

METHANE TO MARKETS PARTNERSHIP - CMM INDIA PROFILE

In the era of clean and green fuel, worldwide attention is focused on supplementing coal based energy resource. In case of India, it is particularly relevant as 55% of commercial energy is sourced from coal & lignite and trend is likely to continue for years to come. The CMM projects are considered comparatively more attractive in the post Kyoto protocol period as they are incrementally loaded with benefits of carbon credit.

Indian Mining Scenario

India being 3rd largest coal producer in the world, hold good prospect for remunerative CMM exploitation. Country has a long history of coal exploration and coal geology of the country is well understood. Mining operation had also started as back as in early 19th century. Present mining operation is taken up under well-stipulated mining laws, whereby monitoring of mining related database are being carried out on routine basis.

Since 1972, in the post nationalization scenario of Coal Industry, mining operation has reached great height and country is now producing around 400 Mt. of coal. The share of production from opencast mines is around 85% and the balance is from underground mines.

The Indian coalfields have limited spatial extent, which is compensated by presence of large number of closely placed coal seams. In some of the coalfields of Damodar Valley like Jharia, Raniganj, East Bokaro and South Karanpura, there are around 25 coal seams and in some cases it even exceeds 40 with cumulative thickness of over 100 meter. In most of the coalfields, only few coal seams have been mined/ being mined and a number of virgin coal seams are lying below the present day workings. Therefore, there exists large coal resource in virgin seams and also in partly distressed coal seams.

About 94% of the high rank coals occurring in India are located in the coalfields of Damodar Valley. Some of the UG mines are gassy and go up to Degree III of gassiness (i.e. 10 M³/t of coal mined or above) .

Coal Rank & Gas Content

The coal seams of India are largely Sub-bituminous B to Bituminous C as per ASTM classification and are generally in the appropriate coal rank window for generation and retention of methane in coal seams.

The gas content data so far generated in the coalfields mostly located in

Damodar Valley indicate values ranging from 6 to 15 cubic metre per tonne of coal.

Most of the gas related data available in the documented form is available for Jharia Coalfield (vitrinite reflectance 0.9 to 1.3%) which is summarized below:

Gas desorption characteristics: The gas content of upper set of coal seams (XVIII to XIVA) indicate values of 7.3 to 14.9 m³/ tonne of coal within depth range of 150 to 800 m. on samples drawn from boreholes in the Parbatpur block located just adjacent to Moonidih and Amlabad mines. The linear regression equation applied to the measured values of gas content in Parbatpur block and corresponding seam depths showed an increase of methane content of about 1.3 m³ per 100m of depth. Adsorption isotherm of some of the above coal seams shows values above 10 to 13 m³/t for 40 kg/ cm² of pressure equivalent to 400m depth. The information in regards to composition of gas is limited to data obtained from pre –mining areas of Amlabad mine, which indicates CH₄ content as 94.4%

Steps initiated

- i) Way back in 1997, CBM policy of Govt. of India was formulated and to facilitate allotment of CBM blocks, MoU between Ministry of Coal (MoC) and Ministry of Petroleum and Natural Gas (MoP&NG) was signed. As per the MoU between MoC & MoP&NG, the coal companies will have the right of CBM exploitation in their working mines including pre & post mining operations.
- ii) Since the recovery of methane was given high priority, with a view to develop indigenous capacity in the field of coal mine related CBM recovery, a GEF/UNDP aided demonstration project was undertaken by Govt. of India, which came under implementation in September, 1999 on CBM recovery & utilization at Moonidih and Sudamdih mines of Bharat Coking Coal Limited (BCCL).

This CMM project is being implemented jointly by BCCL & Central Mine Planning & Design Institute Limited (CMPDI), both subsidiaries of Coal India Limited (CIL). The aim of this project is to:

- (a) Acquire exposure in CBM production from Virgin area and working mines by drilling from surface and underground.
 - (b) Acquire utilization technique of extracted CBM.
- iii) Further, CMPDI conceptualized a long-term perspective in CMM/AMM through a concept paper, which recognizes that CMM and AMM are areas of interest, as large areas in Indian coalfields, especially in

Damodar Valley Coalfields, are available for such development in existing mining areas and also in would be mining areas.

Barriers:

In development of CMM prospect, following barriers have been recognized:

- a) Capacity is lacking in respect of resource modeling in coal seams under de-stressed conditions.
- b) Legal/ safety framework under which CMM prospects can be developed and also matter regarding ownership of the recovered gas is not available.
- c) Lack of infrastructure for cost effective transportation & utilization of recovered methane.

Assistance and Collaboration Areas:

The assistance/ collaboration areas envisaged for overcoming the above-mentioned barriers are mentioned below:

- a) Engagement of an expert for resource modeling.
- b) Assistance to develop a model project with well defined functional areas for each of the stake holder i.e. the coal producing company, company which is assigned the role of recovery of methane, mine safety authorities and also to develop a mechanism where the administrative, legal and fiscal regime is well defined for simultaneous coal mining and methane recovery.
- c) Assistance in working out the economics of CMM exploitation and marketing encompassing the most economic mode of transport of methane to market.
