Introduction to IEA PVPS Task 13

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Overview

- What is IEA PVPS?
- Task 13 activities
- Task 13 deliverables

What is IEA PVPS?

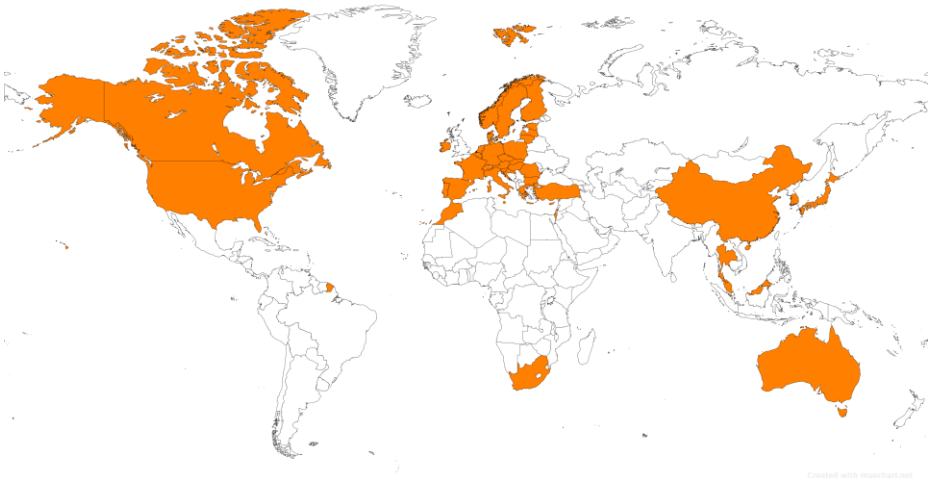
The IEA Photovoltaic Power Systems Programme (IEA PVPS) is one of the **Technological Collaboration Programmes (TCP)** established within the International Energy Agency (IEA). Since 1993, international participants have collaborated on a diverse range of joint projects, all aimed at **advancing the application of photovoltaic technology** for the conversion of solar energy into electricity.

The IEA PVPS Executive Committee and PVPS Task Experts in 2023

9	Research Projects are currently operational
around **340**	Individuals from all over the globe are participating in PVPS
over **175**	Scientific reports have been published since 1998

PVPS

Our members



- Australia
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- Finland
- France
- Germany
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- Morocco
- the Netherlands
- Norway
- Portugal
- Solar Energy Research Institute of Singapore
- Solar Power Europe
- South Africa
- Spain
- Sweden
- Switzerland
- Thailand
- Türkiye
- United States

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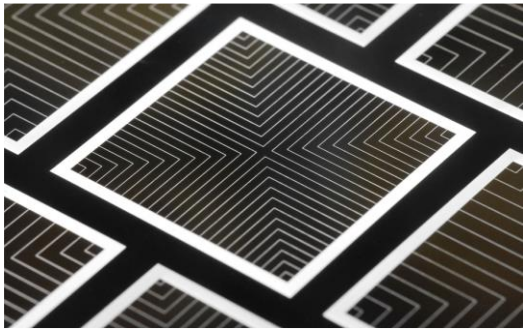
Task 13: Reliability of novel PV materials, components and modules

PV Cells and Modules

- Degradations modes of new backsheet materials
- Degradation modes in new cell and module technology
- Impact of testing strategies under specific load conditions
- Review of PV module repair strategies
- Re-qualification & standardization of 2nd life PV



PV + Storage Systems

- Application-specific performance and degradation
- Estimating lifetime of PV + storage systems
- Guidelines for O&M of PV + storage systems
- Cost estimations for O&M of PV + storage systems

Task 13: Performance and Durability of PV Applications (ST2)

PV Applications

- Floating PV performance (modelling vs. real data)
- Floating PV - Degradation modes and PLR
- Agri PV: Performance of dual land use
- Bifacial PV tracking systems: Performance modelling
- Bifacial PV tracking for optimal performance and cost

PV Integration

- Digital integration of PV systems from design to O&M
- Digital twinning of PV power plants
- Module Level Power Electronics (MLPE) in PV systems
- Performance comparison of MLPE vs. string inverter

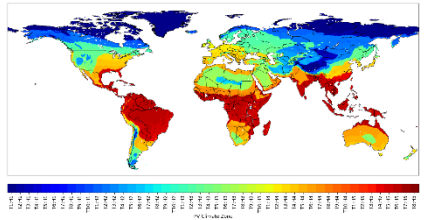
Task 13: Techno-Economic Key Performance Indicators (ST3)

Overview and Assessment of

- Extreme weather events and impact on KPIs
- Diagnostics, repair and mitigation strategies
- Best performing technologies for climatic conditions
- Guidelines for module selection and system design

Mapping of PV economic KPIs

- Decision matrix of KPIs along the value chain
- Develop best practice flowcharts for PV projects
- Analysis of large-scale impact on reliability KPIs
- Visualization of techno-economic KPIs and global mapping



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Extreme Weather Impacts on PV System Reliability

PVPS Task 13 Workshop at PVSEC-35 in Numazu, Japan, 12 Nov 2024

Ulrike Jahn
Introduction of Task 13 Activities

Laurie Burnham
Tropical Cyclone Impacts: case studies from the US, where damage from hurricanes has ranged from catastrophic failure of both modules and hardware to accelerated performance degradation.

Kota Sato
Structural Damages: natural disasters to be classified into categories such as earthquakes, strong winds, heavy snow, and torrential rain, and case studies of damage to PV systems in Japan provided.

Leonardo Micheli
Dust and Sand Storm Impacts: discussing monitoring, forecasting and mitigation techniques that can limit the consequences of such phenomena and reduce the soiling-induced losses.

Alexander Granlund
Snow Snowstorms and Blizzards Impacts: The behavior of snow can vary greatly, meaning that snow loads can occur despite preventative measures, and mitigation strategies should still be in place.

Tadanori Tanahashi
Final Discussion & Wrap-Up

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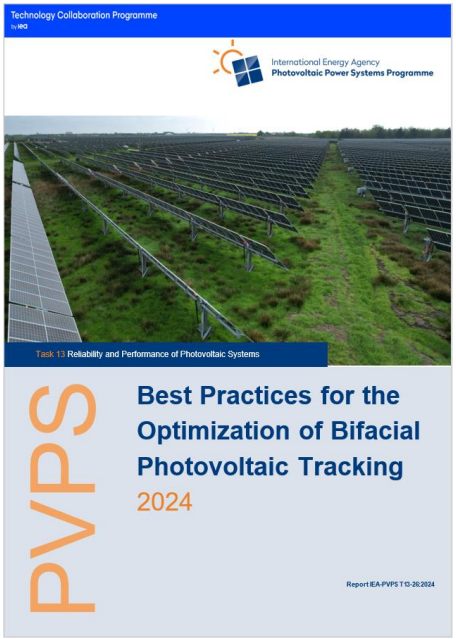
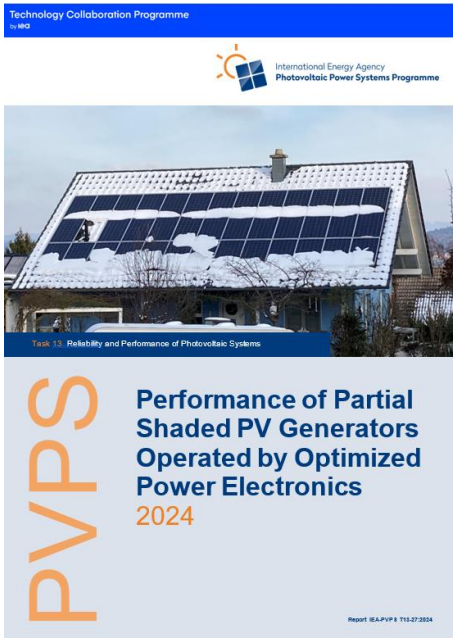


This report overviews current best practices for optimizing the performance of such systems.



This report provides insights on partial shading and power electronics for maximizing PV system performance.

Thank You

PVPS Task 13 Collaboration: 185 experts from 25 countries