

Electricity Generator Working from Paddy Husk

Maduwanthi, A.L.^{1*}, Nirmala, R.H.¹, Chanka, R.W.B.M.T.¹, Maduranga, V.G.K.¹

¹*Department of Materials Technology, Faculty of Technology,
Rajarata University of Sri Lanka.*

**ent1718054@tec.rjt.ac.lk*

The research focuses on innovative design, development, and performance evaluation of an electricity generator powered by paddy husk, an abundant agricultural byproduct, with a specific emphasis on addressing rural electrification challenges in Sri Lanka. Approximately 20% of the country's total paddy production, from both the Yala and Maha seasons, constitutes paddy husk. The study aims to assess the feasibility and sustainability of utilizing paddy husk as a viable energy source. Beginning with an in-depth analysis of key properties of Sri Lankan paddy husk, including moisture content, calorific value, and combustion characteristics, the research progresses to the meticulous design of the prototype generator. This innovative generator uses advanced gasification techniques to efficiently convert paddy husk into combustible gases, paving the way for a sustainable future of electricity generation from agricultural byproducts. The fabrication process, including raw material collection, paddy husk preparation, combustion, and gas content analysis, adheres to stringent environmental standards. The study showcases the generator's effectiveness in converting paddy husk into electrical power, highlighting its consistent production, adaptability to various conditions, and competitive conversion rates. Despite challenges in turbine design and DC motor usage, it suggests improvements for broader implementation. Emphasizing the critical need for sustainable energy solutions, the prototype achieved a maximum of 0.014A Direct Current (DC) electricity, utilizing a 2.4V DC motor, resulting in a maximum voltage of 0.84V DC and a power output of 0.02 W. These findings represent a successful milestone toward a scalable and impactful energy solution for widespread application.

Keywords: *Rural electrification; Paddy husk; Sustainable energy; Generator design; Gasification technology; Environmental standards*