industry and academia.

[www.aist.go.jp](http://www.aist.go.jp)

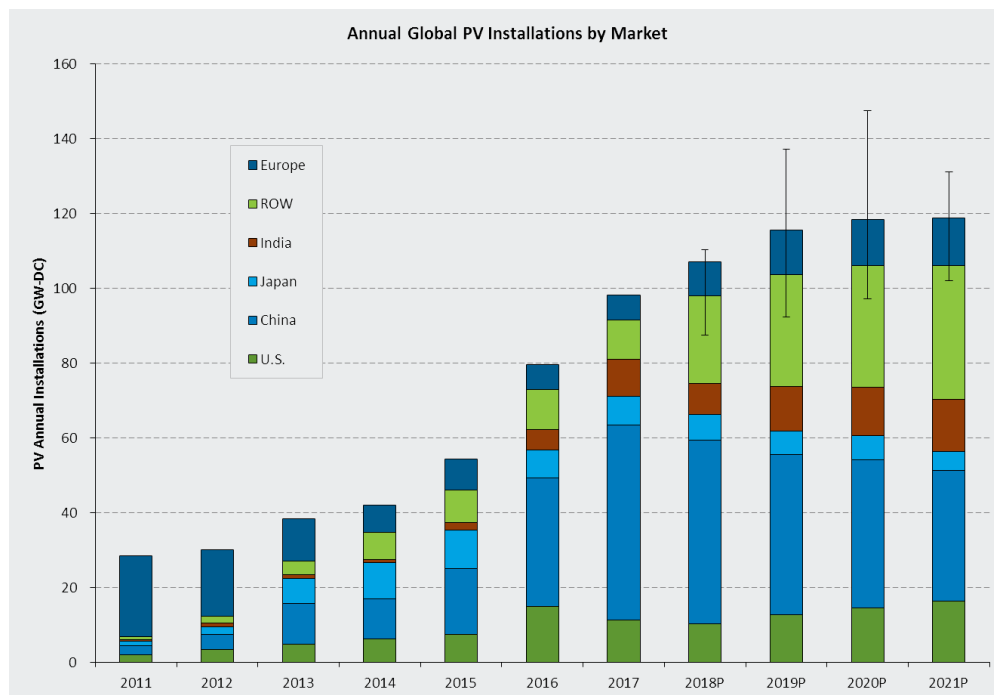
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**FRAUNHOFER INSTITUTE FOR SOLAR ENERGY SYSTEMS ISE**
**About Fraunhofer ISE**

With a staff of 1200, the Fraunhofer Institute for Solar Energy Systems ISE in Freiburg, Germany is the largest solar energy research institute in Europe. Fraunhofer ISE is committed to promoting sustainable, economic, safe and socially just energy supply systems based on renewable energies. Its research provides the technological foundations for supplying energy efficiently and on an environmentally sound basis in industrialized, threshold and developing countries throughout the world. Focusing on energy efficiency, energy conversion, energy distribution and energy storage, the Institute develops materials, components, systems and processes in five business areas. One particular feature of Fraunhofer ISE is its excellent technical infrastructure, which is organized into eight laboratory centers and four technology evaluation centers providing testing and experimental services on a production scale. In addition, the Institute has several accredited testing facilities. The Institute is a member of the Fraunhofer-Gesellschaft, Europe's largest application-oriented research organization. For more information, visit us at [www.ise.fraunhofer.de](http://www.ise.fraunhofer.de)

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Annual Global PV Installations by Market

 David Feldman, Jack Hoskins, Robert Margolis. 2018. Q4 2017/Q1 2018 Solar Industry Update. NREL/PR-6A20-71493. <https://www.nrel.gov/docs/fy18osti/71493.pdf>.

The **Fraunhofer-Gesellschaft** is the leading organization for applied research in Europe. Its research activities are conducted by 72 Fraunhofer Institutes and research units at locations throughout Germany. The Fraunhofer-Gesellschaft employs a staff of 25,000, who work with an annual research budget totaling more than 2.3 billion euros. Of this sum, 2 billion euros is generated through contract research. More than 70 percent of the Fraunhofer-Gesellschaft's contract research revenue is derived from contracts with industry and from publicly financed research projects. Branches in Europe, the Americas and Asia serve to promote international cooperation.