



## **Short-term solar irradiance forecast for the efficiency assessment of photovoltaic systems in Poland.**

K. Sobotka (1), J. Struzewska (1), and J.W. Kaminski (2)

(1) Department of Environmental Engineering Systems, Warsaw University of Technology, Nowowiejska 20, 00-653 Warsaw, Poland, (2) WxPrime Corporation, 2161 Yonge St., Suite 808, Toronto, Ontario, Canada, M4S-3A6

Efficiency of solar based energy generation systems depend to a large extent on weather conditions. In Poland, the solar irradiance is often highly variable due to passages of frontal zones and extratropical cyclones. Consequently, electricity generation varies in time and often energy production pattern does not follow load demand.

Efficient management of a solar electricity production system requires reliable short-term forecast of solar irradiance and energy yield. The existing methodologies are based on different approaches depending on the forecast length, e.g. satellite images, statistical models and numerical weather prediction models.

Although the use of short-term meteorological forecast products to predict energy production from photovoltaic systems does not seem to be a complicated issue, the outcome from such experiments is very often inconclusive and in general less accurate than from statistical models.

In Poland there is a growing effort to expand installations of photovoltaic systems; however, there is no forecasting system for solar energy production and the existing maps of solar irradiance are based mainly on measurements from a sparse network of stations.

An attempt will be made to develop a short-term solar electricity production forecast for Poland based on the environmental forecast prepared by EcoForecast.EU. The GEM-AQ meteorological and air quality model is used as a computational platform. We will present modeling results for solar irradiance and a comparison with available measurement and climatological data. In addition, the developed parameterization of the energy production using GEM-AQ forecast will be presented.