THE DESIGN OF A SUSTAINABLE EFFICIENT LIGHTING PROGRAM FOR SRI LANKA

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by

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DECLARATION

The work submitted in this dissertation is the result of my own investigation, except where otherwise stated.

It has not already been accepted for any degree, and is also not being concurrently submitted for any other degree.

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I endorse the declaration by the candidate.

UOM Verified Signature

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Contents

Abstract

In each year, electricity distribution expands through various requirements such as state sponsored rural electrification schemes and other interventions, connecting more consumers to the national grid, means the demand growth at the end of each year.

The main challenge facing the CEB will be the rising price of oil and the generation capacity shortage. Generation capacity additions are required every year to keep pace with the increasing demand. Unless cheaper solutions are developed to meet this electricity demand, the financial burden of fuel oil based power generation will further strangle the government owned CEB.

Importance of demand side management strategies have rapidly grown in the context of rising oil prices as well as extensive delays in implementing low cost electricity generation projects. Especially as a developing country, saving of energy has much more advantages.

This report proposes to maximise the usage of existing capacity by introducing a sustainable lighting programme to popularize the use of efficient lighting devices among the consumers as energy development, which will offset the adverse impacts.

The most economically effective method to achieve this goal is to introduce compact fluorescent lights among the consumers. That is because while a regular (incandescent) light bulb uses heat to produce light, a fluorescent bulb creates light using an entirely different method that is far more energy-efficient - in fact, 4-6 times more efficient. It can be easily implemented if a CFL bulb is priced as per the incandescent bulb price and distributed through CEB depot / offices.

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List of Figures

List of Tables

List of Abbreviations

CO_2	Carbon dioxide
CO_2-e	Carbon dioxide equivalent
BESCOM	Bangalore Electricity Supply Company
C.Cy	Combined Cycle
C.PS	Chunnakam Power Station
CDM	Clean Development Mechanism
CEB	Ceylon Electricity Board
CFL	Compact florescent lamp
DSM	Demand Side Management
EFL	A non electrode version of CFL
ELI	Efficient Lighting Initiative
EVN	VietNam Electricity
f	Frequency
GJ	Giga jules
GT	Gas turbine
GWh	Giga watt hour
HID	High Intensity Discharge
HPF	High power factor
I	Current
KKS	Kankasanthurai
KPS	Kankasanthurai Power Station
KW	Kilo watt
KWh	Kilo watt hour
LAD	Lanka Auto Diesel
LECO	Lanka Electric Company
LHF	Lanka Heavy Fuel
LPF	Low power factor
LV	Low voltage

MW	Mega watt
MWh	Mega watt hour
PC	Personal computer
PF	Power factor
RMS	Root mean square
SLR	Sri Lankan rupee
SPPS	Sapugaskanda Power Station
TCLP	Toxicity Characteristic Leaching Procedure
tCO2e	Tonnes of CO2 equivalent
THD	Total harmonic distortion
TV	Television
v	Voltage
VA	Volt amperes
w	Watt