



## Photovoltaic Power Systems TCP

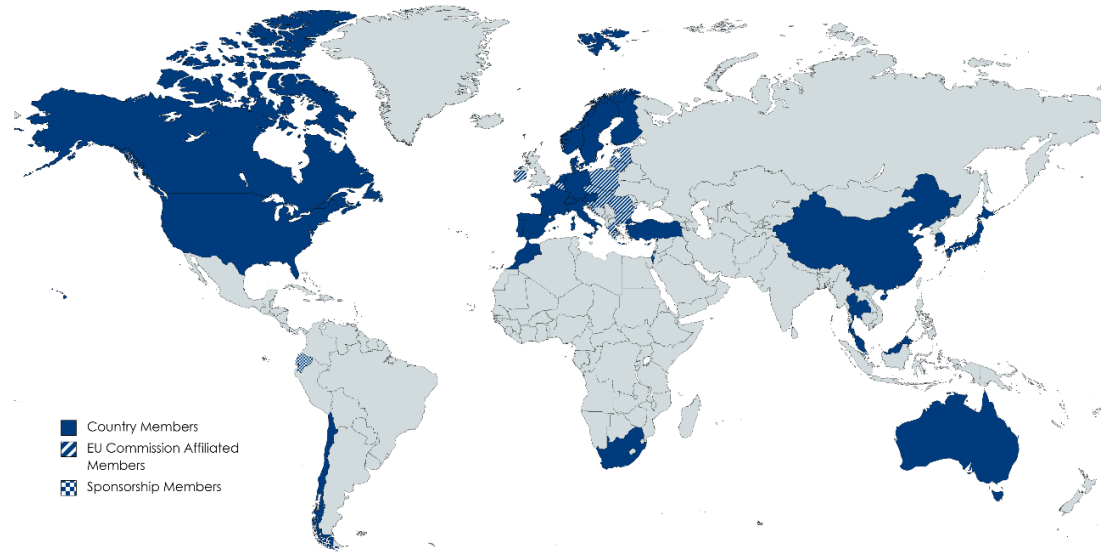
Emily Mitchell, Executive Secretary

Polish TCP Co-ordination Day, Virtual, 23<sup>rd</sup> March 2023

# IEA PVPS Overview



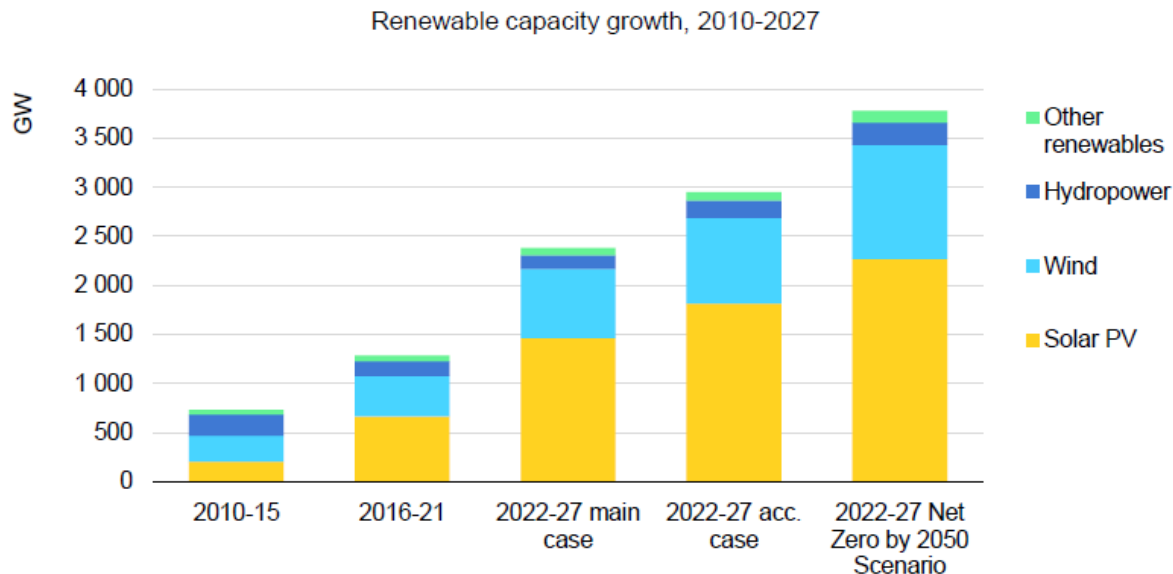
- 30 years of operation
- 31 members including 25 countries, plus EC and 5 sponsors
- 8 currently active Tasks
- 20 reports in past year
- Working across topics of **PV technologies, applications, markets and policies.**



# Solar PV is set to lead global markets



## Improved policies can further narrow the gap with net zero by 2050



**Faster permitting, addressing grid and system integration issues and enabling affordable financing in developing countries could unlock 25% additional capacity in the accelerated case narrowing the gap with net zero by 2050**

# PV Industry Status



- **Global PV markets expanding rapidly**, significantly over **200 GW** by end 2022
- **Decentralised market growing**, as well as new applications (AgriPV, floating PV)
- Climate change mitigation in 2022 = **3% of global emissions saved**
- Cost competitive → **removal of subsidies**, sale of “merchant PV”
- Initiatives to diversify global PV manufacturing **supply chain**
- Increasing **grid congestion**, need for flexible generation, demand side response
- Need to focus on **social acceptance** (land use concerns, circularity)
- **Complexity of policies** needed to frame PV will increase, especially with regard to grid costs and contribution to system stability.

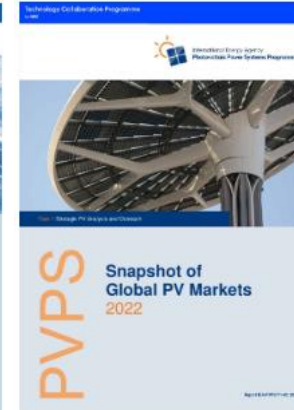
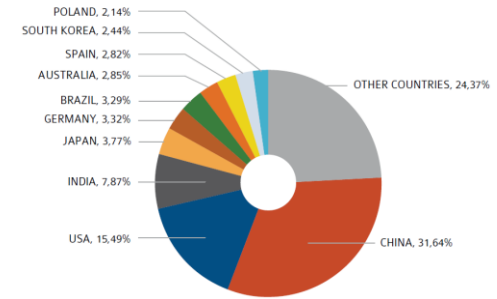


# Task 1 - Strategic PV Analysis and Outreach



- Foundational never-ending Task
- Participation by **all PVPS Members**
- **Systematic analysis of PV market development, costs, industry trends, support policies & business models**
- Annual publication of:
  - **Trends in Photovoltaic Applications**
    - 27 years
  - Snapshot of Global PV Markets
  - National Survey Reports

FIGURE 2.5: GLOBAL PV MARKET IN 2021



# Evolution of Top 10 PV Markets (from Trends report)







RANKING	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	ITALY	GERMANY	CHINA	CHINA	CHINA	CHINA	CHINA	CHINA	CHINA	CHINA	CHINA
2	GERMANY	ITALY	JAPAN	JAPAN	JAPAN	USA	INDIA	INDIA	USA	USA	USA
3	CHINA	CHINA	USA	USA	USA	JAPAN	USA	USA	INDIA	VIETNAM	INDIA
4	USA	USA	GERMANY	UK	UK	INDIA	JAPAN	JAPAN	JAPAN	JAPAN	JAPAN
5	FRANCE	JAPAN	ITALY	GERMANY	INDIA	UK	TURKEY	AUSTRALIA	VIETNAM	GERMANY	GERMANY
6	JAPAN	FRANCE	UK	SOUTH AFRICA	GERMANY	GERMANY	GERMANY	TURKEY	AUSTRALIA	AUSTRALIA	BRAZIL
7	BELGIUM	AUSTRALIA	ROMANIA	FRANCE	KOREA	THAILAND	KOREA	GERMANY	SPAIN	KOREA	AUSTRALIA
8	UK	INDIA	INDIA	KOREA	AUSTRALIA	KOREA	AUSTRALIA	MEXICO	GERMANY	INDIA	SPAIN
9	AUSTRALIA	GREECE	GREECE	AUSTRALIA	FRANCE	AUSTRALIA	BRAZIL	KOREA	UKRAINE	SPAIN	KOREA
10	GREECE	BULGARIA	AUSTRALIA	INDIA	CANADA	TURKEY	UK	NETHERLANDS	KOREA	NETHERLANDS	POLAND
RANKING EU	1	1	2	3	3	4	5	4	2	2	2
MARKET LEVEL TO ACCESS THE TOP 10											
	426 MW	843 MW	792 MW	779 MW	675 MW	818 MW	944 MW	1 621 MW	3 130 MW	3 492 MW	3 710 MW


# Overview of currently active Tasks







<u>Task:</u>	<u>Topic:</u>	<u>Running:</u>
• Task 1	“PV market analysis”	29 years
• Task 12	“PV sustainability activities”	15 years
• Task 13	“PV Reliability & Performance”	12 years
• Task 14	“PV Grid Integration”	12 years
• Task 15	“Building-Integrated PV”	7 years
• Task 16	“Solar Resource Forecasts”	45 years*
• Task 17	“PV & Transport”	4 years
• Task 18	“Off-Grid & Edge-of-Grid PV”	2.5 years



T1    
 Gaetan Masson Izumi Kaizuka



T12    
 Garvin Heath Jose Bilbao


T13   
 Ulrike Jahn

T14    
 Roland Bründlinger Gerd Helscher

T15    
 Francesco Frontini Helen Rose Wilson

T16    
 Jan Remund Manajit Sengupta

T17    
 Keiichi Komoto Manuela Sechilariu

T18   
 Christopher Martell

\* Task 16 was part of SHC from 1977 until 2017, when it moved across to PVPS.


# More information on Tasks




- Technical report highlights in PVPS Annual Report
- Task overview pages on PVPS Website
- Task publications available on PVPS Website
- **Polish Experts** are welcome to observe in our Tasks!

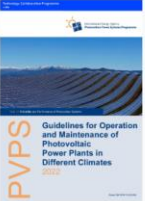
Publications Research tasks Events About us

## Task 13 Reports






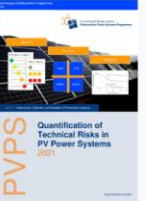
**Soiling Losses – Impact on the Performance of Photovoltaic Power Plants**




**Guidelines for Operation and Maintenance of Photovoltaic Power Plants in Different Climates**



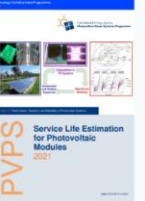
**Fact sheet: Qualification of PV Power Plants using Mobile Test Equipment**



**Quantification of Technical Risks in PV Power Systems**



**The Use of Advanced Algorithms in PV Failure Monitoring**



**Service Life Estimation for Photovoltaic Modules**

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Service Life Estimation for Photovoltaic Modules

22 | IEA PVPS ANNUAL REPORT 2024 TASK 14 HIGHLIGHT

## ANCILLARY SERVICES FROM PV

TASK 14 HIGHLIGHT

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Task 14 Webpage



**KEY MESSAGE**

Laboratory and field experiences from IEA PVPS countries highlight the technical capabilities and the future potential of Solar PV systems to provide power system services.

**OBJECTIVE**

The report aims to highlight the status and the potential of PV and PV hybrids as ancillary service providers. The report provides a collection of laboratory and field experiences from different IEA PVPS countries and for different ancillary services and PV inverter functions.

**METHODOLOGY**

Field experiences and lessons learned for different ancillary services provided by PV systems and PV hybrids are presented in the report. Frequency control services, power curtailment, voltage support [1], PV hybrids in insular power systems, Power quality support and new services from PV systems.[2]



**REFERENCES**

These are relevant older reports from Task 14:

M. Khasay, A. Mikhal, T. Sato and M. Braun, "On-Island Local Voltage Support by Distributed Generation—A Measurement Summary" Report IEA-PVPS 14-08-2017, 2017.

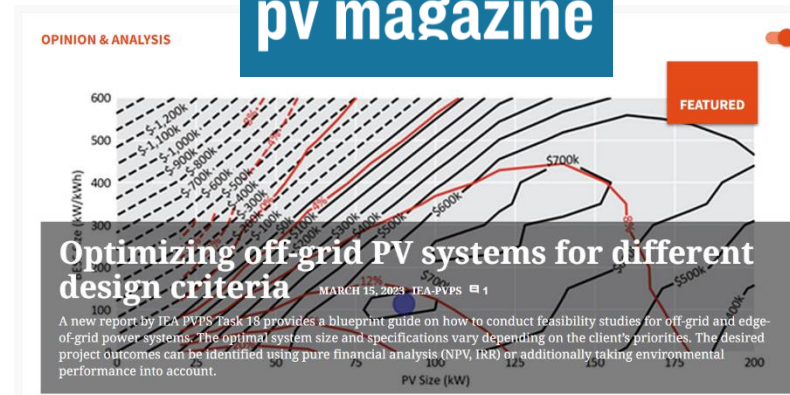
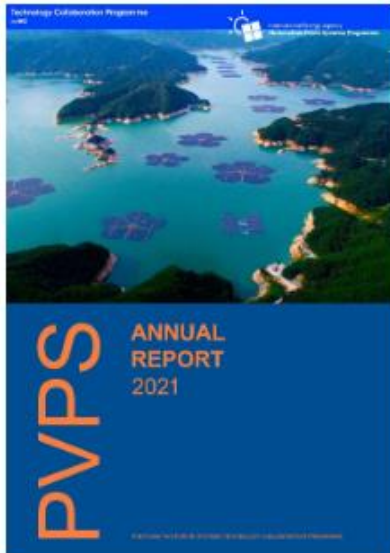
I. Sato, M. Khasay, T. Theophilus and et al., "Transition from On-Island to Off-Island Distribution Grids: Management Summary of IEA Task 14 Subtask 2." Report IEA PVPS 14-03-2014, 2014.



# Communications and Outreach



- Monthly featured articles in PV Magazine
- Workshops & Exhibitions
- Annual report, Newsletters, Social Media





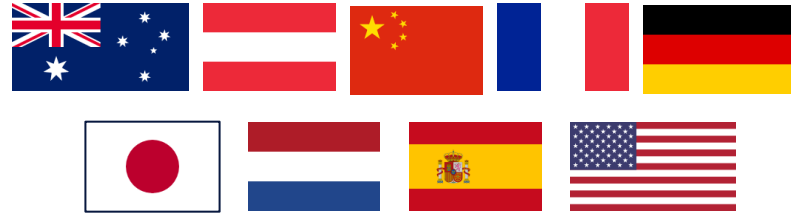
- Members pay annual contributions to PVPS Common Fund of **EUR 10 000**
  - Covers secretariat, communications, outreach and programme management.
  - Does not cover Tasks, with the exception of Task 1 Management
- Time, travel and resources are the responsibility of Members:
  - Task Experts
  - Executive Committee delegates
- Minimum responsibilities of each Member:
  - Participation in Task 1, including 2 meetings per year and provision of data
  - Participation at 2 ExCo meetings per year
  - Contribution to Annual Report, approvals of technical reports





- Delegates typically come from:
  - Energy ministries
  - Research funding bodies
  - Photovoltaic industry associations
  - Universities
- The work of the ExCo includes:
  - Programme strategy
  - New Task definition
  - Coordination of national Experts
  - Approval of current Task progress

- The PVPS Management Board
  - Around 10 representatives
  - Meeting monthly
  - Advising Chair and Secretary



# Poland is most welcome in PVPS!



- Advanced market
- Relevant research
- Growing industry

Come and benefit from participating in the **global leading** collaborative research programme in Solar PV



We look forward to having you!

Emily Mitchell, Executive Secretary  
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Daniel Mugnier, Chair  
[daniel.mugnier@iea-pvps.org](mailto:daniel.mugnier@iea-pvps.org)

