Abstract

Short-term electricity forecasting is one of the main topics in the electricity distribution optimization forecasting. There are many models that were developed to find an accurate short-term electricity load forecast. The aim of this research is to develop TLSAR model based on Time Series regression, ARIMAX, and Neural Network (NN) for short-term electricity load forecasting. Generally, TLSAR consists of two models, i.e. model on the first level that usually developed from linear forecast model to explain the trend and seasons pattern of the data (known as potential load), and model on the second level which developed from ARIMA model to catch data's Autoregressive pattern (known as irregular load). In this research, the mixed between linear model on the first level, i.e. Time Series Regression or ARIMAX, and non-linear model on the second level, i.e. NN, will be examined. ARIMAX is ARIMA model that includes some predictors, such as deterministic trend and special days effect. NN is a network from a group of little processor units that based on human’s neural network. NN is a non-linear data statistic device that can be used for modeled complicated connection between input and output to find data patterns. As a case study, this research used short-term electricity load from Pusat Pengaturan Beban Jawa-Bali as of January 1st, 2009 to December 31st, 2010. The result showed that the forecasting value conducted by using TLSAR method based on ARIMAX has MAPE value minimum, under 2% for 1 to 6 days onwards forecasting. It can be concluded that TLSAR based on ARIMAX forecasting method is good enough to be used for 6 days onwards.

Keywords: ARIMAX, NN, Time series regression, TLSAR.
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