Ain Shams University
Faculty of Engineering
Department of Architecture Engineering

Energy Efficient Retrofitting of Hotel Buildings in Cairo

A Thesis Presented in Partial Fulfillment of the Requirements for Master of Science Degree in Architecture Engineering

By

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Statement

This thesis is submitted to Ain Shams University for the M.Sc. Degree in Architecture.

The work included in this thesis was carried out by the researcher at the department of Architecture, Faculty of Engineering, Ain Shams University, and during the period from 2015 to 2017.

No part of this thesis has been submitted for a degree of a qualification at any other university or institute.

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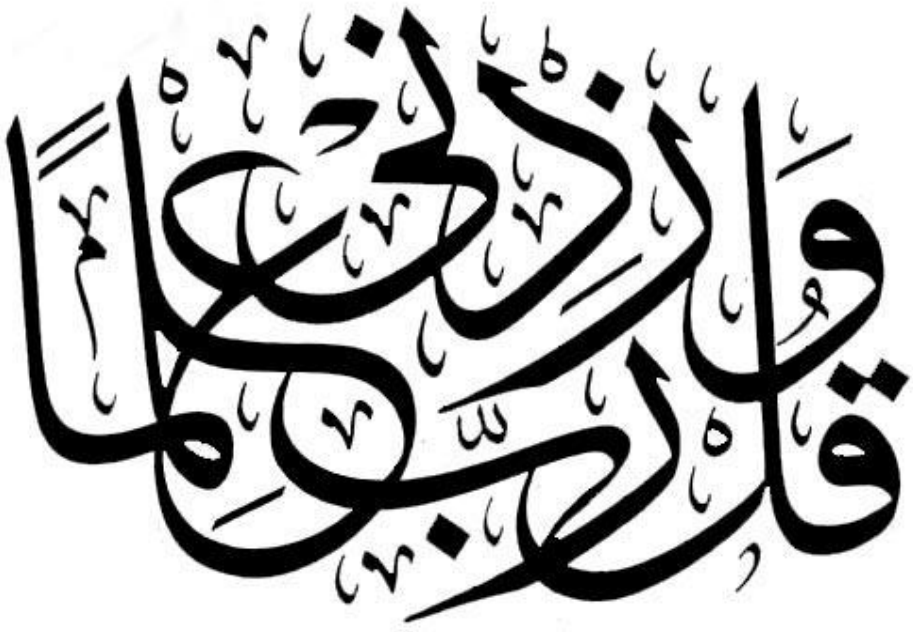
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Abstract

Greenhouse gases (GHG) emissions of Egypt represent nearly 1 percent of the World's GHG emissions, and according to IPCCC, Egypt will be affected by the impact of climate change risks. It was also pointed out that the building sector consumes up to 40 percent of all energy and contributes up to 30 percent of global annual greenhouse gases emissions through the operational phase. That makes existing buildings sector is an opportunity to provide the potential of energy savings techniques and programs and reducing CO2 emissions. It can be achieved through retrofitting existing buildings to promote environmental conservation and sustainable development during the operational periods of building use. Hotels sector in Egypt uses huge amounts of energy, therefore, investments in more efficient energy use can lead to significant reductions in energy consumption, operating costs and energy bills. Hoteliers are nowadays more environmentally conscious than ever because it can cost far more to operate a lodging facility if it is not sustainable. Some innovative energy management systems could cut energy costs for hotels by up to 65%.

The thesis consists of two parts and ends with conclusion and recommendations. The first part introduces the current situation of energy crisis, global warming and the effect of built environment (in chapter 1). It also discusses the international efforts can be taken towards sustainability through the built environment and the retrofit process as a solution. The hotel buildings situation is introduced (in chapter 2), the energy consumption activities and the energy efficiency measures can be implemented. In the second part of this thesis 6 hotels in Cairo were selected as case studies (in chapter 3). It analyzed the different implemented measures and the effect on saving energy. Conclusion of the thesis is presented in chapter 4 to be considered in other searches.

Key words: Climate change**,** Retrofitting, Energy Efficiency, Hotels.

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