Development of CBM in India: An Overview

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Flare of Methane at Moonidih

S R Pump at Moonidih

A.K.Singh

Chairman-cum-Managing Director, CMPDI
&
Co-chair, Coal Sub-committee, M2M

Presentation outline

- India's energy scenario
- Coal: Reliable source for energy security in India
- Coal: A source of clean energy
- Development of CBM: India's accomplishments
- Development of CBM/CMM: CIL/CMPDI's initiatives
- Development of CMM: Opportunities and challenges
- VAM: An area for development

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India's Energy Scenario

- ✓ India is one of the fastest growing economies
- ✓The GDP growth is over 8%, likely to increase to over 10% in near future
- ✓This GDP growth is required to eradicate poverty and meet country's human development goal
- ✓ To sustain such growth 3/4 fold increase in primary energy requirement envisaged
- ✓Integrated Energy Policy Document indicates total energy requirement of the country will increase from a current level of about 500 MTOe to 2000 MTOe by 2031-32.
- ✓Efforts are on to utilize all possible energy resource-renewable, non-renewable, coal based additional resource etc to meet this gigantic target.

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Coal: Reliable Source for Energy Security in India

- Coal is the main source of energy in India.
- At present it meets about 55% of the primary energy requirement of the country.
- Studies indicate that this situation is likely to continue in the foreseeable future
- To meet the projected demand of coal (2 BT by 2031-32), efforts are on to:
  - Increase the proved resource base
  - New coal extraction technologies

Coal: A Source of Clean Energy

- Usage of coal as a source of clean energy is a priority area both at Govt. and CIL level to meet the overall objective of low carbon path

- For the purpose Clean Coal Technology is being pursed with right earnest and a National Mission has been established for coordinating efforts taken in this field by academic & scientific institutions along with industry :

  - ***Pre-combustion processes*** – Coal Beneficiation: CIL to increase the existing washing capacity from 39.4 MT to 140.5 MT by 2012 mainly through participation of private players under BOM

  - ***Combustion processes*** – Development of sub-critical, Super-critical & Ultra super-critical Pulverized Coal Fired Boilers, IGCC

  - ***Un-conventional energy source*** – Priority development of CBM, CMM, AMM,VAM, Gasification (surface & in-situ) of coal etc.

Development of CBM: India's Accomplishments

- To facilitate development of CBM, Govt. of India formulated CBM Policy in 1997. The highlights are as under:
  - Blocks to be awarded through open international competitive bidding system
  - No participating interest of the Government
  - No upfront payment, No signature bonus
  - Exemption from payment of customs duty on imports required for CBM operation
  - Freedom to sale gas in the domestic market
  - A seven years tax holiday
- As a result of liberal fiscal provisions, commercial development of CBM took a fast pace
  - 26 such blocks allotted, 8 more blocks under allotment by Govt of India.
  - Production started from few allotted blocks
  - Production likely to pick-up rapidly.

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Development of CBM: India's Accomplishments .,.

- CBM resource in allotted (26)/ under allotment (8) CBM blocks: 1.8 TCM, Area- 17700 sq km
- Production potential in allotted blocks: 38 Million Cubic Meter per day, which can support power generation of 6700 MW.
- CBM well drilled: 280, Total investment: Rs 256 Crores (USD 57 million)
- Reserve established by different operators in 5 blocks: 8.4 TCF
- 3 blocks (Raniganj South-GEECL, Sohagpur West and Sohagpur East- Reliance Industries Ltd) has entered in development stage

Details of allotment of CBM Blocks for Commercial Development up to 3rd Round

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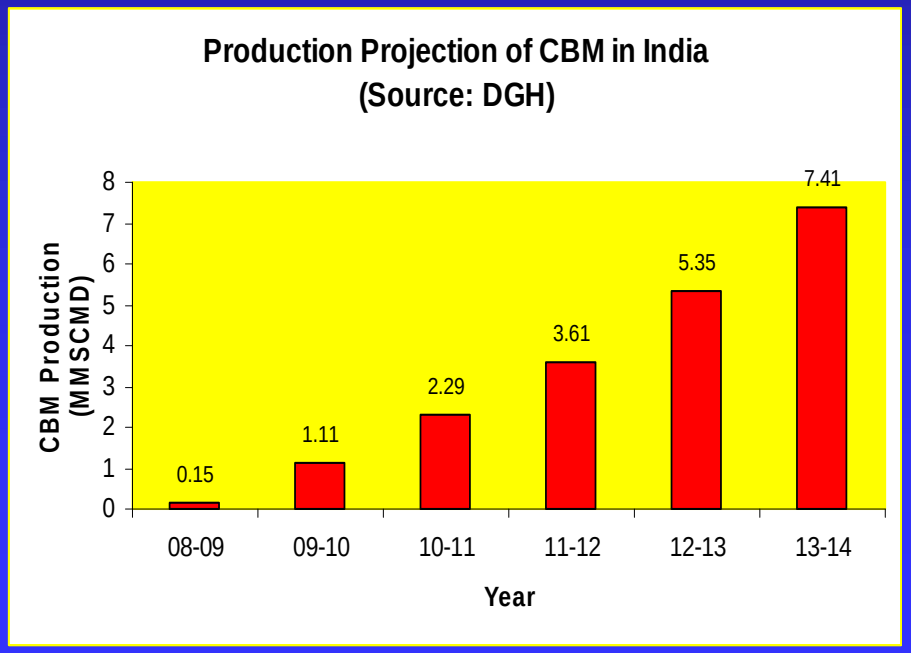
Status of Allotment/Development of CBM Blocks

1	Blocks awarded till date	**Total**	26
2	Status of Blocks as on date under	i. Exploration Phase – I	10
		ii. Exploration Phase - II	8
		iii. Development Phase-III [DGH approved Development Plan for 3 Blocks: Raniganj(S), Sohagpur(E) & Sohagpur (W)]	3
3	Area awarded, sq. km.		13,600
4	Total CBM Resources, BCM		1374
5	CBM wells drilled so far (Core Hole/ Test well/ Pilot well)		500
6	CBM reserve established (Gas Initial In Place), TCF/BCM for 4 blocks		8.4
7	Expected Production Potential, MMSCMD		38
8	Commercial Production commenced , w.e.f.		14.07.07
9	Approved gas sale Price, $/MMBTU		6.79
10	Present Gas Production from 3 blocks: RG(S), SP(E) & SP(W), MMSCMD		0.15
11	Expected CBM gas production from 3 blocks by 2013, [Raniganj (S), Sohagpur (E), Sohagpur(W)], MMSCMD		7.4

Development of CBM: India's Accomplishments …

- Commercial production of CBM started and during 2008-09 it was 0.15 MMSCMD (million std cubic meter per day).
- The CBM production is expected to increase to 3.6 MMSCMD by 2011-12 and to 7.14 by 2014



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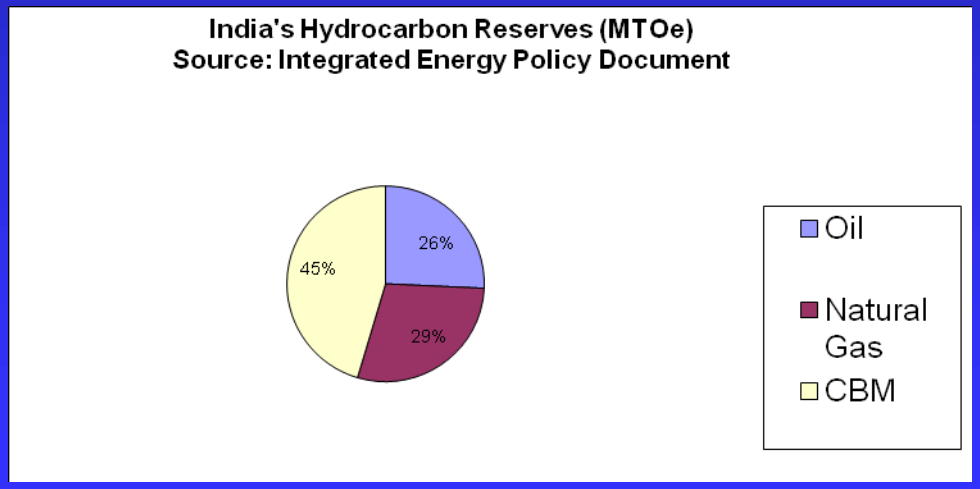
Development of CBM/CMM: CIL/CMPDI's initiatives

- CMPDI is pursuing development of CBM through:
  - Resource assessment: 3.4 TCM (Prognosticated)
  - Generating CBM related data for enlarging resource base
  - Preparation of data dossiers for allotment of CBM blocks
  - Implementation of Projects (Demonstration- CMM & Commercial-CBM)
  - Pursuing development of CMM & VAM



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Development of CBM/CMM: CIL/CMPDI's initiatives ..

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Implementation of Projects:

- UNDP/GEF/GoI funded Demonstration project at Moonidih & Sudamdih mines of BCCL
- CIL-ONGC commercial projects in Jharia and Raniganj CBM blocks

CBM Recovery and Commercial Utilization- Demonstration Project

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CBM Rig unit in operation

Hydro-frac unit at 3rd Well

- ✓ Successfully implemented at Moonidih mine of BCCL.
- ✓ 3 CBM wells drilled and 3 potential seams in each well hydro-fractured
- ✓ 2 CBM wells are producing gas after dewatering
- ✓ Dewatering being taken up in 3rd well after which CBM production will start.

CBM Recovery and Commercial Utilization- Demonstration Project …

- ✓ The produced gas is being utilised for continuous running 500 Kw gas-based generators
- ✓ So far over 1.1 million units of electricity generated.
- ✓ Generated electricity being supplied to Moonidih Mine Colony.
- ✓ Successful implementation of this project proved efficacy of CMM extraction technology in Indian geo-mining conditions.

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Commercial Development of Coalbed Methane : CIL/CMPDI's Endeavour

- Co-implementing commercial CBM Project in Jharia and Raniganj CBM Blocks allotted to CIL-ONGC consortium.
- Production from Jharia CBM Block likely to start by 2010.
- A Development Plan with budgetary estimate of Rs 1290 Crores (USD 290 Million) has been submitted to the Govt. for approval

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Development of CMM: Opportunities & Challenges

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Opportunities

- ✓ Occurrence of high rank coal in many coalfields
- ✓ Substantial coal resource is available in virgin coal seams lying below the worked out seams
- ✓ Successful implementation of demonstration project has opened opportunities for harnessing CMM in Indian mining conditions.
- ✓ CMPDI is implementing a R&D project for identification of suitable area for CMM development.
- ✓ Under this project, few blocks have been identified.
- ✓ Expression of Interest floated for identification of suitable service provider.
- ✓ Blocks to be awarded for commercial CMM development through bidding.

Development of CMM: Opportunities & Challenges

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Challenges

1. Technical

- Resource assessment technique of CMM in de-stressed condition
- Techno-economic evaluation of identified project area.
- Utilization of recovered methane

Since expertise on above are not available, international experts help from partner countries would be required.

2. Regulatory:

- Regulatory framework for development of coal mines and CBM are in place
- Regulatory framework for simultaneous and harmonious exploitation of CBM and coal mining under formulation by Govt. of India.

Development of VAM

- **Development of Ventilation Air Methane (VAM)**

  - ✓Development of VAM is another priority area.
  - ✓CMPDI has recently generated VAM specific data in several D-III mines of CIL.
  - ✓ An EoI has been floated for identification of suitable collaborator for commercial development of VAM projects.
  - ✓ Low concentration of methane in the ventilation air is a technological challenge.

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India CBM/CMM Clearinghouse

- India CBM/CMM Clearinghouse has been established at CMPDI, Ranchi in Nov'08 under the aegis of MoC and USEPA.
- This will help promotion of development of CMM/CBM in country.
- An international workshop was also held in Nov'08 which was attended by national/international experts in the subject.
- A web-site is functional which highlights the opportunities of CBM/CMM development in India

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Thank You