Assessment of economical biogas production from chilean municipal solid waste in a decentralized off-grid strategy

Muñoz P.

Muñoz L.

Cordero C.

Bibire L.

Morales M.P.

The management of municipal solid waste (MSW) is one of biggest challenges that developing countries are currently facing. Despite several environmental friendly alternatives being available, in Chile 90 % of MSW is disposed of in landfills, which produces large amounts of greenhouse gases (GHG) by the uncontrolled anaerobic digestion of its organic fraction. In addition, the way in which MSW is collected and transported increases the negative impact to the environment, especially when wastes classification is not properly performed at the generation point. On the other hand, the use of resulting biogas, in a decentralized off-grid form, at the generation point, could directly reward to waste producers with economic saving. This strategy will reinforce population motivation and an important reduction of the GHG emissions can be expected. Thus, this paper explores the biogas potential of food wastes by using reactors with no heating and stirring devices, with the aim of assessing the minimum expectable energy and CO2,eq savings. Based on laboratory tests at batch and semi-continuous mode and Chilean historical data, it is concluded that more than 1,704 Gg of CO2,eq can be avoided per year and an average of 425 GWh primary energy may be saved by Chilean householders.

CO2 emission

Food waste

Household scale

Psychrophilic

Waste management