



## **Application of Energy Efficiency Techniques & Design of Building Facades by Simulation Model**

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**Abstract :** In view of the energy crisis that encounters the entire world, it is inevitable to find new solutions and innovative alternatives to provide other sources in order to generate energy instead of mere dependence on traditional, non-renewable sources of energy that incur huge expenses with the utilization of technological methods, modern technologies and information technology that operate in an integral way to provide a better amount of energy while maintaining it. The building facades cladding technique has been known since a long ago, but its technique differs with different age. In the light of the scientific advancements that we are witnessing in modern times in all areas and fields it is mandatory for architecture to interact with these variables, including the usage of all available technological methods and techniques and their utilization in designing the building facades. The impact of these techniques on the users of the building should be highlighted. This research presents the best methodology for improving energy efficiency by designing building facades within Greater Cairo by evaluating the existing building of the Faculty of Engineering, Architecture Department, Cairo University. This takes place by using the computer and simulation programs in order to develop different and appropriate design alternatives that contribute to the fulfilment of the requirements of comfort and provision of eligible and good environment to determine the extent of the impact of the proposed methodology on energy efficiency.

**Keywords :** Energy efficiency, buildings' envelopes, building facades, energy consumption reduction.