

## Estimation of photovoltaics power generation in consideration of both its installed capacity and satellite-estimated solar irradiance

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Recently, in Japan, large photovoltaics (PV) power systems have been penetrated after feed-in-tariff (FIT) in 2012. PV power generations have large variability in both temporal and spatial scales because PV power depended on solar irradiance (or downward shortwave radiation). Solar irradiance has also impact from both clouds and aerosols distributions.

PV power generation from roof-top PV power system on residences, industrial manufactures and small-, mediam- and large-scale solar plants have not directly been monitored even by electrical power companies in Japan because monitoring instruments have not been installed even in distributing substations and residences. This is a problematic situation for safty control of electric power grid, because accurate PV power generation from PV power system under various weather conditions were not grasped. Accurate monitoring of PV power generation could be important data for a safety electric power control of power grid in energy management system.

Thus, PV power generation estimation using satellite-estimated solar irradiance data in consideration of PV syetem capacity for city-wide scale are conducted in Japan in this study for the first time. Furthermore, installed PV power system capacity for each area and future status of PV power will be also discussed.

Keywords: photovoltaics power generation, Meteorological satellite, PV power estimation