



Methane to Markets Partnership Coal Subcommittee Draft Action Plan, Years 2 to 5

Introduction

The Methane to Markets Partnership Terms of Reference (TOR) states that each Subcommittee should develop an Action Plan. The *Charge to the Subcommittees* adopted by the Partnership suggests that the Action Plans “identify needs, opportunities, and priorities for project development in the sector and for interested Partners ... with input from members of the Project Network.” The *Charge to the Subcommittees* outlines specific elements that should be a part of the Action Plan, including:

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

At the second meeting of the Coal Subcommittee in Geneva in April 2005, the Subcommittee first developed an Interim Action Plan, which listed a number of discrete short-term activities that the Subcommittee agreed to embark upon. This document, the Action Plan, is intended to incorporate those specific actions into a broader framework that addresses the key elements of the Action Plan proscribed by the Steering Committee to provide a plan for the Subcommittee’s specific activities for Years 2 through 5 of the Partnership. This Action Plan is intended to be a living document that will be updated on an ongoing basis to reflect the new projects and activities that are undertaken. ***Table 1 also summarizes ongoing project activities of the Subcommittee in greater detail.***

The Coal Subcommittee’s Action plan identifies three main types of activities:

1. Developing overview materials,
2. Identifying and addressing key barriers to project development, and
3. Identifying country-specific needs and opportunities.

Each of these three elements is discussed in more detail below.

Each element of this action plan incorporates cooperative activities to increase methane recovery and use in the sector as well as outreach to engage Project Network members. Through the Coal Mine Methane Subcommittee’s regular meetings and contacts among Partner countries and their private sector counterparts through the Project Network, the Subcommittee will continue to pursue cooperative activities on a bilateral or multilateral basis that meet the identified needs and overcome key barriers to CMM project development.

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 specific areas identified above. Each country should work to establish open lines of communication with the relevant private sector parties to ensure active participation in the ongoing activities of the Partnership. The Methane to Markets Partnership

Administration Support Group (ASG) will develop a comprehensive Coal Subcommittee website with portal to key websites and tools to make information accessible to all.

1) Development of overview materials, including recovery and use opportunities and descriptions of available technologies and best practices

Methane is produced from underground and surface mines and as a result of post-mining activities including coal processing, storage, and transportation. Underground mines are the single largest source of coal mine methane emissions in most countries. At active underground mines, methane must be removed from underground operations for safety reasons. Large-scale ventilation systems remove the methane by moving massive quantities of methane through the mines. At some active and abandoned mines, methane is also produced from degasification systems (also known as gas drainage systems) that employ vertical and / or horizontal wells to recover methane.

There are a variety of profitable uses for coal mine methane (CMM), and the optimal use at any location depends on factors such as the quality of methane, the availability of end-use options, and project economics. The range of CMM projects includes natural gas pipeline injection, electric power production, co-firing in boilers, district heating, mine heating, coal drying, vehicle fuel, flaring, and manufacturing or industrial uses. Technological development is emerging to oxidize the low-concentration ventilation air methane to produce thermal energy.

Successful CMM projects require a thorough methane resource assessment and analysis of gas liberation; effective integration of mine degasification and utilization with mining operations; and an available, accessible market for the methane. Thus, the first task for project development is to begin with an assessment of the opportunities for CMM project development.

The Subcommittee has begun the task of compiling country-specific information into a “Global Overview” as well as compiling a global database of CMM projects and project opportunities. These informational work products (e.g., deliverables or reports) are expected to be made widely available to the Methane to Markets community through the internet, and workshops should be open to participants from a broad selection of Partner countries.

While these activities in themselves do not directly lead to methane emissions reductions or utilization, they contribute to the overall knowledge base to encourage such projects and ultimately to ensure their successful implementation.

Specific activities: Informational Work Products

- Preparation, development, updates to Global Overview of CMM Opportunities
 - Draft in development, undertaken by US EPA, to be posted on Methane to Markets website (tentative date: June 2006)
- Preparation, updates to global database of projects and project opportunities
 - Draft in development, undertaken by US EPA

2) Identify and address key barriers to project development

The Coal Subcommittee recognizes that under the Partnership, priority is given to activities that have the greatest chance to achieve emissions reductions in the near term. However, a number of important barriers to project development can be addressed that are associated indirectly or in the longer-term with emissions reductions.

CMM project developers face a range of technical, economic, and institutional issues that impede progress. The key barriers identified by the Subcommittee that inhibit development of CMM projects are the following:

- (1) Lack of clarity about CMM ownership and regulatory issues, as well as the hurdles presented by existing regulations
- (2) Lack of appropriate technology and technical knowledge;
- (3) Lack of demonstration of the technical or economic feasibility of these projects in a specific situation; and
- (4) Lack of financing or understanding of how to obtain financing.

The Partnership activities that address those barriers include the following:

- (1) Information-based activities;
- (2) Technology transfer activities;
- (3) Technical feasibility studies and technology demonstrations; and
- (4) Activities that build capacity for project financing and investment.

Below, each of these major types of barriers are briefly discussed, along with potential solutions and specific activities proposed by the Subcommittee to address each of these barriers to support project development and methane emissions reductions.

1) Barrier: Legal and regulatory issues.

One key barrier is lack of understanding about the legal, regulatory, and economic framework in developing countries with potential for project development. Barriers that many countries face include lack of clarity about ownership of coal mine methane in many countries; lack of transparency in regulatory regimes or the processes for obtaining rights to gas in many countries; lack of information about the ways in which infrastructure, economic factors such as taxes or incentives, and market barriers may impact a project; or lack of standardization or harmonization of technical terminology.

The Coal Subcommittee will support information-based activities that provide critical information about barriers to project development, such as general information about market, economic, or legal issues. These activities may not directly lead to methane emissions reductions or utilization, but they contribute to the overall knowledge base and therefore encourage project development and their ultimately successful implementation. Specific examples of such information-based activities include producing reports and white papers that are made widely available to the Methane to Markets community, covering topics such as ownership and regulatory issues and recommendations for standardization and harmonization of terminology and standards in the CMM field.

Specific barriers of regulatory barriers include

- Lack of clarity regarding the ownership status of coal mine methane
- Lack of transparency in regulatory regimes and legal framework
- Lack of clarity regarding procedure for obtaining rights to gas in many countries,
- Lack of information about economic factors such as taxes or incentives, or market barriers that may impact a project.
- Lack of standardization of terminology and technical terms in the CMM industry
- Ownership regulations or other legal restrictions that prevent project developers or investors from working on CMM projects
- Lack of market-based or tax incentives

Informational activities to address these barriers include

- Preparation, development, updates to White Paper on Ownership issues (*Draft in development, undertaken by US EPA*)
- Preparation of a document that develops recommendations for the standardization and harmonization of terminology and standards in the CMM field (*UNECE to take lead*)

Informational work products (e.g., deliverables or reports) are expected to be made widely available to the Methane to Markets community through the internet, and workshops should be open to participants from a broad selection of Partner countries.

2) *Barrier: Lack of technology or technical knowledge to implement CMM recovery and utilization projects*

A second key barrier is lack of technology or technical knowledge to implement CMM recovery and utilization projects. Such technical knowledge includes a spectrum of activities such as conducting robust resource assessments; drilling and recovering methane from the coal mine and coal seam efficiently and effectively; designing methane utilization systems for specific project and site needs; and coordinating gas and / or power production with the appropriate end users.

The Coal Subcommittee will engage in a variety of technology-transfer activities to provide specific training or knowledge through workshops, enhanced training seminars, study tours, or establishment of information centers. Through these activities, countries with more developed CMM industries and technologies can provide assistance to countries where such activities are developing or nascent. Such technology transfer activities provide an opportunity to build capacity within each country through development of a core group of knowledgeable practitioners. These activities are not directly associated with methane emissions reductions, but they help to ensure that long-term, sustainable methane emissions reductions will be achieved.

Specific barriers include

- Lack of technical expertise to conduct resource assessments,
- Lack of technical expertise to effectively conduct drainage activities, pre-mining and during mining, and recover methane,
- Lack of technical expertise to design effective and efficient utilization systems for specific project needs,
- Lack of technical expertise to coordinate project activities for gas and / or electricity production with appropriate end users
- Lack of appropriate technology such as horizontal or directional drilling equipment, gas upgrade technology, monitoring technology, or end-use technology

Solution: Technology-transfer Activities

Technology-transfer activities refer to opportunities to provide specific training or knowledge to participants, usually through workshops, enhanced training seminars or sessions, or study tours. Supporting travel for delegates from developing Partner nations will also strengthen awareness and information about CMM project opportunities. Through these activities, countries with more developed CMM industries and activities can provide assistance to countries where such activities are in a nascent or developing stage. Technology-transfer provides a critical opportunity to build capacity within each country by developing a core group of knowledgeable practitioners. These activities do not typically have directly-associated methane emissions reductions but by building technical capacity for project development, they help to ensure that long-run methane emissions reductions will be achieved. The activities can be undertaken in the short term and on an ongoing basis as appropriate and necessary.

Specific examples of technology-transfer activities include

Workshops are a commonly-used technology transfer mechanism and provide a relatively short-duration (typically one to three-day) opportunity to explore a specific topic or aspect of project development.

Examples of Technology-Transfer Workshops:

- M2M Regional Workshop in Beijing December 2, 2005, sponsored by Australia Greenhouse Office, Japan NEDO, US EPA, China CCII

Extended training or seminars may be used in specific circumstances, for example to provide on-the-ground training in operation of technical equipment. *Example:*

- US AID / US Department of Labor is providing training to operate directional drill at mine site in Ukraine. The host mine will get to keep the drill (project value ~ US \$1.4 million)

Study tours provide an opportunity for participants to witness first-hand projects that are operating and to observe their physical and regulatory working environment. They also provide an opportunity for extended conversations with key players.

- None identified at this time

Information centers (or “clearinghouses”) provide a source of in-country technical and regulatory expertise, data collection about existing or potential projects and opportunities, and consulting services for in-country as well as foreign project developers and investors. *Examples:*

- US EPA continues to support China Coalbed Methane Clearinghouse through cooperative agreement
- US EPA is pursuing discussions with Government of India to support a clearinghouse

Sponsor travel from delegates from developing Partner nations to participate in appropriate coal mine methane conferences and symposia. *Example:*

- Japan NEDO funded travel for delegates to participate in Regional CMM Workshop in Beijing, December 2005, and Tuscaloosa, Alabama Coal Subcommittee meeting

3) *Barrier: Lack of demonstrated feasibility and demonstration of successful CMM projects at specific sites.*

A third key barrier is the lack of demonstrated technical and economic feasibility studies and demonstrated technical success at specific project sites. Usually these types of analyses are required before a project developer can obtain external funding for a project.

To address this barrier, the Coal Subcommittee will support technology feasibility and demonstration projects to assess the technical and economic viability of specific projects at their site. By supporting these activities, the Subcommittee helps to move projects closer to commercial implementation. Technology demonstrations actually achieve methane emissions reductions, albeit on a relatively small scale. Specific activities include conducting pre-feasibility studies detailed economic and technical feasibility studies, and technology demonstrations.

Solution: Technology Feasibility and Demonstration Projects to assess the technical and economic viability of specific projects at specific locations to move project development closer to commercial implementation.

Specific activities include**Technical and Economic Pre-Feasibility Analysis**

- *Example:* US EPA funded a pre-feasibility analysis of use of ventilation air methane to generate electricity in Huainan, China

Technical and Economic Feasibility Studies**Technology Demonstration Projects**

4) *Barrier: Lack of financing or capacity to obtain financing for CMM projects*

A fourth key barrier is the lack of financing required for project development, as well as the lack of understanding of how to apply for funding or investment from multilateral and other financial institutions. Coal mine methane projects are typically quite capital-intensive and individual mines or project developers may not be able to finance a project with private funding. The mines and project developers may also not be familiar with the type of documentation to present to financial institutions for project funding (e.g., the way in which key information should be presented in “bankable documents”) whether from financial institutions or alternative funding mechanisms.

To address this barrier, the Coal Subcommittee will provide the capacity for project developers to obtain project financing through analysis of key issues, sponsoring project financing workshops, and supporting Project Expos where project developers can directly market their projects to interested investors and financiers.

Solution: Promoting Project Financing and Investment Capacity-Building to enable project developers to obtain project financing from multilateral and other financial institutions.

Specific activities include:

Identification of sources of finance and capacity-building

- UNECE is conducting a three-year project to build capacity for obtaining project financing for CMM projects (in up to three countries, including Russia), funded by US EPA

Project Financing Workshops

- UNECE Project Financing Workshop, held in Geneva, Switzerland, January 31, 2006

Partnership Expo: Forum for Projects, Technologies, Financing, and Policy

- To be held in autumn 2007, Beijing, China

3. Identifying country-specific needs and opportunities

Most of the members of the Coal Subcommittee have submitted country-specific profiles that begin to identify country-specific needs, opportunities, and priorities. Learning the specific needs of Partner countries will be an ongoing activity of the Coal Subcommittee. At the Coal Subcommittee Meeting in Buenos Aires, Argentina, in November 2005, country delegates were asked to provide detailed lists of project opportunities, needs, and priorities to be developed for the 2007 Partnership Expo.

Conclusions

The Coal Subcommittee is committed to work cooperatively in activities that will help to develop and disseminate general information about opportunities for coal mine methane project development and address the key barriers to project development: lack of information, lack of technology and technical knowledge, lack of demonstration for project feasibility, and lack of financing or financing capacity. The Subcommittee will conduct these activities in a way that promotes cooperation among the Partner nations and the private sector Project Network. The Subcommittee will also continue to work to understand the needs and priorities of individual countries within the Partnership.

**Table 1. Coal Mine Methane Subcommittee Activities Undertaken Under Action Plan
(as of May 12, 2006 – to be updated at Coal Subcommittee meeting, May 22-23, 2006)**

Action plan element	#	Activity	Lead / Participants	Status	Next Steps
Overview of Methane Recovery & Use opportunities	1.	Draft global overview of CMM activities	US EPA	Under review by countries and Project Network (edits and comments requested by Jan. 1, 2006)	Publish on M2M website (June 2006)
Overview of Methane Recovery & Use opportunities	2.	Draft global database of CMM activities	US EPA	Content under review by countries and Project Network (due by Jan. 1, 2006)	Develop a searchable database to be posted on M2M website (4 th quarter 2006)
Overview of Methane Recovery & Use opportunities	3.	Develop database of technologies and technology providers	To be identified		
Address key barriers: (1) Clarity of legal, regulatory issues	4.	Develop a white paper on regulatory issues, including ownership	US EPA Project Network (K. Schultz)	Template distributed to Subcommittee; Have not received responses from many delegations	Request information from Partners and Project Network; compile and distribute to Members only (4 th quarter 2006)
Address key barriers: (1) Clarity of legal, regulatory issues	5.	Develop recommendations for adopting uniform technical standards and terminology	UNECE Australia US EPA	Have begun ad hoc compilation of terminology & standards	Need to convene working members and compile glossary of most critical terms; determine need for further action
Address key barriers:	6.	Conduct workshops			

Action plan element	#	Activity	Lead / Participants	Status	Next Steps
(2) Technology transfer					
	6a.	Regional M2M Workshop	Australia AGO, Japan NEDO, US EPA, China CCII	December 2, 2005, Beijing, China	---
	6b.	Other workshops ?			
Address key barriers: (2) Technology transfer	7.	Sponsor study tours			
Address key barriers: (2) Technology transfer	8.	Establish information centers / clearinghouses	US EPA Government of India	Under discussion	Framework agreement, cooperative agreement
Address key barriers: (2) Technology transfer	9.	Travel to conferences			
	9a.	Travel to M2M Regional Workshop in Beijing	Japan NEDO	Sponsored travel for five delegates to Dec. 2, 2005 workshop	Completed
	9b.	Travel to Tuscaloosa	Japan NEDO		
Address key barriers: (2) Technology transfer	10.	Technology feasibility studies – capacity building			
	10a.	CMM feasibility study	US TDA China	Awarded, underway	
	10b.	CMM feasibility study	US TDA Ukraine	Awarded, underway	
	10c.	Ventilation air methane feasibility study	US EPA CCII	Pre-feasibility study completed for Huainan Mining Group	Under review by mine
Address key barriers: (3) Support development of demonstration projects	11.	Demonstration projects			

Action plan element	#	Activity	Lead / Participants	Status	Next Steps
	11a.	Demonstration of in-mine drilling in Ukraine	US AID Ukraine	Underway	Drill to be installed in 2006
Address key barriers: (4) Identify finance sources & build capacity for financing	12.	Conduct finance workshops			
	12a.	Finance workshop part 1	UNECE US EPA	Held Jan. 31, 2006	Completed
	12b.	Finance workshop part 2	UNECE	TBD	
Address key barriers: (4) Identify finance sources & build capacity for financing	13.	Project to develop capacity for finance in Russia and other ECE countries	UNECE US EPA	Year 1 of 3-year program underway	
Address key barriers: (4) Identify finance sources & build capacity for financing	14.	Participate in Partnership Expo, Beijing, 2007	R. Pilcher, RRR H. Shengchu, China	Participants in Task Force; China to host Partnership Expo	To be identified
Country-specific needs and opportunities	15.	Expand database of CMM activities within each country	All	Requested to provide info / updates for international database	
Country-specific needs and opportunities	16.	Report on CMM-specific regulatory regime	All	Requested to respond to questionnaire for white paper	
Country-specific needs and opportunities	17.	Identify country-specific infrastructure needs	All		
Country-specific needs and opportunities	18.	Identify specific project opportunities within each country	All		
Country-specific needs and opportunities	19.	Identify project-specific needs within each country	All		
Country-specific needs and opportunities	20.	Address project-specific needs within each country	All		
Country-specific needs	21.	Develop pre-feasibility and feasibility studies	All		

Action plan element	#	Activity	Lead / Participants	Status	Next Steps
and opportunities		for projects in each country			
Country-specific needs and opportunities	22.	Develop a short list of projects in each country to participate in Project Expo	All		