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Techno economic visibility of PV system feeding LEDs lighting

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Recently, there are great needs to reduce the electricity consumption via using renewable energy systems and less energy consumption loads. Widespread application of photovoltaic (PV) systems provides achieving this goal. In addition, the need for “green” concepts in buildings is an important demand in particular for official buildings to depend on PV systems as sources of electric energy. Enormous energy savings are possible when using energy efficient lighting equipment and devices with effective controls and careful design. Electric lighting design also strongly affects visual performance and visual comfort. The proposed work investigates the techno economic visibility due to change of lighting from FLs to LEDs fed from PV system. The proposed change will cover the 1st stage (40 Labs & 90 Offices) of new buildings which consist of the Electronics Research Institute. The change includes using the PV arrays on the roof of the building to feed the LEDs while the excess energy gained will provide office or lab equipment with electricity or supplied to the grid. Using PV and energy efficient lighting reduces emissions that alter our climate dramatically for the associated CO₂. Recent needs to use energy efficient systems become more urgent due to continuous increase in electricity price and reduction in subsidization. The full paper will present and discuss details of lighting design of labs & offices, PV system design & selection and economical expressions & computations. The investigation results in finance and environment measure; and discussion that will be provided in the paper. The study illustrates: 1. Improve energy efficiency and reduce the energy consumption; 2. Provide more comfort working condition for the employees; 3. Make an active contribution to environmental and climate protection; 4. Reduce energy costs, and thus provide better budget use of buildings.

Biography

Faeka Khater (IEEE Life SM) received BS, MS and PhD degrees in Electrical Engineering from Cairo University, Cairo, Egypt, in 1967, 1976 and 1982, respectively. From 1984 to 1987, she was an Honorary Fellow in the ECE Department at the University of Wisconsin, Madison, USA. Since Graduation, she has been working for the Electronics Research Institute (ERI) as, RA (1967-1982), Assistant Professor (1982-1987), and Associate Professor (1987-1992). Since 1992, she has been a Professor in the Department of Power Electronics & Energy Conversion, ERI, in which she was Department Chair from 2001 to 2006. She was a visiting Professor at the Institute of Power Electronics & Electric Drives, Aachen, Germany (May/June 2001). Her interests include electric machines, electric drives system control, power electronics converters, digital electronic control, renewable energy, and energy efficient techniques.

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