Session IV

Success Story of Biomethanation Projects in India

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- Background of Project by Spectrum Energies at Kolhapur
- Salient features of Project Process
- Technology Details
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Success Story of Biogas CNG Plant at Kodoli Kolhapur

Highlights:

– Developed on a BOOT (Build, Own, Operate and Transfer) basis
– Daily capacity of approximately 100 tons, or 35,000 annual tons, of sugarcane waste (pressmud)
– Daily production of approximately 7,000 to 9,000 kg’s of Bio-CNG per day
– PESO (Petroleum and Explosives Safety Organization) License for storage and filing of Bio-CNG in high pressure cylinders
– Daily production of organic manure/soil conditioner after further processing for commercial sale
– NOCA (National Organic Certification Association) approved organic manure for further sale to farmers
– MNRE (Ministry of New and Renewable Energy) approved investment subsidy received in early 2013
– Substantial cost savings for industrial customers due to low-cost Bio-CNG use
– Climate friendly – CO2 negative: Biogas-to-CNG conversation is the most productive use of agricultural waste

In partnership with India’s largest sugar producer, Bajaj Hindustan Limited, SREL will convert approximately 30,000 to 50,000 tons of pressmud annually into renewable energy and organic manure/soil conditioner. Construction is expected to start in late-2014.
Step 1: Conversion of Organic Waste into Biogas

Organic, biodegradable waste, or feedstock (pressmud), enters the system for digestion where an anaerobic process using bacteria ferments the wastes and produces biogas as a gaseous bi-product. Several times a day, waste, fresh water and recycled water (over 30% water is reused during plant operations) is fed into digesters, which serve to treat the feedstock, eventually turning it into biogas consisting of mostly methane, as well as carbon dioxide and hydrogen sulphide.
The biogas produced at our plant will contain approximately 60% to 70% methane, 30% to 40% carbon dioxide and trace amounts of hydrogen sulphide. This biogas produced is further processed so that the carbon dioxide and hydrogen sulphide gases are removed. The result is a gas consisting of mostly methane.

Step 2: Biogas Conversion into Bio-CNG
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By using compressors in our bottling plant, the methane and carbon dioxide gases will be stored under high pressures in cylinders. These gases can then be utilized in industrial applications, for fuel in vehicles, electrical power generators and for other heating purposes. With an onsite combined heat and power (CHP) unit, electrical power generation is also viable. The Warana Bio-CNG project will be using a portion of the gas for auxiliary power consumption to run the plant. The waste heat from the CHP unit will also be used to maintain the temperature of the digesters.
Step 3: Organic Manure/Soil Conditioner Use and Storage

- The remaining non-digestible solids exit the digester in the form of a liquid slurry. The liquid slurry is further processed by a separator where solids (dry) are separated and sold as a soil conditioner.

- The liquids from the separation process is sold to local farmers and the remaining portion is stored in an adjacent storage lagoon and eventually recirculated back into the digesters with the feedstock at the beginning of the anaerobic digestion process.

- The liquid Bio-fertilizers (LBF) are suspensions having useful microorganism, which fix atmospheric nitrogen and solubilize insoluble phosphates and potash mobilize and make it available for the plants LBFs have a shelf life of minimum one year, with no health hazards to production workers and are easy to transport.

- Additionally, LBF can be used in drip irrigation and as a component of organic farming.

- Bio-fertilizers are broadly categorized in three ways as Nitrogen Fixing, Phosphate mobilizing, and organic matter decomposers Thus they are eco-friendly as compared to chemical fertilizers
### Other Biomethanation Projects undertaken in Maharashtra

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<tr>
<th>Maharashtra</th>
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<th>Year</th>
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Biomethanation Project using Dairy Waste at Ludhiana (Punjab)

1.0 MW power project based on cattle dung at Haebowal Dairy Complex Ludhiana, Punjab
Biomethanation Project based upon Mixed MSW at Lucknow (Non-Operational)

Biomethanation plant in Lucknow using BIMA technology, 5 MW design capacity, 500 TPD MSW
Biomethanation Project on Mixed Market Waste at Vijayawada (A.P.)

150 kW Power Project Utilizing Vegetable Market and slaughterhouse Wastes at Vijayawada, A.P.
60 MTPD Biomethanation Project at Slaughter House
Waste at Al Kabir Exports (Telangana)

3000 cum biomethanation project for solid waste at Slaughterhouse in Andhra Pradesh
Biomethanation Project on Tannery Waste at TATA International Dewas (M.P.)

2 MTPD Biomethanation Project at TATA International Dewas (M.P.)

5 MTPD Biomethanation Project at Vishram Tanneries, Chennai (TN)
List of Successful Biomethanation projects on Industrial Waste

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Conclusion

- Biomethanation technology has proven credentials for achieving energy recovery from wide spectrum of industrial waste.

- Successful replication of Biomethanation technology with various kind of waste under different geographical and climatic conditions have made it among the best options prevailing in the country.

- Government support along with private funding in terms of Equity participation, loans and other support provides best option to choose for waste to energy project for non-hazardous organic industrial waste.

- With up gradation of technology offered by international vendors in India, its easy to develop real time monitoring based Biomethanation technology projects.

- For India as agrarian economy and disposal of agro-industrial, food and vegetable market waste, Biomethanation can be terms as most versatile technology for Indian conditions.
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