Design of a Wet Coffee Bean Peeling and Drying Machine with Solar Panel Innovation as a Source of Electrical Energy

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ABSTRACT

Indonesia is the world's fourth largest coffee producer, after Brazil, Vietnam, and Colombia. Wet coffee processing has a significant impact on the quality of the coffee produced. In general, Indonesian coffee producers employ a horizontal single cylinder mechanical peeler. This sort of cylinder, fitted with four cylindrical eyes, can remove dry coffee skin at a rate of 75-100 kg/hour. There are two techniques for drying that is conventional solar drying and mechanical drying with a drying machine. These limits can increase the time, cost, and energy required to produce coffee. This is one of the most significant issues confronting coffee farmers, as it is claimed to lower income. To address these issues, a renewable energy-based coffee bean peeling and drying system is required that reduces the use of fossil fuels while also benefiting farmers at a reasonable cost. The design procedures include literature research, tool planning, tool and material collecting, tool fabrication, testing, and assessment. The peeling machine consumes 47 Watt at level 1 speed with 60 rpm speed, which produces 480 kg/hour, 52 Watt at level 2 speed with 75 rpm speed, which produces 600 kg/hour, 55 Watt at level 3 speed with 83 rpm speed, which produces 900 kg/hour, 357 Watt on the drying machine, and 2,544 Watt when the machine is idle. The average moisture content of the drying machine reduced by 10% each hour.

Keywords: *Coffee Bean Dryer, Coffee Bean Huller Machine, Solar Panel*