# Biogas harvesting from organic fraction of municipal solid waste as a renewable energy resource in Malaysia: a review

## ABSTRACT

The accumulation of organic fraction in municipal solid waste (OFMSW) is now becoming scarce globally due to population and economic boosts, especially in Malaysia. Municipal solid waste (MSW) landfills remain the predominant end-state for waste disposal in most developing countries. Unsustainable MSW management accelerates environmental degradation through landfill gaseous (LFG) emissions of mainly methane (CH4) and carbon dioxide (CO2), which promote global warming that finally is affecting human health. Recently, harnessing CH4 from anaerobic digestion of solid waste has attracted more interest and promised betterment in MSW management. With its current amount of more than 50%, organic material in landfills is estimated to emit 310,225 CH4/year with carbon credit of US$ 85.93, which can potentially generate 2.20×109 kWh of electricity valued at US$ 220 million. This present work is a review manuscript that discusses the state-of-the-art anaerobic digestion of OFMSW as treatment in term of waste diversion from a landfill. The study also estimates the renewable energy potentials from OFMSW waste diversion. Finally, this paper discusses the benefits of harnessing biogas from the perspectives of environmental benefits, energy recovery, and economics.

**Keyword:** Anaerobic digestion; Biogas; Carbon capture; Environmental remediation; Environmental biotechnology; Waste treatment; Waste minimization