

**Analisis Intensitas Radiasi Matahari terhadap Daya Keluaran
Panel Surya pada Alat ICDP MOSS**
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ABSTRAK

Peran energi listrik saat ini bagi manusia sangatlah penting, hampir setiap kegiatan yang manusia lakukan membutuhkan listrik di dalamnya. Namun, ketersediaan sumber energi listrik konvensional seperti fosil semakin menipis serta harganya yang semakin mahal. Energi matahari memiliki potensi yang tinggi sebagai sumber energi terbarukan di Indonesia dengan durasi penyinaran sekitar 2400 jam per tahun dan rata-rata intensitas radiasi $4,8 \text{ kWh/m}^2$ per hari. Pemanfaatan energi matahari membutuhkan panel surya dengan *solar cell* atau komponen fotovoltaik agar dapat mengkonversi energi dari iradiasi matahari menjadi energi listrik. Penelitian ini dilakukan untuk mengetahui pengaruh intensitas radiasi matahari terhadap daya keluaran serta efisiensi panel surya pada Alat *Integrated Coffee Dryer-Pulper Machine Off-Grid Solar System* atau ICDP MOSS yang diterapkan di kediaman Bapak Kasim selaku coordinator kelompok tani Sumber Kembang. Penelitian ini terbagi menjadi beberapa tahap yaitu studi literatur, pengumpulan data, pengolahan dan analisis data, serta kesimpulan. Metode analisis data dilakukan melalui beberapa tahap perhitungan, meliputi perhitungan faktor pengisian panel surya, perhitungan daya keluaran, perhitungan daya masukan, dan perhitungan efisiensi panel surya. Berdasarkan hasil penelitian dapat diketahui bahwa intensitas radiasi matahari dapat mempengaruhi daya keluaran panel surya pada Alat ICDP MOSS serta rata-rata efisiensi panel surya yang digunakan yaitu 17,39%.

Kata Kunci: Efisiensi Panel Surya, Intensitas Radiasi Matahari, Panel Surya.

***Analysis of Solar Radiation Intensity on Solar Panel Output
Power on the ICDP MOSS Tool***

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ABSTRACT

The role of electrical energy today for humans is very important, almost every activity that humans do requires electricity in it. However, the availability of conventional electrical energy sources such as fossils is running low and the price is getting more expensive. Solar energy has high potential as a renewable energy source in Indonesia with an irradiation duration of about 2400 hours per year and an average radiation intensity of 4.8 kWh/m² per day. Utilization of solar energy requires solar panels with solar cells or photovoltaic components in order to convert energy from solar irradiation into electrical energy. This research was conducted to determine the effect of solar radiation intensity on the output power and efficiency of solar panels on the Integrated Coffee Dryer-Pulper Machine Off-Grid Solar System or ICDP MOSS tool applied at the residence of Mr. Kasim as the coordinator of the Sumber Kembang farmer group. This research is divided into several stages, namely literature study, data collection, data processing and analysis, and conclusions. The data analysis method is carried out through several stages of calculation, including the calculation of the solar panel charging factor; calculation of output power; calculation of input power; and calculation of solar panel efficiency. Based on the results of the study, it can be seen that the intensity of solar radiation can affect the output power of solar panels on the ICDP MOSS Tool and the average efficiency of solar panels used is 17.39%.

Keyword: *Solar Panel, Solar Panel Efficiency, Solar Radiation Intensity.*