



Reliability of Battery Systems in PV Power Plants

IEA PVPS Task 13 – Ulrike Jahn, Task Manager

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IEA PVPS in a nutshell



- One of 38 currently active Technology Collaboration Programmes within the IEA
- 33 years old – established in 1993
- 30 countries plus the European Commission and 2 Sponsors
- 9 active Tasks
- 27 reports published and 20 events organized in the past year
- ~400 participants across ExCo and all Tasks



- The Executive Committee

Our members



32

Members
from 5 continents



Member Countries

- | | | | | |
|-------------|-----------|-------------------|----------------|----------------------------|
| • Australia | • Finland | • Japan | • Norway | • Switzerland |
| • Austria | • France | • Korea | • Portugal | • Thailand |
| • Belgium | • Germany | • Lithuania | • Slovakia | • Türkiye |
| • Canada | • India | • Malaysia | • South Africa | • United States of America |
| • China | • Israel | • Morocco | • Spain | • United Kingdom |
| • Denmark | • Italy | • The Netherlands | • Sweden | |

Member Organisations

-  European Union
-  SolarPower Europe
-  Solar Energy Research Institute of Singapore

Task 13 Collaboration - History and Presence



Task 13: Reliability and Performance of Photovoltaic Systems

Task 13: 2010-2014

- + Performance and reliability of components
- + Testing and standards

Task 13: 2014-2017

- + Economical aspects and business models
- + Yield prediction & uncertainties
- + Failure detection and statistics

Task 13: 2018-2021

- + New module and system designs
- + Field testing
- + O&M practice
- + Risk assessment & mitigation

Task 13: 2022-2025

- + New materials & applications (IPV)
- + Digitalization
- + Climate/environment specific design/testing
- + Techno-Economic key performance indicators
- + Second Life PV
- + PV & storage

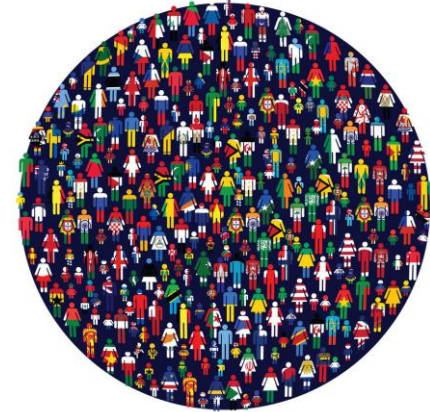
Task 13: 2026-2029

- PV module structures
- Digitalization and AI
- PV Applications
- PV Enabler

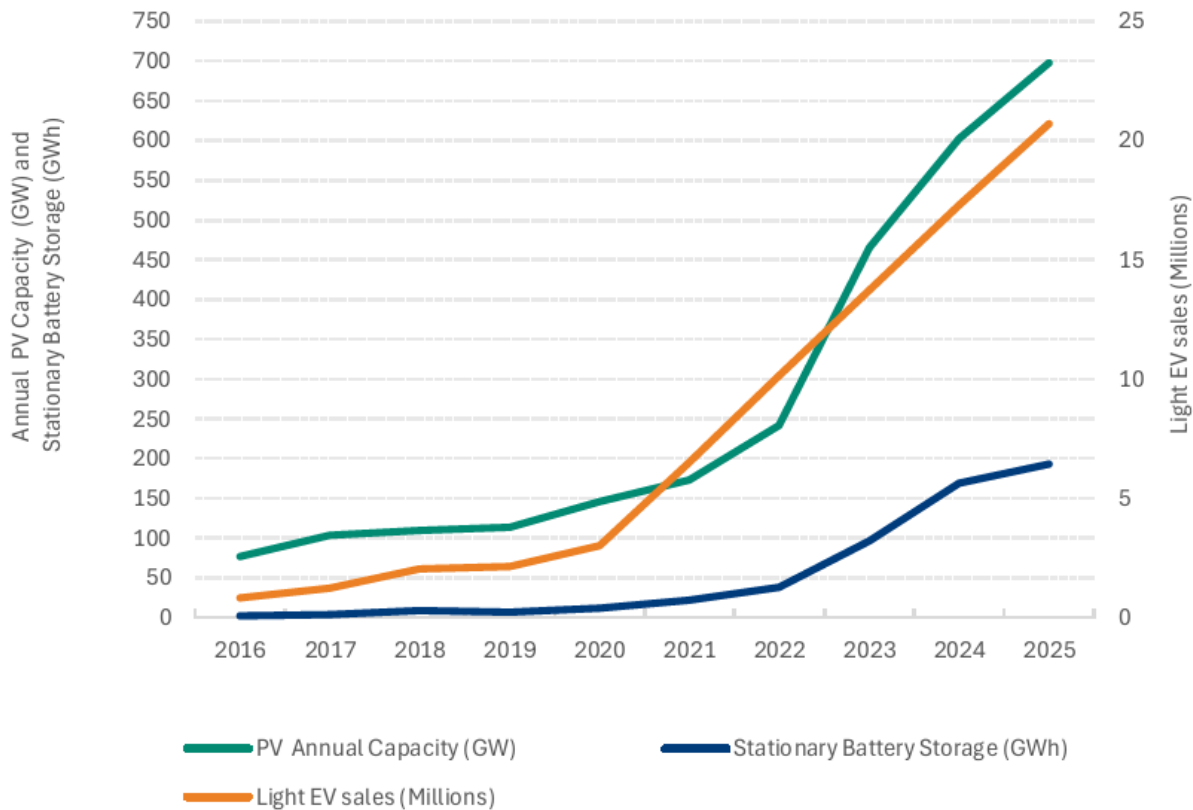
Bridging Research and Industry for PV



- With strong technical focus and global expert input, Task 13 delivers relevant outcomes to both research and industry, supporting technology development, risk reduction, and standardization.
- Its high-quality results rely on **active expert collaboration** and **long-term data efforts**. Maintaining this dynamic is key to keeping pace with the fast-evolving PV market.



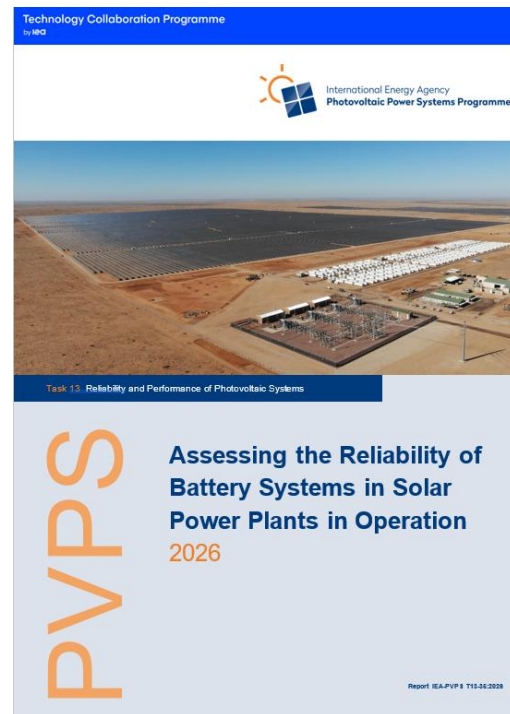
EVOLUTION OF ANNUAL NEW PV, EV AND STATIONARY STORAGE





Motivation

- Rapid PV growth + falling BESS costs drive major PV+BESS investments – long-term reliability essential for grid services
- PV duty cycles $\neq$ automotive/consumer $\rightarrow$ battery ageing knowledge not directly transferable
- Lack of long-term field data, validated ageing models & harmonised KPIs for operational PV + BESS
- Report reviews technologies, defines metrics, and highlights research gaps via case studies.



What are the objectives of this Task 13 Event?



- Review current technologies and key use cases for battery systems in solar power plants
- Discuss efficient methods to assess performance and reliability of operational battery systems
- Share operational experience from real-world PV + BESS deployments

Reliability of Battery Systems in PV Power Plants



PVPS Task 13 Workshop at EU PVSEC, Rotterdam, 17 Sep, 2026

Ulrike Jahn
Fraunhofer CSP, Germany
Welcome & Introduction



Atse Louwen
RISE, Sweden
Operational Experience from Battery Systems in PV Power Plants



Erik Stensrud Marstein
IFE, Norway
Overview of PV Battery Technology and Use cases



Panel Discussion

Alexander Erber
AIT, Austria
Performance, Degradation and Lifetime



Erik Stensrud Marstein
Wrap-Up of Workshop



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Thank You!

