

## Food Waste based Anaerobic Digestion with Centralized Monitoring System

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Globally about 1.6 billion tonnes of food is wasted annually. This is equivalent to the food produced from 28% of the world's arable land and has the potential to reduce about 3.3 billion tonnes of CO<sub>2e</sub>. About 10 million of food waste is generated in the UK of which 70% comes from households. In Thailand food waste is usually intermingled with other waste types and collected as MSW, 27.02 million tonnes in 2016, and is treated extensively in 106 landfill sites. MSW consists of about 51.3% and 42-68% of Food/organic waste in UK and Thailand, respectively. In Thailand 18% of the total MSW is recycled, 31% landfilled, and the balance 51% is disposed improperly. Thailand government has introduced feed-in tariff to promote energy generation from biodegradable wastes. It is expected that by 2036, 600MW of electricity and 1,283 ktoe of heat will be generated from biodegradable waste. Thailand also has prioritized the involvement of community people for wider dissemination of biogas technology and to establish a proper biogas system network through the installation of decentralized community scale biogas digesters. The promotion of community scale biogas digesters will enhance public awareness, increase waste recycling rate to achieve the combined effects, and improve the efficiency of source-separated waste collection system. Adoption of this approach has the potential and will significantly enhance the waste management scenario and improve green energy access. The Newton fund biogas project, a collaborative research approach between the Loughborough University, UK, with the Asian Institute of Technology (AIT), Thailand, with the vision to promote community scale decentralized anaerobic digestion system for energy and resource recovery started in 2016. This paper describes the design and development stages of community scale anaerobic digester equipped with controlled mechanisms and remote monitoring system considering source-separated food waste as feedstock, and present the economic and environmental benefits.

**Keywords:** food waste, anaerobic digestion, centralized monitoring system, UK-Thailand collaboration