

Electricity Generation from Waste Heat in Coconut Charcoal Production

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This project delves into the transformative potential of waste heat generated during traditional coconut charcoal production in Sri Lanka, focusing specifically on 'Wanasinghe' Holdings' pit-type charcoal factory in Pannala, Sri Lanka. The proposed innovative system captures and utilizes this underutilized resource, converting it into electricity through steam-powered turbines. Our multifaceted approach combines research, field visits, industry collaboration, and laboratory tests to quantify the significant amount of wasted heat in the traditional pit method and assess its viability for steam generation. Calculations indicate the system's capacity to generate electricity through a turbine-connected generator. The implemented methodology includes a thorough literature review, hands-on site visits, consultations with experts, and crucial testing, including an enthalpy test. The results are remarkably promising, showcasing an impressive 133.47 kW output power and generating a substantial 3203.28 kWh of electricity daily. These findings solidify the potential of waste heat recovery in Sri Lanka's coconut charcoal industry, unlocking exciting avenues for further exploration and implementation in the pursuit of sustainable energy solutions.

Keywords: *Waste heat recovery; Electricity generation; Steam-powered turbines; Sustainable energy solutions; Sri Lanka renewable energy*