Opportunities to Reduce Coal Mine Methane (CMM) Emissions in India

November 22, 2005
US – India Energy Dialogue
Coal Working Group
Washington, D.C.

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Coalbed Methane Outreach Program

Outline

1. US EPA's Coalbed Methane Outreach Program
2. Methane to Markets Partnership update
3. Benefits to India of developing coalbed methane (CBM) and coal mine methane (CMM)
4. Establishing a CBM-CMM Clearinghouse in India

EPA's Coalbed Methane Program

- Voluntary program established in 1994
- Our mission: to reduce methane emissions from coal mining to mitigate climate change
  - Methane is a potent greenhouse gas, 2nd only to carbon dioxide
  - Coal mine methane accounts for nearly 10% of all anthropogenic methane emissions
  - Methane is a a bane to mining but a key resource
    - Key source of coal mine explosions and fatalities
    - Valuable, clean-burning energy source
- Domestic and international programs
  - EPA maintains formal cooperative partnerships that support coalbed methane clearinghouse in China, Ukraine, and Russia
  - Informal relationships with many other countries

Methane to Markets

Methane to Markets Partnership

- 17 member, international, public-private partnership launched in 2004
- Focus on overcoming barriers to commercial project development
- Potential: 50 MMTCE emission reductions by 2015
  - 500 BCF of natural gas
- Coal Subcommittee
  - Co-chairs: India (S. Chaudhuri) & USA (P. Franklin)

Methane to Markets

Coal Subcommittee Action Plan

- Three key elements:
  1. Overview of methane recovery & use opportunities
  2. Identify and address key barriers to project development
  3. Identify and address country-specific needs, opportunities and priorities

- Continuing activities:
  1. Identify and develop cooperative activities to increase methane recovery & use
  2. Outreach to engage Project Network Members

Methane to Markets

Plans for M2M Project Expo

- Opportunity to bring project opportunities (sites), project developers, and investors together
- Will include all four sectors plus a technology component
- Taskforce has been created to develop a work plan, identify options, and investigate logistical details
  - Planned for mid- to late-2007

- Coal Subcommittee developed a “Roadmap to the Project Expo”
  - Need to focus on developing “pipeline of projects”
  - Countries need to first identify specific project opportunities and needs

Benefits to India of Recovering & Utilizing CMM and CBM (1)

Mine Safety and Productivity

- Mine worker's safety will be improved, especially in the deeper, gassier mines.
- Improving mine productivity will help lower mining costs.

Environment

- Fuel substitution, especially in rural areas, could have a significant positive impact on air quality
- By reducing methane emissions, India can receive additional revenues due to the monetary value of the emission reductions.

Benefits to India of Recovering & Utilizing CMM and CBM (2)

Economy

- CBM development in the coalfields of the Damodar valley area would create relatively high-wage jobs.
- Taxes would be generated at both the national and local level.

Gas Reserves/Energy Security

- India is currently considering importation of gas and LNG. Production and use of CBM and CMM may help reduce India's reliance on foreign imports.

Role of a CBM-CMM Clearinghouse

- Serve as a central in-country "information center" and resource for data collection and dissemination
- Conduct policy and regulatory analyses for stakeholders
- Promote opportunities to encourage additional CBM/CMM recovery and spur project development
- Conduct technical training and facilitate technology transfer
- Provide consulting services for in-country and international investors and project developers
  - Technical
  - Economic, financial, regulatory
  - Logistical

* *US EPA has developed successful clearinghouses in China, Russia, and Ukraine*

US EPA, US TDA efforts to establish India CBM/CMM Clearinghouse

- Definitional missions by US Trade & Development Agency (TDA) in Fall 2003/Spring 2004 determined that there is substantial interest in an India coalbed methane (CBM) clearinghouse
- US EPA mission in August 2004 introduced concept to Government of India
  - Potential roles and responsibilities of the organization
  - Potential Indian-based stakeholders that would support the clearinghouse including a possible lead sponsor
- US EPA mission in September 2005: Ascertain interest and commitment of Government of India to host a clearinghouse sponsored by US EPA and US TDA
  - Discussed the financial, institutional, and human resource commitment to the project by the Government of India and the US Government
  - Discussed a milestone schedule for the establishment of the Clearinghouse

India CBM-CMM Clearinghouse: US EPA & US TDA Support

- US EPA and US TDA strongly recommend that the clearinghouse be structured as a single organization, with both CMM and CBM integral to the organization's mission and governance
  - Requires participation, cooperation between Ministry of Coal, Ministry of Petroleum & Natural Gas
  - Based on our experience, this structure is the most efficient approach to support joint CBM / CMM projects leading to commercial development
- US EPA and US TDA are willing to provide support for a Clearinghouse
  - Technical assistance
  - Kickoff event
- Indian support for the Clearinghouse is vital and integral
  - Staff, in-kind resources, on-going commitment

India CBM-CMM Clearinghouse: Next Steps

To proceed with the establishment of and support for the Clearinghouse, US EPA and US TDA need the following:

- Written commitment from the Government of India
  - Identify Indian organization(s) to serve as sponsor(s)
  - Sign Memorandum of Understanding with US Government
- Develop milestones for implementing clearinghouse
  - Sign cooperative agreement(s) with US Government as appropriate
- Develop an agenda for a proposed kickoff event, such as a CMM/CBM workshop, including dates, location and topics

Thank you!

US Environmental Protection Agency

Coalbed Methane Outreach Program

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Benefits to India of Recovering & Utilizing CMM: Mine Safety and Productivity

U.S. Experience

- Producing the methane in advance of mining can reduce methane levels in the mine workings by as much as 60%. Methane explosions are one of the most serious threats to mine workers safety.
- Lowering methane emission levels in the mine also increases mine productivity as it allows for faster rates of advance and less down time due to "gas-outs" at the face.

Indian Potential

- Mine worker's safety will be improved, especially in the deeper, gassier mines.
- Improving mine productivity will help lower mining costs.

Benefits to India of Recovering & Utilizing CMM and CBM: Economy

U.S. Experience

- According to the University of Alabama Center for Business and Economic Development, for a two-county area in the Warrior Basin (the basin encompasses 8 counties), CBM development has the following economic effects:
  - Total economic impact of $3.9 billion
  - Generated 13,000 new jobs
  - Generated $935 million in state and local taxes
  - Reduced unemployment to under 5%, well below both the state and national average at the time.
- Nationally, the CBM industry has generated nearly $2 billion in corporate taxes.

Indian Potential

- CBM development in the coalfields of the Damodar valley area would create relatively high wage jobs.
- Taxes would be generated at both the national and local level.

Benefits to India of Recovering & Utilizing CMM and CBM: Environment

U.S. Experience

- Methane emissions from coal mines have decreased due to an increase in methane utilization which grew from 5 million metric tonnes of carbon dioxide equivalent in 1990 to 18MMT in 2002.
- Increased CBM and CMM recovery has increased natural gas substitution of other higher polluting fuels

Indian Potential

- Fuel substitution, especially in rural areas, could have a significant positive impact on air quality
- By reducing methane emissions, India can receive additional revenues due to the monetary value of the emission reductions.

Benefits to India of Recovering & Utilizing CMM and CBM: Gas Reserves/Energy Security

U.S. Experience

- Unconventional gas production reached about 5.5 Tcf in 2002, accounting for 30% of U.S. gas production and for all of the growth in U.S. gas production since 1990;
- The development of CBM has minimized the need for importing gas from Canada and Mexico and for the importation of expensive LNG from overseas.
- The continued growth of U.S. gas supplies is important in the development of new, independent power plants which favor gas over coal for environmental as well as cost reasons.

Indian Potential

- India is currently considering importation of gas and LNG. Production and use of CBM and CMM may help reduce India's reliance on foreign imports.