

**Coal Sub committee meeting at Cagliari, Italy
29-30 April'2008**

Strategies for promoting CMM project development in India

1. Broad National Initiative:

India is vigorously pursuing clean coal technologies and is one of the founder member countries of Methane to Markets.

Activities for CBM development were taken up in early 90's. However, the main thrust on development of CBM came with formulation of CBM policy in 1997 by Govt. of India. Under this policy, 26 VCBM blocks have so far been allotted for commercial development to different operators through global bidding. The ultimate production potential of the allotted blocks is 38 MMSCMD having electricity generation capacity of 6700 MW. With utilization of CBM, there is potential of reduction of 27 mt/year of CO₂ if compared with coal-fired power plants.

Development of CMM is on high agenda of Indian coal mining industry and steps are being taken up for its commercialization. A mine related demonstration project under UNDP/GEF/Govt. of India funding is under implementation in 2 underground mines of BCCL.

2. Development of country specific strategy:

For developing a meaningful strategy for development of CMM, participation of Governmental agencies, Mine Planning Department, Mine Safety Department, Environmental Protection Agency, Coal industries representatives and operators of CMM recovery may be associated.

The representatives of following organizations may be involved for development of strategies for CMM development:

a) Govt. Organizations:

- i) Ministry of Coal (MoC)
- ii) Ministry of Environment and Forest
- iii) Directorate General of Mines Safety (DGMS)

b) Coal Industry Sector:

- i) CIL/CMPDI
- ii) Singareni Collieries Co. Ltd. (SCCL)
- iii) Neyveli Lignite Corporation (NLC).

c) CMM operators: Representative from private sector interested in CMM

CMPDI may act as a nodal agency for coordinating various activities.

Description of Country's Coal Sector

Overview of Coal Sector	Description
Annual production	431 Million Tonnes (2006-07)
Coal reserves	257 Billion Tonnes (As on 1 st April, 2007)
Percentage of coal mined from underground mines	About 15%
Number of underground mines considered gassy:	D-III mine: 18 (>10 m ³ of gas per tonne of coal produced) D-II mine: 102 (>1 to 10 m ³ of gas per tonne of coal produced) D-I mine: 222 (up to 1 m ³ of gas per tonne of coal produced)
Status of regulatory Framework	<ul style="list-style-type: none"> • Coal mines: Available • CBM: Regulated through CBM policy of Govt. of India formulated in 1997. • CMM: Regulatory framework under formulation by Govt. of India.
CMM/CBM Project Status	Description
Commercial-scale CMM projects	Presently there is no commercial scale CMM project in India.
Pilot or demonstration CMM project.	<p>One UNDP/GEF/Govt. of India funded CBM/CMM demonstration project for Recovery and Utilization of methane is under implementation in Sudamdih and Moonidih mines of BCCL. The 23.11 million USD project is being jointly implemented by CMPDI and BCCL. The aim of the project is to acquire experience in:</p> <ul style="list-style-type: none"> ➤ CBM production from virgin seams ahead of mining ➤ Recovery of methane from Gob areas ➤ Recovery of methane through long hole in-seam underground drilling ➤ Utilization technique of captured methane

	<p>Present status of the demonstration project:</p> <p>a. Moonidih</p> <ul style="list-style-type: none"> ➤ Hydro fracturing in 2 vertical wells completed ➤ Dewatering in 1 well under progress ➤ Laying of surface gas pipeline completed ➤ Production of methane likely to commence from June'08. ➤ The produced gas will be utilized to generate 1 MW electricity <p>b. Sudamdih</p> <ul style="list-style-type: none"> ➤ Long-hole in seam drilling likely to commence soon 	
Commercial scale CBM production	Commercial production of CBM has started since June'2007 from Raniganj South CBM block operated by M/S GEECL. The annual production is reportedly 23.7 million cubic metre.	
Barriers to CMM Project Development	Rank Barriers (1 st , 2 nd , 3 rd)	Description
Technical	1	<p>Resource assessment technique and techno-economic evaluation</p> <ul style="list-style-type: none"> ✓ Resource assessment technique in de-stressed condition ✓ Techno-economic evaluation of identified project area. ✓ Utilization of recovered methane <p>Since this expertise is not available, international experts' help from partner countries would be required.</p>

Legal/regulatory/ownership for CMM development	2	<p>Legal/regulatory/ownership for CMM development</p> <ul style="list-style-type: none"> • Legal/safety framework under which CMM prospects can be developed. • Simultaneous and harmonious exploitation of CMM and coal. This issue is under consideration of a duly appointed government committee. <p><i>Contract & Fiscal Matter (Commercial Issues):</i></p> <ul style="list-style-type: none"> • Ownership issue of recovered gas/ Carbon credits
Market	3	<p>The economy of India is growing at a rate of about 9%. Further, there is a gap in the demand and supply of natural gas. As such, market is available for produced CMM. <i>However, there is a lack of infrastructure for transportation of the produced CMM.</i></p>

Table 2: Assessment of Ongoing and Potential Activities

Data collection/information products:

1. On going activities:

One UNDP/GEF/Govt. of India funded CBM/CMM demonstration project for Recovery and Utilization of methane is under implementation in Sudamdih and Moonidih mines of BCCL. The 23.11 million USD project is being jointly implemented by CMPDI and BCCL.

2. Potential activities:

Development of CMM within CIL command area:

Five Damodar valley coalfields namely Raniganj, Jharia, East & West Bokaro and South Karanpura with a CMM resource potential of 150 BCM have been identified for commercial development of CMM. These blocks are to be awarded for commercial development of CMM through global bidding.

3. CMM Projects associated with the opencast mine:

Pre-drainage of methane in the deeper projectised opencast mining area is considered. In this context, Moher sub-basin and Korba coalfields were considered for development of CMM. Templates in the flyer format on these likely projects were displayed in the M2M Expo at China.

4. Establishment of CBM/CMM clearinghouse:

- A MoU has been signed between GoI and USEPA to establish CBM clearinghouse in India under the aegis of M2M.
- As per the Govt. decision, the clearinghouse is to be established at CMPDI, Ranchi with the following purposes:
 - ✓ To contribute to legislation improvement with an aim of attracting foreign investment.
 - ✓ To support governmental and non-governmental organizations involved in the implementation of global climate change prevention projects;
 - ✓ To encourage collaboration between governmental and commercial organizations through the development and implementation of joint projects;
 - ✓ To contribute to training of qualified local specialists and broad dissemination of information concerning environmental protection problems; and
 - ✓ To contribute to development of a new fuel and energy industry sector, establishing projects for utilization of India's deposits of coalbed and coal mine methane.

- The clearinghouse is scheduled to carryout following tasks:
 - ✓ Establish a website which will post useful data and reports.
 - ✓ Conduct workshops and training programs for the Indian mining community and government officials to promote technology transfer and the exchange of ideas.
 - ✓ Participate in technical, financial, and managerial training programs or conferences in the US, India, or another country to enhance the Clearinghouse's services.
 - ✓ Study geological survey materials of coal and coal mine methane in the main coal basins and deposits of India.
 - ✓ Identify project opportunities among the gassy coal basins and facilitate development of CMM projects.
 - ✓ Publish a semi-annual newsletter on CMM/CBM.
 - ✓ Prepare a coalbed and coal mine methane database.
 - ✓ Promote investment in CMM projects and prepare an investment guide

Specific Activity	(A) Has the activity already been undertaken? (Yes/No)	(B) If already undertaken describe/list extent (e.g., number of workshops per year)	(C) If already undertaken, does it need to be modified, updated, or expanded? (Yes/No)	(D) Can it be implemented in the near term? (Yes/No)	(E) How much would it cost? (Estimate \$/year, or indicate High, Medium, Low)	(F) Are there any policy initiatives already promoting this activity? (Yes/No)	(G) Would this be a recommended activity for this country? (Yes/No)
Inventory gassy mines on a national scale	Yes	120	Yes	Yes	Low	Yes	Yes, it requires to be seen in context of CMM
Database of country-specific opportunities/project sites	Preliminary assessment for 5 coal fields and 2 opencast projectised areas carried out	No	Techno-economic feasibility needs to be worked out	Yes	Medium	Yes	Yes
Database of CMM related businesses	No	No		Yes	Medium	No	Yes
Technical reports addressing specific issues	No	No				No	Yes
Other?							

2) Capacity-building (general)							
Information center, clearinghouse, or organization to coordinate and disseminate information	A clearinghouse is proposed to be open shortly. Details of activities furnished above.						
3) Targeted information exchange							
Web site dedicated to CMM issues	Envisaged in the proposed clearinghouse						
Newsletters	Envisaged in the proposed clearinghouse						
Roundtable workshops, conferences, Web-based seminars, etc.	Workshop /seminar envisaged in the proposed clearinghouse						
4) Specific training							
Intensive training (e.g., study tour, orientation visit) on technical, legal, policy, financial issues	Required						
5) Prefeasibility studies of potential CMM projects at specific sites	Required						
6) Feasibility studies of CMM projects at specific sites	Required						
7) Technology demonstrations at coal mines	Yes (stated earlier)		Yes, needs expansion				

Table 3: Prioritizing Recommended Activities

Priority	Recommended Activities From Table 2
1 – <i>top priority</i>	Know how for Techno-economic feasibility studies of the CMM sites
2 – <i>second priority</i>	Data base of country specific opportunities
3 – <i>third priority</i>	Training/study tours on technical/legal/policy/financial issues including sharing of carbon credits
4 – <i>fourth priority</i>	Pre-feasibility/feasibility studies of potential CMM projects at specific sites including preparation of data dossiers.

Table 4: Implementation Plan for Recommended Activity (used in Step 6)
 (Consider completing one individual table for each recommended activity)

Recommended activity name: (e.g., technical training)	
Implementation Plan Essentials	Description
Resources required <i>(e.g., funding, equipment, training)</i>	Sponsored Intensive training in <ul style="list-style-type: none"> ▪ Techno-economic feasibility studies ▪ Hands on training at a running CMM project for 2/3 months to geologist/mining engineers and finance persons
Personnel/organization/agency to lead effort <i>(Name, affiliation)</i>	MoC, CIL/CMPDI
Expected opportunities/outcomes <i>(e.g., tonnes CMM abated, training materials)</i>	5 CMM projects and 2 methane drainage projects associated with OC mines can be soon implemented
Milestones/progress indicators <i>(e.g., emission reductions, draft documents)</i>	Availability of DPR for projectisation.
Implementation timeline <i>(day, month, year – include milestones)</i>	18 months
Plan for communicating results <i>(description)</i>	Quarterly

Table 5: Summary Template for Presenting Country-Specific Strategies in the CMM Sector

[INDIA]	
Eight Steps	Short Description
Step 1) Reference broader national-level initiatives	<ul style="list-style-type: none"> • India is vigorously pursuing clean coal technologies and is one of the founder member countries of Methane to Markets initiatives. • Activities for CBM development were taken up in early 90's. • Govt. of India formulated CBM policy in 1997. • 26 VCBM blocks have so far been allotted for commercial development to different operators through global bidding. • The ultimate production potential of the allotted blocks is 38 MMSCMD having electricity generation capacity of 6700 MW. • With utilization of CBM, there is potential of reduction of 27 mt/year of CO₂ if compared with coal-fired power plants. • Development of CMM is on high agenda of Indian coal mining industry and steps are being taken up for its commercialization. • A mine related demonstration project under UNDP/GEF/Govt. of India funding is under implementation in 2 underground mines of BCCL.
Step 2) Agencies proposed to be involved for developing strategies for CMM development	<p>The representatives of following organizations may be involved for development of strategies for CMM development:</p> <p>Govt. Organizations:</p> <ul style="list-style-type: none"> iv) Ministry of Coal (MoC) v) Ministry of Environment and Forest vi) Directorate General of Mines Safety (DGMS) <p>Coal Industry Sector:</p> <ul style="list-style-type: none"> iv) CIL/CMPDI v) Singareni Collieries Co. Ltd. (SCCL) vi) Neyveli Lignite Corporation (NLC). <p>CMM operators: Representative from private sector interested in CMM</p> <p>CMPDI may act as a nodal agency for coordinating various activities.</p>

<p>Step 3) Summarize country's coal sector in relation to CMM/CBM projects</p> <ul style="list-style-type: none"> ▪ Coal production ▪ Coal mine types ▪ Gassy mines ▪ Regulatory framework (<i>Ownership of coal/gas</i>) 	<p>431 Million Tonnes (2006-07)</p> <p>Opencast (Producing about 85%) and Underground (Producing about 15%)</p> <p>D-III mine: 18 (>10 m³ of gas per tonne of coal produced) D-II mine: 102 (>1 to 10 m³ of gas per tonne of coal produced) D-I mine: 222 (up to 1 m³ of gas per tonne of coal produced)</p> <p>Status of regulatory Framework:</p> <ul style="list-style-type: none"> • Coal mines: Available • CBM: Regulated through CBM policy of Govt. of India formulated in 1997. • CMM: Regulatory framework under formulation by Govt. of India.
<ul style="list-style-type: none"> ▪ Are there commercial scale CMM recovery and use projects? ▪ Are there commercial-scale CBM production projects? 	<p>No</p> <p>Yes</p>
<ul style="list-style-type: none"> ▪ Barriers to CMM Project Development 	<ul style="list-style-type: none"> • Resource assessment technique and techno-economic evaluation • Legal/regulatory/ownership for CMM development • Contract & Fiscal Matter (Commercial Issues) • Lack of infrastructure for transportation of the produced CMM.
<p>4) Describe ongoing activities promoting in-country CMM/CBM recovery and use</p> <ul style="list-style-type: none"> ▪ Data collection information products ▪ Capacity building ▪ Targeted information exchange ▪ Specific technical training ▪ Pre-feasibility assessments ▪ Feasibility assessments 	<ul style="list-style-type: none"> • Yes for promoting VCBM • Yes by operators of the allotted VCBM block • A CBM/CMM related clearing house is to be opened soon which will cater to the needs of information exchange • For VCBM and CBM blocks • Ongoing in several allotted VCBM blocks

<ul style="list-style-type: none"> ▪ Technology demonstrations ▪ Other activities 	<ul style="list-style-type: none"> • In both VCBM and CMM blocks • Creation of base line data for CBM • Preparation of data dossiers for award of VCBM blocks
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<p>Step 5) Recommend appropriate activities to further promote CMM/CBM project development</p>	<ul style="list-style-type: none"> ▪ Know how for Techno-economic feasibility studies of the CMM sites ▪ Data base of country specific opportunities ▪ Pre-feasibility/feasibility studies of potential CMM projects at specific sites including preparation of data dossiers. ▪ Sponsored Intensive training in <ul style="list-style-type: none"> ✓Techno-economic feasibility studies ✓Hands on training at a running CMM project for 2/3 months to geologist/mining engineers and finance persons
<p>Prioritize activities</p>	<ul style="list-style-type: none"> ▪ Know how for Techno-economic feasibility studies of the CMM sites ▪ Data base of country specific opportunities ▪ Pre-feasibility/feasibility studies of potential CMM projects at specific sites including preparation of data dossiers. ▪ Sponsored Intensive training

<p>Step 6) Outline implementation plan for each recommended activity</p> <ul style="list-style-type: none"> ▪ Resources required ▪ Personnel/organization/agency to lead effort ▪ Expected opportunities/outcomes ▪ Milestones/progress indicators ▪ Implementation timeline (<i>Start to finish; milestones</i>) ▪ Plan for communicating results 	<p>Sponsored Intensive training in</p> <ul style="list-style-type: none"> ▪ Techno-economic feasibility studies ▪ Hands on training at a running CMM project for 2/3 months to geologist/mining engineers and finance persons <p>MoC, CIL/CMPDI</p> <p>5 CMM projects and 2 methane drainage projects associated with OC mines can be soon implemented</p> <p>Availability of DPR for projectisation</p> <p>18 months</p> <p>Quarterly</p>
<p>Step 7) Create a plan for updating and communicating the strategy to key individuals, organizations, and incorporating it into national-level initiatives, if present</p>	<p>Updation and communication may be made through:</p> <p>Web site</p> <p>Newsletter</p> <p>Individual communication and newspaper</p>