ANALISA EFESIENSI ENERGI LISTRIK PADA PROSES PENGOLAHAN MINYAK SAWIT PADA PT SAMUDERA SAWIT NABATI DI SUBULUSSALAM

ABSTRAK

Energi listrik merupakan komponen penting dalam menunjang operasional pabrik kelapa sawit karena hampir seluruh proses pengolahan dijalankan menggunakan peralatan listrik. Tingginya konsumsi energi listrik berpengaruh langsung terhadap biaya produksi dan efisiensi operasional, sehingga pengelolaan energi yang tepat menjadi faktor kunci dalam meningkatkan kinerja pabrik. *Penelitian ini bertujuan untuk menganalisis konsumsi serta tingkat efisiensi energi listrik pada proses pengolahan minyak kelapa sawit di PT Samudera Sawit Nabati, Subulussalam*. Penelitian dilakukan melalui observasi lapangan, pengukuran langsung parameter kelistrikan, serta pengumpulan data operasional pada enam stasiun proses, yaitu stasiun sterilizer, thresher, pressing, klarifikasi, pengolahan biji dan ampas kempa, serta boiler. Parameter yang dianalisis meliputi daya listrik, konsumsi energi, dan efisiensi penggunaan energi pada masing-masing stasiun proses. Hasil penelitian menunjukkan bahwa total kebutuhan daya listrik seluruh stasiun sebesar 468,1 kW, dengan kapasitas pembangkit listrik tenaga uap sebesar 600 kW. Konsumsi daya tertinggi terdapat pada stasiun pengolahan biji dan ampas kempa sebesar 174,38 kW, sedangkan konsumsi terendah terjadi pada stasiun sterilizer sebesar 25,46 kW. Rata-rata efisiensi energi listrik sistem mencapai 72,1%, dengan efisiensi tertinggi pada stasiun pressing sebesar 81% dan terendah pada stasiun pengolahan biji dan ampas kempa sebesar 64%. Perbedaan efisiensi dipengaruhi oleh tingkat pembebanan motor, durasi operasi peralatan, serta jumlah dan jenis mesin. Hasil ini menunjukkan adanya peluang peningkatan efisiensi melalui optimalisasi beban, perawatan peralatan, dan pengelolaan sistem kelistrikan yang lebih efektif.

Kata kunci: *efisiensi energi listrik, konsumsi energi, pabrik kelapa sawit, sistem kelistrikan, turbin uap.*

ANALYSIS OF ELECTRICAL ENERGY EFFICIENCY IN PALM OIL PROCESSING AT PT SAMUDERA SAWIT NABATI IN SUBULUSSALAM

ABSTRACT

Electrical energy is a critical component in supporting the operation of palm oil mills, as nearly all processing stages rely on electrically driven equipment. High electricity consumption has a direct impact on production costs and operational efficiency, making effective energy management essential for improving overall plant performance. *This study aims to analyze electricity consumption and the level of energy efficiency in the palm oil processing system at PT Samudera Sawit Nabati, located in Subulussalam*. The research was conducted through field observations, direct measurement of electrical parameters, and the collection of operational data from six main processing stations, namely the sterilizer, thresher, pressing, clarification, kernel and press cake processing, and boiler stations. The analyzed parameters include electrical power demand, energy consumption, and energy efficiency at each processing station. The results show that the total electrical power demand of all processing stations is 468.1 kW, while the available steam power plant capacity is 600 kW. The highest power consumption occurs at the kernel and press cake processing station, reaching 174.38 kW, whereas the lowest consumption is found at the sterilizer station at 25.46 kW. The average electrical energy efficiency of the system is 72.1%, with the highest efficiency recorded at the pressing station (81%) and the lowest at the kernel and press cake processing station (64%). Variations in energy efficiency are influenced by motor loading conditions, equipment operating duration, and the number and type of machines used. These findings indicate that there is still potential to improve electrical energy efficiency through load optimization, enhanced equipment maintenance, and more effective electrical system management.

Keywords: *electrical energy efficiency, energy consumption, palm oil mill, electrical system, steam power plant*