

Perancangan dan Analisis Tekno Ekonomi PLTS Rooftop On-Grid System di Tefa Fish Canning Politeknik Negeri Jember Menggunakan Software HelioScope (Design and Techno-Economic Analysis of On-Grid System Rooftop Solar Power Plant at Fish Canning Tefa at State Polytechnic of Jember Using HelioScope Software). Risse Entikaria Rachmanita, S.Pd., M.Si

Moh. Syafrizal Nur Widyanto
Study Program of Renewable Energy Engineering
Majoring of Engineering
Program Studi Teknik Energi Terbarukan
Jurusan Teknik

ABSTRACT

The need for electrical energy is increasing along with population growth and technological developments. Most of the energy needs in Indonesia come from fossil energy which has limitations and is not environmentally friendly and requires emissions. Indonesia has the potential for solar electrical energy with solar irradiation of about 4.8 kWh/m². Therefore, we need a power plant from renewable and environmentally friendly energy sources, one of which is the Solar Power Plant (PLTS). The purpose of this research is to design an on-grid system roof PV and a techno-economic analysis using HelioScope software. This design requires 68 solar modules from the Longi Solar LR5-72HPH-550M brand and an inverter from the Huawei SUN2000-30KTL-M3 brand. The estimated production of electrical energy produced is 46,307.4 kWh per year in the first year. The initial investment cost for this PLTS system is Rp. 465,951,967. The estimated savings for 25 years is Rp. 797,037,217.42. Economically, based on the feasibility analysis using the method based on the calculation of the LWBP tariff, the NPV value of Rp. 10,926,756, BCR 1.33 and PBP 16.17 years. Meanwhile, based on the feasibility analysis using the method based on the LCoE calculation, the NPV value of Rp. 48,432,272, BCR 1.43 and PBP 15 years. So, based on the research that has been done, the construction of this rooftop solar power plant is feasible to be realized. The estimated reduction in CO₂ emissions from the design of roof PLTS for 25 years is 805.712.45 kg CO₂.

Keywords: *PLTS, On-Grid, HelioScope, Techno-Economic, Savings.*