



# Methane to Markets

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## *Landfill Subcommittee Report to Steering Committee*

**Co-Chair**

**Gabriel Blanco**

**Argentina**

2 March 2010  
New Delhi, India

# Overview

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- Activities since the 2009 Monterrey Steering Committee Meeting
  - Recent Subcommittee meetings
  - Partnership Expo Involvement/Planning Efforts
  - Selected Subcommittee Achievements
  - Activities by Country
  
- Issues for Consideration by the Steering Committee
  
- Next Steps and Conclusions

# *Subcommittee Achievements Since January 2009*

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- **10<sup>th</sup> Landfill Subcommittee Meeting – September 2009, Long Beach, California**
  - 12 attendees
  - Argentina, Brazil, China, Colombia, Poland and United States were represented
  - Brainstormed topics and suggested speakers for landfill technical session agenda at the New Delhi Expo
  - Discussed delegate participation and attendance at the Expo
  - Discussed submitting projects in search of development to display at the Expo
  - Discussed interest on incorporating wastewater treatment projects under a new “Urban Infrastructure” Subcommittee covering both waste water and solid waste projects.
  - Discussed tracking landfill biogas project activities
  - Suggested improvements to the International Landfill Database

# *Subcommittee Achievements Since January 2009 (cont'd)*

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- **Activities to support M2M Expo**
  - Small task force focused on reviewing abstracts for the Expo
    - Considered Subcommittee suggestions for topic areas
    - Identified session topics and speakers to fill gaps that
  - Developed an input template for Partner Countries to submit landfill biogas project opportunities on the Expo Web site
  - Developed a landfill-specific template for presenting biogas project opportunities and success stories on posters and handouts
  - Coordinated a tour of a New Delhi-area landfill for Expo participants

# Landfill Projects Submitted to the Expo

Country	Landfills in Search of Project Development	Landfill Project Success Stories
Argentina	7	
Brazil	10	2
China	10	3
Colombia	5	1
Ecuador	4	
India	7	1
Mexico	5	1
Poland	1	
Russia	1	
Thailand		1
Ukraine	4	3
<b>TOTALS</b>	<b>54</b>	<b>11</b>

# ***Subcommittee Achievements (cont'd)***

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- **Continued to populate and improve the International Landfill Database**
  - Number of landfills increased from 302 to 668
  - Number of registered users has increased from 774 to 1,068
  - Number of Partner countries with landfills in or linked from the database increased from 9 to 17
  - Added a LFGE project module to the database to track planned, operational and under construction projects
  - Currently 124 planned or operational landfill biogas projects are in the ILD

# 2009 M2M Landfill Sector Grant Support (USG)

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## **Argentina**

- \$100,000 to Asociación para el Estudio de los Residuos Sólidos (ARS) to fund three workshops in northern, central and southern Argentina to improve operations and management of landfills.

## **Brazil**

- \$120,000 to Appalachian State University for funding a community based landfill gas utilization project in Brazil

## **Bulgaria**

- \$80,000 to EnEffect to assess several landfills and pilot a LFG Recovery Project

## **China**

- \$99,996 to the International City/County Management Association (ICMA) for capacity building and training on landfill gas management
- \$98,550 to the California State University - Fullerton Auxiliary Services Corporation to provide training on maximizing emission reductions from landfills and optimizing energy recovery

# 2009 M2M Landfill Sector Grant Support (USG)

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## **Colombia**

- \$125,000 to Centro Nacional de Produccion Mas Limpias y Tecnologias Ambientes to facilitate and promote methane capture and usage projects at medium and small landfills in Colombia

## **India**

- \$120,000 to National Environmental Engineering Research Institute (NEERI) to develop a landfill biogas model for India

## **Nigeria**

- \$21,000 to Centre for People and Environment to host a study tour and visits to landfills in the United States

## **Poland**

- \$170,000 to the Oil and Gas Institute to develop a handbook and provide training on the “best and most effective” technologies of LFG utilization

## **Russia**

- \$99,660 to RUSDEM-EE to conduct a pre-feasibility study of landfill gas commercial use in Russia



# Additional Activities by Country



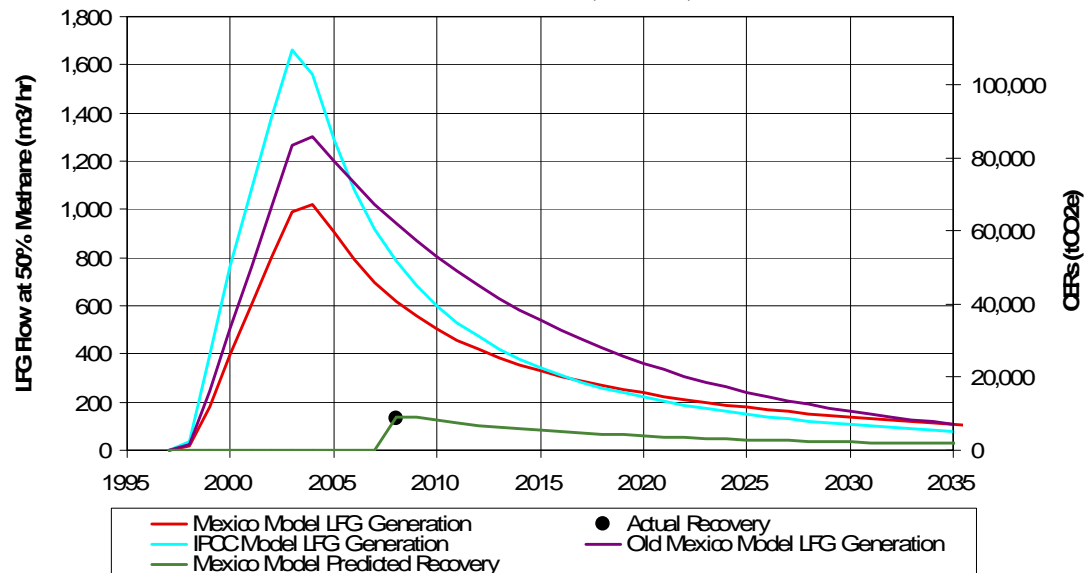
- **Argentina**
  - Completed first direct-use project (infrared heater)
  - Construction of a pyrolysis furnace at Olavarria
  - Completed study of direct-use opportunities (6 sites)
- **Brazil**
  - First O&M workshop held in northeast Brazil
  - Completed grant to develop inventory of landfills in State of Espirito Santo
- **China**
  - Finalized Landfill Biogas Model for China, now available on-line at: <http://www.methanetomarkets.org/tools-resources/tools.aspx#three>
  - Completed assessments of 5 landfills in China
  - Gaoantun Landfill (a 2007 Project Expo site) added a second engine
- **Colombia**
  - Worked with federal Public Services Agency to expand national landfill database and improve data quality
  - First O&M workshop in Medellin, Colombia
  - Doña Juana Landfill (a 2007 Expo site) began flaring



# Activities by Country (cont'd)

- **India**
  - Hosted the 2010 New Delhi Partnership Expo
  - First flare reduction project in India began at Gorai Landfill
  - Grant completed for assessing LFG to liquefied natural gas potential
  - Completed assessment of Pondicherry landfill
  
- **Mexico**
  - Updated Mexico landfill gas model using new waste composition data and additional field data from Mexico landfills. Model available on-line at: <http://www.methanetomarkets.org/m2m2009/tools-resources/tools.aspx#three>

LFG Generation and Recovery Projection  
Merida Landfill Cells 1-4, Merida, Mexico



# Activities by Country *(cont'd)*

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- **Philippines**

- Worked with World Bank and LandBank in Philippines to conduct landfill assessment studies
- Conducted a workshop in Manila on renewable energy and landfill regulations
- Adapted China LFG model for landfills in Philippines

- **Poland**

- Regional M2M workshop held in Krakow
- Completed landfill inventory and conducted first feasibility assessment at Mielec (a 2010 Expo featured project)

- **Russia**

- Completed the country's first landfill inventory of over 500 landfills
- Clean Energy Information Center established. Center is a clearinghouse for information on LFG as a clean energy resource.

# Activities by Country (cont'd)

- **Thailand**

- Completed first assessment study in Thailand at the ESBEC landfill in Chonburi Province
- Conducted a workshop with the Ministry of Environment's Pollution Control Department
- Adapted China LFG model for landfills in Thailand

- **Ukraine**

- Infrared heaters, the first Ukrainian LFGE project, are being installed in Khmel'nitsky
- LFGE construction by private investor started in Mariupol
- Developed Ukraine landfill gas model available on-line at: <http://www.methanetomarkets.org/m2m2009/tools-resources/tools.aspx#three>

- **Vietnam**

- Conducted solid waste management workshops in Vietnam with the Clinton Climate Initiative



Photo of Electric Grid  
near ESBEC LF

# Activities by Country (cont'd)

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- **United States – U.S. EPA and Department of State**
  - Provided funding and technical assistance to complete landfill assessments
    - 7 desktop studies; 1 pre-feasibility study and pump test; and 13 assessment reports
  - Prepared two feasibility studies for direct use projects
  - Conducted 11 workshops providing training on landfill gas energy fundamentals, landfill operations and maintenance to improve gas recovery, and landfill gas modeling
    - Over 600 people trained
  - Identified several Expo speakers on landfill gas modeling, reviewing requests for proposals, and leachate management.
  - Funded development of landfill gas models for China, Ukraine and Mexico
  - Continued to provide maintenance and improvements to the International Landfill Database

# Issues for Consideration/Decision by the Steering Committee

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- Need direction on how to proceed with wastewater treatment
- Encouraging project and emission reduction tracking among Delegates and Project Network

## Next Steps

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- Plan 12<sup>th</sup> Subcommittee Meeting
- Develop an international best practices manual for landfill biogas projects
- Target sites that will allow for near term methane recovery
- Use improved databases to analyze emission reduction potentials and identify and prioritize project activities and grant funding
- Continue to post results and communicate lessons learned from recent assessment reports and pre-feasibility studies

# Summary and Conclusions

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- **Since January 2009, the Landfill Subcommittee continued to implement capacity building and pilot project activities**
  - 6 under construction and operating landfill gas projects
  - 11 workshops
  - 10 grant awards within landfill sector in 2009 and two 2008 round grants are finalizing LFG recovery projects (Argentina, Ukraine)
  - Completed site visits and assessment reports to 21 landfills
  - Showcased 65 landfill project opportunities at the Expo
- **Enhanced landfill data tracking systems**
  - Significant growth in landfills entered in the International Landfill Database (a 120% increase in the number of landfills and 38% increase in the number of registered users since January 2009)
  - Added a module to track landfill project activities



# Operating and Under Construction Projects

Flare at Dona Juana



Infrared Heater in Ukraine and Argentina

Flare at Gorai



Engines at Bandeirantes



Direct Use Project in Argentina