Landfill Subcommittee Action Plan

I. Introduction

The Methane to Markets Partnership is an international initiative that advances cost-effective, near-term methane recovery and use as a clean energy source. The goal of the Partnership is to reduce global methane emissions in order to enhance economic growth, strengthen energy security, improve air quality, improve industrial safety, and reduce emissions of greenhouse gases. The Partnership currently focuses on four sources of methane emissions: coal mines, landfills, oil and gas systems, and animal waste management.

II. Development of the Landfill Subcommittee Action Plan

The Methane to Markets Partnership Terms of Reference (TOR), adopted and signed on 16 November 2004, establishes sector-specific subcommittees that "will be responsible for guidance and assessment of specific activities and engaging representatives of the private sector, multilateral development banks, researchers and other relevant non-governmental organizations." In response, the Landfill Subcommittee (LS) was formed to focus efforts on landfill gas (LFG) capture and use project opportunities in Partner countries.

Section 3.4 of the TOR directs each subcommittee to develop a collaborative action plan, and the Charge to the Subcommittee notes that "ideally, action plans would identify needs, opportunities, and priorities for project development in the sector and for interested Partners, and would be developed with input from members of the Project Network." The Charge continues by outlining the specific elements of an action plan:

- Overview of methane recovery and use opportunities and description of available technologies and best practices.
- Identification of key barriers and issues for project development.
- Discussion of market assessment and reform issues.
- Identification of project finance opportunities and mechanisms.
- Discussion of country-specific needs, opportunities, and priorities.
- Identification of possible cooperative activities to increase methane recovery and use in the sector.
- Outreach to engage Project Network members.

In revising the action plan, the LS determined that these elements will be critical in guiding its near-term activities, particularly its preparation for the planned cross-sector Methane to Markets Partnership Expo in the Fall of 2007.

The LS convenes approximately two times per year and the Action Plan is revised and updated at each of these meetings, incorporating input from country representatives and the Project Network members in attendance. The Action Plan is a living document and is intended to focus the work of the LS. In general it identifies the key barriers to project development and outlines ways to overcome those barriers. It also

identifies the LS's priorities for action. Accordingly, it describes each of the tasks, establishes expected time frames for their completion, designates leads for each task from member countries and the Project Network, and identifies other member countries and Project Network members who are participating on the working group for each task.

The Action Plan includes activities that will result in emissions reductions in the near term and that facilitate project development. Moreover, a number of important barriers to project development are addressed that are associated indirectly or in the longer term with emissions reductions. [DEH1]

III. Action Plan

A) Overview of LFG Recovery and Use Opportunities and Descriptions of Available Technologies and Best Practices

Each day, millions of tons of municipal solid waste are disposed of in sanitary landfills and dump sites around the world. LFG is created as a natural byproduct of the decomposing organic matter, such as food and paper, disposed of in these landfills. LFG consists of about 50 percent methane (CH_4)—the primary component of natural gas and a potent greenhouse gas when released to the atmosphere—about 50 percent carbon dioxide (CO_2), and a trace amount of non-methane organic compounds.

LFG is extracted from landfills using a series of wells and a vacuum system. LFG can be used to produce electricity with engines, turbines, or other technologies; used as an alternative to fossil fuels; or refined and injected into the natural gas pipeline. Capturing and using LFG in these ways can yield substantial energy, economic, environmental, air quality, and public health benefits. Internationally, significant opportunities exist for expanding the productive use of LFG. The technologies for collecting and beneficially utilizing LFG are proving to be cost effective.

To successfully develop LFG energy projects, one must address a range of issues. At a minimum, a successful project will require:

- Estimation of LFG recovery potential at the candidate landfills and a preliminary feasibility assessment.
- Access to capital markets and an economic feasibility assessment to examine end use options and support efforts to obtain financing.
- Determination of the project structure (e.g., management, engineering, and construction).
- Determination of gas rights ownership, energy sales contracts, and securing permits and approvals, as applicable.

One important issue for project development is that open dumps and unmanaged landfills are the predominant disposal options in many developing countries. These sites can be less-than-optimal candidates for LFG energy development because they contain only small amounts of methane (resulting from aerobic degradation and rapid decomposition of high organic wastes). However, many developing countries are currently transitioning to landfills from more uncontrolled systems. Landfills are a more environmentally sound disposal option for these countries, but they also will produce more methane. The LS can help facilitate a transition to landfilling by sharing information on effective landfill design and management, as well as integration of LFG capture and beneficial use into these planning processes.

Another important issue for LFG energy project viability in both developing and developed countries is energy price structure. Government policies on energy and solid waste management can promote or hinder the beneficial use of LFG. An uncertain regulatory environment is often a concern among potential

investors. For example, project developers can be subject to different and sometimes conflicting laws at the local, regional, and national levels. Moreover, a lack of regulations governing landfills and LFG energy projects (i.e., no requirement or incentive to collect and combust LFG) in some countries can inhibit project development.

As countries begin to implement laws, regulations, and policies to improve solid waste management practices, promote alternative energy, and address greenhouse gas emissions; the economic viability of LFG energy projects will improve. Moreover, creating an atmosphere in which potential investors (the private sector, international development banks, and financiers) are secure in the technical and policy framework that supports LFG energy projects will be essential to project development. The LS brings together the collective resources and expertise of the international community to address technical and policy issues and facilitate LFG energy projects. Early Partnership actions may include:

- Assisting with solid waste management capacity building.
- Identifying potential landfill resources.
- Performing initial gas generation and feasibility studies.
- Technology transfer through demonstration, training, and workshops.
- Creating an environment for sound investment.

LFG capture and use is a reliable and renewable fuel option that represents a largely untapped environmental and energy opportunity at thousands of landfills around the world. However, certain barriers hamper LFG project development in Partner countries. In response, the LS is developing an action-oriented strategy to find solutions to overcome barriers and facilitate LFG projects in Partner countries.

B) Identification of Barriers to LFG Project Development and Landfill Subcommittee Actions to Address Barriers

Several of the key barriers identified by the LS are:

(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 Partner countries.

(3) Difficult access to existing LFG documents, tools, and resources**.**

(4) Difficult identification of suitable landfills in Partner countries for potential LFG project assessment and development.

(5) Lack of financing or capacity to obtain financing for LFG projects.

(6) Lack of in-country partners and international organization involvement

These categories are not meant to be rigid or exclusive; they merely characterize the major types of barriers and Partnership activities that can support project development and methane emissions reductions.

(1) Barrier: lack of country-specific information on disposal practices, LFG management, and opportunities for LFG capture and use

Many nations lack essential information about opportunities for LFG capture and use in a given country or region, including information on many of the key factors (e.g., technical, legal, regulatory, economic) in project development. In many countries, tracking and maintaining quantitative and qualitative data on disposal sites is problematic due to the lack of a systematic and readily available inventory or database for those data.

Action item: develop landfill country profiles

The LS has made significant progress in compiling country-specific landfill information into "country profiles," which provide essential background information on solid waste management activities and the status of LFG development projects. New submissions from Brazil, Canada, and Ecuador bring the number of developed profiles up to 9. This action item will remain a priority for those countries that have yet to complete their country profiles. As soon as they become available, profiles are posted to the Methane to Markets Web site.

Action item: develop an international landfill and LFG project opportunities database for the Partnership

In the previous action plan, the LS proposed to develop a database to document landfills and LFG projects in the partner countries, identify landfill candidates for potential technical evaluation, identify project development and investment opportunities, and track LFG projects facilitated by the Methane to Markets Partnership. To address this action item, the U.S. delegate agreed to modify the existing U.S. EPA International Landfill Database to meet the needs of the Partnership and Project Network. A draft design and template for the modified database was presented at the 12 May 2006 LS meeting. At that meeting, the participants agreed to form a small LS task force to study the landfill database development, aiming to develop a list of critical fields that would be useful for conveying project opportunities. Delegates from Argentina, Ecuador, Italy, and the United States, as well as three Project Network members (Adrian Loening, Greg Vogt, and Ulrich Sawetzki), offered to serve on the database task force.

Action item: sponsor LFG training workshops and activities to support the fall 2007 Methane to Markets Partnership Expo

One of the highest-priority action plan items is the preparation and planning for the cross-sector Methane to Markets Partnership Expo, to be held in the fall of 2007 in Beijing. The Partnership Expo has been proposed as a 3- to 4-day event that will focus on highlighting project opportunities in each of the sectors and countries and bringing together project developers and local stakeholders to promote further development of these projects. In addition, there will be opportunities for training sessions on a variety of topics related to each sector. The LS has identified a number of near-term activities, outlined below, that will support the Partnership Expo.

- Contact and engage officials at the municipal level to encourage their participation in the Partnership Expo. More specifically:
    - Country delegates should make contact with key locally focused aid and development organizations in their regions, including, among others, the International Council for Local Environmental Initiatives (ICLEI), the U.N. Sustainable Cities Programme, and public-private partnerships within the USAID Global Development Alliance. The U.S. delegate has already met with the U.S. office of ICLEI, which indicated that it

sees opportunities to share with its members information related to Methane to Markets and LFG opportunities in the Cities for Climate Change program.
  - Country delegates should consider ways to sponsor the participation of municipal officials (i.e., mayors and public/solid waste directors) from developing countries that have a demonstrated need for travel sponsorship at the Partnership Expo, as this is considered a critical target audience.
  - Country delegates should assess the needs of local officials and landfill owners/operators through an informal survey in order to make specific recommendations for the Partnership Expo agenda.
  - The LS should consider opportunities to set up side-events at key international conferences that would reach out to local officials and landfill owners/operators and encourage them to participate in the Partnership Expo. Venues to investigate include the Carbon Expo Asia, U.N. Framework Convention on Climate Change, U.N. Sustainable Development Program.

- Develop a draft agenda for the Partnership Expo:
  - The LS has developed a draft agenda to share with the other Methane to Markets Subcommittees and the overall Partnership Expo Task Force. This will help the groups develop a coordinated program that will meet both cross-sector and sector-specific needs. The U.S. delegate agreed to finalize this draft agenda through consultation with LS members, and the ASG will distribute for consideration by other subcommittees, the Partnership Expo Task Force and the Steering Committee.

- Develop financing/training workshops and materials in support of the Partnership Expo:
  - Country delegates of the LS will contact the key solid waste trade associations in their areas to encourage their participation at the Partnership Expo. Some leading organizations to contact include the International Solid Waste Association (ISWA) and the European Waste Organization. These organizations can participate directly in the Expo, possibly through side-events, technical presentations, or training sessions on specific topics.
  - Country delegates should coordinate with any planned in-country landfill-related conferences to present information on the Partnership Expo and prepare potential participants with the training and information they need to further engage in the project development process.

(2) Barrier: insufficient knowledge and experience in developing LFG capture and use projects in Partner countries

Conventional and leading-edge technologies to collect and utilize LFG are currently operational in a number of Partner countries. Several Partner countries also possess the technical expertise to design, construct, finance, and manage LFG projects that could be shared with other Partner countries. However, deployment of these technologies and expertise into other countries has lagged for a variety of reasons, including lack of political, regulatory, legal, and economic policies and capacity to facilitate LFG projects. The LS believes this shows the need for a “lessons learned” approach, in which solutions are shared for the technical challenges encountered at developing LFG projects around the world. Particularly important are technical challenges in adverse environments or where specific problems arise (e.g., high leachate levels). Most of the major technical problems have been addressed in one form or another in countries with extensive experience in LFG project design, development, construction, and operation. The LS should facilitate the dissemination of such experiences, communicating the lessons learned via the Methane to Markets Web site.

Action item: create "lessons learned" white papers on technical challenges and solutions encountered at LFG projects

The first draft of a lessons learned white paper called "Conducting a Successful Landfill Gas Pump Test" has been issued with a request for comments from LS members. This white paper will be finalized shortly and posted to the Methane to Markets Web site.

Potential next planned white papers will describe steps to project development (for landfill owners and operators) and waste picker issues. No specific deadlines have been set for these papers; since the priority for the next few months is to prepare for the Partnership Expo, the development of these papers will be integrated with the needs of the Partnership Expo. Other papers may result from ISWA activities related to technical and management considerations for conversion of open dumps to controlled landfills, or be based on sharing experiences from recently completed pre-feasibility studies.

Canada is currently working on a *Quantification Protocol for Landfill Gas Capture and Combustion* to meet ISO 14064 requirements. This protocol will describe how to measure greenhouse gas emission reductions, discussing the types of instrumentation, the required accuracies, the sampling frequency, the reporting, and what needs to be done during contingencies.

Action item: disseminate information on technical solutions to landfill gas energy (LFGE) project development through workshops and training sessions

The LS has identified workshops as an excellent way to disseminate information and technical guidance for LFGE project development, and this remains a goal of the action plan. One such activity is the U.S. EPA's planned LFG Energy Workshop, to be held in cooperation with the Third International Conference on Biomass Energy, 18–20 Sept 2006, in Kiev, Ukraine.

A training session(s) is also under consideration at the Partnership Expo to address specific barriers to projects (e.g., contracting services)

(3) Barrier: difficult access to existing LFG documents, tools, and resources

As evident in the review of country profiles and from related experiences of the Project Network, much has already been accomplished in the area of LFG project development guidance (e.g., the World Bank Latin America LFG project development handbook and the U.S. EPA's LFG project development handbook, feasibility studies, estimation tools and software). The delegate from Brazil recently presented a new biogas software calculation tool for estimating greenhouse gas reductions, costs, and energy utilization that has applications in Latin America and can be adapted to other world regions as well. This tool will soon be posted on the LS Methane to Markets Web site. The LS will continue to identify and distribute these resources as they become available and asks that all members alert the ASG to any such resources they would like to be posted to the Methane to Markets Web site.

Action item: develop a bibliography of existing documents, tools, and resources for the Methane to Markets Web site

The LS recommended focusing on collecting these existing resources, compiling them, and making them available to the Partnership and Project Network through the Methane to Markets Web site, instead of creating new materials. In response to this recommendation, the ASG and the LS have developed a bibliography of landfill resources. Titled "Landfill Subcommittee Guide to

On-line Landfill Methane Documents, Tools, and Resources," this bibliography is now posted on the Methane to Markets landfills Web site. It provides brief descriptions and links to a large number of useful references—guidance on landfill development, pre-feasibility study reports, LFGE project development guidance handbooks, landfill databases, and estimation models.

All LS members are encouraged to add to the on-line resource guide by submitting new materials to the ASG. In addition, the ASG will consider ways to improve the list's organization and ability to be searched.

4) Barrier: difficult identification of suitable landfills in countries for potential LFG project assessment and development

All of the Partner countries use disposal sites to manage the municipal solid waste they generate. Disposal sites range from uncontrolled open dumps to modern sanitary landfills. However, there is often little documentation or data maintained by the countries (at the national, state/provincial, or local level) to allow project developers and others to sufficiently assess opportunities for LFG capture and use projects.

Action Item: Develop country listings of viable landfill sites for potential LFGE project assessment, and for potential exhibition at the Partnership Expo

The primary goal of the Partnership is to deliver near-term methane reductions. To meet this goal, the LS considers it essential to identify near-term LFG project development opportunities in the Partner countries. The LS has asked Partner countries to develop and submit a list of up to 10 landfill sites.

For the action plan, the LS has placed a high priority on the identification of potential sites for LFGE development. To move this activity ahead, the U.S. and Australian delegates have been developing a draft template to request country-specific information on their most promising sites. The template will be revised to reflect comments from the latest meeting, then released to the LS as a short-term action plan activity. It is considered a critical planning step for the Partnership Expo to identify these candidate sites as early as possible so that sufficient information and technical assessment (e.g., pre-feasibility studies) can be collected and prepared as part of a presentation package to showcase sites at the Partnership Expo.

Significant progress has already been made toward identifying viable landfill sites in a number of Partner countries; as part of the action plan, this information will need to be compiled and consolidated into the reporting template mentioned above. Argentina is actively preparing a list of candidate landfill sites for pre-feasibility studies, and Brazil has compiled an extensive list of landfills with associated technical information (http://www.snis.gov.br/diag_2003_rs.htm). Also, Brazil's Ministry of Cities is further evaluating sites that have LFGE potential, as biogas utilization is receiving increasing attention in that country. Ecuador has identified five cities where gas assessment studies would be most beneficial. Ukraine has collected information and done preliminary screening of landfills that have the highest probability of methane extraction and utilization. A large amount of information has also been collected for landfill sites in India, Korea, Mexico, and China in support of bilateral LFG-related activities in those countries—information that should also be an adequate source for a prioritized list of sites in those countries.

After the candidate project template is finalized, Partner countries will work to complete site-specific templates to reflect these recent LFG investigations and data collection efforts for their most viable sites. The data will be added to the International Landfill Database. The templates will then be available for widespread distribution via the Partnership Web site.

(5) Barrier: lack of financing or capacity to obtain financing for LFG projects

Project financing is a major challenge to LFGE project development. In spite of this, the emergence of carbon markets is becoming a significant driver for LFG project development in the near-term. The focus on carbon financing has increased interest in LFG project development, accelerated that development, and reduced the risk perceived by the investment community. "Up-front" financing to support the early stages of project development is becoming increasingly important. However, carbon financing will not overcome all of the financial barriers to project development. As a result, the LS has determined that it would be beneficial to engage the financial community in LS activities and to produce tools to assist in the financial planning of LFG projects.

Action item: provide information and guidance to help overcome financial barriers

The LS has previously identified project development templates and feasibility templates for investors as tools that could help reduce early transaction costs. However, the specifications of these tools have not yet been confirmed: questions remain as to who is the best audience for this type of guidance and how to properly define this barrier in the context of project development. The Project Network members have also recognized that local officials and developers need benchmarking tools so they can prepare independent measures of the financial costs/benefits of proposed landfill projects.

In response to these evolving needs, and in anticipation of a financing workshop or training session either before or during the Partnership Expo, LS participants will submit ideas to the LS chairs on what topics/tools to include in a financing workshop. The guidance and tools will focus more on stakeholders who are unfamiliar with the financial aspects of project development, and less on the carbon financiers who are already well-versed in the issues. One of the goals is to give local officials realistic information on financial returns—to defuse unrealistic expectations that might affect project development.

(6) Barrier: lack of in-country partners and international organization involvement

There is a need to increase the linkages and shared resources that result from bi-lateral, multi-lateral, and international organization involvement in sustainable development activities that include biogas recovery and utilization.

Action item: identify possible cooperative activities to increase methane recovery and use in the landfill sector

Through regular meetings and contacts among Partner countries and their private-sector counterparts through the Project Network, the LS continues to pursue cooperative activities on a bilateral or multilateral basis that meet the identified needs and overcome key barriers to LFG project development.

Many of the activities identified above, such as providing overview information or developing strategies or carrying out activities to reduce barriers to project development, can be carried out by two or more Partner countries working together. Administrative activities, such as developing a broad set of criteria and goals for the Subcommittee to consider, also fall under this category of activities.

A number of Partner countries have identified LFG/LFGE projects in their ongoing bilateral, multilateral, and CDM-related activities, and will continue to stress the importance of Methane to Markets participation in the upcoming year. Examples of these activities include:

- Japan identified 5 existing CDM projects under development in the landfill sector, as well as another 17 pre-feasibility LFG projects in the CDM/JI pipeline.
- Italy is supporting a broad spectrum of cooperative arrangements in China, including LFGE projects that should be excellent candidates for showcasing at the Partnership Expo. These activities involve extensive contacts with state, Beijing, and other city officials and institutions within China that support LFG project development.
- Australia is actively exploring project opportunities as part of its bilateral partnerships on climate change, including its participation in the Asia Pacific Partnership.
- The United States is working with Mexico to identify candidate landfill sites, conduct pre-feasibility studies and pump tests, and develop energy utilization at the most viable sites. The United States is also partnering with the World Bank to conduct pre-feasibility studies in Latin American countries, and has already initiated bilateral activities in Argentina and Ecuador to focus on project development and technical assistance. USAID has designated $400,000 in grant monies for Methane to Market projects in India; moreover, that country may host a cross-sector Methane to Markets workshop in November 2006. The U.S. EPA is also working with Ukrainian and Russian officials to identify viable LFGE landfill sites and to conduct pre-feasibility studies on those sites.

IV. Country-Specific Needs, Opportunities, and Priorities

Many members of the LS have submitted country-specific profiles that identify needs, opportunities, and priorities. Learning the specific needs of Partner countries will be an ongoing activity of the LS as more site-specific investigations and information is collected.

Several such needs—of the type that can be addressed through action plan activities—were brought up at the 12 May 2006 LS meeting and are summarized below. More detailed profiles for each country are provided on the Methane to Markets Web site (http://www.methanetomarkets.org/resources/landfills/index.htm):

- Argentina specified a need for more technical capacity building in the area of LFG project development. Argentina has already identified several landfills suitable for pre-feasibility studies. Upon completion of the pre-feasibility study(s) a workshop to disseminate the results to attract investment is being considered for late-2007 or 2008, either at or before the Partnership Expo.
- Ecuador's needs include capacity building in the area of solid waste management, technical assistance in converting uncontrolled disposal sites to sanitary landfills, technology transfer to the local level, gas assessment, and LFGE pre-feasibility studies. These may be addressed through bilateral activities, training workshops, and dissemination of technical guidance through the upcoming year.
- South Korea is seeking ways to create economic feasibility for smaller landfill sites, which account for a significant proportion of their landfills. This need is seen in many other areas of the

world, and the LS should consider it when it develops financing guidance/training sessions as part the action plan activities.

- Ukraine needs assistance in developing economically feasible utilization of LFG, including help with overcoming lower power sales tariffs and locating alternative sales agreements through private power and heat purchases. Some of these issues can be integrated into the agenda for the LFG Energy Workshop in Kiev (planned for September 2006) and through bilateral assistance from the United States on identification of potential energy users.

V. Outreach to Engage Project Network Members

Encouraging private-sector organizations to join the Project Network will continue to be a vital component of the Subcommittee's activities in each of the areas identified above. Each country should work to open lines of communication with the relevant private-sector parties to ensure their active participation in the ongoing activities of the Partnership. All Partner countries should actively recruit organizations for the Project Network to increase awareness of project opportunities and barriers in their respective countries.

Close to 300 Project Network members have joined the Partnership as of the 12 May 2006 meeting, due in part to the LS goal for each Partner country to recruit 10 Project Network members since the last Subcommittee meeting. The LS will continue to focus recruitment efforts through conference participation, dissemination of outreach materials, and targeted recruitment for organizations that would be beneficial for the Partnership Expo. Translations of outreach materials and resources into Russian, Chinese, and Spanish will continue, as this is an effective way to engage and communicate with interested parties from large areas of the world.

Landfill Subcommittee Action Plan Activities —Updated at subcommittee meeting held on 12 May 2006

Item	Barrier	Action	Activities Completed	Current Planned Activities	Lead for Current Activities
1	Lack of country-specific information on disposal practices, LFG management, and opportunities for LFG capture and use.	**Develop landfill country profiles.**	9 country profiles have been completed, with 8 currently posted on the Methane to Markets Web site.	Follow up with member countries that have not yet submitted country profiles. Post all submitted country profiles to the Methane to Markets Web site.	All Partner country delegates that have not yet submitted country profiles. ASG to post submitted country profiles to Web site.
		International Landfill Database. The database will serve as a useful resource to assist in identifying potential methane recovery and use projects in the M2M partnership countries.	Designed the template for a Web-based tool to provide data and contact information for key government contacts and for specific landfill project opportunities in Partner countries. Preliminary data collected for four countries: China, India, Mexico, and Brazil.	Convene a Task Force to provide guidance and revise inputs to reflect the need for key elements related to project opportunities and to be consistent with priority landfill site listing information prepared for the Partnership Expo. Consider a design for sub-module templates for more detailed landfill characteristics. Launch database by January ’07.	LS Landfill Database Task Force: • Argentina • Ecuador • Italy • United States • Project Network (Vogt, Sawetzki, and Loening)

Item	Barrier	Action	Activities Completed	Current Planned Activities	Lead for Current Activities
		Sponsor LFG training workshops and Project EXPO.	Sponsored Landfill Methane Training Workshop in Moscow, Russia, 31 May–1 June 2005 (a U.S./Russia collaboration). Cosponsored Latin American LFG Project Expo 2005 in Montevideo, Uruguay, 7–8 July (a World Bank event).	Support the Partnership Expo in fall 2007. Immediate task: develop draft agenda items; identify venues to promote the Partnership Expo and suitable landfills to profile. Contact ISWA about approach to training/workshops in preparation for Partnership Expo. LFG Energy Workshop in Kiev, Ukraine, 18–20 September 2006 (planned).	All LS participants (draft agenda circulated to other subcommittees in May/June 2006). Greg Vogt (PN). United States/Ukraine.
2	Insufficient knowledge and experience in developing LFG recovery and use projects in M2M countries.	**Create "lessons learned" white papers on technical problems and solutions:** summaries of key technical problems with developing LFG projects in developing countries, explaining how the problems have been addressed.	Developed a template for lessons learned papers: experiences, problems encountered, solutions, and associated cost. First draft of lessons learned on "Conducting a Successful Landfill Gas Pump Test" issued for comment.	Finalize "Conducting a Successful Landfill Gas Pump Test" paper and post it to the Methane to Markets Web site. Consider activities that can readily translate to lessons learned papers (e.g., results of pre-feasibility studies).	United States (finalization of paper) and ASG (posting to Web site). LS and PN members engaged in pre-feasibility activities, project development, research, etc.

Item	Barrier	Action	Activities Completed	Current Planned Activities	Lead for Current Activities
3	Difficult access to existing LFG documents, tools, and resources.	**Develop a bibliography and provide links to existing documents, tools, and resources.**	Implemented Web site links to articles, case studies, and existing feasibility and pre-feasibility studies.	Refine the landfill on-line resource listing to enhance searching functions and organization	ASG.
				Solicit additional documents and resources from subcommittee members.	All LS participants.
4	Insufficient identification of suitable landfills in Partner countries for potential LFG project assessment and development.	**Develop a list of the most viable LFG project development opportunities in each Partner country.**	Developing a template for countries to use in submitting landfills for evaluation.	Finalize the draft template; submit to LS members for comments.	United States, Australia, Project Network (Loening and Vogt) to finalize template elements.
				Input and submit information on top candidate landfill sites to finalized template.	All Partner countries.
				Candidate landfill list made available on the Partnership Web site to facilitate LFG project opportunity evaluation.	ASG will post submissions as they are received.
5	Lack of financing or capacity to obtain financing for LFG projects.	**Provide information and guidance to help overcome financial barriers.**	Supported the cross-sector finance session at the Steering committee meeting in Buenos Aires (Nov 3, 2005) with two speakers on LFG case studies.	Support input to a cross-sector financing session that may be held at the Partnership Expo in September - November 2007.	All LS Participants.

Item	Barrier	Action	Activities Completed	Current Planned Activities	Lead for Current Activities
6	Municipal officials and local stakeholders need more exposure to LFG project opportunities.	**Outreach to municipal officials and local owners/operators in preparation for Partnership Expo.**	This barrier/need was prioritized at the 12 May 2006 LS meeting.	Methane to Markets to consider side events at key international meetings involving municipalities.	ASG.
				Partner country delegates to make contacts with national and international organizations that support municipal development/sustainability efforts (e.g., ICLEI, United Cites Program, public/private partnerships).	All Partner countries; USAID (Edgar Thornton to help facilitate ISWA/ICLEI/United Cities/National League of Cities contacts).
				Partner countries should attempt to secure funding to support travel/expenses of identified municipal officials to attend and participate in the Partnership Expo, where necessary.	All Partner countries.
				Partner countries to assess the needs of their municipal officials to help in defining assistance opportunities, training sessions, and agenda items for the Partnership Expo.	All Partner countries.

Item	Barrier	Action	Activities Completed	Current Planned Activities	Lead for Current Activities
7	Need to expand the Project Network to include more organizations involved with local investment and aid.	**Identify and recruit Project Network members with ties to municipalities and local development/growth programs.**	There are almost 300 Project Network members in the Partnership now.	Partner countries to contact regional representatives and encourage organizations such as ICLEI, the World Cities Organization, and others to join the Project Network.	All Partner countries.
				Translation of the Project Network information package into Italian.	Italy.