## **World Bioenergy Congress and Expo**

June 13-14, 2016 Rome, Italy

Performance evaluation of large scale anaerobic digester using gas mixing for wholesale vegetable complex waste producing biogas and power

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The present case study demonstrated the performance of large scale biogas plant for wholesale vegetable complex waste (30 tonnes per day) using biogas induced mixing arrangement (BIMA) digester for biogas and power generation. The BIMA digester located in Koyambedu, Chennai (India) is one of the unique facilities in India producing biogas and power using wholesale vegetable complex waste, operated successfully for the past eight years. The vegetable complex waste contains predominantly banana stem, cauli flower, cabbage, etc., dumped onsite threatened huge health related, and ground water related issues in and around the market complex. Alternatively, the same was collected and transported to the biogas plant, minced and fed into the BIMA digester produced biogas and power. The average total solids (TS) and volatile solids (VS/ TS) in the minced mixed feed stock material was found to be 21%, and 75% respectively which was amenable for biogas production. The designed OLR, HRT, biogas and power generated during the entire study period was 1250 m<sup>3</sup>/day and 3150 kwh/ day respectively. The daily average biogas and power generated during the entire study period was found to be 0.80 Nm m<sup>3</sup>/kg of VS removed and 1.85 kWh/m<sup>3</sup> of biogas at 60% CH<sub>4</sub> with an average calorific value of 5400 Kcalories/Nm<sup>3</sup> of biogas. The detailed operational strategy adopted to maximize biogas and power yield using wholesale vegetable complex waste are being presented.

## **Biography**

C Prem Ananth Surendran is a part time PhD Scholar in the Bio-energy Research Group of Environmental Technology Department in Central Leather Research Institute (CSIR), Adyar, Chennai, working as a full time Deputy Planner in the Chennai Metropolitan Development Authority (CMDA) Government of Tamil Nadu. He has completed his Master's in Engineering (ME) degree in Urban Engineering, from Department of Civil Engineering, Anna University, Chennai. He has played a key role in developing and planning smart and green cities in Govt. of Tamil Nadu.

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