



PROJECT SUMMARY

Ref No.: MRIC-PCS-2102	Title: Anaerobic co-digestion of vinasse & poultry wastes for production of organic fertilizer and renewable energy
Local Company: Omnicane Limited	
Collaborating Institution: University of Mauritius	
Project Leader	
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TECHNICAL ABSTRACT	
<p>Omnicane’s Industrial Cane Cluster is based on the Circular Economy concept which makes it unique world-wide. All activities of the cluster are inter-connected and work in synergy by using every waste of each process as an input for another process of valorisation.</p> <p>The rationale behind this project is to create an industrial symbiosis between the waste from the distillery (vinasse) with that from wastes from the poultry industry. The application of anaerobic digestion technology is growing worldwide because of economic and environmental benefits. Vinasse mono-digestion however often fails owing to an accumulation of volatile fatty acids, leading to low pH. Addition of poultry manure to vinasse allows for stable digestion performance by improving the buffer capacity. Furthermore, vinasse allows dilution of total ammonia concentration from the poultry waste avoiding ammonia inhibition. When considering anaerobic digestion of different organic materials there is therefore a potential complementarity between the two types of wastes with poultry wastes having a high nitrogen content and vinasse having a high potassium content. Vinasse and poultry manure co-treatment can thus improve the energy recovery and economic feasibility of installing biogas plants as part of the ethanol production chain. The potential outcomes are as follows:</p>	
<ol style="list-style-type: none"> 1. Production of bioenergy as firm and stable electricity supply which will help in increasing the renewable energy mix on the local grid 	

2. Production of an organic fertilizer from the anaerobic digestate that can be marketed to satisfy the whole southern region's cane planters' needs and help the transition to organic farming.
3. Potential application of the anaerobic technology developed in this project for other agro-industrial wastes on the island.
4. Reduction of organic wastes disposed at the landfill and extending its lifetime.

The aim of this project is to carry out a technical and economic feasibility study on the co-digestion of vinasse and poultry manure as an alternative for agro-waste management in Mauritius. The anaerobic treatability, Biochemical Methane potential (BMP) and nutrient content of the digestates of different mixtures of the two wastes will be determined in laboratory and pilot plant experiments using semi-continuous and continuous anaerobic digesters will be carried out to get insight in design parameters for a full-scale plant. A technical and economic feasibility study will then be carried out for the installation and operation of a full-scale plant at Omnicane.

Key Words: Circular Economy, anaerobic co-digestion, vinasse, poultry waste, biogas, digestate, organic nutrient