All Sky Imagers Benchmarking – introduction to Task 16

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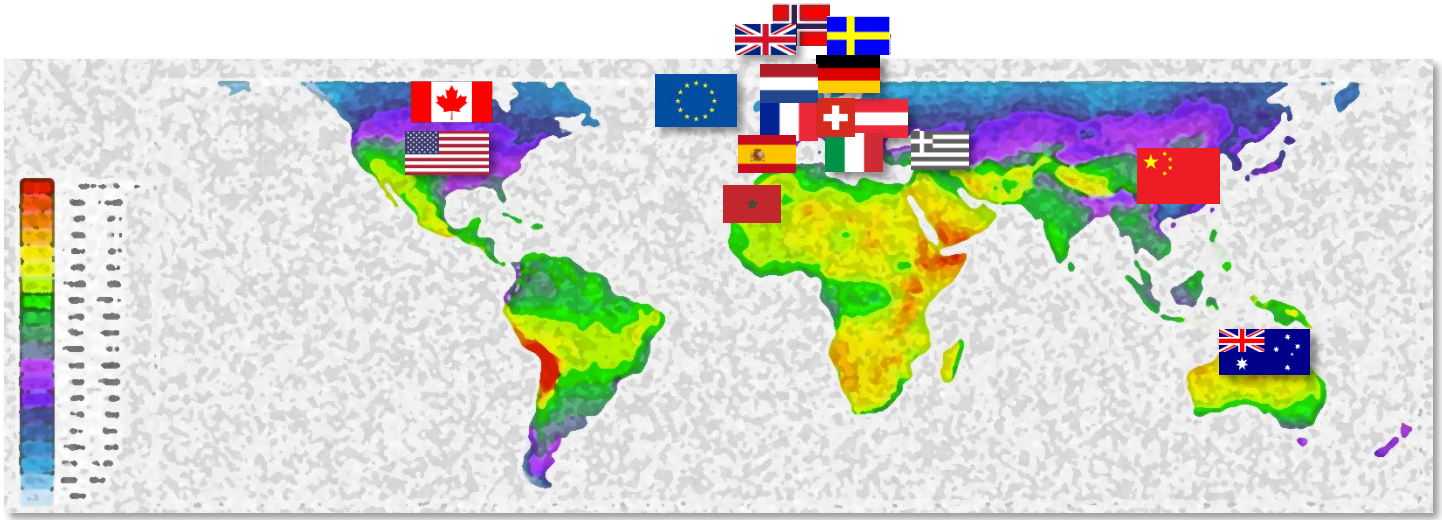
Webinar – 15.12.2022

What is IEA PVPS?

- The International Energy Agency (IEA), founded in 1974, is an autonomous body within the framework of the Organization for Economic Cooperation and Development (OECD).
- The **Technology Collaboration Programme (TCP)** was created with a belief that the future of **energy security and sustainability starts with global collaboration**.
- The Photovoltaic Power Systems Programme (PVPS) is one of the TCPs established within the IEA in 1993.
- The objective is to facilitate the role of photovoltaic solar energy as a **cornerstone in the energy transition.**

International Collaboration of Task 16

- Universities, research organizations, met services, and service providers
- 19 countries



Global horizontal irradiance. Source: www.meteonorm.com Version 8.0

Why a Solar Task?

- Solar resources are the fuel of PV, CSP and solar thermal energy
  - Big PV and high penetration need high quality of meteorological information
- Added values
  - Independent benchmarks
    - State of the art descriptions
  - Lower uncertainties → lower costs of implementation → **more PV**
- **2nd phase of Task 16 runs till June 2023**
- **3rd phase planned (July 2023 – June 2026)**

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Task organization

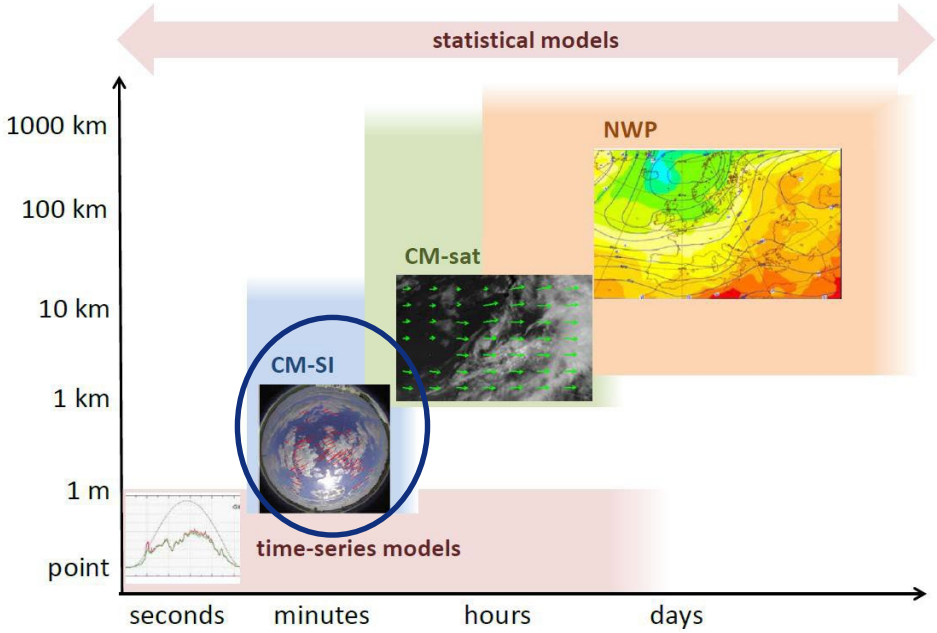
- Subtask 1: **Measurements & Models** (M. Sengupta, NREL, S. Wilbert, DLR)
  - Ground based methods models, **benchmarking framework**
- Subtask 2: **Enhanced data & bankable products** (P. Blanc, Mines Paristech)
  - Quality & format, long term variability, PV at urban scales, data for bifacial modules
- Subtask 3: **Solar forecasting techniques** (E. Lorenz, Fraunhofer ISE)
  - Regional forecasts, Probabilistic forecasts**, All sky imagers**, Firm PV power
- Subtask 4: Dissemination & Outreach (J. Remund, Meteotest)
  - Reports, Papers, **Update of Solar Resource Handbook,** Workshops, ***Webinar****, o*nline code archive

Current work & main products

- 5 Reports are currently worked on:
  1. Benchmark of solar resource data (June 2023)
  2. Benchmark of GHI gap filling methods (January 2023)
  3. Benchmark of probabilistic forecasting (June 2023)
  4. Firm power production (January 2023)
  5. Solar Resource Handbook 4th edition (November 2023)
- Main products
  1. Solar Resource Handbook: https://iea-pvps.org/key-topics/best-practices-handbook-for-the-collection-and-use-of-solar-resource-data-for-solar-energy-applications-third-edition/
  2. Online archives: www.solarstations.org www.assessingsolar.org

Nowcasting with ASI

- Cloud Motion forecasts based on all sky imagers (ASI)
- Optimal method for minute time and 100 m spatial scales
  - Forecast horizon of 15 minutes
  - Time resolution of 10 – 60 sec.
- Why solar irradiance nowcasts?
  - Minimized costs and risks for power plant/grid operators from improved situational awareness
  - Cloud passing are largest influencing factor for short-term fluctuations of irradiance on local scale



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https://iea-pvps.org/research-tasks/solar-resource-for-high-penetration-and-large-scale-applications/

Thank you

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