



Forecasting of Hourly Photovoltaic Energy in Canarian Electrical System

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The Canarian Archipelago face similar problems as most insular region lacking of endogenous conventional energy resources and not connected to continental electrical grids. A consequence of the “insular fact” is the existence of isolated electrical systems that are very difficult to interconnect due to the considerable sea depths between the islands.

Currently, the Canary Islands have six isolated electrical systems, only one utility generating most of the electricity (burning fuel), a recently arrived TSO (REE) and still a low implementation of Renewable Energy Resources (RES). The low level of RES deployment is a consequence of two main facts: the weakness of the stand-alone grids (from 12 MW in El Hierro up to only 1 GW in Gran Canaria) and the lack of space to install RES systems (more than 50% of the land protected due to environmental reasons).

To increase the penetration of renewable energy generation, like solar or wind energy, is necessary to develop tools to manage them. The penetration of non manageable sources into weak grids like the Canarian ones causes a big problem to the grid operator. There are currently 104 MW of PV connected to the islands grids (Dec. 2009) and additional 150 MW under licensing.

This power presents a serious challenge for the operation and stability of the electrical system.

ITC, together with the local TSO (Red Eléctrica de España, REE) started in 2008 and R&D project to develop a PV energy prediction tool for the six Canarian Insular electrical systems. The objective is to supply reliable information for hourly forecast of the generation dispatch programme and to predict daily solar radiation patterns, in order to help program spinning reserves.

ITC has approached the task of weather forecasting using different numerical model (MM5 and WRF) in combination with MSG (Meteosat Second Generation) images.

From the online data recorded at several monitored PV plants and meteorological stations, PV nominal power and energy produced by every plant in Canary Islands are estimated using a series of theoretical and statistical energy models.