

MAKERERE



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DEPARTMENT OF ELECTRICAL AND COMPUTER
ENGINEERING

PROJECT TITLE: ENERGY CONSERVATION IN UGANDA
INDUSTRIES CASE STUDY UGANDA BAATI LIMITED

BY

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
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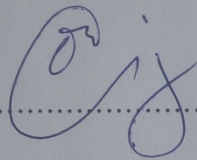
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DECLARATION

I, **EMOJONG JOEL**, hereby declare that this report submitted to the university is a record of an original work done by me. The results embodied in this thesis have not been submitted to any other University or Institute for the award of any degree or diploma. This research was conducted together with my project partner **WAIDHIRA MULSHID**.

Signed:.....  Date: 11 / June / 2018

We the supervisors have approved this report and verified that it meets the requirements for a Bachelor of Science degree in Electrical Engineering at Makerere University.

Prof. Peter Lating  Date: 11/06/2018

Main Supervisor

Dr. Milton Edimu..... Date.....

Co-supervisor

DEDICATION

I dedicate this report to my beloved family and friends

ACKNOWLEDGEMENTS

I would like to acknowledge and extend my heartfelt gratitude to the following persons who have made the completion of this final year project and report possible: My Family, for their vital encouragement, love and endless support they have rendered me through this whole education journey.

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ABSTRACT

The Project presents energy saving in Uganda industries case study being Uganda Baati Ltd, the main objective was to identify and reduce power losses and wastages in the industry. This was achieved through the collection and analysis of energy consumption (bills) data from the plant, on-site measurements of the electrical load inventory of which are motors using a data logger(power quality analyzer PQAB24) , analyzing the data to find the energy gaps and a cost evaluation for the solutions provided.

The findings from the audit were, the industry was running on low power factor due to poor servicing of capacitor banks or no capacitor banks at some large motors, the average percentage motor loading of most motors was way below the required 50 % for optimum running of such systems, only one motor operating under a variable frequency drive, identified an oversized motor, generally most of the motors in the industry were running under low capacity utilization for longer periods of time. Identified inefficient technology of some equipment and lighting system.

Recommendations include power factor correction by installation and regular servicing of capacitor banks, demand control limiting, upgrade to high efficiency premium NEMA motors, upgrade to LED lights, proper motor sizing ,VFD installation and machine scheduling which includes operating machines for shorter periods of time at optimum high capacity, in conclusion there is great energy saving potential in Uganda Baati with shorter pay back periods of less than 3 years from the solutions identified coupled with an investment cost of 86 ,828,000 that result to savings of 98,736,000 per annum thus reduction of the energy bill when the solutions provided implemented by company .

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LIST OF ACRONYMS

IRR.....	Internal Rate of Return
KWh.....	Kilo-Watt hour
KVA.....	kilo-Volt Amperes
KVAR.....	Reactive Power
LCC.....	Life Cycle Cost
LED.....	Light Emitting Diode
NPV.....	Net Present Value
VFD.....	Variable Frequency Drives

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