

Project I Description

Design and Analysis of a Sustainable “Zero Net” Energy Building under Local Lebanese Solar and Wind Conditions

Team Size: 4 MEE Students

Sponsor : LAU

Project Overview

Sustainable energy design of buildings has become a vital component of the overall architecture design due to many factors including environmental, economic, security and socio-ergonomic ones. The definition of a sustainable zero net energy building is such that the building must not and does not use more energy than it creates. This could be achieved by a systematic design and analysis of both the electrical energy consumed by a building and its occupants as well as the electricity produced by the building’s sustainable energy production components. The project would analyze and design both aspects of the building and integrate them to achieve a zero net energy sustainable architecture.

Project Areas

- Energy/Heat Transfer/HVAC (2-3 MEE Students)

Project Deliverables

Project deliverables consist of the following:

- Analysis of electrical energy needs and energy efficiency levels of a model building.
- Selection of HVAC systems to minimize the energy consumption levels.
- Design a renewable (green) hybrid solar PV/wind sustainable energy system for the model building based on Lebanon solar and wind data.
- Calculation of the overall building carbon foot print and the total yearly reduction in equivalent CO2 emission.

Project Constraints

- NA

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Students:

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Team 2	William Bechara
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