Technical assessment of captive solar power plant : a case study of Senai airport, Malaysia

S. Sreenath[a], K.Sudhakar[b c], A. F. Yusop[b]
[a] Renewable Energy and Energy Efficiency Research Cluster, Universiti Malaysia Pahang, Malaysia
[b] Faculty of Mechanical and Automotive Engineering Technology, Universiti Malaysia Pahang, 26600, Malaysia
[c] Energy Centre, Maulana Azad National Institute of Technology Bhopal, India

ABSTRACT

Solar PV system in the airport environment is a relatively new application. Unlike land-based solar systems, the site selection for the airport-based PV power plant is a complicated process and lacks proper methodology. The objective of this work was to develop a general sitting procedure for an airport-based solar PV system and identify ideal sites for solar farms in Senai International airport, Malaysia. Feasible sites were selected with due consideration to airport and aviation compatibility constraints. Next, suitability of such selected sites is assessed based on environmental impact and proximity to electrical infrastructure. Using glare prediction software, the adherence to FAA's solar interim policy is assessed. Eleven (11) sites which lie within the airport are chosen for the study. The duration of glare from sites 2, 3, 4, 6 were 1125, 4724, 3805, 1125 min receptively. As a result, design parameters are changed for these sites. The results of the study showed that the solar PV potential and theoretical energy generation from the selected sites of the airport were 12.50 MW and 16,745 MWh respectively. The knowledge on the suitability of sites and prior glare assessment increases the level of confidence to airport stakeholders and project developers.