Methane on Wheels

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Global warming has had a worldwide impact with methane gas being a significant contributor. According to calculations by the Environmental Defence Fund (EDF) based on a 2018 Intergovernmental Panel on Climate Change (IPCC) report, 25% of all man-made global warming is caused by methane emissions. Methane's molecular structure enables high thermal intake, making it 84 times more potent than CO2 at absorbing heat during the first 20 years after its release. By inventing a portable biodigester with a blender, we aimed to reduce global warming through minimising methane emissions from organic waste. Biodigesters, utilising methanogen microorganisms in the anaerobic digestion of organic waste have been used in agricultural settings for one hundred years. Domestic use has been limited as an estimated 10kg of household organic waste is required to produce enough methane to fuel one hour of cooking. Optimal metabolic digesting rates for methanogens occur between 30-40ºC which is not easy to achieve with installed biodigester tanks. Our portable Methane on Wheels biodigester can be manoeuvred in or out of the sun to optimise methanogen metabolic conditions. It also incorporates a mechanical blender which increases the rate of biogas production by more than 20%. This improved biogas yield was determined through a controlled 50-day investigation of 6 different food types, either blended or unblended, as the independent variable. Methane on Wheels has proven to be a viable and innovative domestic biodigester which recycles household organic waste, produces free fertiliser, provides a sustainable cooking fuel source while also reducing methane emissions.

Awards Won: