A PROPOSAL FOR ENERGY CREDITS IN AN EGYPTIAN GREEN BUILDING RATING SYSTEM FOR EXISTING STRUCTURES

By

Ahmed Ibrahim AbdelAzim Ahmed Ali

A Thesis Submitted to
Faculty of Engineering, Cairo University
In Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
In
Electrical Power and Machines Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Under the Supervision of

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Title of Thesis:

A Proposal For Energy Credits In An Egyptian Green Building Rating System For Existing Structures

Keywords

Energy Efficiency, Sustainability, Decision Making, Analytic Hierarchy Process, Energy Modelling.

Summary:

This research proposes the use of a multiple criteria decision making technique, namely the Analytic Hierarchy Process (AHP), to develop an energy efficiency rating system for existing buildings. Nine energy rating criteria were identified by comparatively analyzing international green building rating systems for existing structures and then a survey was conducted to collect the opinions of engineering professionals regarding the relative priority of the identified criteria, and to determine which criteria are mandatory and which are optional. Using AHP, weights are developed for the optional criteria, representing their relative importance. To verify the positive impact of applying the identified criteria on existing buildings, a case study office building in New Cairo (5th settlement) was modeled and simulated using software. The simulation results demonstrated more than 26% reduction in the annual electric utility costs and energy consumption, and a 14% reduction in the peak electrical power required by the building.

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I ask of God to give me the devotion and strength to continue this journey of learning.

TABLE OF CONTENTS

LIST OF FIGURES