

# Partner Country Update

Municipal Solid Waste Subsector

Philippines

Marina Bay Sands, Singapore

2-3 July 2012



# Summary of Landfill in the Philippines

As of 3rd Qtr 2011

Region	Open Dumpsite	Controlled Disposal Facilities	Sanitary Landfill	SLF w/ ECC	MRF
1	35	57	3	17	672
2	32	30	3	10	170
3	42	10	4	4	326
4a	58	46	8	4	657
4b	44	22	2	1	117
5	70	7	1		299
6	45	24	3	6	644
7	116	50	6	2	401
8	69	11	1	7	875
9	29	27			248
10	38	42		2	481
11	1	27		1	607
12	6	17	3	1	174
13	43	8		2	549
CAR	15	5	1	3	154
NCR			2		935
ARMM			1		18
<b>Total</b>	<b>643</b>	<b>384</b>	<b>38</b>	<b>60</b>	<b>7327</b>

# Philippine Landfill Gas Composition

Typical landfill gas composition <sup>[2]</sup>	% (dry volume basis) <sup>a</sup>
Methane, CH <sub>4</sub>	45-60
Carbon dioxide, CO <sub>2</sub>	40-60
Nitrogen, N <sub>2</sub>	2-5
Oxygen, O <sub>2</sub>	0.1-1.0
Sulphides, disulphides, mercaptans etc.	0-1.0
Ammonia, NH <sub>3</sub>	0.1-1.0
hydrogen, H <sub>2</sub>	0-0.2
carbon monoxide, CO	0-0.2
Trace constituents	0.01-0.6

# Philippine Landfill Gas Projects

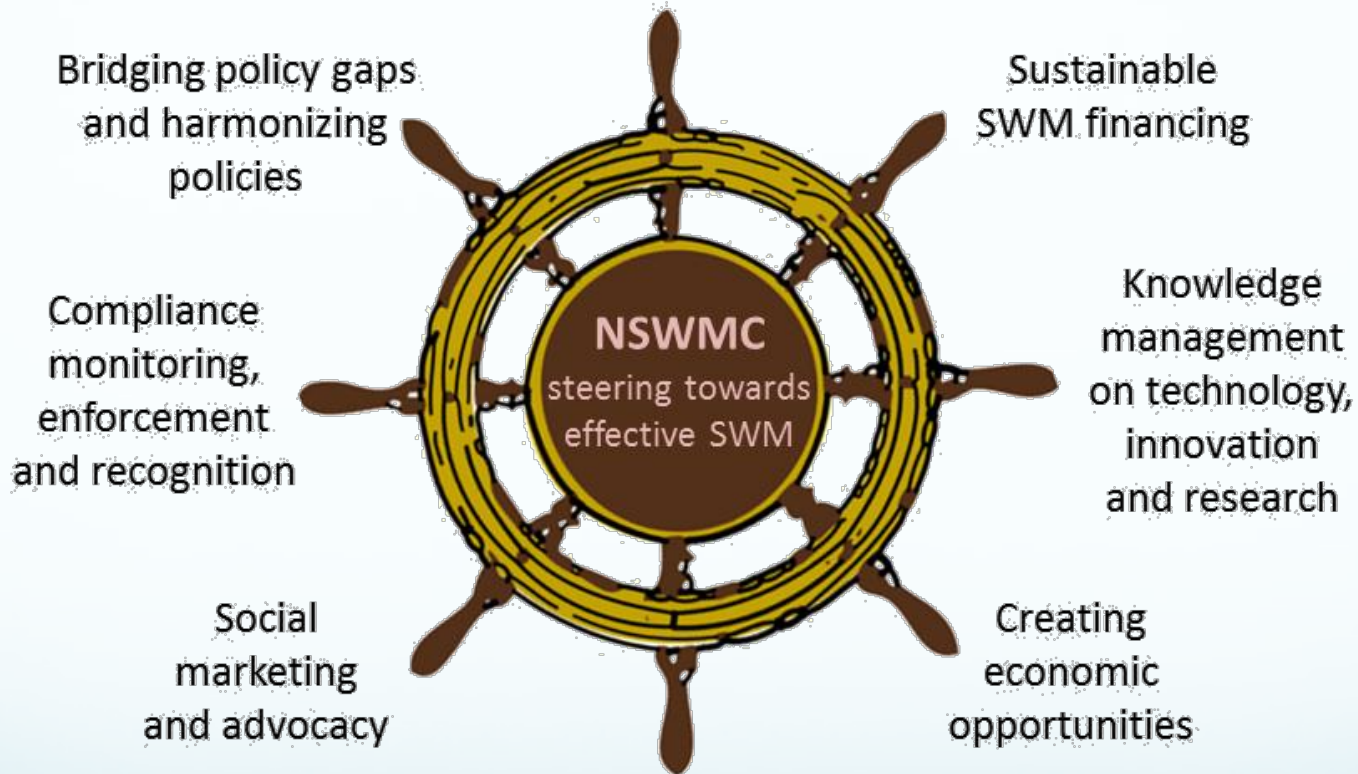
- 4.0 MW Bacavalley Energy, Inc. (San Pedro, Laguna)
- 14.8 MW Montalban Methane Power Corporation (Rodriguez, Rizal)
- 1.2 MW Pangea Green Energy Philippines, Inc. (Payatas, Quezon City)
- 4.0 MW AEC Landfill Methane Recovery and Electricity Generation (Consolacion, Cebu)
- Metro Clark LFG Flaring (Pampanga)
- VGPuyat SLF Gas to Energy (Del Monte, Bulacan)
- Gen. Santos City SLF Gas to Energy (South Cotabato)

# Legislative Drivers

- Ecological Solid Waste Management Act of 2000 (R. A 9003)
- Clean Air Act of 1999 (R.A. 8749)
- Clean Water Act of 2004 (R.A 9275 )
- Climate Change Act of 2009
- Renewable Energy Act of 2009 (R.A 9513)

# National Solid Waste Management Strategy

Organizational development and  
enhancing inter-agency collaboration



Cross-cutting issues:

- (a) Good governance
- (b) Caring for vulnerable groups
- (c) Reducing disaster and climate change risks

# National Solid Waste Management Strategy

## Component 8c **Cross-cutting Issue: Reducing Disaster and Climate Change Risks**

### Objective 8c.1 **Climate-proofed SWM systems, programs and infrastructures**

#### Strategy 8c.1.1 Reduction of greenhouse gas emissions (GHGs) from MSW

Key Initiative 8c.1.1.1 Promote waste avoidance, materials recovery, composting of bio-waste, biogas production, eco-efficient soil cover and methane capture techniques as contribution to climate change mitigation

Key Initiative 8c.1.1.2 Capacity development of LGUs and other stakeholders in calculating greenhouse gas (GHG) emissions reduction in SWM activities (with or without CDM)

#### Strategy 8c.1.2 Increase awareness and coordination among government agencies for effective disaster risk management and response in SWM facilities and communities

Key Initiative 8c.1.2.1 Formulate protocols or guidelines on disaster preparedness and response at SWM facilities

Key Initiative 8c.1.2.2 IEC and capacity development on the health, safety, potential environmental risks, preventing disasters and proper handling of disasters at SWM facilities

Key Initiative 8c.1.2.3 Capacity development and technical assistance to LGU SWM Boards on the use of vulnerability assessments and hazard maps in local SWM planning and implementation

#### Strategy 8c.1.3 Ensure garbage-free waterways

Key Initiative 8c.1.3.1 Promote waste diversion and efficient waste collection

Key Initiative 8c.1.3.2 Inter-agency coordination and private sector collaboration in the Adopt-an-Estero Program



# Barriers

- Lack of awareness of emission levels and value of lost fuel
- Lack of information and training on available technologies and management practices
- Traditional industry practices
- Regulatory and legal issues
- Limited methane markets and infrastructure
- Uncertain investment climate

# GMI Project Update

- Identify and assess project opportunities
  - Landfill Inventory
  - Philippines Landfill Gas Estimation Model
  - Countrywide Landfill Action Planning
- Support technology transfer, training and capacity building
  - Awareness Campaigns
  - Best Practices for Landfill
    - Technology demonstrations
    - Policy study
    - Standards development

# Nationally Appropriate Mitigation Actions (NAMAs)

- Philippines as Non-Annex Party to UNFCCC and Kyoto Protocol, agreed to implement NAMAs
- Proposed mitigation strategies for adoption
  - Integration of climate change mitigation to energy policies, plans and strategies including laws and regulations
  - Development of Guidelines on Reporting of Emissions and Emission Reduction Projects including establishment of reporting forms and database
  - Implementation of emission reduction projects, strategies, programs, and/or measures

# Nationally Appropriate Mitigation Actions (NAMAs)

- Proposed mitigation strategies for adoption
  - Sharing and dissemination of knowledge, research and best practices on mitigation
  - Development and adoption of sustainable financing mechanisms
  - Monitoring, reporting and evaluation systems of mitigation policies and measures

# Nationally Appropriate Mitigation Actions (NAMAs)

- Climate Change Capacity Building Project in the Framework of the Low-Emission Capacity Building Program
  - Executing Partner: UNDP-Philippines
  - Implementing Partner: Climate Change Commission
  - Develop/establish GHG Inventory management systems
  - Develop NAMAs and or Low Emissions Development Strategies (LEDS) in the context of national development
  - Design Measurable, Reportable and Verifiable (MRV) systems

**Thank You...**