Jintaporn Newinpun 2012: A Comparison of the Four Forecasting Methods of Peak Electric Energy Demand in Thailand. Master of Science (Statistics), Major Field: Statistics, Department of Statistics. Thesis Advisor: Assistant Professor Boonorm Chomtee, Ph.D. 104 pages.

The purpose of this research is to study and compare the forecasting methods for peak electric energy demand in the five regions of Thailand; Metropolitan areas, Center region, Northeastern region, Southern region and Northern region. The four forecasting methods were used in the study; Exponential smoothing Holt-Winter method, Regression analysis with dummy variables, Box-Jenkins method and Fuzzy regression analysis with dummy variables. The suitable forecasting methods were chosen by considering the smallest value of MAPE, MAD and MSE.

The studied data were monthly time series. The time series data was divided into two groups. The first group was monthly from January 2002 to December 2007 for the best identification models. The second group was monthly from January 2008 to December 2008 for finding the best suitable forecasting period by calculating the difference between the forecast and time series of the second group.

For the results; it is found that all of the five regions of the time series have trend and seasonal variation. Multiplicative exponential smoothing Holt-Winter method is the best method for Center region. Additive regression analysis with dummy variables is the best method for Metropolitan areas, Northeastern region, Southern region and Northern region. Then, by using the best method of each region for finding the best suitable forecasting period for 2, 6 and 12 months. The result of the study show that the 2 month forecasting is suitable for Metropolitan areas, Center region, Northeastern region and Southern region and the 6 month forecasting is suitable for Northern region.

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