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Cost Benefit Analysis for Renewable Energy Projects

by

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COMMITTEE DECISION

**This thesis (Cost Benefit Analysis for Renewable Energy Projects) was
successfully defended and approved on (9-5-2018)**

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DEDICATION

To my loving parents who supported me all the way; to my brother and sisters; my friends who supported me through tough times, I dedicate this work, hoping that made all of them proud.

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List of abbreviations

REP	Renewable energy projects
PV	Photovoltaic
KW	Kilowatts
GW	Gigawatt
TWh	Terawatt hours
TOE	Ton of oil equivalent
IMF	International Monetary Fund
FIT	feed-in tariff
JAEC	Jordan Atomic Energy Commission
JNRC	Jordan Nuclear Regulatory Commission
MEMR	Ministry of energy and minerals resources
NREL	National Renewable Energy Laboratory
IEA	the International Energy Agency
EMRC	Energy & Minerals Regulatory Commission
JREEEF	Jordan Renewable Energy & Energy Efficiency Fund

Abstract:

Despite the high growth in renewable energy technologies in recent years, the overall share of renewable power is still low. To overcome the existing challenges and promote expansion of renewable energy production, governmental policies and incentives have a high influence on the behavior of project developers and investors and on public acceptance to renewable systems.

This approach addresses the limitation of the Jordanian policy towards small renewable energy projects: residential and small businesses to make a better understanding for incentives offered. Two case studies were chosen to represent different land uses in Jordan. The first case study is a small house that represents the residential sector. The second case study is a small business (factory) that represents the industrial sector.

The Cost-Benefits analysis calculates net present value, internal rate of return and payback period for discounted cash flow. The avoided electricity cost is considered as a positive cash flow. It starts with a self-financed phase as if the investor would pay the cost directly without any mediator. The second phase is applying the governmental incentives which is paying the interests on the loan related to REP, to understand the advantages comparing to the first phase. The third phase is applying the 30% tax credit (foreign policy) as if the Jordanian government would adopt.

In both case studies the tax credit results showed much better results comparing to the governmental policy which means that local policy toward small REP is not enough to compete with foreign policy and needs more study, enhancement and development to make the renewable energy projects more desirable to public and investors.