

INFORPV / 417: Innovative Forecasting PV Energy Yield Solution for Sustainable Large Scale Deployment

Project duration: from 08.2017 to 07.2019
Report submitted: 12.2019

Publishable Summary

A main challenge in the scope of ensuring large scale deployment and sustainability of photovoltaic (PV) systems is to improve the accuracy of production forecasting for both large and small scale capacity systems in high concentrations on the distribution grid. Accurate point and aggregated PV production forecasts are major themes of the research roadmap of many international taskforces and are also in line with the objectives of the Solar Europe Industry Initiative (SEII) for accurate energy yield forecasting, increased flexibility of the power system and deployment.

It is with this background that the INFORPV project has been initiated to enable large scale deployment of PV systems through accurate production forecasting and active grid management (supply side forecasting and control), in countries with a high solar resource and a potentially significant PV share of small capacity systems.

The project aimed to develop a PV power production forecasting solution with improved accuracy for point and aggregated forecasts at day- and hour-ahead forecasting horizons. In particular, the end-solution emanating from the implementation of the project provides the first worldwide attempt to achieve hourly averaged PV power production day- and hour-ahead forecasting accuracies less than 5 % root mean square error (RMSE) relative to the nameplate power for single plants and less than 4.5 % at a regional aggregated level.

In parallel, the end-solution which is a unified web-based PV power production and grid management platform (front and back-end) is integrated with interoperable data-flow modules (software modules to seamlessly interface with numerical weather predictions and PV system monitoring systems), tools for grid topology mapping and statutory analysis (grid location mapping and power flow analysis on the forecasts) and advanced interfaces for automated active grid management (alerting and signalling to mitigate power quality issues).

In addition, the advanced PV power production and grid management platform can further act as the buffer between PV installations and the grid, contributing with control algorithms to supportive functions for grid stability especially for the important task and requirement by many distribution/transmission system operators (DSO/TSO) for forecasting the day-ahead energy yield of PV systems. Therefore, the proposed system is of interest to a large stakeholder target group ranging from policy makers, utilities, plant operators, engineering procurement construction (EPC) contractors and investors.

Finally, the project was based on a collaboration of 5 experienced partners (from 2 countries Israel and Cyprus) that greatly assisted in materialising its objectives and to generate a commercial product that will enhance the competitiveness of their research institutions and industries. Furthermore, the skills, complementarity and balance of the consortium greatly assisted in contributing to the solar energy ambitions of the participating countries.

Project consortium

Coordinator and all contact details:

Full name of organisation	M.G.Lightning Electrical Engineering (MGL)
First and family name of coordinator:	Mike Green
Full address:	8 HaPalmah street Raanana 43414, Israel
E-mail:	info@lightning.co.il

Participating countries and financing:

Country	Number of organisations involved	Project costs in EUR	Public funding in EUR
Israel	2	346'484	173'242
Cyprus	3	190'830	175'000
Total	5	537'314	348'242

Funding agencies involved and contracts

Funding Agency	Contract N° and Title
Ministry of Energy & Water Resources - Israel	Innovative Forecasting PV Energy Yield Solution for Sustainable Large Scale Deployment -216-11-031
Research Promotion Foundation - Cyprus	KOINA/SOLAR-ERA.NET/1215/02