



# Methane to Markets

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## *Landfill Subcommittee Report to Steering Committee*

**Co-Chairs**

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31 October 2007  
Beijing, China

# Overview

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- Background and Landfill Subcommittee Meetings
- LS Action Plan: Barriers to LFG Project Development
- From Planning to Action: Overcome the Barriers
- Activities since the 2006 Rome Steering Committee Meeting
- Envisaged Next Steps
- Issues for Consideration/Decision by the Steering Committee

# Background and Landfill Subcommittee Meetings

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- Six Subcommittee Meetings
  - **17 November 2004, at the Ministerial Meeting, Washington, USA**
  - 13 June 2005, Torbay, United Kingdom;
  - **2 November 2005, Buenos Aires, Argentina**
  - 12 May 2006, Cologne, Germany
  - 29 November 2006, Cuenca, Ecuador
  - 2 May 2007, Cologne, Germany
- Teleconferences
- Task forces (International Database, Partnership Expo)

# LS Action Plan: Barriers to LFG Project Development

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1. Lack of country-specific information on disposal practices, LFG management, and opportunities for LFG capture and use
2. Insufficient knowledge and experience in developing LFG recovery and use projects in M2M countries
3. Difficult access to existing LFG documents, tools, and resources
4. Insufficient identification of suitable landfill in M2M countries for potential LFG project assessment and development
5. Lack of financing or capacity to obtain financing for LFG projects

# From Planning to Action: overcome the Barriers

- **Barrier #1 - Lack of country-specific information on landfill and LFG management practices**

## **Implemented Actions**

- Engage country delegates with more frequent communication to facilitate more information about in-country landfill and LFG practices
- Collect and update country landfill profiles (9 profiles submitted to date)
- Develop and launch International Landfill Database (completed September 2007)
- M2M landfill grant funding in Argentina, Brazil, China, Colombia, Ecuador, India, Korea, Mexico, Nigeria, Russia and Ukraine

## **Planned Actions**

- Identify new delegates for countries with inactive participation
- Country profiles: Follow up with member countries that have not yet submitted country profiles.
- International Landfill database (ILD): Help and promote database population. Outreach of the ILD
- Posting results and communicating lessons learned from assessment reports and pre-feasibility studies

# From Planning to Action: overcome the Barriers (con't)

- **Barrier #2 - Insufficient in-country knowledge and experience in developing LFG recovery and use projects**

## Implemented Actions

- Conduct landfill gas assessments and pre-feasibility activities (i.e., training local landfill personnel) and engage country delegates and landfill owners in technical analyses
- Conduct training workshops (e.g., India, Ukraine, Russia, Ecuador, Colombia) for local officials
- M2M landfill grant funding in Argentina, Brazil, China, Colombia, Ecuador, India, Korea, Mexico, Nigeria, Russia and Ukraine

## Planned Actions

- Continue to develop training sessions, assessments and pre-feasibility studies
- Need to expand the Project Network to include more organizations involved with local investment and aid
- Consider side events at key international meetings involving municipal contacts
- Posting results and communicating lessons learned from assessment reports, pre-feasibility studies, etc.

# From Planning to Action: overcome the Barriers (con't)

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- **Barrier #3 - Difficulty accessing existing LFG technical documents, tools, and resources**
- **Implemented Actions**
  - Review and post of a searchable bibliography of on-line resources (file posted May 2007)

## **Planned Actions**

- Review and improve the searchable bibliography of on-line resources
- Promote its usability

# From Planning to Action: overcome the Barriers (con't)

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**Barrier #4 - Insufficient identification of suitable landfills in Partner countries for potential LFG project assessment and development**

## **Implemented Actions**

- Developed a template for countries to use in submitting landfills for evaluation (final template posted June 2007)
- Used to develop landfill posters in China Expo
- Develop and launch International Landfill Database (completed September 2007)

## **Planned Actions**

- Encourage more countries use the template
- Emphasize data entry of ILD

# From Planning to Action: overcome the Barriers (con't)

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- **Barrier #5 - Lack of financing or capacity to obtain financing for LFG projects.**

## Implemented Actions

- Conduct a *Finding Carbon Finance for Landfill Methane Projects* session during the M2M Expo.
- Conducted several training workshops that included project financing components

## Planned Actions

- Subcommittee will evaluate further finance training and guidance documents after this event

# Activities since the 2006 Rome Steering Committee Meeting

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- **Activities to support M2M Expo**
  - Small task force focused on preparing for the Expo
    - Developed sector-specific agenda
    - Identified session topics and speakers
  - Developed template for Partner Countries to submit LFG project opportunities on the Expo Web site
  - Developed a landfill-specific template for biogas project opportunities on posters and handouts. The template was shared with other sectors
  - Outreach to Project Network members
  - Coordinated a tour of a Beijing-area landfill for Expo participants

## Activities since the 2006 Rome Steering Committee Meeting (con't)

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- **Developed and Launched International Landfill Database (September 2007)**
- **Posted Online Landfill Biogas Bibliography (May 2007)**
  - Posted a searchable bibliography of on-line resources for landfill biogas resources
    - [http://www.methanetomarkets.org/resources/landfills/docs/guide\\_onlineresources.xls](http://www.methanetomarkets.org/resources/landfills/docs/guide_onlineresources.xls)
- **Growth in the Landfill Project Network**
  - Project network members interested in landfills grew by 30% in 2007 to 362

# Activities since the 2006 Rome Steering Committee Meeting (con't)

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- Conducted 5 Workshops

- January 2007 – Several U.S. Agencies conducted a workshop on *How to Enter Mexico's Landfill Gas Energy Market*
- February 2007 – FICCI, Government of India, and U.S. EPA jointly organized a two-day workshop on Methane to Markets and methane recovery and use project opportunities in India
- May 2007 – U.S. EPA sponsored workshop held in conjunction with *International Trade Fair and Congress WasteTech* in Moscow, Russia
- June 2007 – U.S. EPA, ISWA, Turkish National Committee on Solid Waste, and Kriton Curi conducted a workshop on *Landfill Biogas Capture and Energy Recovery* in Istanbul, Turkey
- August 2007 – U.S. EPA sponsored a regional meeting to present recent landfill reports and pre-feasibility studies *Exploring Opportunities for Landfill Biogas Projects in Latin America*

# Activities since the 2006 Rome Steering Committee Meeting (con't)

## 11 Landfill Grant Awards totaling over \$1.2 million

- **Argentina** - ISWA awarded \$125,000 to design and construct small-scale direct use demonstration LFG energy project
- **Brazil** - ICLEI awarded \$140,000 for capacity building/landfill methane reduction projects at 3 to 5 landfills
- **India**
  - FICCI awarded \$150,000 to engage stakeholders in dialogue and activities
  - Texas A&M University awarded \$100,000 for pre-feasibility study on LFG to LNG in state of Maharashtra
- **Korea** - Korea District Heating Corp. awarded \$80,000 for landfill feasibility studies at Chuncheon, Gangneung, Jinju, and Mokpo landfills
- **Mexico** - Border Environment Cooperation Commissions awarded \$190,000 for LFG energy feasibility studies in Sattillo and Hermosillo.
- **Nigeria** - Center for People and the Environment awarded \$35,000 for country-wide landfill inventory
- **Russia** –
  - Ecological Regional Centre awarded \$35,000 for country-wide landfill inventory
  - Capacity building training for municipalities
- **Ukraine** - \$175,000 for a successful LFG infrared heater project
- **Multiple countries** - CIFAL awarded \$175,000 to conduct capacity building training for municipalities in Argentina, Brazil, Colombia and Ecuador

## Activities since the 2006 Rome Steering Committee Meeting (con't)

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- Completed site visits, pump tests, 18 assessment reports, and 8 pre-feasibility studies
- Showcased 48 landfill project opportunities at the Expo,

# Landfill assessment reports and pre-feasibility studies submitted to the Expo by U.S. EPA

Country	Landfills	Estimated Average Annual Potential Emission Reductions (MTCO <sub>2</sub> E) over a 15-year project life
Argentina	3	115,600
Brazil	11	13,824,000
China	4	179,000
Colombia	4	1,688,400
Ecuador	5	692,900
India	3	191,200
Mexico	2	73,100
Ukraine	4	185,100
Russia	1	323,700
<b>TOTALS</b>	<b>37</b>	<b>17,279,000</b>

## Landfill project opportunities submitted to the Expo by Argentina, China, and Mexico

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<b>Country</b>	<b>Landfills</b>	<b>Estimated Average Annual Potential Emission Reductions (MTCO<sub>2</sub>E) over a 10-year project life</b>
Argentina	3	86,300
China	7	20,600*
Mexico	2	173,600
<b>TOTALS</b>	<b>12</b>	<b>280,500</b>

\*Gas estimates only available for one of the 7 submissions

## *Examples Activities by Country*

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- **Argentina**
  - Coordinated with U.S. EPA on two assessment reports and one pre-feasibility study with a pump test
  - Submitted three additional opportunities for landfill biogas projects that were presented on posters at the Expo
  - Attended and presented project opportunities at *Exploring Opportunities for Landfill Biogas Projects in Latin America*
- **Australia**
  - Conducted an Expo marketing campaign covering over 90% of Australian landfill sector stakeholders
  - Provided several speakers for the Expo technical session *Finding Carbon Finance for Landfill Methane Projects*
- **Brazil**
  - Presented on the gap in electricity supply and demand and the role landfill biogas may play in closing this gap
  - Completed and distributed a Brazilian biogas model to the subcommittee

## *Example Activities by Country (con't)*

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- **China**
  - Ministry of Construction (MOC) completed a survey of Chinese landfill sites to identify suitable opportunities for project evaluation
  - Coordinated with U.S. EPA on three landfill assessment reports and one pre-feasibility study with a pump test
  - MOC submitted seven additional opportunities for landfill biogas projects that were presented on posters at the Expo
  - Coordinated a tour of a Beijing-area landfill for Expo participants
- **Colombia**
  - Coordinated with U.S. EPA on four landfill assessment reports
  - Attended and presented project opportunities at *Exploring Opportunities for Landfill Biogas Projects in Latin America*
- **Ecuador**
  - Coordinated with U.S. EPA on three landfill assessment reports and two pre-feasibility studies with pump tests
  - Ministry of Environment hosted *Exploring Opportunities for Landfill Biogas Projects in Latin America* and presented five project opportunities for Ecuador

## *Example Activities by Country (con't)*

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- **India**
  - Coordinated with U.S. EPA on three landfill assessment reports and one pre-feasibility study with a pump test
  - February 2007 - Federation of Indian Chambers of Commerce and Industry (FICCI), and the Government of India, and U.S. EPA jointly organized a two-day workshop on Methane to Markets and methane recovery and use project opportunities in India
  
- **Italy**
  - Italian Ministry for the Environment, Land and Sea is funding technical assistance to carry out 10 landfill assessment and pre-feasibility studies in China
  - Italian Ministry for the Environment, Land and Sea, provided funding and technical assistance for training and capacity building in CDM and LFG projects for Chinese Administrations
  - Provided a speaker for the Expo technical session *Landfill Methane Utilization Projects Lessons Learned*

## *Example Activities by Country (con't)*

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### ■ **Mexico**

- Coordinated with U.S. EPA and U.S. AID on two landfill pre-feasibility study with pump tests
- SEMARNAT submitted two additional opportunities for landfill biogas projects that were presented on posters at the Expo
- Attended and presented project opportunities at *Exploring Opportunities for Landfill Biogas Projects in Latin America*

### ■ **Russia**

- Coordinated with U.S. EPA on one landfill assessment report
- Attended *International Trade Fair and Congress WasteTech* in Moscow

### ■ **Ukraine**

- Coordinated with U.S. EPA on two landfill assessment reports

### ■ **Russia and Ukraine**

- Attended workshop on *Landfill Biogas Capture and Energy Recovery* in Istanbul, Turkey

## *Example Activities by Country (con't)*

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### ■ **United States**

- U.S. EPA provided funding and technical assistance to complete 18 landfill assessment reports and 8 pre-feasibility studies
- USAID provided funding and technical assistance to complete 1 pre-feasibility study
- U.S. EPA provided several Expo speakers on bringing small landfill gas projects to market, biogas modeling, and innovative disposal practices
- U.S. EPA launched the International Landfill Database
- Trainings and Workshops:
  - January 2007 – Several U.S. Agencies conducted a workshop on *How to Enter Mexico's Landfill Gas Energy Market*
  - February 2007 – FICCI, Government of India, and U.S. EPA jointly organized a two-day workshop on Methane to Markets and methane recovery and use project opportunities in India
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  - August 2007 – U.S. EPA sponsored a regional meeting to present recent landfill reports and pre-feasibility studies *Exploring Opportunities for Landfill Biogas Projects in Latin America*

## Envisaged Next Steps

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- **Next Subcommittee Meeting: November 1, 2007, Beijing**
- **Encourage project and emission reduction tracking among delegates and Project Network**
- **Posting results and communicating lessons learned from recent assessment reports and pre-feasibility studies**
- **Forming Permanent Working Groups (PWGs) on training, technical resources, programme, policies, and initiating PWGs activities**

# Issues for Consideration/Decision by the Steering Committee

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- **Need to develop Actions Plans for country-specific strategies towards M2M goals**
  - **Develop country templates that characterize opportunities to advance landfill biogas recovery and use (baseline landfill data, pre-feasibility studies, training)**
- **Landfill Subcommittee requests approval of Vice Chair position for Roberto Urquizo of the Ecuador Ministry of Environment**
- **Encouraging project and emission reduction tracking among Delegates and Project Network**
- **Identifying new Delegates for countries with inactive participation**



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Thank you