

ABSTRACT

The high demand for electrical energy in commercial buildings such as shopping centers leads to large operational costs and full dependence on conventional energy sources. The Delta Plaza Surabaya building, as one of the large shopping centers, is still fully dependent on electricity supply from PLN. This study aims to analyze the potential for energy and cost savings through the implementation of a Solar PV system, and evaluate its feasibility using the Levelized Cost of Energy (LCOE) approach. The method used involves the conversion of annual energy consumption into PLTS capacity, investment calculations, energy production, and long-term economic projections. The results show that the PLTS system with a capacity of 4,622.102 kWp can produce 7 million kWh per year with an LCOE of IDR 425.82/kWh, lower than the PLN tariff of IDR 1,035.78/kWh. The potential savings reached 58.9% or around Rp 4.69 billion per year with a payback period of around 11 years and 7 months. The conclusion of this research is that the PLTS system is considered technically and economically feasible to be implemented as a long-term energy efficiency strategy.

Keywords: Delta Plaza, renewable energy, energy efficiency, Levelized Cost of Energy (LCOE), solar PV.