

SUMMARY OF ECUADOR FINDINGS TO DATE

November 2010

Methane to Markets Support for Livestock and Agro-Industrial Wastes

1. THE GLOBAL METHANE INITIATIVE

The Global Methane Initiative is an initiative to reduce global methane emissions in four main sectors: agriculture, landfills, oil and gas and coal mines. USEPA is conducting livestock and agro-industry resource assessments (RA) in twelve countries. 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, will serve as the basis for future country-level policy planning and efforts to promote implementation.

2. CURRENT ECUADOR FINDINGS TO DATE

Based on data in EPA's Global Anthropogenic Emissions of Non-CO₂ Greenhouse Gases report, in 2005, Ecuador's estimated anthropogenic methane emissions amounted to 15.46 MMTCO₂e. Manure management and wastewater accounted for 13% of Ecuador's total methane emissions. The table below summarizes the current findings of the Ecuador RA (November 2010).

Sector	Description of the sector and assumptions	Direct emissions ¹		Indirect ²	Total
		CH ₄ (MT CH ₄ / yr)	CO ₂ e (MT CO ₂ e / yr)	Fuel replacement (MT CO ₂ e / yr)	Direct + Indirect (MT CO ₂ e / yr)
Distilleries	3 distilleries, 146,000 L/d or ~50,000 MT/yr, all use lagoons, COD: 70 kg/m ³ , WW: 13 m ³ /MT	9,100	191,100	36,000	227,100
Sugar	6 sugar mills, 5 MMT sugarcane, 0.5 MMT sugar, COD: 3 kg/m ³ , WW: 11 m ³ /MT, no emissions offsets since use bagasse to generate electricity	3,700	77,800	N/A	77,800
Palm oil	400,000 MT oil, assumed 90% use open lagoons, COD: 55 kg/m ³ , WW: 0.6 m ³ /MT	2,500	51,800	9,700	61,500
Shrimp processing	61 processing plants, ~130,000 MT/yr, assumed 50% use lagoons, COD: 1 kg/m ³ , WW: 60 m ³ /MT	800	16,800	3,200	20,000
Total		16,100	337,600	48,900	386,500

MMT: Million metric tons – COD: Chemical Oxygen Demand – WW: Wastewater generation

¹. Baseline methane emissions due to the current waste management system; assume CO₂ 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.