

# Coal Based Non Conventional Energy Source: Opportunities for CMPDI



Flare of gas from ONGC appraisal well of  
ONGC-CIL Jharia CBM Block

# Coal Based Non Conventional Energy Source

- With the thrust on clean coal technology and advancement in supporting technologies, following Coal based non-conventional energy resource are focus area for development:
  - Coalbed methane (CBM) and its subsets like:
    - Virgin Coalbed Methane (VCBM)
    - Coal Mine Methane (CMM)/ Abandoned Mine Methane (AMM)
  - Underground Coal Gasification
- In addition, other emerging technology areas are:
  - CO<sub>2</sub> sequestration
  - Carbon Credit

# Emerging Technology in Coal Based Non Conventional Energy Source: CMPDI's Perspective

- CMPDI being repository of exploratory/mining data, is playing an important role in the development of CBM and UCG through:
  - ✓ CBM related data generation in national perspective
  - ✓ Delineation of prospective VCBM blocks, resource assessment and preparation of data dossiers for global bidding by DGH
  - ✓ Development of CMM
  - ✓ Development of UCG
- In addition to resource estimation and conceptualization in these emerging technological area, CMPDI is also implementing Pilot as well as commercial projects:
  - ✓ CMPDI took up a mine related demonstration project where it is co-implementing agency under UNDP/GEF/GoI funding
  - ✓ CMPDI is the implementing agency on behalf of CIL in the 2 blocks allotted to CIL-ONGC in Jharia and Raniganj CBM blocks. In these blocks exploratory drilling and allied tests have been undertaken.

## Development of VCBM: Work done by CMPDI

- CMPDI is creating CBM data base from boreholes being drilled under promotional drilling during X plan period. This work is expected to continue during XI plan period.
- This will be helpful in carving out future CBM blocks.
- CMPDI at the instance of MoC has carved out CBM blocks and prepared data dossiers under paid consultancy mode for DGH.
- As a result of this 26 CBM blocks have so far been allotted with prognosticated resource of 1.45 TCMTC in 13600 sq. km area
- The production potential from the allotted blocks is 38 MMSCMD .
- The present prognosticated resource of the CBM in the country, as assessed by CMPDI stands at 3.4 TCM.

# Development of VCBM: Revenue Generation for CMPDI

## Revenue Generation

- Job carried out so far: Rs 3.8 Crores (approx)
  - Data dossier for 3 rounds of VCBM block allotment
- Project under implementation: Rs 28.75 Crores
  - CBM related data generation in the promotional drilling being carried out during X plan period: Rs 8.83 Crores (under PRE funding)
  - Implementing VCBM projects on behalf of CIL in Jharia and Raniganj CBM blocks allotted to CIL-ONGC consortium: Rs 19.92 crores (up to exploratory stage).
- Job in the pipeline: Rs 11.45 Crores
  - CBM related data generation in 45 slimholes during XI plan period: Rs 7.45 Crores
  - Data dossier preparation for 4th round VCBM block allotment: About Rs 4.0 Crores

# CMM/AMM- A Profitable by product of Mining

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- CBM from mining areas are identified coal mine methane (CMM) and abandoned mine methane (AMM).
- As per MOU between MOC & MOP&NG harnessing of CBM from mining areas comes under the purview of coal producing companies.
- Harnessing the CMM resource is an opportunity area for Indian coal mining industry and could be a revenue generation source.

# CMM/AMM- CMPDI's Initiative

- In the XI Plan document, prognosticated CMM resource of 150 BCM largely in working and potential underground mining blocks have been identified.
- Additional CMM resource associated with major opencast projects in NCL & SECL command area is under process of evaluation.
- A Project Proposal under CIL R&D funding is at an advance stage of approval. This proposal is for
  - ✓ Capacity building and
  - ✓ Formulating legal & regulatory framework work so that stake holders (Govt, mine owner & coal gas recovery company) have defined roles and functions.
- Delineation of viable CMM blocks and preparation of bankable project report is also an identified area for possible collaboration under the 3rd Indo-US Working Group Meeting held in April'06.

# CMM/AMM- CMPDI's Initiative

- Under this background the proposed road map for commercial development of CMM is as under:
  - ✓ Floating of Expression of Interest (EOI) by June'07
  - ✓ Interaction with respondent of EOI for development of a suitable commercial model – Jan'08 – March'09
  - ✓ Preparation of data package of suitable blocks and formulation of regulatory frame work: March'09
  - ✓ Floating of NIT for commercial exploitation of CMM: Sept'09
  - ✓ Award of CMM blocks for commercial development: March'10



# CMM/AMM- Revenue Generation for CMPDI

- Revenue Generation:
  - ✓ Project under implementation:
    - A mine related demonstration project Being implemented jointly by BCCL and CMPDI in Sudamdih and Moonidih mines of BCCL under UNDP/GEF/GoI funding at cost of Rs 92.43 crores out of which Rs 46.89 crores is from UNDP/GEF. The completion schedule is Dec'07.
    - CMM specific data generation in NCL area: Rs 1.94 Crores
  - ✓ Projects in pipeline
    - A R&D project to identify 4-5 viable CMM blocks and to address related issues is under active consideration of CIL : Rs 5.22 Crores
    - CMM specific data generation in SECL area: Rs 1.7 Crores

# Underground Coal Gasification (UCG)

- The UCG is a physico-chemical process of conversion of coal into gaseous energy source at the place of its occurrence
- Techno-economically unviable coal resource for mining due to greater depth/ isolated deposit can yield energy for present day use through underground gasification
- The UCG process is also environment friendly:
  - Minimum surface disturbance/ site rehabilitation requirement
  - No ash or slag removal
  - Reduced CO<sub>2</sub> emission
- Under this background action for development of UCG has been initiated.

## UCG: Work done so far at CMPDI

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- CIL and ONGC are pursuing UCG under collaborative regime.
- CMPDI has prepared data packages for 5 prospective blocks for Pilot Scale studies.
- Out of the 5 sites, 1 has been short listed for generation of additional data for pilot scale studies.
- The additional data is under process of generation. The full data is expected to be generated by **Sept'08**.
- Thereafter the results would be considered for its suitability for pilot test by the experts of SIM who are consultant of ONGC for UCG.

## Underground Coal Gasification: Collateral Activities to Support UCG Development

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- Draft Regulatory Frame Work to support UCG operation has been formulated by a multi organizational group and submitted to MoC for consideration.
- In 3<sup>rd</sup> Indo-US working group meeting held in April'06 UCG has been identified as one of the possible area for collaboration.
- Under the aegis of Indo-US Working Group, a workshop was organized in Nov'06 with a focus on criteria for identification of suitable site.

## UCG: Proposed Developmental work by CMPDI

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- As a follow up of the UCG workshop identification of additional UCG blocks have been taken up.
- This would be discussed with the international experts for short listing of 4-5 blocks for generation of UCG specific data. Activities to be completed by Sept'07.
- Additional data generation through exploration by Sept'09.
- Pilot scale studies to be taken up by April'10 .

## UCG: Revenue Generation of CMPDI

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- Project under implementation:
  - ✓ Additional Data generation in Kasta block for UCG: Rs 4.0 Crores
- In addition, revenue for CMPDI is expected through identification of suitable block, UCG specific data generation etc.

# Coal Based Non Conventional Energy Source: Future Perspective

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Emerging technology identified for developing expertise by CMPDI

- CO<sub>2</sub> sequestration
- Carbon credit mechanism

# Coal Based Non Conventional Energy Source: Future Perspective

## CO2 sequestration

- CO2 sequestration is an emerging solution to effect reduction of CO2 emission in the atmosphere.
- India is the founder member of Carbon Sequestration Leadership Forum (CSLF).
- NTPC has requested CMPDI to take leadership in this field with preparation of suitable approach note with a time bound action plan.
- An action programme has been prepared by CMPDI and submitted to NTPC which has been forwarded to Dept. of Science and Technology.
- Subsequently CMPDI has been asked by Dept. of Science and Technology to prepare a national project on carbon sequestration.
- A project Proposal to assess sink capacity of Indian coal bearing basin will be prepared under collaborative regime with technical institutions of national repute



# Coal Based Non Conventional Energy Source: Future Perspective

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## Carbon Credit Mechanism

- With emphasis on clean coal technology and in terms of Kyoto Protocol, carbon credit is an internationally salable commodity.
- Understanding Carbon Credit Mechanism and preparation of project report and assessment of carbon credits on account of environmental mitigation is an area of development in the emerging technology.

Thank You