

**LONG TERM ANNUAL ELECTRICITY DEMAND
FORECASTING BY ARTIFICIAL NEURAL
NETWORKS INCLUDING
SOCIO-ECONOMIC INDICATORS AND CLIMATIC
CONDITIONS**

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159361A

Degree of Master of Science

Department of Electrical Engineering

University of Moratuwa

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DECLARATION

I declare that this is my own work and this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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The above candidate has carried out research for the Masters Dissertation under our supervision.

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ABSTRACT

Electricity has become a major form of end use energy in present complex society. The influence of electricity is tremendous and has been recognized as a basic human need. It is an important element of infrastructure on which the socio economic development of the country heavily depends.

Electricity demand forecasting is very important and crucial for a utility, in order to make right decisions regarding future power plant and network development. Accurate electricity demand forecasting is one of the challenges and several techniques are used in forecasting demand based on the availability of data in each country.

CEB in their long term generation expansion planning studies use three long term demand forecasting methodologies namely econometric approach, time trend approach and end user approach.

New application for long term demand forecasting based on Artificial Intelligence has identified as important due to its ability in mapping complex non-linear relationships. Therefore under this study, the use AI method based on Artificial Neural Networks for long term annual electricity demand forecasting in Sri Lanka is discussed and modeled including Socio-Economic Indicators and Climatic Conditions.

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LIST OF ABBRIVIATIONS

AI	-	Artificial Intelligence
ANN	-	Artificial Neural Network
CBSL	-	Central Bank of Sri Lanka
CCPI	-	Colombo Consumer Price Index
CEB	-	Ceylon Electricity Board
EI	-	Energy Intensity
GDP	-	Gross Domestic Product
GDPPC	-	Gross Domestic Product Per Capita
LTGEP	-	Long Term Generation Expansion Plan
MLR	-	Multiple Linear Regressions
MSE	-	Mean Squared Error

LIST OF APPENDICES

Appendix A- Analysis of Average Annual Temperature