ABSTRACT

Energy efficiency of buildings is gaining importance in both economic and environment perspective. This research deals with the “Evaluation of system design parameters for optimum energy performance of a green Information Technology (IT) building” using Energy modelling to achieve energy efficiency in an IT park in Chennai. The outcome of this study will help all the decision makers to design better energy efficient buildings and protect the environment by preserving natural resources.

The Commercial building sector in India is expanding rapidly during the past few years. This expansion is necessary for the economic growth of the nation. The expansion also places a huge demand on real estate and infrastructure and affects the environment. Avoiding or eliminating this impact is not feasible but minimising it is possible by means of adopting sustainable developmental principles. The IT sector is one of the rapidly growing areas known for high energy consumption.

In view of the above background the objective of this research is to evaluate the design parameters for an energy efficient building using energy modelling. The methodology adopted for the research is identification of energy optimization factors and their options, generate scenarios with possible combinations, evaluate each scenario and apply the optimum scenario in the design.
The results of energy simulation showed a minimum saving of 16.8% savings over baseline design standards. The actual energy consumption of the operating campus was also recorded and validated for 1 year.

From the evaluation, the 3.4 Million sq.ft, LEED – GOLD rated “Ramanujan IT city” campus, the potential minimum energy savings of 16.8%, had also been realised in actual operating conditions. The study also helped in understanding the performance of various design Parameters such as HVAC, lighting, etc. to arrive at an optimum energy efficient design, which has brought in the following advantages for the Campus, such as operational cost reduction, minimal use of natural resources. reduction in emissions, water recycling and reuse and enhanced indoor air quality.

**Key words:** Energy conservation, Energy modeling, Sustainability, Energy simulation, Energy efficient buildings