ABSTRAK

RANCANG BANGUN ALAT PENCETAK BRIKET TEMPURUNG KELAPA OTOMATIS BERBASIS PLC

(2025: 63 Halaman + 37 Gambar + 6 Tabel + Daftar Pustaka + Lampiran)

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Krisis energi akibat ketergantungan pada energi fosil mendorong pentingnya pemanfaatan energi terbarukan di Indonesia. Salah satu solusi potensial adalah penggunaan biomassa, seperti tempurung kelapa, untuk menghasilkan briket arang sebagai bahan bakar alternatif. Briket arang tempurung kelapa memiliki nilai kalor tinggi, menghasilkan sedikit asap, serta telah diminati pasar ekspor. Penelitian ini bertujuan untuk merancang dan menguji alat pencetak briket otomatis berbasis *Programmable logic controller* (PLC). Sistem dirancang dengan kombinasi motor AC, *screw conveyor*, aktuator pneumatik, dan sensor proximity kapasitif. Hasil pengujian menunjukkan bahwa alat mampu melakukan proses pencetakan dan pemotongan briket secara otomatis dan efisien. Motor bekerja stabil selama 15 menit, sensor proximity mendeteksi briket secara akurat, dan produk briket yang dihasilkan memiliki bentuk yang relatif seragam. Alat ini dinilai layak untuk skala produksi kecil hingga menengah, dengan potensi pengembangan lebih lanjut pada aspek mekanik dan otomatisasi.

Kata kunci: briket arang, tempurung kelapa, PLC, biomassa, energi terbarukan, otomatisasi.

ABSTRACT

DESIGN OF A PLC-BASED AUTOMATIC COCONUT SHELL BRIQUETTE PRINTER

(2025: 63 Pages + 37 Figure + 6 Tables + Bibliography + Appendidix)

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The energy crisis resulting from reliance on fossil fuels has emphasized the importance of renewable energy utilization in Indonesia. One promising solution is the use of biomass, such as coconut shells, to produce charcoal briquettes as an alternative fuel source. Coconut shell charcoal briquettes have a high calorific value, produce minimal smoke, and are already in demand in export markets. This study aims to design and test an automatic briquette pressing machine controlled by a Programmable logic controller (PLC). The system integrates an AC motor, screw conveyor, pneumatic actuator, and capacitive proximity sensor. Experimental results show that the machine can perform briquette pressing and cutting processes automatically and efficiently. The motor operated steadily for 15 minutes, the proximity sensor accurately detected the briquettes, and the resulting products had relatively uniform shapes. This machine is considered feasible for small- to medium-scale production and has potential for further development in mechanical and automation aspects.

Keywords*: charcoal briquettes, coconut shell, PLC, biomass, renewable energy, automation.*