Oral presentation: 47

Statistical modelling of monthly electricity sales in Colombo: ARIMA approach

H. M. R. D. S. Herath and N. Varathan*

Department of Mathematics and Statistics, Faculty of Science, University of Jaffna, Sri Lanka
*varathan10@gmail.com

Electricity is the most essential form of energy, used all over the globe. It has influenced the economy, public health, technological growth and all other spheres of human activities. The electricity sales are growing day by day with the population growth and industrialization, etc. Even though Sri Lanka is a developing country, it has shown a huge progress, showing a national electrification ratio of 99.7% in 2017. Colombo; the capital of Sri Lanka, is the main commercial hub with the largest population and by far the most developed city in Sri Lanka. This study investigates to develop a suitable time series model for the monthly electricity sales of Colombo City. The monthly electricity sales data was obtained from Ceylon Electricity Board during the period of January 1982 to December 2016. The data analysis has been done using the Box-Jenkin's Auto Regressive Integrated Moving Average (ARIMA) procedure. Results reveal that, the SARIMA $(0,1,2)(0,1,1)_{12}$ is the most appropriate model for the monthly electricity sales data. Moreover, Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC) and Mean Square Error (MSE) were used to select the best model. Further, adequacy of the best model has been checked using Ljung-Box Chi-Squared test. Finally, the monthly electricity sales for the year 2017 were predicted using the selected best model.

Keywords: ARIMA, electricity sales, SARIMA, time series