

SUMMARY OF PHILIPPINES FINDINGS TO DATE
Methane to Markets Support for Livestock and Agro-Industrial Wastes

1. THE METHANE TO MARKETS PARTNERSHIP

The Methane to Markets Partnership (M₂M) 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 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. PHILIPPINES FINDINGS TO DATE

The table below summarizes the findings of the Philippines RA.

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)
Swine	14 million pigs, 29% in commercial farms, 65% of medium-large commercial farms use lagoons and 6-12% have biogas systems; small commercial farms: 49% use lagoons and 47% settling ponds	73,381	1,541,000	247,500	1,788,500
Distillery	12 distilleries, 23 MMT sugarcane, 80 ML ethanol, WW: 10-15 m ³ /MT ethanol	22,762	478,000	84,000	562,000
Coconut processing	90 coconut oil mills, 57 coconut oil refineries, 11 dessicated coconut (DCN) plants, 147,000 MT/yr DCN, WW: 23 m ³ /MT of DCN	7,738	162,500	28,500	191,000
Slaughter houses	1,100 slaughterhouses, 10 million pigs. 0.6 million cattle slaughtered per yr, slaughterhouses in urban areas do not have lagoons due to limited space	500	10,500	1,800	12,300
Total		104,381	2,192,000	361,800	2,553,800

MMT: Million metric tons – ML: million litres – 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 odours 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.