



UMTS Network Stations

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The weakness of small island electrical grids implies a handicap for the electrical generation with renewable energy sources. With the intention of maximizing the installation of photovoltaic generators in the Canary Islands, arises the need to develop a solar forecasting system that allows knowing in advance the amount of PV generated electricity that will be going into the grid, from the installed PV power plants installed in the island.

The forecasting tools need to get feedback from real weather data in “real time” from remote weather stations. Nevertheless, the transference of this data to the calculation computer servers is very complicated with the old point to point telecommunication systems that, neither allow the transfer of data from several remote weather stations simultaneously nor high frequency of sampling of weather parameters due to slowness of the connection.

This one project has developed a telecommunications infrastructure that allows sensorizadas remote stations, to send data of its sensors, once every minute and simultaneously, to the calculation server running the solar forecasting numerical models. For it, the Canary Islands Institute of Technology has added a sophisticated communications network to its 30 weather stations measuring irradiation at strategic sites, areas with high penetration of photovoltaic generation or that have potential to host in the future photovoltaic power plants connected to the grid.

In each one of the stations, irradiance and temperature measurement instruments have been installed, over inclined silicon cell, global radiation on horizontal surface and room temperature.

Mobile telephone devices have been installed and programmed in each one of the weather stations, which allow the transfer of their data taking advantage of the UMTS service offered by the local telephone operator. Every minute the computer server running the numerical weather forecasting models receives data inputs from 120 instruments distributed over the 30 radiometric stations.

As a the result, currently it exist a stable, flexible, safe and economic infrastructure of radiometric stations and telecommunications that allows, on the one hand, to have data in real time from all 30 remote weather stations, and on the other hand allows to communicate with them in order to reprogram them and to carry out maintenance works.