

Application of ANN for Estimation of Power Demand of Villages in Sulaymaniyah Governorate

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Abstract : Before designing an electrical system, the estimation of load is necessary for unit sizing and demand-generation balancing. The system could be a stand-alone system for a village or grid connected or integrated renewable energy to grid connection, especially as there are non-electrified villages in developing countries. In the classical model, the energy demand was found by estimating the household appliances multiplied with the amount of their rating and the duration of their operation, but in this paper, information exists for electrified villages could be used to predict the demand, as villages almost have the same life style. This paper describes a method used to predict the average energy consumed in each two months for every consumer living in a village by Artificial Neural Network (ANN). The input data are collected using a regional survey for samples of consumers representing typical types of different living, household appliances and energy consumption by a list of information, and the output data are collected from administration office of Piramagrun for each corresponding consumer. The result of this study shows that the average demand for different consumers from four villages in different months throughout the year is approximately 12 kWh/day, this model estimates the average demand/day for every consumer with a mean absolute percent error of 11.8%, and MathWorks software package MATLAB version 7.6.0 that contains and facilitate Neural Network Toolbox was used.

Keywords : artificial neural network, load estimation, regional survey, rural electrification

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