A case study for developing eco-efficient street lighting system in Saudi Arabia

Abstract

It is now well-known phenomenon that energy efficiency has highest short-term pay out period to decrease overall energy consumption. The replacement of conventional lighting technology with innovative lighting solutions can save up to 40 % of lighting energy. The ecological evaluation of street light provision system in King Abdulaziz University (KAU), Jeddah is carried out using Sustainable Process Index (SPI) methodology. This study is carried out selecting three commonly used street illuminating devices i.e. High Pressure Sodium (HPS) lamps, Compact Fluorescent (CF) lamp and Light Emitting Diode (LED). The results show that energy consumption can be decreased by a factor of 1 to 4 by replacing HPS lamp with high efficiency LED lamp. Similarly, environmental assessment results reveal that ecological footprint as well as carbon footprint caused by lighting service can also be lowered by replacing HPS and CF lamps with LED lamps.

Keywords: Saudi Arabia; Energy consumption; Lighting technology; Street lighting