SOLiD-PV

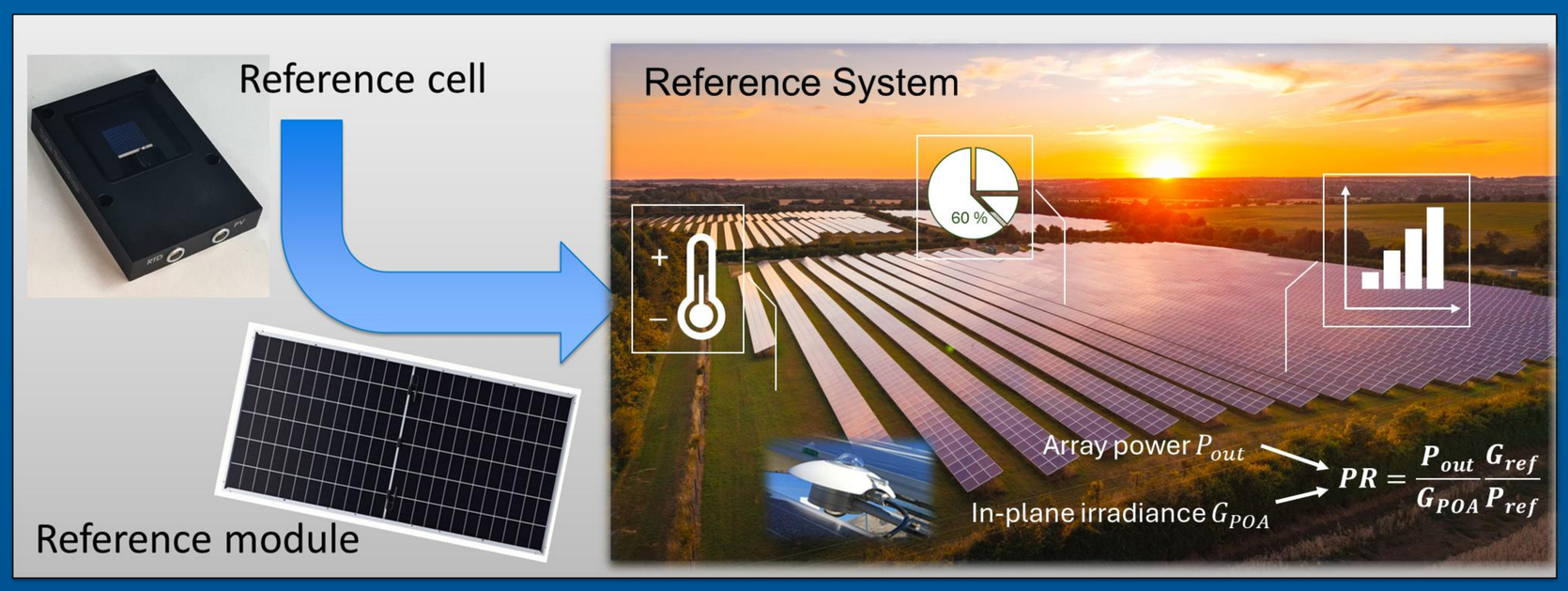
*Metrology to **s**upport the **o**ptimisation of **l**arge-scale eff**i**cient **d**ependable photovoltaic systems*

Need

Accurate measurement of performance and prediction of long-term yield is critical to the solar industry.
Uncertainties cause: Underperformance, Unfair fines, Higher finance costs , Undervalued systems, Poor maintenance decisions
These factors contribute to delayed deployment and missed targets.

Beyond state of the art

- PV reference systems with **metrological digital twin** models
- Validated methods for reference devices with integrated electronics (calibration, angular response, spectral response)
- Uncertainty models for key performance indicators
- Hybrid methods improve reproducibility of performance loss reports from ~0.5 % to ~0.1 % per year



Consortium, Workplan and Impact

NMIs and DIs

NPL National Physical Laboratory; Główny Urząd Miar Międzylaboratoryjne; LNE Laboratoire National de Métrologie et d'Essais; CMI Czech Metrology Institute; University of Ljubljana; Aalto University; PTB; RISE; TÜBİTAK; pmod wrc

Education

Loughborough University; Scuola universitaria professionale della Svizzera italiana SUPSI

1. **Reference devices** Accurate measurement of accessible solar resource
2. **Performance Monitoring** Reduce variability in performance metrics
3. **Performance Loss** Harmonise measurement and reporting of degradation
4. **Reference systems** Comprehensive measurement and digital twin models provide open data
5. **Maximising impact** Standards, Best practice, Workshops, Services, Data

- Bifacial
- Tracker
- Commercial rooftop

Energy and Research Institutes

circe; IFE; Fraunhofer ISE; ISFH; imec; CENER Centro Nacional de Energías Renovables National Renewable Energy Centre; AIT Austrian Institute of Technology

Services

PV Performance Labs; certisolis Test - Certification Photovoltaïque

Greater confidence to accelerate deployment:

1. Better data and metrics improve operational efficiency.
2. Quantified technical risks reduce barriers to investment.
3. Better models and analytics reduce failures and waste.

Economy: 1 % accuracy improvement saves ~€10 billion towards Green Deal objectives
Jobs: 1 % investment increase creates 10,000 local jobs
Society: Affordable, resilient PV systems reduced fuel poverty
Integration: Levelling up quantity infrastructure across Europe

Collaborators

International collaborations

IEA PVPS; PVPMC; SolarPower Europe; Sandia National Laboratories; NREL National Renewable Energy Laboratory

Measurement and data services

Meteotest; TÜVRheinland®; valentin software

Instrument manufacturers

IMT Technology; RERA Solutions Solar Measurement; EKO; Wavelabs

PV systems and components

Statkraft; ALFA Solar Enerji; Sunna Group; Scatec; RINA