

Abstract

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Optimizing Natural Lighting Analyses for Existing Buildings to Minimize Usage of Artificial Lighting and Green House Gas Effect

Securing energy demand on continuous bases is becoming a vital element to achieve sustainable development. One of which is maximizing the dependency upon natural lighting during daytime for existing buildings to minimize the reliance upon nonrenewable resources and hence the unfavorable effect of greenhouse gases. A current analysis situation was done for university buildings using Building Information Model (BIM) software natural lighting analysis to find answers for the research questions under the policy oriented research. All lighting spaces in the buildings were investigated to facilitate reviewing the output results. The results and analyses showed that the dependency on natural lighting could be used to reduce the amount of energy used via artificial lighting during daytime by nearly one third the amounts consumed hence would result in reducing the operating cost. Moreover, carbon dioxide emissions would also be reduced by about 30% and would consequently result in the better wellbeing of the occupants, provide better health, reduce absenteeism, ameliorate productivity, and raise financial savings.