

ABSTRACT

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Title : Planning of Off Grid Solar Power Plant (PLTS) at the
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Electrical energy is a major human need in daily life, but most of it is still met by fossil fuel-based energy sources that contribute significantly to the increase of carbon in the atmosphere, thus triggering global warming. As one of the steps to reduce carbon dioxide (CO₂) emissions. This research aims to design an Off-Grid Solar PV system that is able to meet the daily electrical energy needs of the building, provide backup energy for 3 days without sunlight, and reduce carbon dioxide emissions. The research method includes analyzing the potential of solar radiation, calculating the building's energy needs, designing the PLTS system (including solar panels, batteries, and inverters), and analyzing the efficiency of the system in producing energy and reducing carbon emissions. The results showed that the designed PLTS system has an installed power capacity of 164 kWp, with energy generated of 766,844 kWh/day or equivalent to 279 MWh/year. The implementation of this system is able to reduce carbon dioxide emissions by 293.892 kg CO₂/year. The analysis shows that the high solar radiation potential and adequate building roof area support the optimal performance of the PLTS system. With these results, the construction of Off-Grid PLTS in the Electrical Engineering Laboratory Building is not only able to meet the building's energy needs independently, but also makes a positive contribution to environmental sustainability and carbon emission reduction.

Keywords: Carbon dioxide emissions, Green Campus, Off-Grid Solar PV.