Geophysical Research Abstracts
Vol. 19, EGU2017-10495-4, 2017
EGU General Assembly 2017
© Author(s) 2017. CC Attribution 3.0 License.

Simulation of electricity demand in a remote island for optimal planning of a hybrid renewable energy system

Aristotelis Koskinas, Eleni Zacharopoulou, George Pouliasis, Ioannis Engonopoulos, Konstantinos Mavroyeoryos, Ilias Deligiannis, Georgios Karakatsanis, Panayiotis Dimitriadis, Theano Iliopoulou, Demetris Koutsoyiannis, and Hristos Tyralis

Department of Water Resources and Environmental Engineering, School of Civil Engineering, National Technical University of Athens (NTUA)

We simulate the electrical energy demand in the remote island of Astypalaia. To this end we first obtain information regarding the local socioeconomic conditions and energy demand. Secondly, the available hourly demand data are analysed at various time scales (hourly, weekly, daily, seasonal). The cross-correlations between the electrical energy demand and the mean daily temperature as well as other climatic variables for the same time period are computed. Also, we investigate the cross-correlation between those climatic variables and other variables related to renewable energy resources from numerous observations around the globe in order to assess the impact of each one to a hybrid renewable energy system. An exploratory data analysis including all variables is performed with the purpose to find hidden relationships. Finally, the demand is simulated considering all the periodicities found in the analysis. The simulation time series will be used in the development of a framework for planning of a hybrid renewable energy system in Astypalaia.

Acknowledgement: This research is conducted within the frame of the undergraduate course "Stochastic Methods in Water Resources" of the National Technical University of Athens (NTUA). The School of Civil Engineering of NTUA provided moral support for the participation of the students in the Assembly.