

Perencanaan dan Analisis Tekno Ekonomi PLTS Rooftop Berbasis On Grid Pada Gedung Teknologi Pertanian Politeknik Negeri Jember Menggunakan Software PVsyst. (*Design and Techno-Economic Analysis of On Grid Rooftop Solar Power Plant in the Agricultural Technology Building Jember State Polytechnic Using PVsyst Software*). Supervisor: Mochammad Nuruddin, S.T., M.Si

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ABSTRACT

Increasing energy needs are directly proportional to population growth and technological developments. Most of the energy in Indonesia is currently obtained from fossil energy sources which have limitations and in an inhospitable environment with high emissions. In Indonesia there is great potential to utilize solar thermal energy as a renewable and environmentally friendly energy source. The potential for solar thermal energy in Indonesia reaches 4.8 kWh/m² and can be used as an energy source for Solar Power Plants (PLTS). The method of this research is a quantitative method used in planning the construction of on grid PLTS systems and techno-economic analysis using the PVSyst software. The results obtained from this plan require the components of 40 Longi Solar LR5-72HPH-550M solar panels and 1 Huawei SUN2000-20KTL-M2 inverter. The estimated production of electrical energy is 34,339.32 kWh/year in the first year. The initial investment cost for this PLTS system is Rp. 318,394,986. The estimated savings obtained for 25 years amount to IDR 854,734,570. Economically, based on the feasibility analysis using the method based on the calculation of the LWBP rate, the NPV value is Rp. 74,246,383, BCR 2.26 and PBP 9.8 years. Based on the feasibility analysis using the method based on LCoE calculations, the NPV value was Rp. 138,776,660, BCR 2.61 and PBP 8.4 years. Based on the research that has been done, the construction of PLTS in the Agricultural Technology Building is feasible.

Keywords: *On-Grid, Savings, PLTS, PVsyst, Techno- Economy*