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Sub.: Recommendations to Ramp-up CBM Production  
Ref.: D.O. No. O-19018/11/2015-ONG-I (40578) dated  
November 12, 2015

Dear Sir,

This has reference to the workshop on 'CBM: Potential & Challenges in Emerging Competitive Environment' organised by the Petroleum Federation of India in association with the Oil & Natural Gas Corporation Limited and other industry members on December 23, 2015 at New Delhi.

The workshop aimed to develop recommendations in this regard. The key views of the hydrocarbon industry emerged out of the deliberations at the workshop are enclosed.

We will be happy to provide any clarifications that you may desire.

Thanking you,

Yours faithfully,

S. Rath  
Director (Exploration & Production)

Encl.: as above

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## **Recommendations to Ramp-up CBM Production**

Coal Bed Methane (CBM) is an important national energy resource with growing relevance and potential to reduce the country's import dependence. Over the past two decades 33 CBM blocks have been awarded but the current production is only 1.1 mmscmd. Given a favourable Policy and support from regulatory bodies, State Governments and local authorities, it is considered possible to increase the CBM production by more than five times in the next five to seven years. Development of gas pipelines infrastructure and emergence of gas markets in eastern India is expected to provide foundation for further ramp up in CBM production.

To help identify key issues which need to be addressed, and Policy measures that need to be implemented to ramp-up CBM production, a workshop on 'CBM: Potential & Challenges in Emerging Competitive Environment' was organised by PetroFed on December 23, 2015 at New Delhi. It was attended by all industry personnel involved in CBM besides officials from regulatory authorities, the Ministry of Petroleum & Natural Gas and other industry players. The valedictory address was delivered by the Hon'ble Union Minister for Petroleum & Natural Gas, Shri Dharmendra Pradhan and an address by the Secretary, Ministry of Petroleum & Natural Gas, Shri K. D. Tripathi.

The deliberations on the CBM journey in India, technical challenges in CBM production, co-production of CBM with coal gas and coal, and marketing & pricing of CBM were summarized in the form of key recommendations by knowledge partner, Ernst & Young LLP.

1. The highlights and brief summary of deliberations are presented hereunder:
  - i) **Importance of CBM as Domestic Energy Resource**
    - a. CBM resources in India could be potentially much larger compared to the currently estimated 92 trillion cubic feet (TCF). A few CBM block operators have experienced an increase in resource base following extensive field operations. India also has favourable sub- surface setting in the form of multiple coal seams which is not the situation in other CBM producing countries such as Australia and US.
    - b. Of all Unconventional Gas Resources, CBM offers "low hanging fruit". However, various issues facing the industry need to be addressed expeditiously.



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### **ii) CBM Development Economics**

- a. CBM projects require “hundreds of wells” to be drilled by the operators to build up to critical production volumes which requires extensive upfront capital investment.
- b. CBM projects further require on-going capital investments including continuous drilling of additional wells and hydrofracking to maintain production volumes. Extended dewatering periods, water treatment and disposal operations precede economical flow of gas from wells.
- c. The eastern part of India is devoid of gas marketing infrastructure. Therefore, CBM operators are facing major challenges for creating the basic gas infrastructure and development of gas markets. This entails additional capex from the operators to monetise the gas reserves.
- d. The economics of Unconventional Gas exploitation is sensitive to application of advanced drilling, modelling and well completion technologies. The industry has not adopted many such advanced CBM development technologies due to access, costs and other restrictions. Availability of these advanced technologies is critical for optimum development of not only CBM resources but also other unconventional resources such as shale oil & gas and tight gas reservoirs.
- e. The presence of oilfield services sector in India is already limited and this problem is exacerbated in the regions (often remote) where CBM is present. As a result, operators find it difficult to access the services in a timely and cost effective manner.

### **iii) Operational Issues**

- a. CBM projects require large scale community interface as the amount of land required is much larger compared to conventional exploration and production (E&P) projects for similar levels of gas production. Moreover, many CBM blocks are located in forest and tribal areas. Accordingly, land acquisition for CBM development is cumbersome and one of



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the most challenging aspects for all the CBM operators in India.

- b. All operators were unanimous in their views that community management is critical for CBM operations. Consequently, operators have been making significant CSR investments and other community engagement activities to obtain "Social License to Operate" in their blocks.
- c. The CBM operators are facing challenging operational environments involving hostilities, manhandling, vandalism, etc. This affects the operational efficiency negatively.

### iv) Policy and Regulatory Matters

- a. Fiscal Regime: the current revenue sharing fiscal regime based on production linked payments (PLP) system is good, but should be implemented in full spirit. Cost audits and budget approvals should not be required as there is no cost recovery provision in the CBM contracts.

The operators should be free to adopt optimal procurement practices.

- b. Commencement of CBM operations requires over 40 statutory approvals from various Central and State Government authorities which is a time consuming process and adversely impacts the pace of exploration and development of CBM resources. It is, therefore, imperative that all key stakeholders i.e. Central and concerned State Governments, regulatory bodies, local authorities and communities are fully aligned to the needs of CBM projects by building awareness ahead of the field operations and appropriate mechanism are put in place for grant of various approvals on priority.
- c. Given the many uncertainties, there was consensus that various policies support extended to NELP blocks, including time extensions on excusable delays, should also be extended to CBM blocks.
- d. The Unified Exploration Policy should be extended to CBM blocks so that, besides CBM, the operators can also explore and exploit other hydrocarbon resources, particularly shale



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and tight gas formations. Such measures would expand the coverage for CBM operators and provide more synergies for addressing all unconventional gas resources. Further, it could help in more efficient management of scarce water resources, as water generated from de-watering of CBM wells, can be potentially used for fracking of shale gas wells.

### 1.1 Co-production of CBM, Coal Gas and Coal

In any coal mine, the effort should be to extract CBM first before going in for coal mining as a mine degasification effort. To this end:

- a. Highly gassy mines of Damodar valley coalfield having multi seam presence (few worked out seam above and few virgin seams below) can be considered for CBM exploitation.
- b. Drilling wells in coal mining leasehold areas for producing CBM from virgin seam below worked out seams can be better handled, if viability of introducing Horizontal multilateral drilling techniques in complex geo-mining condition of Indian Coal can be systematically understood. Before attempting drilling, lay and disposition of coal seams, "in seam seismic survey" can be attempted, for which national level efforts need to be evolved.
- c. In the absence of any demonstrated successful model of horizontal multilateral drilling, Coal India is contemplating vertical drilling through standing in pillars, if found technically viable as well safe from operational and statute point of view with reference to surrounding operating mines.
- d. Due diligence is under process for identifying areas for possible CBM exploitation in the leasehold of Coal India especially in Damodar Valley coalfield. Preliminary understanding brings out availability of around 160BCM of exploitable CBM GIP in such areas and 8 to 10% of which may be exploited after due consideration of safety issues.
- e. CBM prospect from coal mining area will be further marginal economic prospect in view of lesser exploitation percentage. However, in combination with coal mining may be viable in view of many shared cost towards staffing, land acquisition and other socio-economic cost as well as lower CAPEX due to shallow well.



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- f. Coal mining in India is being undertaken with large no of already existing statutory compliances in addition to handling sensitive social issues. Under the circumstances, bringing CBM exploitation under the ambit of P&NG rule will call for additional 40 nos. of clearances etc. for mere incidental production of gas as integral part of coal mining.
- g. CBM from Coal mining lease may be allowed to be undertaken under coal lease itself, so that statutory monitoring can also be ensured under single statute.

### 1.2 Pricing of CBM

- i. The panel was of the view that the current gas pricing formula in India is based on the gas markets of countries (i.e. US, Russia, Europe and Canada) dissimilar to India. Globally, the majority of natural gas is traded on market determined pricing, based on gas-to-gas competition or oil price indexation.
  - a. Unlike India, US, Russia and Canada have a significantly developed/mature gas market with surplus gas production
  - b. CBM operations will not be economically viable under the present gas pricing formula.
  - c. India still does not have a country-wide gas market and hence gas-to-gas competition situation will take time to develop.
- ii. India needs higher gas prices to encourage investments to support the relatively high development cost. The scale up in investments will lead to increase in domestic supplies, growth of oil fields services sector, and application of new and latest technologies. Expanding supplies would then drive down the prices to more balanced levels.
- iii. The panellists at the workshop proposed several ideas such as: optimal gas pricing, market linked pricing, alternative fuel based pricing and arms-length pricing that could be implemented in the CBM sector as also provisioned in Article 18 of the CBM contract.

### 2. Key Recommendations

Based on the presentations and deliberations made at the workshop, the following recommendations are proposed for creating a more robust



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policy framework for providing a favourable environment for exploring and exploiting all unconventional gas resources in an accelerated manner.

### 2.1 Policies: new policy provisions for marginal fields should be extended to the CBM sector

- i. Unified Exploration Policy (conventional, CBM, shale oil and gas, tight gas): Operators should be allowed to explore for shale and tight formation hydrocarbons in CBM blocks to achieve better synergies, economics and ease of operations. An enabling provision may be notified in the existing contracts for all operators - public sector and private sector.
- ii. Gas marketing freedom: Same as the provisions of the marginal field policy, the operator may be allowed to market gas on an arms-length basis to any prospective buyer.
- iii. Market-based gas pricing: well head price of gas may be determined on an arms-length basis. Production volumes are considerably lower, more expensive in CBM blocks as compared to that of conventional blocks and are required to be sold in the local/regional markets. Additionally, the operators have to make significant investment in the creation of evacuation infrastructure because of non-existing local gas infrastructure.

### 2.2 Contracts Administration - "No Cost Recovery" - Comparable to "Revenue Sharing"

- i. The existing CBM contracts do not have provisions for cost recovery, revenue is shared with the government through royalty and PLP system. Therefore, CBM contracts are similar to the "Revenue Sharing" model as compared to production sharing contracts (PSCs) with cost recovery provisions. Accordingly, operators should be given freedom for procurement /budgeting, etc. Role of the Steering Committee/DGH could be limited to reviews and compliance for the payment of royalty and PLP. They should, in fact, act as facilitators for growth of the unconventional sector in India.
- ii. At the end of contract period, the transfer of title/ownership of assets to the Government should be on a commercial basis because the contract does not have cost recovery provisions to recover capex/opex incurred by the operator.



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- iii. CBM operations require multiple approvals prior to commencement. Further, CBM operations require vast tracts of land - acquisition/leasing of the same is a very lengthy and cumbersome process. Many such factors are beyond the control of the operator. Accordingly, the provision of "Excusable Delays" applied to NELP contracts, may be extended to the CBM Contracts.

### 2.3 Permissions and Statutory Approvals

- i. Blocks should be offered after clearly checking "No Go" areas to avoid post award delays as well as adverse impact on prospects.
- ii. All statutory approvals, such as Petroleum Exploration License (PEL), Environment Clearance, and Clearance from Pollution Control Board of State Government should ideally be in place before signing of contract. In any case the contract should come into force from the date of receipt of all approvals.
- iii. Land acquisition is the most challenging aspect due to multiple ownership/titles and compensation issues. Therefore, Central and State Government coordination mechanism is required to facilitate land acquisition in an efficient and a time bound manner.
- iv. Ministry of Petroleum & Natural Gas, Ministry of Coal, Ministry of Labour - should have a joint committee to address various regulatory issues and concerns in CBM / Coal mining areas.
- v. DGMS and OISD should finalise a policy for simultaneous exploitation of resources by incorporating enabling provisions in the OMR policy.
- vi. For uninterrupted and safe operations in CBM blocks, Govt. may consider providing appropriate security coverage to CBM projects.

### 2.4 Constraints around Gas Marketing - Inadequate Pipeline Connectivity

- i. The Government should accelerate development of pipeline infrastructure in the Eastern region to enable market connectivity - options such as Viability Gap Funding can be considered.
- ii. Contractors should be allowed to build pipelines to connect to customers, outside the purview of PNGRB regulations. This provision, which is already provided by the CBM Contract, should be implemented in spirit.





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- iii. A time-bound action plan should be formulated to fast-track development of pipelines in the CBM belt. Government may consider setting-up a task force for the same.

### **2.5 National Mission on Unconventional Resource Development**

- i. Time bound evaluation and development of unconventional resources should be assigned National Mission status to bring all stakeholders together - The Central and State Governments, industry, foreign companies, technology sourcing/development/ technology providers, local community representatives for putting in place enabling policies, regulations, incentives, social issues management practices etc. in place to facilitate development of these vital natural energy resources.
- ii. Strong oil field services sector will be critical as the economics of unconventional gas will be sensitive to the cost of such services. The GOI should assign high priority for development of this sector under its "Make in India" Mission.

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