

***Techno-Economic Analysis of a Wet Coffee Bean Peeling and Drying Machine
with Solar Panel Innovation as a Source of Electrical Energy***

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ABSTRACT

Electricity is a primary necessity in human life. However, electricity generation in Indonesia still dominates using fossil energy sources. Fossil energy cannot be used sustainably and produces high emissions of exhaust gases, which in the long run can have a negative impact on the environment. Renewable energy sources are environmentally friendly sustainable sources of energy like sunlight. Indonesia has large enough solar irradiation potential to be used as a source of solar power plants. (PLTS). The offgrid system is a PLTS system that stands on its own without a PLN power connection. Offgrid systems can be applied to a wide variety of devices. One of them is a coffee seed huller and dryer. Solar-powered coffee-seed huller and dryers are an innovation of machines for the mechanical removal of wet coffee seeds skin and coffee bean dryers using a source of electricity from sunlight converted through solar panels. The innovation of this device can be a solution for the development of coffee processing and reducing reliance on fossil fuels while reducing greenhouse gas emissions. In manufacturing machines it's necessary to make calculations of manufacturing one of them in terms of techno-economic. Techno-economic analysis methods used are Net Present Value (NPV), Payback Period (PP), Benefit Cost Ratio (B/C), Return of Investment (ROI), and Break Even Point (BEP). The calculation of the economic viability of the investment machine indicates NPV of Rp 7.142.380, PP 1 month 23 days, BCR 4,96, ROI 0,588 %/year, and BEP of Rp 7.081.909. Based on the calculations with the method NPV, PP, BCR, ROI solar wet coffee seed remover and dryer machines are worth to investing.

Keywords: *Coffee bean, dryer machine, huller machine, solar panel offgrid, solar power*