

Lessons from PVPS Task 14 on integrating high penetrations of PV in the grid

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PV Power Systems (PVPS) Task 14 is dedicated to international collaboration towards solving technical challenges and barriers to PV becoming the main source of power in a future 100% renewable energy supplied power system. Commencing in 2010, it is now in its third phase, and focussing on the following key challenges:

- With growing PV (and other RES) capacity in transmission systems and ancillary services delivered upstream from distribution to transmission, a more integrated viewpoint on PV integration is needed
- New approaches to the management of power systems with declining inertia need to be developed to ensure system stability
- Operational and long-term planning with large amount of PV (and other RES) remains a key challenge in the future 100% RES scenario and requires improved tools and methods
- PV's integration values and costs raise market design and operation aspects is highly relevant to bring cost reductions on the component side to the market
- Reliability, resilience and PV in micro grids are increasingly "hot topics" requiring further attention, particularly given the very high PV penetrations now being achieved in these systems
- Solutions for expanding the role of PV in the power systems of emerging economies are urgently needed, as Solar PV can be one of the most cost-effective solutions on the supply side.
- With Smart Grids becoming reality and opening new opportunities, the possible role of PV in a future Smart Grid needs further exploration.
- Considering insular (small-scale isolated) power systems as the most challenging for the future 100% RES scenario, an improved understanding of PV integration challenges and opportunities in these systems is needed.

In this presentation we will summarise a range of recent reports and other outputs of contributors from the Task including reports on:

- Data Model and Data Acquisition for PV: registration schemes and grid connection evaluations – Best Practice and Recommendations
- Communication and Control for High PV Penetration under Smart Grid Environment - Overview on Control Strategies and Communications Technologies
- Best Practices for High Penetration PV in Insular Systems
- PV as an ancillary service provider