CALL FOR PAPERS

Up until 2014, about 1,600 installations worldwide with a combined capacity of 22,500 MW_{AC} were photovoltaic (PV) power plants larger than 4 MW. Of these plants, several hundred plants have been installed in Germany and Spain, with each plant generating an output of more than 1 MW_p. Of these, 60 plants in Spain and 50 in Germany generate an output of more than 10 MW_p. The number of PV power plants will continue to rise. Several hundred PV power plants will be installed within the next few years. Future PV power plants will have higher power capacity. Indeed, some of them will exceed 1000 MW. More than 90% of the installed capacity consists of grid-connected systems. Since multimegawatt PV power plants require large areas of land, they are usually installed in remote areas, far from cities. For power transmission, a medium voltage network is commonly used.

The power converter topology, system stability, and control of grid-connected PV power plants have attracted considerable interest in recent years, as the existing technologies are not suitable for large-scale PV power plants yet. In the last two decades, extensive research has been carried out in proposing new inverter topologies. Besides the development of inverter topologies, considerable efforts have also been directed toward the progress of maximum power point tracking (MPPT) algorithms and grid stability and control, due to the intermittent nature of solar energy source. Research is needed to push these technologies to solve two enormous challenges, that is, energy and environment, by replacing conventional power plants with solar PV power plants.

Potential topics include but are not limited to the following:

- ▶ Development of solar PV cell and power converter/inverter technologies, MPPT algorithms, and control techniques toward large-scale solar PV power plants
- ▶ Advanced grid integration and smart metering techniques, forecasting, and energy management in solar PV systems
- ▶ Reactive power and voltage ride-through compliance, active power compliance, and harmonics and power quality compliance in PV plants based power systems
- ▶ Modeling of smart micro- or nanogrids with PV power plants in DIgSILENT PowerFactory and MATLAB/Simulink environments
- ▶ Solar irrigation, solar cold storage, and solar boat systems

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