

General Lighting in Offices Building: Techno-Economic Considerations on the Fluorescent Tubes Replacement with LED Tubes

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Abstract

The use of LED light sources is nowadays an attractive solution because it can easily lead to lower operating costs of artificial lighting. In the last years, the replacement of fluorescent lamps with LED tubes for lighting of workplaces have been frequently proposed. The aim of the Authors is to analyze, from techno-economic's point of view, the fluorescent tubes replacement of a typical office building with LED tubes. Using the evaluation of the Lighting Energy Numeric Indicator has been possible to point out that the replacement of the fluorescent tubes allows a reduction in energy consumption for lighting higher than 50% with an obvious reduction in the annual operating cost. For the lamps replacement, in the case study have been estimated a simple payback time of less than 5 years. The methodological approach used by the Authors, although based on a case study, can be extended to numerous office buildings because the analyzed configurations (use and dimension of the rooms, type and features of the luminaires) can be considered significantly representative of this type of buildings. The choice of the LED sources that are suitable for the fluorescent lamps replacement must be preceded by a careful lighting analysis in order to ensure the compliance with the standards requirements.

Keywords: LED lighting; lamps replacement; office buildings lighting; energy consumptions evaluation; operating costs of lighting systems

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