

SUMMARY OF TURKEY FINDINGS TO DATE January 2012

1. THE GLOBAL METHANE INITIATIVE

The Global Methane Initiative (GMI) is a partnership to reduce global methane emissions in five main sectors: agriculture, landfills, oil and gas, coal mines, and wastewater. 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 TURKEY FINDINGS TO DATE (Turkey RA, 2012)

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)
Sugar beet	16 MMT processed in 2010; assumed 80% use lagoons	21,200	444,400	55,400	499,800
Fruit processing	737,200 MT of fruit processed in 2007; assumed 80% use lagoons	11,800	247,700	30,900	278,600
Dairy	4.1 million dairy cattle, 11.6 MMT milk produced in 2009; assumed 2.5% of dairy cattle are on fully confined systems using lagoons	7,400	155,700	25,000	180,700
Slaughter-houses	1.3 MMT (poultry); 371,000 MT (cattle); 110,000 MT (sheep/goat) processed in 2009; assumed 30% used lagoons	6,500	137,200	25,800	163,000
Alcoholic beverages	One billion liters (beer), 69 million liters (raki), 25 million liters (wine) processed in 2009; assumed 80% use lagoons	3,600	76,000	9,500	85,500
Olive oil	143,600 MT produced in 2009; assumed 10% use lagoons	3,600	76,900	4,500	81,400
Corn starch	~500,000 MT produced in 2007; assumed 50% use lagoons	1,200	25,200	3,100	28,300
Fish processing	61,500 MT processed in 2008; assumed 80% use lagoons	320	6,700	840	7,600
Non-alcoholic beverages	8,568 m ³ produced in 2008; assumed 80% use lagoons	140	2,900	360	3,200
Total		55,300	1,172,700	155,400	1,328,100

MMT: Million metric tons

¹. Baseline methane emissions due to the current waste management system; assumes CH₄ 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 replaces conventional woody biomass as a cooking fuel.
- 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.