

Hybrid Dynamic Approach to Optimize the Impact of Shading Design and Control on Electrical Energy Demand

Authors : T. Parhizkar, H. Jafarian, F. Aramoun, Y. Saboohi

Abstract : Applying motorized shades have substantial effect on reducing energy consumption in building sector. Moreover, the combination of motorized shades with lighting systems and PV panels can lead to considerable reduction in the energy demand of buildings. In this paper, a model is developed to assess and find an optimum combination from shade designs, lighting control systems (dimming and on/off) and implementing PV panels in shades point of view. It is worth mentioning that annual saving for all designs is obtained during hourly simulation of lighting, solar heat flux and electricity generation with the use of PV panel. From 12 designs in general, three designs, two lighting control systems and PV panel option is implemented for a case study. The results illustrate that the optimum combination causes a saving potential of 792kW.hr per year.

Keywords : motorized shades, daylight, cooling load, shade control, hourly simulation

Conference Title : ICOIRES 2018 : International Conference on Optimization and Integration of Renewable Energy Systems

Conference Location : Vancouver, Canada

Conference Dates : September 17-18, 2018