



**Institute for
Global Environmental
Strategies**

IGES' Research on Waste Management and Climate Change - *Contributing to UNEP's GPWM* -

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Institute for Global Environmental Strategies (IGES)

- IGES is a policy research institute promoting sustainable development in the Asia-Pacific region
- The institute works closely with international organisations, including UNEP, ADB and UNESCAP
- The HQ is located in Hayama
- Main funding organisations are MOEJ and Kanagawa Prefecture
- IGES employs around 90 researchers



Photo: Yasuhiko Hotta

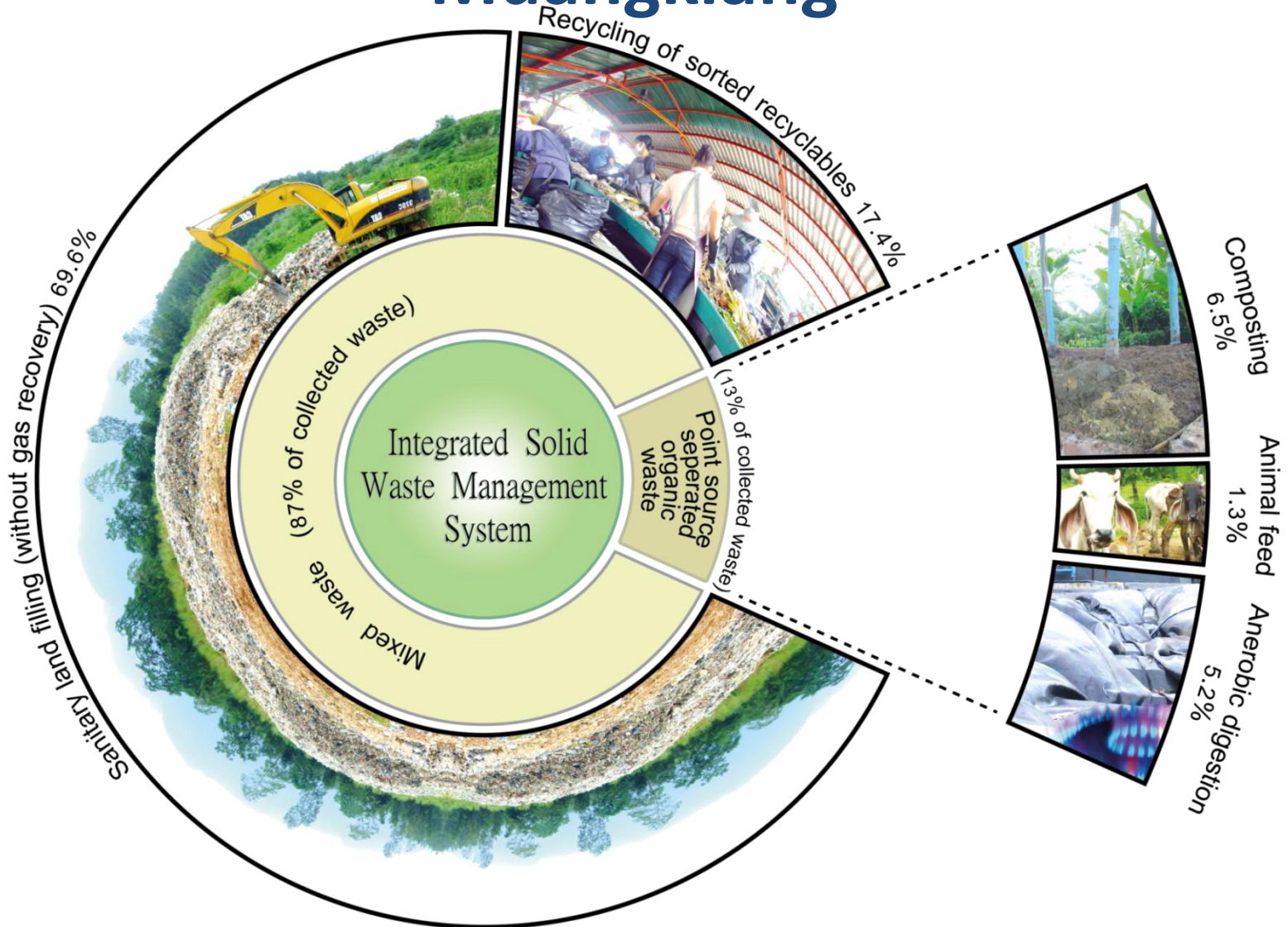
IGES' Work on Waste Management and Climate: Background

- 60–70 percent of municipal solid waste in developing Asian countries is organic
- When disposed in open dumps and landfills, this waste generates methane – a strong greenhouse gas
- Globally, 2-3% of GHG emissions are from waste
- With alternative treatment methods, these emissions can be much reduced
- Recycling of metals, glass, paper, plastics offers additional climate benefits by reducing the demand for new raw materials

The Potential of Alternative Waste Treatment: A Case Study

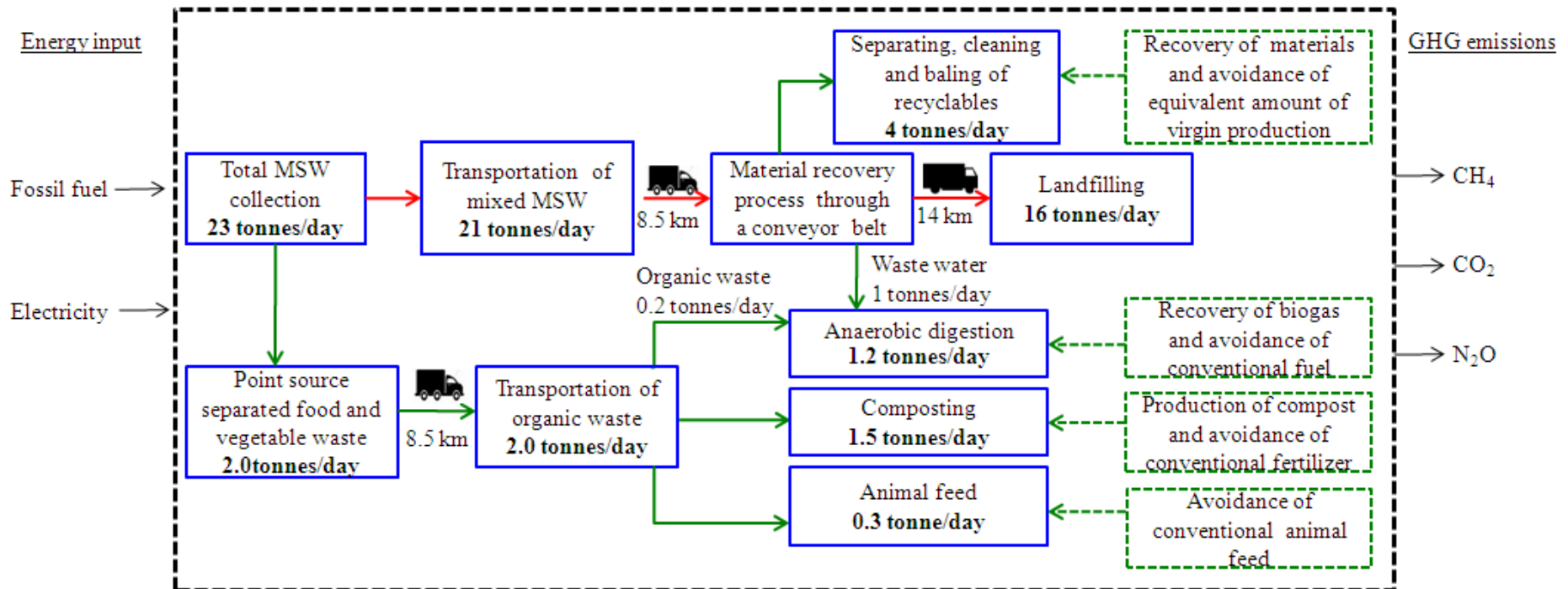
- Muangklang Municipality, located in Rayong Province (190 km East of Bangkok)
- Consists of 13 communities covering 14.5 km²
- Registered population within the Municipality: 17,200 (Dec 2010)
- Muangklang was selected as one of Thailand's three Model Cities under the ASEAN ESC Model Cities Programme
- The municipality has initiated an integrated system for waste management, incorporating source separation, effective waste collection and transport, waste sorting for recovery of recyclables, anaerobic digestion, composting, and feeding of animals with organic waste

The Current Integrated Waste System in Muangklang



Emissions of Greenhouse Gases

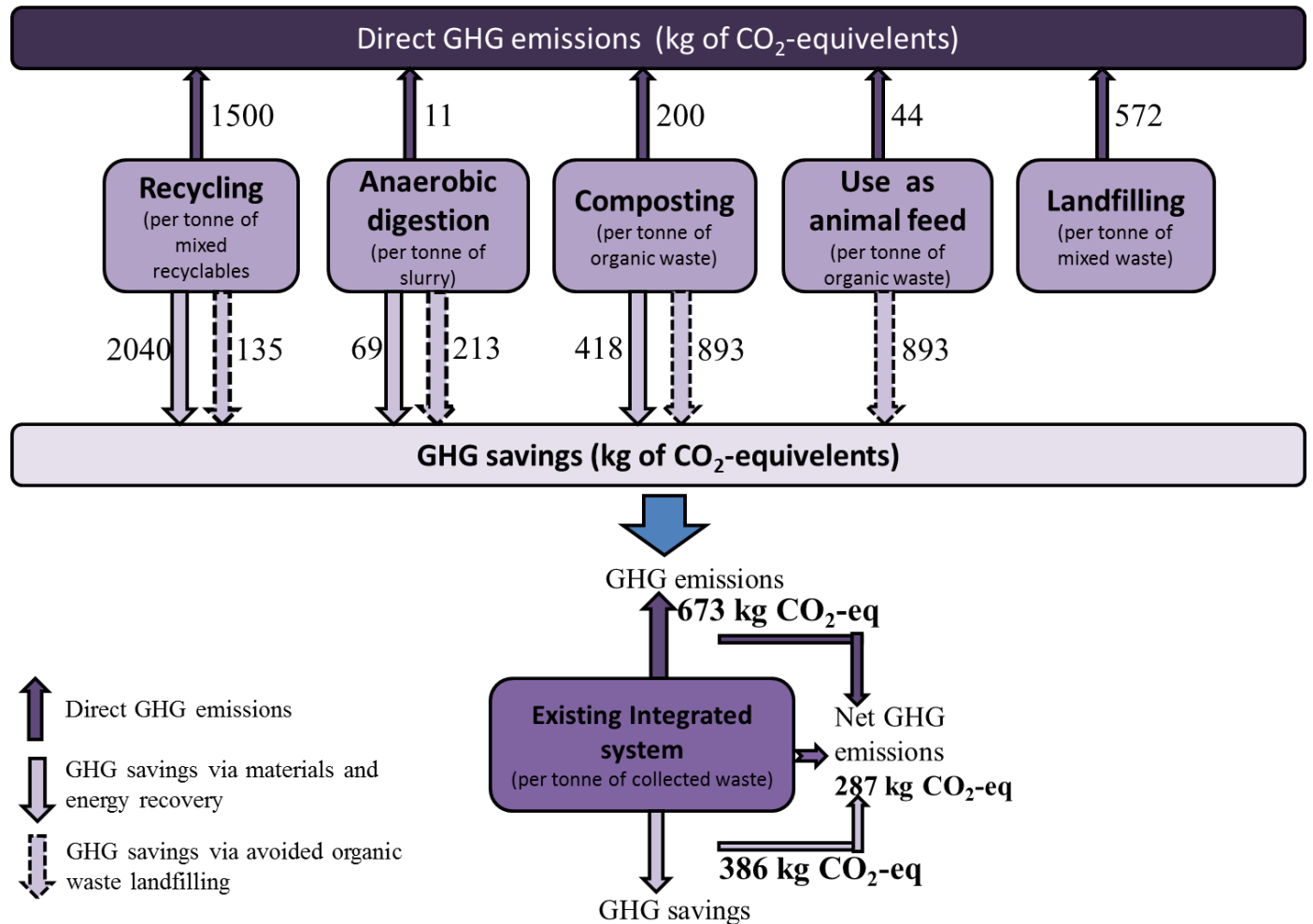
Greenhouse Gas emissions are calculated with a systems model



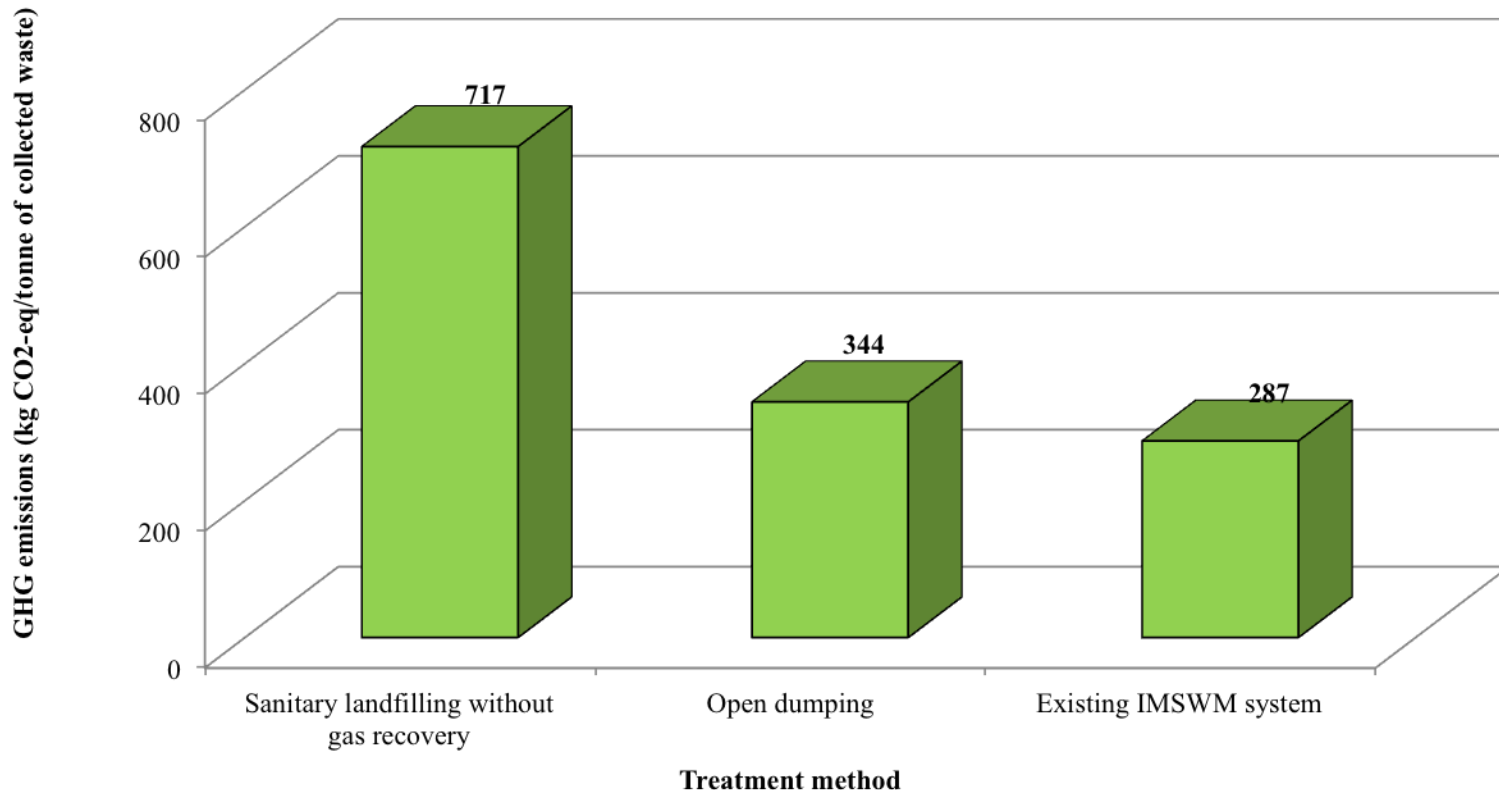
GHG Balance

Emissions from the system itself

Emissions avoided due to resource recovery



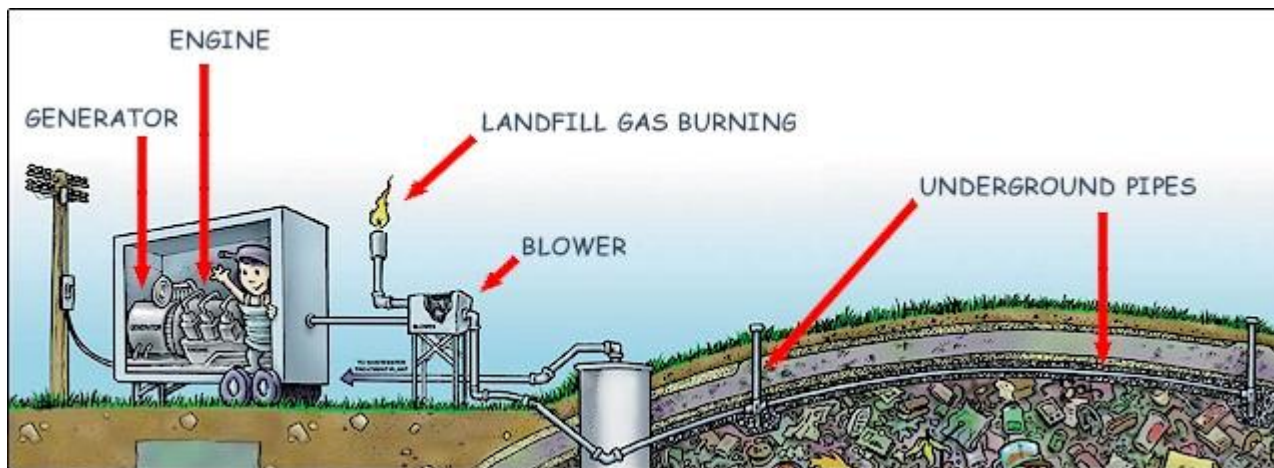
Comparison with Conventional Waste Treatment



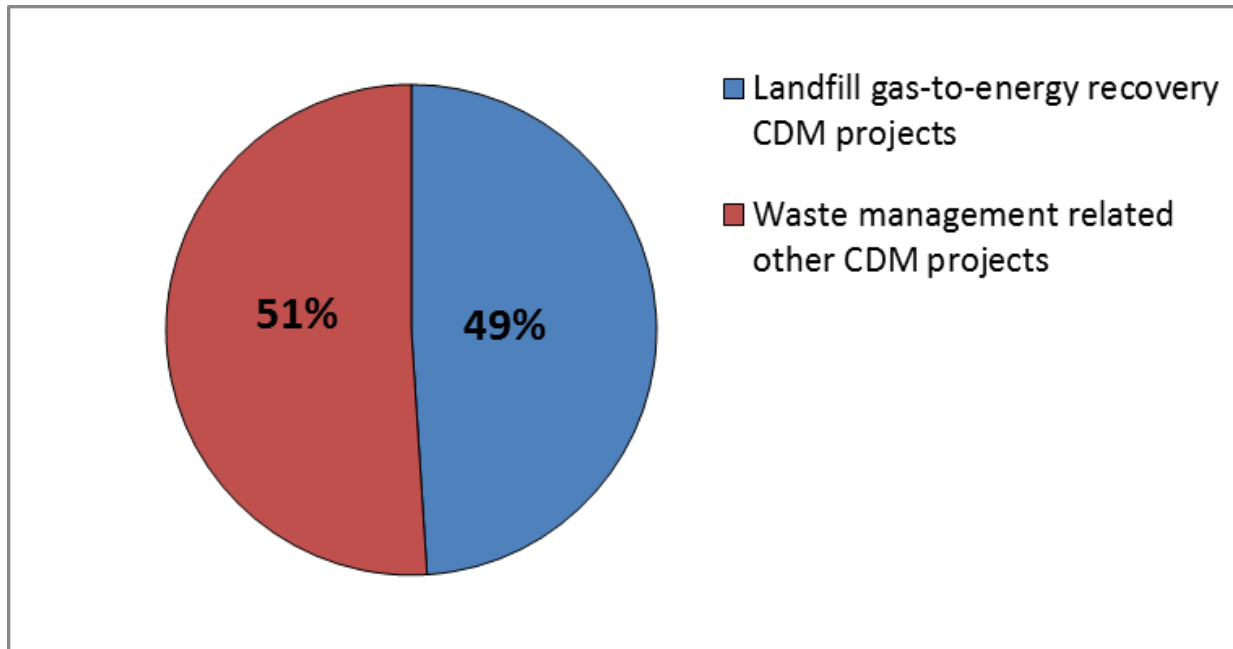
- GHG emissions 13% lower than open dumping and 66% lower than landfill disposal
- Large potential for further improvement

The Potential of Landfill Gas Recovery: The Case of Bangkok

- In principle, methane gas from landfills can be collected
- The collected gas can be made less harmful (by burning it so that it becomes CO_2) or used as fuel

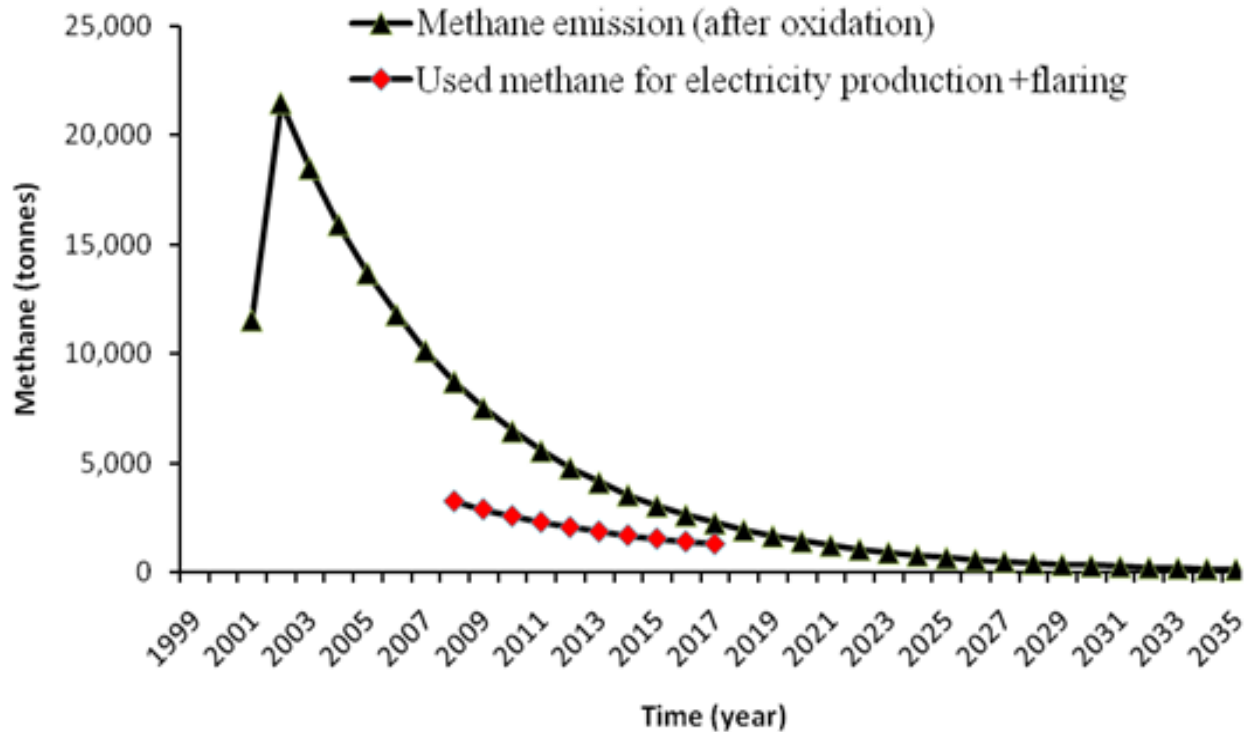


Carbon Finance and Waste Management in Asia



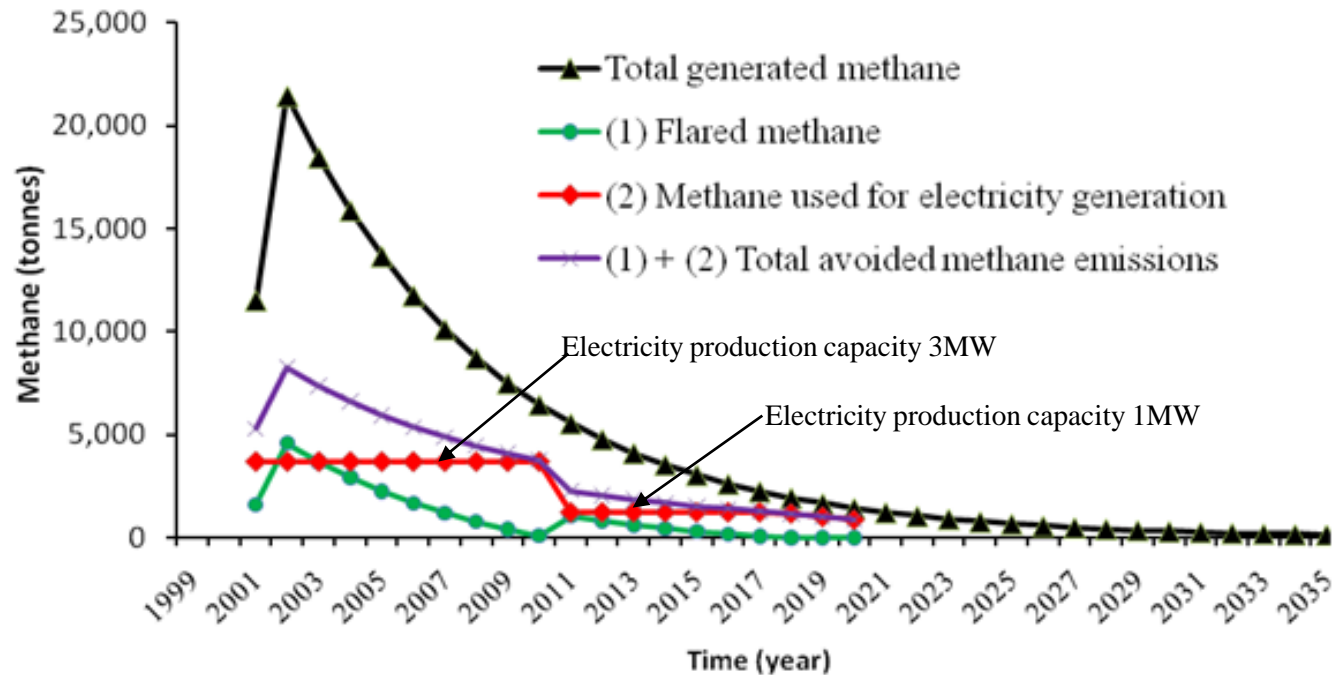
- 147 waste-related projects have been registered under the Clean Development Mechanism
- About half of these projects are on landfill gas recovery

The Gas Recovery Project in Bangkok



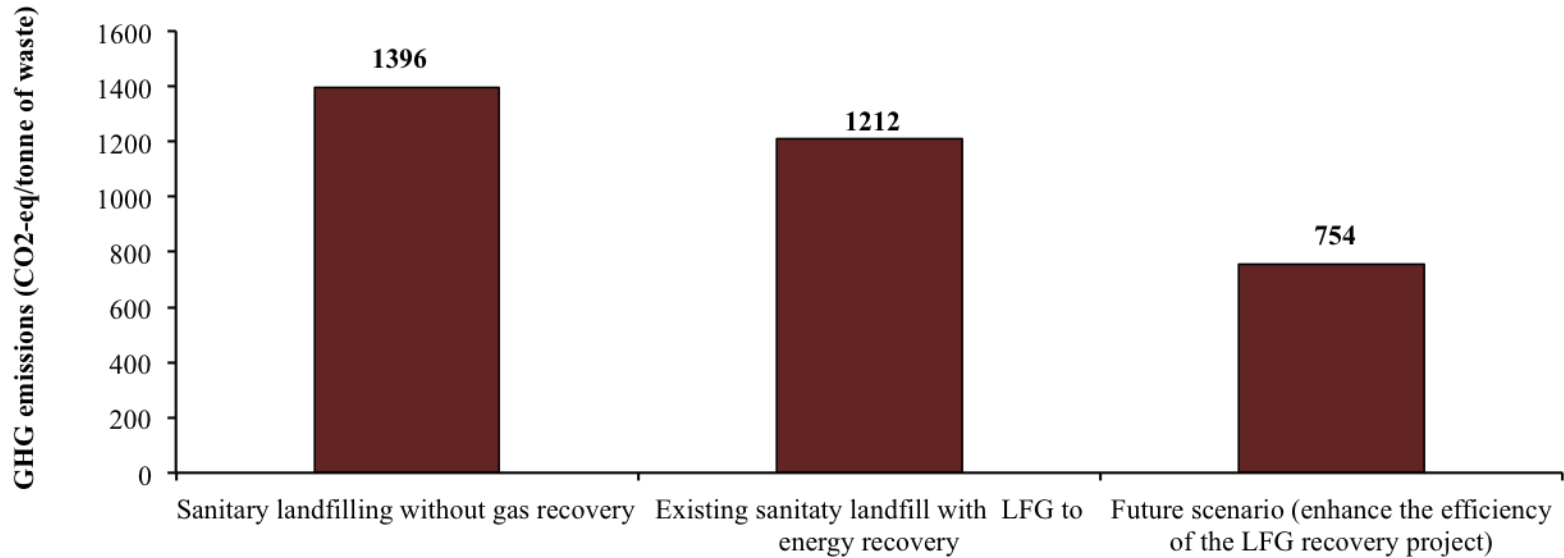
- Project start: 7 years after the closure of the landfill
- Duration: 10 years
- Total recovery: 12%

An Improved System Design



- Project start: at the closure of the landfill
- Duration: 20 years
- Total recovery: 43%

Comparison of Three Scenarios



Summary of Findings

- **Muangklang**

- An Integrated System can have very significant climate benefits over conventional treatment
- Both diversion of organic waste away from landfills and recycling are important
- Large potential for improvement
- Local governments play a key role

- **Bangkok**

- Low efficiency of the current landfill gas project: 88% of the climate impact remains
- Improvements are possible but not economically attractive
- Even an improved system will have large emissions
- Carbon finance creates incentives for landfill gas projects while there are better options (Integrated Systems)