

Biogas Production from University Canteen Waste: Effect of Organic Loading Rate and Retention Time

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Abstract : University canteen waste was used as raw material to produce biogas in Faculty of Industrial Technology, Islamic University of Indonesia. This faculty was home to more than 3000 students and lecturers who work and study for 5 days/week (8 hours/day). It produced approximately 85 ton/year organic fraction of canteen waste. Yet, this waste had been dumped for years in landfill area which cause severe environmental problems. It was proposed to utilize the waste as raw material for producing renewable energy source of biogas. This research activities was meant to investigate the effect of organic loading rate (OLR) and retention time (RT) of continuous anaerobic digestion process for 200 days. Organic loading rate was set at value 2, 3, 4 and 5 g VS/l/d whereas the retention time was adjusted at 30, 24, 18 and 14.4 days. Optimum condition was achieved at OLR 4 g VS/l/d and RT 24 days with biogas production rate between 0.75 to 1.25 liter/day (40-60% CH₄). This indicated that the utilization of canteen waste to produce biogas was promising method to mitigate environmental problem of university canteen waste. Furthermore, biogas could be used as alternative energy source to supply energy demand at the university. This implementation is simultaneous solution for both waste and energy problems to achieve green campus.

Keywords : canteen waste, biogas, anaerobic digestion, university, green campus

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