شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

HOSSAM MAGHRABY

شبكة المعلومات الجامعية

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

HOSSAM MAGHRABY

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها

علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

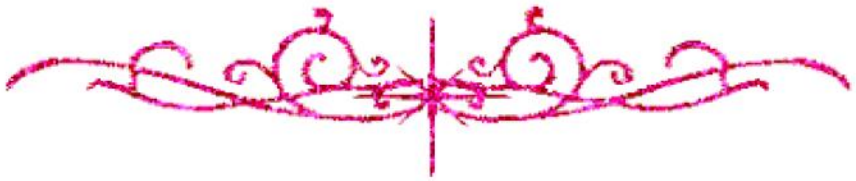
يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

HOSSAM MAGHRABY

شبكة المعلومات الجامعية

بعض الوثائق الأصلية تالفة



HOSSAM MAGHRABY

بالرسالة صفحات

لم ترد بالأصل

HOSSAM MAGHRABY

Sustainability of Wind Energy Resources in Yemen

By

Ahmed Nasser Al-Jabali

B.Sc. in Meteorology

For

M.Sc. Thesis

In

Meteorology

Under the Supervision of

Prof. Dr. Mohammed Magdy Mohammed Abdel-Wahab

Head of Ast. & Met. Department,

Faculty of Science,

Cairo University, Egypt

Faculty of Science

Cairo University

2005

Acknowledgment

I would like to express my sincere appreciation and gratitude to the supervisor of this thesis, Prof. Dr. Mohammed M. Abdel-Wahab Head of Ast. & Met. Department, Faculty of science, Cairo University, for his kindness, encouragement, suggestion and following this work.

I wish to express my thanks to the staff members of Astronomy and Meteorology Department, Faculty of Science, for their kindness encouragemnt. The support of Civil Aviation and Meteorology Authority in Yemen is very appreciated to complete this work.

Also, I would like to express my thanks to my colleagues at Egyptian Meteorological Authority for their help.

Many thanks to my family and especially to my wife for her encouragement and support throughout this thesis.

CONTENTS

Contents

Page

List of Figures

List of Tables

Abstract

Our study is to develop clean, competitive power technologies for 21st century, including wind energy as a renewable energy resource. This technologies will be work together to transform the power sector; Lowering energy costs, reducing greenhouse gas emission and pollutants, and improving reliability of service.

Wind Power plants have relatively little impact on the environment compared to the other conventional power plants.

The present work demonstrate the availability of wind power over Yemen. The Geography of Yemen is very variable and charactristized by wide area of mountains, this may influence the wind pattern in the lowest part of the atmosphere. In fact it may be considered the most significant parameter to calculate wind energy.

The climatology of the area presented showed that, in general, the highest wind speed may be detected in summer season (June–August) regardless the wind speed differences from one site to another. The Weibull parameters for wind distribution and energy calculations were estimated for different locations.

The current work used different climate scenarios from general circulation models climate change were investigated at the area up to 2099.

The results indicated while there are considerable change in temperature and precipitation, there were no evidence for expected changes in wind speed at the area. So, final conclusions extracted from this work supported the importance of use of wind energy in Yemen Republic and the sustainability of this type of energy within the expected climate changes.

Key Words: **Wind Energy, Yemen Climate, General Circulation Models, Renwable energy, Greenhouse Gases.**