International Conference on Sustainability in Energy and Buildings

Invited Sessions

Title of Session: Forecast, monitoring, diagnosis, prognosis and fault tolerance control of photovoltaic systems

Name of Chairs: Giuseppe Marco TINA and Abdelhamid RABHI

Description:

Solar energy is the most abundant, inexhaustible and clean among renewable energy sources. Interest in photovoltaic (PV) power generation has been increasing in recent years thanks to its evident advantages.

Such large installation of PV power plants has not been followed by an adequate development of monitoring, fault detection and diagnosis tools to ensure better profitability.

The good dimensioning of PV installations is very important, initially, for the optimization of its size and its cost. Then, it is crucial to continuously follow and control the performances of such installations. In fact, electrical faults and aging of PV modules can cause important malfunctions.

The faults in PV plants do not only affect the performance and services of the plant but they may also lead to critical and detrimental situations. In fact, without proper fault detection, the presence of faults in PV arrays not only causes power losses, but also can cause lack of safety and a probable fire hazard for the whole system. Having considered these problems, it is of paramount importance to check the PV system status (normal or abnormal conditions).

Monitoring photovoltaic systems can provide useful information about their operation and the means to improve their performance if data are reported correctly. To be useful, a monitoring report must provide information on relevant aspects of the operation in terms that can be easily understood by a third party. Appropriate performance parameters must be chosen, and their values constantly updated.

The main purposes of this session concern development of tools and methods in diagnosis and monitoring for PV systems. This special session aims to focus on recent studies and trends for the development and application of new methods for monitoring and evaluating photovoltaic systems as a key point in the deployment of large scale PV systems around the word.

A final aspect that deserves special attention is about the forecast of PV system production; in fact, PV systems belong to the category of renewable non programmable systems. To reduce their impacts on power systems, effective and reliable medium and short term forecast algorithms should be developed and tested.

Aims and Scopes (include but not limited to):
1- PV modules indoor and outdoor measurements;
2- PV system measurements;
3- Diagnosis methods for PV arrays and systems;
4- Reliability and testing methods for PV modules;
5- Models for PV power production forecast.

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