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Assessment of Technical and Financial Viability of Producing Biomass Pellets with the Use of Brewery Sludge and Saw Dust for Local Industrial Boilers**Lansakara A.* , Bandara R.***University of Kelaniya, Dalugama, Sri Lanka***akila4529@gmail.com***Abstract**

Energy has huge demand in the world present and future. The best way to meet the high demand increment in energy sector is through diversification. In this context, biomass appears as an attractive source for a number of environmental, economical, political and social considerations. There are several techniques exist in the world to obtain energy from biomass. Among these techniques, bio mass press pelleting is a newly discovered feasible and widely acceptable technique in many countries. In Sri Lankan context, Sustainable Energy Authority of Sri Lanka is focusing on replacing 85 MW of fossil fuel by renewable energies including biomass energy by 2037. At the same time, there is no proper economically viable solution for brewery sludge and saw dust management and these have become economical burden to the industries. This study was designed to make use of brewery sludge and saw dust by producing mechanically stable, financially feasible, energy rich and viable biomass pellets to use in biomass boilers in local industries. Brewery sludge and saw dust were pre-proceed by drying and grinding then used in different proportions (25:75-B1, 50:50-B2 and 75:25-B3) to produce pellets using a hydraulic type pellet press machine maintaining 65-70 MPa. Energy properties including moisture content, volatile matter content, ash content, fixed carbon and calorific value and mechanical properties including bulk density, compressed density, relaxed density, durability, water resistance capacity and water boiling time were measured and fuel wood value indices (FVI) of produced pellets were estimated using standard methods in 5 replicates from each type of pellets. All the parameters were subjected to one way ANOVA in MINITAB version 14 after following Anderson Darling Normality test. Tukey's pair wise comparison was carried out to find out whether the values are significantly different. Cost Benefit Ratio, Internal Rate of Return and Net Present Value were calculated to find out the financial feasibility. The best type of pellet was selected and evaluated with the international standards and some cited findings. B3 pellets are the best mixing saw dust to brewery sludge in 50:50 to produce pellets are within the standards. According to the all analysis performed, the production of brewery sludge saw dust pellets are found financially and technically feasible. With the obtained results, it is recommended to start producing pellets as a commercial venture for biomass pelleting with use of brewery sludge and saw dust.

Keywords: Pelleting, Saw dust, Brewery sludge, Biomass