SUMMARY OF INDIA FINDINGS TO DATE
December 2010

1. THE GLOBAL METHANE INITIATIVE

The Global Methane Initiative (GMI) is a partnership to reduce global methane emissions in four main sectors: agriculture, landfills, oil and gas and coal mines. In support of GMI, the U.S. Environmental Protection Agency is conducting livestock and agro-industry resource assessments (RAs). The objective is to identify and characterize the potential for incorporating anaerobic digestion into waste management systems to reduce methane emissions and provide a renewable source of energy. These RAs, together with feasibility studies and demonstration projects of appropriate technologies, will serve as the basis for future country-level policy planning and development of an agricultural methane implementation plan to replicate technologies in targeted sectors.

2. CURRENT INDIA FINDINGS TO DATE (India RA, 2010).

Sector	Description of the sector and assumptions	Direct emissions[1]		Indirect[2]	Total
		CH_4 (MT CH_4 / yr)	CO_2e (MT CO_2e / yr)	Fuel replacement (MT CO_2e / yr)	Direct + Indirect (MT CO_2e / yr)
Dairy farms (milk production)	103 million dairy cattle, 80 million dairy buffalos, considered only medium to large farms (32%)	173,455	3,642,560	686,054	4,328,614
Distilleries	3.25 MMT of ethanol; Assumed only 5% use open lagoons, COD: 110 kg/m^3; WW: 12 m^3/MT	38,729	813,313	153,183	966,495
Dairy plants (milk processing)	109 MMT milk, 35% processed, all have ETP with methane recovery (no baseline emissions) and flaring (potential for emissions offsets), COD: 2.7 kg/m^3, WW: 7 m^3/MT	N/A	N/A	456,297	456,297
Sugarcane mills	348 MMT of sugarcane; Assumed only 5% use open lagoons, COD: 3.2 kg/m^3; WW: 11 m^3/MT	6,915	145,223	27,352	172,575
Fruit and vegetables	79 MMT vegetables, 63 MMT fruits, Assumed only 9% use lagoons, COD: 5 kg/m^3, WW: 20 m^3/MT	5,096	107,018	20,156	127,174
Corn and tapioca starch	660,000 MT of corn starch, 100,000 MT tapioca starch, assumed 14% (corn) and 17% (tapioca) use open lagoons, COD (kg/m^3): 15 (corn), 6 (tapioca); WW (m^3/MT): 8 (corn), 30 (tapioca)	4,858	102,016	19,214	121,230
Total		229,054	4,810,130	905,959	5,716,089

MMT: Million metric tons; COD: Chemical Oxygen Demand; WW: Wastewater generation; ETP: Effluent Treatment Plant
[1]. Baseline methane emissions due to the current waste management system; assumes CO_2 GWP is 21
[2]. Indirect emissions reduction potential: the emissions that would be reduced by fuel replacement through the use of biogas

3. BENEFITS

Anaerobic digestion provides the following benefits:

1) *Water, Greenhouse Gases, and Renewable Energy*: Stabilization of organic wastes and reduction of methane emissions, via combustion of captured methane (biogas) in either a flare or for use as a renewable energy resource. This improved waste management practice also improves kitchen air quality when gas is used as a cook fuel that replaces conventional woody biomass as a fuel source.

2) *Sanitation and Human Health*: Eliminates fly attracting odors thereby reducing this disease vector while also directly reducing pathogen levels in the treated wastewater.

3) *Economics*: Off-setting of purchased fossil fuel energy as methane can be used as a fuel for electricity generation, and/or direct heat, or as a cooking fuel. In addition, many such facilities have availed themselves of carbon credits, further improving the economics of anaerobic digestion.