

ABSTRAK

ANALISIS PENGARUH RASIO MASSA BIOPELET CAMPURAN SEKAM PADI DAN TEMPURUNG KELAPA TERHADAP KNERJA KOMPOR BIOMASSA

(Reyna Amelia Br Tanjung, 2026: 54 Halaman, 5 Tabel, 13 Gambar)

Energi merupakan salah satu kebutuhan utama manusia yang hingga saat ini masih didominasi oleh bahan bakar fosil. Namun, ketersediaannya yang terus menurun mendorong pemanfaatan sumber energi alternatif terbarukan, salah satunya biomassa. Penelitian ini mengkaji pemanfaatan limbah sekam padi dan tempurung kelapa yang melimpah di Indonesia sebagai bahan baku pembuatan biopellet. Penelitian ini bertujuan untuk menganalisis pengaruh variasi rasio massa campuran sekam padi dan tempurung kelapa terhadap kinerja kompor biomassa serta menentukan rasio campuran yang paling optimal. Penelitian dilakukan secara eksperimental dengan membuat biopellet menggunakan perekat tepung tapioka dan variasi rasio massa bahan baku. Parameter yang dianalisis meliputi nilai kalor, laju konsumsi bahan bakar (*Fuel Consumption Rate*), *boiling time*, efisiensi termal, serta analisis proksimat yang terdiri atas *inherent moisture*, *ash content*, *volatile matter*, dan *fixed carbon*. Hasil penelitian menunjukkan bahwa rasio massa campuran berpengaruh terhadap karakteristik biopellet dan kinerja kompor biomassa. Komposisi 75% sekam padi : 25% tempurung kelapa menghasilkan performa terbaik secara keseluruhan, sedangkan peningkatan proporsi tempurung kelapa cenderung meningkatkan nilai kalor dan kandungan *fixed carbon* serta menurunkan *inherent moisture* dan *ash content*. Hasil penelitian ini menunjukkan bahwa biopellet berbahan baku sekam padi dan tempurung kelapa berpotensi sebagai bahan bakar alternatif yang ramah lingkungan untuk kompor biomassa rumah tangga.

Kata Kunci : Biopellet, Sekam Padi, Tempurung Kelapa, Kompor Biomassa, Efisiensi Pembakaran.

ABSTRACT

ANALYSIS OF THE EFFECT OF MASS RATIO OF RICE HUSK AND COCONUT SHELL BIOPELLET BLENDS ON THE PERFORMANCE OF A BIOMASS STOVE

(Reyna Amelia Br Tanjung, 2026: 48 Pages, 5 Tables, 13 Images)

Energy is one of the primary human needs and is currently still dominated by fossil fuels. However, the continuous depletion of fossil fuel reserves has increased the need for renewable alternative energy sources, such as biomass. This study investigates the utilization of rice husk and coconut shell waste, which are abundantly available in Indonesia, as raw materials for biopellet production. The objectives of this research were to analyze the effect of different mass ratios of rice husk and coconut shell on the performance of a biomass stove and to determine the optimum mixing ratio. The study employed an experimental method by producing biopellets with various mass ratios using tapioca starch as a binder. The evaluated parameters included calorific value, fuel consumption rate, boiling time, thermal efficiency, and proximate analysis consisting of inherent moisture, ash content, volatile matter, and fixed carbon. The results showed that the mass ratio significantly affected both the characteristics of the biopellets and the performance of the biomass stove. The 75% rice husk : 25% coconut shell composition produced the best overall performance, while increasing the proportion of coconut shell improved the calorific value and fixed carbon content and reduced the inherent moisture and ash content. These findings indicate that rice husk and coconut shell biopellets have good potential as an environmentally friendly alternative fuel for household biomass stoves.

Keywords: Biopellets, Rice Husk, Coconut Shell, Biomass Stove, Thermal Efficiency.