

## Design and Modeling of a Green Building Energy Efficient System

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**Abstract :** Conventional commercial buildings are among the highest unwisely consumes enormous amount of energy and as consequence produce significant amount Carbon Dioxide (CO<sub>2</sub>). Traditional/conventional buildings have been built for years without consideration being given to their impact on the global warming issues as well as their CO<sub>2</sub> contributions. Since 1973, simulation of Green Building (GB) for Energy Efficiency started and many countries in particular the US showed a positive response to minimize the usage of energy in respect to reducing the CO<sub>2</sub> emission. As a consequence many software companies developed their own unique building energy efficiency simulation software, interfacing interoperability with Building Information Modeling (BIM). The last decade has witnessed very rapid growing number of researches on GB energy efficiency system. However, the study also indicates that the results of current GB simulation are not yet satisfactory to meet the objectives of GB. In addition most of these previous studies are unlikely excluded the studies of ultimate building energy efficiencies simulation. The aim of this project is to meet the objectives of GB by design, modeling and simulation of building ultimate energy efficiencies system. This research project presents multi-level, L-shape office building in which every particular part of the building materials has been tested for energy efficiency. An overall of 78.62% energy is saved, approaching to NetZero energy saving. Furthermore, the building is implements with distributed energy resources like renewable energies and integrating with Smart Building Automation System (SBAS) for controlling and monitoring energy usage.

**Keywords :** ultimate energy saving, optimum energy saving, green building, sustainable materials and renewable energy

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