Sustainable Development and Rehabilitation of Green Buildings:

Case-Study of Al-Isra University in Jordan

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AUTHORIZATION

I, Wael Ahmed Al-Hashmi , Authorized Al Isra University to supply copies of my thesis to libraries or establishment or individuals on request , according Al Isra University regulation .

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DEDICATIONS

Thanks to Allah who is the creator of everything, and peace upon Prophet Mohammed the last of profits and messengers.

After a hard journey of research, efforts and diligence this research has been accomplished successfully, for this, I thank Allah for his blessings that he gifts us

To the one who raised me, lighted my way with her prayers, to my most precious person in this world; my beloved mother.

To who worked hard for me, and taught me the meaning of the struggle toward success, and helped me to be what I am; My Father may Allah expand his years.

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Abbreviations	Meaning
AC	Alternating current
A-si	Amorphous silicon
CDTE	Cadmium telluride
CFL	Install Compact fluorescent light
CS/CLGS	Copper idiom gallium selenide
DC	Direct current
HVAC	Heating , ventilation ,Air Conditioning
KWH	Kilowatt-hour
MoNI-SI	Monocrystalline Silicon Solar cells
OPC	Organic photovoltaic
PV	Photovoltaic Solar cell
RWH	Rainwater harvesting
RWH	Rainwater harvesting
Single-crystal-si	Single-crystalline silicon
TFPV	Thin-film photovoltaic cells
TFSC	Thin-film solar cells
VOCs	Volatile organic compounds
USGBC	United states Green Building
LEED	Leadership in Energy and Environment Design
CIB	Council Of Research And Innovation In Building
IRIS	Institute For Research And Innovation In Sustainability
TFPV	Thin-Film Photovoltaic Cells
GDP	Global Gross Domestic Product

ABSTRACT

Sustainable Development and Rehabilitation of Green Buildings: Case-Study of Al-Isra University in Jordan

By: ***Wael Ahmed Al- Hashmi***

Supervised by: ***Dr. Taiseer Rawashdeh***

Co-Supervisor: Prof. ***Dr. Khaled Tarawneh***

The benefits of green building practices include a lower and more efficient use of energy, water and other resources, improved health and safety standards for the building residents, as well as reduced environmental impact, through less waste-production and pollution. Jordan limited and costly supply of natural resources, our future must be a sustainable. Jordan is one of the highest in the world depending on foreign energy sources , with 96% of the country oil and natural gas imports from neighboring middle eastern countries . This full reliance on foreign oil imports consumes a considerable amount of GDP in Jordan. The government of Jordan had established a renewable energy target equal to 7% of the energy mix by 2016 and 10% by 2020 as part of its 2007-2020 Energy Strategy. The plan calls for up to 1,000MW of wind, 600MW of solar and 50MW of waste-to-energy to be brought online by 2020. It lies in the hands of architects to reduce the effect of the construction because building construction contributes to around 41% in the carbon emissions and electricity use. The construction sector represents the major share of the energy consumption in Jordan consuming 45% of electricity. The objective of the study is to convert Al-Isra University to be a green building. To achieve this object surveying literature to know what has been done in this field, a comprehensive literature review has been done then investigating the energy levels consumption in

Al-Isra university ,followed by design and analysis for electricity, design and analysis for cooling and heating, replacing traditional materials with green building materials, finally comparing the sustainable alternatives wing economical engineering analysis for selecting the best alternatives. Results of the engineering economic analysis of the five alternatives showed the alternative is installing a pv system which will save 10,577,250JD over 25 year so, it is recommended to apply the results and recommendations of this study and working hardly to convert Al-Isra University to be a green building.