

**Methane to Markets**  
**Landfill Subcommittee Meeting**  
Torquay, United Kingdom  
13 June 2005

## **MEETING MINUTES**

### **Summary of Key Discussion Points and Conclusions**

The Landfill Subcommittee (LS) of the Methane to Markets Partnership held its second session on June 13, 2005 at the Palace Hotel in Torquay, United Kingdom. The meeting provided an open dialogue and discussion forum for country delegates, Project Network members, and other interested participants. The following Partner countries participated: Argentina, Australia, Brazil, Italy, United Kingdom, and the United States. Project Network members from six countries also were in attendance.

The committee focused its attention on developing near term activities for the LS Action Plan (see Annex I for a listing of activities in the draft Action Plan). The final Action Plan for the LS will be submitted to the Methane to Markets Steering Committee prior to the next ministerial meeting to be held 2-4 November 2005 in Buenos Aires, Argentina.

In summary, there was agreement amongst the meeting participants that an increasing market for landfill gas capture and use project development is quickly emerging, due to drivers from the Clean Development Mechanism (CDM), national renewable energy goals and requirements, and other emerging carbon trading systems. An overarching objective identified for the LS is to keep pace with project development needs, in terms of both financial planning and technical guidance. Increasing and enhancing public/private partnership opportunities, identifying the most viable landfill sites for project development, and speeding up the project development process were all highlighted as important considerations for reaching this objective. A number of key issues and program needs related to these considerations emerged from the meeting discussion. Following is a summary of each of these key discussion areas and the tangible activities identified in the Action Plan to address them.

***Expediting landfill gas project development:*** All participants expressed a strong need for creating tools and resources that can accelerate the process of getting LFG projects up and running, particularly in those countries that have do not have mature systems for LFG development in place. Partner country delegates and Project Network members both stressed the need for concrete actions to help get viable, practical projects moving at a more accelerated pace. This effort will require a multifaceted approach, and the following Action Plan items were identified to aid in this effort:

- (i) Develop an international landfill and landfill gas projects database to record landfills in the partner countries; identify landfill candidates for potential technical evaluation; identify project development and investment opportunities; track progress of the partnership;
- (ii) Provide practical guidance to project developers on overcoming financial barriers to developing landfill gas projects, and particularly for increasing investor confidence and securing up-front financing;
- (iii) Review the outcome of the upcoming Methane to Markets (USG) cosponsored 2005 Latin America LFG Project Expo and explore possibilities for a 2006 landfill methane project expo;
- (iv) Request that each country prepare a short list of landfill gas sites in Partner countries that have high potential for project development and which can be further considered by the project development community;

A number of specific Action Plan activities related to item (ii) above were identified: 1) creating a bankable project early on and overcoming the barrier of cost-competitiveness for LFG-generated electricity were identified as key steps to developing projects. To begin to address these issues, the Action Plan proposes background papers and guidance on the topics of feasibility and investment cost templates, the influence of the carbon credits market on investment strategies, and project financing opportunities and mechanisms.

***Sharing technical challenges and solutions encountered at LFG projects:*** Meeting participants highlighted the need for a “lessons learned” approach to share solutions to technical challenges encountered at LFG projects. Meeting participants recognized the value in communicating the lessons learned from the extensive experiences already gained in LFG project development globally. In particular, technical challenges in adverse environments or where specific problems arise (e.g., high leachate levels) may be potential technical barriers to overcome for project implementation. The Subcommittee agreed to develop a summary template of key technical issues and solutions to support this effort. In addition, an on-line landfill forum will be considered for future development as another means for sharing project experiences and finding solutions to problems encountered.

***Distributing existing guidance, tools and information for project development:*** A review of the country profiles and experiences of the Project Network participants showed that there are many existing sources for general guidance on project development and that the LS should not be redundant in repeating these efforts. Instead, the meeting participants agreed that a comprehensive list of existing tools and resources (e.g., World Bank LFG project development handbook, EPA International LFG Model) should be compiled for the LS Methane to Markets Web site, with links to access them from the site. Some modifications to existing tools might be necessary to make them more useful under the Methane to Markets Partnership. Also as part of the Action Plan, it was recommended that case studies be posted that help show various aspects of the project stages and help communicate practical experiences in the field.

***Tracking projects facilitated by Methane to Markets Partnership:*** The meeting participants identified a need to track LFG projects that had been facilitated by the Methane to Markets Partnership as a means to measure the progress and success of the program. Because of the large number of potential LFG projects and activities in the Methane to Markets countries, originating from different mechanisms and developing influences, the Subcommittee believed it was important to differentiate those LFG activities that had been facilitated by the Methane to Markets Partnership. The ASG stated that there is a general need across all the technical subcommittees for guidelines to properly label an activity as a ‘Methane to Markets’ activity. The ASG will be proposing some general guidelines to the Steering Committee to ensure proper use of the Methane to Markets name. In addition, possibilities for cross-walking LFG projects facilitated by the Methane to Markets LS with the proposed International Landfill Database were raised as a means to further track project development as well as identifying LFG project development opportunities. The design and template for the International Landfill Database is a short-term action item in the draft Action Plan.

In addition to the specific topic areas addressed above, a number of on-going activities were emphasized at the meeting. These included the continued, active recruitment of new members for the Project Network and facilitating on-going communication between Partnership members and the greater project development community. The importance of the Project Network was emphasized in the opening remarks by the Co-Chairs, where the need for public/private interaction was identified as a key to successful project implementation.

The following sections provide more details of the meeting discussion and each of the main topic areas covered in the agenda.

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## **Opening Remarks and Introductions**

Co-Chairs Atilio Savino of Argentina and Mario Lazzeri of Italy called the meeting to order at 9:00 on 13 June 2005 at the Palace Hotel in Torquay, United Kingdom. The List of Attendees is included as Annex II to this report.

In his opening statement, the Co-Chair from Argentina, Dr. Savino stated the importance of the Methane to Markets Partnership as one of the emerging tools to address climate change, and one that particularly helps to involve developing countries in addressing climate change issues. The Co-Chair from Italy, Mr. Lazzeri stated the important energy security and GHG reduction goals of the Methane to Markets Partnership and that this is to be considered a long-term international partnership. He highlighted the development of methane capture and use technologies and their dissemination to the world energy market as a key objective for the Partnership. Both Co-Chairs stressed the importance of establishing public/private partnerships to see projects advance from concept to reality. The Co-Chairs emphasized that the key objective of the meeting was to identify near-term activities that would be the initial input for the LS Action Plan. The full LS Action

Plan will be submitted to the Methane to Markets Steering Committee prior to November 2-4, 2005, the schedule timeframe for the next ministerial and LS meetings.

### **Methane to Markets Partnership Update**

Erin Birgfeld, head of the Methane to Markets Administrative Support Group (ASG), provided an update on activities since the last LS and Methane to Markets Ministerial meetings held in November 2004. Since that meeting subcommittees have been established and country delegates assigned for all sectors. The number of Partner countries has grown to a total of 15 at present with South Korea recently joining, and Canada having made a request to join the Partnership in May. Ms. Birgfeld stated that over 120 organizations have joined the Project Network overall, and of these, 66 are landfill members. The next Steering committee meeting will be held in Buenos Aires, Argentina, 2-4 November 2005. The technical subcommittees will also meet during this time.

Ms. Birgfeld re-stated the Steering Committee's charge to the technical subcommittees from the November 2004 meeting which was to develop a sector specific Action Plan for the next ministerial meeting. Subcommittees are also charged with preparing progress reports on activities, reporting on milestones, and contributing to technical outreach activities.

An update on the Outreach and Communication Plan was also provided. The plan is a partnership-wide plan and is centered on a comprehensive, web-based platform. The Web site will contain fact sheets, quarterly updates (first update planned for the end of June, 2005), meeting reports, links to pertinent tools and resources, reports and database products resulting from subcommittee Action Plans, and the newly proposed Project Network project submission mechanism. The United States has proposed this mechanism as a means for the technical subcommittees to solicit and receive project ideas from Project Network members. Project Network members can submit a project proposal form which will be made available on the web site. The proposal form gives Project Network members an avenue from which to suggest new project ideas, and to increase communication with other Subcommittee members who may be interested in pursuing new project development. This mechanism will be implemented on a provisional basis until the next Steering Committee meeting in November 2005 at which time the Committee can review the utility of this mechanism and recommend changes as necessary.

### **Developing the Action Plan**

The discussion of current and future program work areas for the LS revolved around three main topics: (i) overcoming financial hurdles for project development, (ii) overcoming technical hurdles for project development, and (iii) collecting and disseminating information and guidance to aid in project development. Discussion of these topics centered on the main objective that was emphasized throughout the

meeting—namely, to accelerate investment in and development of viable projects around the world.

Review of the country profiles and comments from the Project Network members highlighted the key challenges and opportunities to project development. The financial issues discussed included: (i) cost competitiveness of LFG capture and use with traditional fossil fuels, (ii) the use of incentives and subsidies, (iii) carbon market drivers, (iv) increasing investor certainty, and (v) identifying specific potential project development opportunities for submittal and consideration by the LS. The Project Network members also expressed that it would be beneficial to engage the financial community in LS activities and to produce financial tools to assist in the financial planning of LFG projects.

A number of responses have emerged to address the cost-competitiveness problem for LFG use in electricity production, where it can cost 2 to 3 times as much as fossil-based production. A number of the Partner country delegates described the influence of emerging national and local requirements for renewable energy as a driver for LFG project development. These national programs have often created the necessary financial incentives for LFG projects to move ahead by providing a secure market. Project Network members agreed that the existence of such renewable energy goals and requirements would contribute to building investor confidence in up-front project financing. In response to this discussion, a number of short-term action items related to developing and providing information on financial feasibility and considerations were proposed.

Meeting participants also discussed the emerging carbon market and identified it as a significant driver for LFG project development in the near future. Project network members highlighted the Clean Development Mechanism (CDM) as an important factor in the carbon credit market and key consideration for LFG project development. The focus of CDM implementation has resulted in an upswing in interest in LFG project development, a reduction in perceived risks by the investment community, and accelerated pace for LFG project development. Project network members noted in particular that ‘up-front’ financing to support the early stages of project development is becoming increasingly important. Some contributing factors to investor certainty in early stage development were identified and included host site development, capabilities and expertise of the project developer, secured and locally available equipment providers, and a verifiable carbon-credit accounting. It was also noted that CDM LFG project development will significantly expand within the next 12 to 18 months, creating a need for LS guidance and tools to keep ahead of this activity so as to provide timely financial and technical assistance.

The influences of other mechanisms (e.g., the European Unions Emission Trading System program) were also mentioned as potential drivers in LFG project development. Project Network member raised the likely scenario of an accelerated schedule of CDM-driven projects, and then a slower development path for projects resulting from other

drivers. It was felt that looking at LFG project development this way may help the LS identify and prioritize its activities in the short term.

Many Project Network members expressed the need for more guidance from the financial community on how to access funding for project development. One suggestion was to prepare project development templates and feasibility templates that could help reduce early transaction costs. It was also suggested that by focusing on specific stages of the project cycle, and the stakeholders' needs at those stages, a more accurate picture of how much and what type of information is needed at any given time in the project cycle. This type of information would be particularly valuable to project developers in working effectively with investors in the early stages of project development. A number of action items were identified related to financial planning guidance, including development templates for investors and stakeholders.

Regarding technical barriers, participants recognized that 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. Thus the LS should facilitate the dissemination of such experiences, and the lessons learned, are communicated via the Methane to Markets Web site. The group agreed that the Action Plan should include a near term activity to prepare a "lessons learned" white paper or check-list on technical issues, solutions, and associated costs for remediation to facilitate development of successful LFG projects. In addition, any available case studies or technical literature that addresses technical problems and solutions should be collected and posted on the Methane to Markets LS Web site.

The group also discussed the need to collect and distribute the available guidance, tools, and information on LFG project cycle development. As evident in the review of country profiles and from experiences of the Project Network members, much has already been accomplished in the area of LFG project development guidance. As examples, the World Bank LFG project development handbook and the U.S. EPA's Landfill Methane Outreach Program (LMOP) LFG project development handbook were identified as possible resources. The consensus was that the LS should focus on collecting, compiling, and making available these existing resources as soon as possible through the Methane to Markets LS Web site, instead of recreating new materials. Specific Action Plan items were proposed to post known resources, as well as an ongoing Action Plan initiative for all members to provide information on links to resources to the ASG. Such resources might include case studies of LFG projects, feasibility and pre-feasibility studies, technology profiles, and business listings of technology or equipment providers.

There was also discussion of an on-line landfill discussion forum. This forum would exist on the Methane to Markets LS Web site, and would allow Partner country and Project Network members to communicate on arising issues and technical problems encountered in LFG project development. Overall, this activity was identified as a lower priority and a longer term item in the Action Plan, with preliminary options to be drawn up by the ASG for the next LS meeting.

Finally, the group discussed the need to identify near-term landfill gas project development opportunities for possible technical evaluation in the Methane to Markets countries. Since the primary goal of the Methane to Markets Partnership is to deliver near-term methane reductions, countries were asked to develop and submit a list of up to 10 landfill sites for consideration by the LS. The list of sites will be screened and potentially selected for further evaluation.

### **Action Plan & Reporting Progress**

Action items were agreed to at the meeting, and included as Annex I to this meeting report, that will become a part of the Action Plan. The plan proposes both short term and long-term activities to address the needs expressed in the Program of Work areas discussed above. The Action Plan will be circulated to other committee members for their review and comment before being sent to the ASG for distribution to the Steering Committee.

A short memorandum on progress as a result of activities and meetings to date will be drafted by the LS co-chairs and forwarded to the Methane to Markets Steering committee prior to the next Ministerial meeting.

### **Plans for Next Steering Committee Meeting**

The next LS meeting will be held in conjunction with the next Methane to Markets Ministerial and Steering Group meetings in Buenos Aires, Argentina in November 2-4, 2005. Immediate items for consideration in planning the next meeting were identified:

- Finalize LS Action Plan, the basis of which is provided in Annex I to this report;
- Obtain country profiles for Partner countries that have not yet submitted;
- Obtain input from Partner countries not able to attend 2<sup>nd</sup> LS meeting on ideas for next meeting;
- Partner countries should focus on actively recruiting and engaging Project Network members;
- Obtain initial feedback from Methane to Markets cosponsored 2005 Latin American LFG Project Expo and possibly begin planning for 2006 LFG Project Expo;
- Develop and provide a list of up to 10 landfill sites for consideration by the LS. The list of sites will be screened and potentially selected for further evaluation.

### **Closing Comments and Adjournment**

The Co-Chair provided the opportunity for each delegation to provide closing comments and statements. Following the closing remarks, Mr. Lazzeri expressed his appreciation to all participants for their attendance and contributions at the meeting. Mr. Lazzeri then adjourned the meeting at 17:30 on 13 June 2005.

## Country Updates

Country-specific profiles were identified in the first LS meeting as one of the key background pieces for developing the Action Plan and identifying topic area priorities. A country-by-country review of LFG program activities by the country delegates highlighted the range of applications and considerations for LFG projects based on national circumstances and pointed to topic areas that would help set the draft Action Plan activities. Key topic areas for LFG projects identified in the review included:

- Development of public/private partnerships for LFG project development;
- Legislation to promote LFG project activity;
- Utilizing subsidies to cost support LFG projects;
- Contribution of LFG projects to renewable energy portfolios;
- LFG projects as part of voluntary programs for GHG reductions;
- LFG projects in carbon crediting programs; and,
- Effect of national waste management practices on LFG collection/utilization.

Following is a brief summary of the six attending Partner delegates' review of their current programs as presented in their opening remarks, along with perspectives on LS program issues and needs. The full-length texts of the country profiles were made available at the meeting.

**Italy:** The delegate from Italy described an active national LFG program that has seen significant increases (7 fold growth between 1996 and 2003) in the amount of electrical energy produced by LFG projects. National programs supports for LFG project development have included price supports on sales to national energy buyers, and more recently, crediting LFG projects towards a 2% renewable target for energy producers. Italy has also been active in bilateral agreements involving LFG CDM projects, including a recent cooperative activity with China on LFG recovery for energy production. It was also noted that there is a recent, decreasing trend in the landfilling of biodegradable wastes as Italy reduces the amount of such waste going to landfills. This will likely have some affect on long term LFG potential.

**Australia:** The delegate from Australia described a number of national programs that support LFG project development. Included among these are market-based initiatives under national renewable energy targets, certification programs for GHG off-sets, and numerous grant-based funding mechanisms to support LFG project start-up. Methane recovery from landfills in Australia has increased 24% between 1990 and 2003, with expected increases out to 2010. However, there is an anticipated leveling off due in part to the impacts of waste minimization strategies. While LFG is not specifically part of any existing bilateral agreement at this time, it is recognized as a candidate for such through the partnerships that Australia holds with countries such as China, India, Indonesia, and Mexico.



**United Kingdom:** The delegate from the United Kingdom described a mature LFG industry within the country with secure financial arrangements through Renewable Obligation Certificates that make LFG-generated power economically viable. An expected 5-10 year growth period in recovered methane is expected, but then declines are anticipated due to the diversion of biodegradable wastes from landfills. Still there is much potential with current disposed waste, however there are technical issues to resolve regarding extraction of lower quality, unpredictable, amounts of gas at less suitable sites. While no LFG-specific project support exists with other countries at this time, there are many possibilities to share technology and lessons learned from UK's mature LFG industry to newly developing LFG project sites around the world.

**United States:** The delegate from the United States described an active voluntary program for reducing methane emissions from landfills through capture and utilization known as the Landfill Methane Outreach Program (LMOP). This program has resulted in over 285 LFG energy projects in the last ten years, and has contributed to a six fold increase in methane recovered and combusted at landfill sites from 1990 to 2003. Addressing international activities, the United States has a wide ranging and active program of international assistance in LFG capacity building and project development organized through a joint working group of U.S. EPA, U.S. AID, and the U.S. Trade Association. These activities have included feasibility assessments, technical capacity building, and workshops in developing countries and economies in transition. The U.S. is hoping to provide similar assistance through the Methane to Markets Partnership.

**Argentina:** The delegate from Argentina stated that there is an enormous potential for LFG generation in the country as most of the municipal waste is collected and placed in either open dumps or sanitary landfills, with no incineration of municipal waste practiced. Over 40% of the waste is organic in nature and landfills account for almost 50% of all methane emissions in the country. The delegate described an open market to sell LFG-generate electricity to the grid, but that it may be necessary to use incentives to accelerate investment since the extremely competitive pricing of fossil-fuel based electricity would deter project development. The possibility for LFG projects related to international carbon credit programs is also an interesting possibility that needs further consideration.

**Brazil:** The delegate from Brazil described a number of ongoing activities related to LFG project development in the country. Japan has a bilateral agreement with Brazil to develop 20 methane recovery projects, with one LFG CDM project currently in process. In the city of San Paolo, LFG projects are being investigated to capture and combust methane, with 50% of recovery going to electricity production. The World Bank also currently has 2 LFG projects running in metropolitan areas. Also, there are plans to develop a national Web site and brochure to raise awareness of methane recovery options.

**ANNEX I**  
**Draft Action Plan Items for Landfill Subcommittee**

<i>Activity</i>	<i>Timeline</i>	<i>Lead</i>	<i>Other Participants</i>
<p>“Lessons learned” white paper on technical problems and solutions.</p> <p>A summary of key technical problems with developing LFG projects in developing countries, and how the problems have been addressed.</p> <p>Template to include: Experiences, problems encountered, solutions, and associated cost.</p>	<p>15 Sept.</p>	<p>Greg Vogt, ISWA</p> <p>Brian Guzzone, US Delegate</p> <p>Bruce Mailliet, Shaw Group</p>	<p>All to provide input</p>
<p>International Landfill Database</p> <p>Web based tool to provide data and contact information for key government contacts and for specific landfill project opportunities in Partner countries</p>	<p>Design and template circulated for comment by end of August.</p>	<p>Brian Guzzone, US Delegate</p>	<p>Ulrich Sawetzki, Deutz Power Systems</p> <p>Country delegates to add data</p>
<p>Develop lists and provide links to existing documents, tools, and resources for the Methane to Markets Web site.</p> <ul style="list-style-type: none"> <li>• Share articles on several relevant article and case studies</li> <li>• ASG to explore possible definitions for categories of PN members for landfill sector, and list PN members accordingly on Web site (e.g., developers, financiers, equipment suppliers, service providers such as drilling) – possible longer term implementation</li> <li>• Modify US EPA LMOP “steps to project development” fact sheet for Methane to Markets.</li> <li>• Include links to existing feasibility and pre-feasibility studies.</li> <li>• Post EPA LMOP LFG technology presentation.</li> </ul>	<p>15 Sept. for initial set of materials and links to be posted on the Methane to Markets Web site</p>	<p>All – members will provide information to ASG as they become available.</p>	

<i>Activity</i>	<i>Timeline</i>	<i>Lead</i>	<i>Other Participants</i>
<p>On-line landfill forum</p> <p>An area of the Web site where subcommittee members and PN members can discuss issues and provide assistance.</p> <p>ASG to investigate options for next meeting.</p>	TBD	ASG	
<p>Provide information and guidance to help overcome financial barriers:</p> <ul style="list-style-type: none"> <li>• Provide information on financing mechanisms e.g., what do financiers consider to be a bankable project?</li> <li>• Develop project development templates for investors and stakeholders.</li> <li>• Develop feasibility template to reduce early investment costs.</li> <li>• Background paper on role of carbon finance</li> <li>• Engage financial sector through project network (All)</li> <li>• Brief background paper on project financing opportunities</li> <li>• Plan cross-sector finance session at Steering committee meeting (ASG)</li> </ul>	TBD	Jonathan Churchman-Davies, ICF	Hernan Carlino, Argentina Tim Atkinson, Natsource ASG
<p>Finalize remaining country profiles</p> <ul style="list-style-type: none"> <li>• To be made available on the Web site</li> <li>• Circulate current profiles to Subcommittee members</li> <li>• Follow up with countries that have not yet submitted profiles</li> </ul>	31 August	ASG	

<i>Activity</i>	<i>Timeline</i>	<i>Lead</i>	<i>Other Participants</i>
<p>Track projects and activities facilitated by the Partnership.</p> <p>Proposal: At least one country has approved project or activity as a Methane to Markets activity and. The activity should support the goals of the Partnership as set forth in Terms of Reference.</p>	Ongoing	ASG	
Recruit new members of the Project Network.	Ongoing	All	
<p>Develop list of possible LFG project development opportunities</p> <ul style="list-style-type: none"> <li>• Develop and provide a list of up to 10 landfill sites for consideration by the LS. The list of sites will be screened and potentially selected for further evaluation.</li> <li>• Obtain initial feedback from Methane to Markets cosponsored 2005 Latin American LFG Project Expo and possibly begin planning for 2006 LFG Project Expo;</li> <li>• In communication identify benefits, process, and outcomes of the expo.</li> </ul>	October 15	Helen Grinbergs, Australia Delegate	Brian Guzzone, US Delegate

## **Annex II**

### **Meeting Attendees**

#### **Partner Country Delegates**

##### **Argentina**

Hernan Carlino, Secretariat of Environment and Sustainable Development  
Atilio Savino, Secretariat of Environment and Sustainable Development (Co-Chair)

##### **Australia**

Tas Sakellaris, Australian Greenhouse Office

##### **Brazil**

Joao Alves, CETESB – Sanitation and Environmental Agency

##### **Italy**

Mario Lazzeri, D'Appolonia (Co-Chair)  
Francesco Presicce, Italian Ministry for the Environment and Territory

##### **United Kingdom**

Alan Rosevear, Environment Agency

##### **United States of America**

Barbara De Rosa-Joynt, U.S. Department of State  
Brian Guzzone, U.S. Environmental Protection Agency

#### **Project Network Members**

Markus Francke, G.A.S. Energietechnologie GmbH, Germany  
Ulrich Sawetzki, Deutz Power Systems, Germany  
Tim Atkinson, Natsource Europe, Ltd., United Kingdom  
Ian Farr, G.A.S. Energy Technology, Ltd., United Kingdom  
Jonathan Churchman-Davies, ICF Consulting, United States  
Greg Vogt, SCS Engineers, United States

#### **Other Attendees**

Reg Edwards, Shaw Group, United Kingdom  
N.C. Vasuki, Delaware Solid Waste Authority, United States

#### **Administrative Support Group/Meeting Support**

Erin Birgfeld, U.S. Environmental Protection Agency, United States  
Lauren Lariviere, Eastern Research Group, United States  
Joseph Mangino, Eastern Research Group, United States