



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



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التوثيق الإلكتروني والميكرو فيلم



شبكة المعلومات الجامعية التوثيق الإلكتروني والميكرو فيلم



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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Cairo University

POWERING POULTRY FARM USING BIOMASS AND SOLAR ENERGY

By

Eng. Mina Magdy Aziz Yousef

A Thesis submitted to the
Faculty of engineering at 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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Title of Thesis: Powering poultry farm using biomass and solar energy.

Key Words: Biomass Energy; Grid; Hybrid; Poultry; Solar Energy.

Summary:

This thesis proposes a new economically feasible and resilient solution to power an existing poultry farm in the Western desert in Egypt by merging biomass energy with solar energy in the hybrid system connected to the national grid. The grid is used in this proposed project to add reliable and resilient dimensions to keep the stability of the farm's internal grid in addition to using it as energy storage instead of using batteries. Biomass energy is coming from converting poultry litter to electrical energy through the gasification process. The location of the farm in the western desert in Egypt has a great potential to combine solar energy with biomass energy to reduce the cost of energy.

The economic feasibility of this hybrid system is examined using the HOMER program and compared with different configurations. The result shows this configuration is the most optimal whether from an economic or technical perspective to maintain stabilize the farm's grid.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all resources used and have cited them in the references section.

Name: Mina Magdy Aziz Yousef

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DEDICATION

To my dad, mam and sister

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LIST OF ABBREVIATIONS

AC	Alternating current
ARC	Anti-reflection coating
CAPEX	Capital expenditure
COE	Cost of energy
CFBG	Circulating Fluidized Bed Gasifier
CHP	Combined Heat and Power
DC	Direct current
D-map	Data Map
DOCs	Day-old chicks
GHI	Global horizontal irradiance
HOMER	Hybrid Optimization Model for Electric Renewables
HRES	Hybrid renewable energy systems
LCOE	Levelized cost of energy
LE	Egyptian pound
NPC	Net present cost
NREL	National renewable energy laboratory
O&M	Operation and maintenance
OPEX	Operational expenditure
PV	Photo Voltic
USA	United stated of America
ROI	Return on investment
WG	Wadi Group company