Chapter-4

COAL MINING POLICY AND MAJOR INITIATIVES

4.1 GUIDELINES FOR MINE CLOSURE

With a view to restore mined out areas to the primary level to the extent possible, it has been decided to make it mandatory to have mine closure plans for which Ministry of Coal has issued guidelines for adoption by Coal mine owners. This would help in addressing environmental issues related to Coal mining.

4.2 STATUS OF COAL MINES (NATIONALIZATION) AMENDMENT BILL 2000

The Amendment Bill is waiting for arriving consensus in the matter.

4.3 REGULATOR FOR COAL SECTOR

The Coal Regulatory Authority Bill, 2013 was introduced in the Lok Sabha on 13.12.2014.Since the said Bill of 2013 pending in the Lok Sabha has lapsed with the dissolution of the 15th Lok Sabha on 18th May, 2014, the proposal for re-introducing the same is under consideration as the Coal Regulatory Authority Bill 2014 in the 16th Lok Sabha..

4.4 CAPTIVE COAL MINING BLOCKS

4.4.1. Under the Coal Mines (Nationalisation) Act, 1973, Coal mining was mostly reserved for the public sector. By an amendment to the Act in 1976, two exceptions to the policy were introduced viz., (i) captive mining by private companies engaged in production of iron and steel and (ii) sub-lease for Coal mining to private parties in isolated small pockets not amenable to economic development and not requiring rail transport.

4.4.2. The Coal Mines (Nationalisation) Act, 1973 was amended in June, 1993 to allow Coal mining for captive consumption for generation of power, washing of Coal obtained from a mine and other end uses to be notified by Government from time to time. As per the provisions in Section 3 (3) (a) (iii) of the Coal Mines (Nationalisation) Act, 1973, a company engaged in production of iron and steel, generation of power, production of cement, and production of syn-gas obtained through Coal gasification (underground and surface) and Coal liquefaction only can do Coal mining in India for captive consumption.

4.4.3. The Government company (including a State Government company), a Corporation owned, managed and controlled by the Central Government can do Coal mining without the restriction of captive use.

4.5 REVIEW OF ALLOTMENT OF COAL BLOCKS BY INTER-MINISTERIAL GROUP (IMG)

4.5.1 Monitoring of Progress of Captive Coal Blocks Allocated and its associated end use projects:

In pursuance of the announcement in the budget speech for the year 2012-13, an Inter-Ministerial Group (IMG) headed by the Additional Secretary, Ministry of Coal has been constituted on 21.06.2012 to undertake periodic review of the development of Coal / lignite blocks allotted by the Government. The terms of reference of the IMG are:

i) The IMG shall undertake periodic review and the progress of allocated Coal mines / blocks and make recommendations on action to be taken including de-allocations, if required.

ii) The IMG may consider the replies where the show cause notices have been given and recommend action against the allocate companies including de-allocation, wherever necessary.

iii) The IMG may make its own assessment and recommend action as to deduction of Bank Guarantee, if required.

iv) Any matter where a reference is made by the Competent Authority.

4.5.2 The IMG has held 26 meetings so far. The IMG has discussed and finalized the guidelines/modalities for conduct of its business and also regarding computation of deduction of BG. The IMG has also decided to give an opportunity of giving personal hearing to all the allocatee companies of Coal blocks before giving its recommendations. With respect to the allocations made to the Private Companies, the IMG has recommended de-allocation of 62 Coal blocks allocated to 136 companies, deduction/forfeiture of Bank Guarantee (BG) in the cases of 27 blocks allocated to 38 companies and imposition of BG in case of 7 Coal blocks allocated to 7 companies. The recommendations of the IMG have been accepted by the competent authority and orders for de-allocation of 62 Coal blocks as well as for imposition/deduction/forfeiture of Bank Guarantee, have been issued subject to Court orders, wherever applicable.

4.6 TECHNOLOGICAL INITIATIVES

Emphasis is laid on technology development through adoption of State of the Art Technologies for both underground and opencast

operations for higher Coal production, productivity and improved safety. Deployment of high capacity shovels and dumpers, surface miners etc. along with matching ancillary equipments and Coal handling facilities for opencast mines is being practiced in various PSU Coal companies.

Deployment of draglines in conjunction with shovel dumper combination is a time tested method in major projects with multiple seam extraction and high stripping ratios. Crusher conveyor technology for Coal as well as overburden is also in use for quite some time in some of the opencast mines in these companies.

Of late, deployment of surface miners for selective mining, sizing and

Deployment of high capacity shovel & dumper in opencast coal mine is one of subsidiaries of CIL

avoiding cyclic drilling and blasting operations in Coal for improved productivity is assuming importance. In addition to the outsourced operations using surface miners, PSU Coal companies are also procuring the same for departmental operations. Radar based monitoring of slope stability of benches in open cast mines is being adopted for improved safety of operations. GPS based truck despatch monitoring systems are also being adopted for improving productive use of dumpers.

Controlled blasting in opencast mines is being practiced to minimise ground vibrations. Coal handling plants with silo and rapid loading systems are being developed in all major open cast mines.

Similarly, planning new underground mines for adoption of mass production technologies like continuous miners and longwall equipments is continuing. Deploy-+ment of bolter miners in conjunction with longwall operations for faster gate road drivage is also assuming significance in mechanisation of workings. Planning longwall mines with bigger blocks and longer face lengths is becoming possible due to faster rate of gate road preparation.

Adoption of Continuous Miners (CM), Side Discharge Loaders (SDL) and Load Haul Dumpers (LHD) and conveyors for mechanising the underground operations wherever it is techno-economically feasible is being taken up. Man riding systems are being installed in a number of underground mines to avoid manual walking to reach the workings.

Recently, CIL and SCCL have adopted high wall mining technology to extract Coal from the high walls of open cast mines which otherwise would remain sterilised. This technology provides extraction of Coal using high wall mining machines from the open cast benches when the economic extraction of Coal from open cast operations is not feasible. This technology is widely in use in USA.

For lignite mines, specialised mining equipment comprising bucket wheel excavators with high capacity conveyor systems and spreaders are being deployed for extraction of both overburden and lignite.

Further CIL has floated an expression of interest seeking application from international consultancy organisations for modernisation and techno-

logy development in their mines with a view to integrate the systems and adopting new technologies as may be feasible for CIL to enhance their Coal production in quickest possible manner and to improve the productivity and safety.

4.7 CLEAN COAL AND WASHERY CAPACITY

4.7.1 Coal washing is an important area from economic and environment point of view. Number of studies were carried out earlier have clearly highlighted benefits of using washed Coal in improving the economics of power generation and also reduction of emissions. The directive of Ministry of Environment & Forests (MoEF) restricts the use of Coal containing more than 34% ash content in power stations located 1000 km away from pit heads. MoEF is contemplating to further reduce this distance to 500 km. With this as a drive, number of power utilities have shown inclination to use washed Coal for power generation. Also Coal washing is one of the clean Coal technologies prior to combustion of Coal.

The present installed capacity of washery for thermal Coal is about 103 MT per annum and is envisaged to reach about 244 MT per annum in the next five years time.

4.7.2 Realizing the importance of washed Coal supply, Ministry of Coal issued guidelines for setting up of Coal washeries on Public Sector Coal Company's land in September'2005. Accordingly, subsidiary Coal companies of CIL are extending necessary assistance to facilitate setting up of Coal washeries on their land to the private operators.

4.7.3 CIL has also decided in principle to wash all inferior grade Coal linked to non-pit head power stations by setting up washeries with the state-of-the art technology on Build-Operate-Maintain [BOM] concept where CIL will provide the capital funding and other infrastructure facilities to the BOM operator. All new mines producing high ash Coal having capacity 2.5 MT and above not linked to pit head power plants will be designed with an integrated washery.

4.7.4 CIL has undertaken a massive programme of setting up of new washeries and proposed to set up 16 nos. of washeries in its subsidiaries with total installed capacity of 92.1 MT (18.6 MT in coking Coal and 73.5 MT in non-coking Coal sector).

Out of the above 16 nos. of new washeries, tenders for 10 washeries have been floated. Out of these 10, Agreement for 3 washeries has been signed and 2 more washeries is expected to be signed soon. Construction work for 2 washeries has already been started out of three [3] washeries, for which agreement has been signed. Balance five nos. of washeries are at various stages of Bid Process Management.

Tender for remaining six washeries will be floated as soon as acquisition of land and finalization of infrastructure facilities are completed.

4.7.5 Two nos. of R&D Projects to promote dry Coal beneficiation are also under implementation with CIL R&D Grant namely

- Radiometric dry deshaling plant (Ardee-Sort) at Madhuband washery, BCCL: Tender has been finalized and Work Order issued. Construction work has started at site.
- All-mineral All-air Jig dry deshaling system at Bharatpur, MCL: Tender has been floated. Evaluation of offers received is under process.

4.7.6 Besides above, CIL has identified to set up sixteen nos. of washeries with a total capacity of 126.3 MT in the second phase.

4.7.7 To expedite the process of setting up of washeries, CIL is also exploring the possibility of setting up of washeries on Build-Own-Operate (BOO) concept. Preparation of Model Bid Document (RFQ & RFP) has been completed and forwarded for approval of competent authority.

4.8 COAL BED METHANE (CBM)

4.8.1 New area of clean energy source like Coal bed Methane (CBM) and Coal Mine Methane (CMM), Underground Coal Gasification (UCG), Coal Liquefaction and Shale gas etc are under focus and Government is taking all the necessary steps for expediting development of these resources within the existing legal framework.

4.8.2 CBM is one of the potent greenhouse gases which is generated during the Coalification process. CBM occurs associated with Coal and possess a potential threat from safety angle during Coal mining operation. If extracted separately and used gainfully, it forms a supplementary source of energy. In view of the abundant resource of Coal in the country, there is a significant scope for

commercial development of CBM. Methane associated with virgin Coal beds is conventionally termed as Coal bed Methane whereas extraction of methane from existing and projectised mining areas is termed as Coal Mine Methane (CMM).

4.8.3 Consequent to the formulation of CBM Policy in 1997, Govt. of India has so far allotted 33 CBM blocks in 4 rounds of global bidding to various operators for exploration and exploitation of CBM. CBM is jointly managed by Ministry of Coal and Ministry of Petroleum and Natural Gas. CMPDI has prepared data dossiers for most of the allotted CBM blocks.

CMPDI has also prepared data dossiers on 8 prospective CBM blocks (in Johilla, Singrauli Coalfields and Cambay basin) and submitted to DGH in March 2013 for their allotment in forthcoming round of global bidding.

Further at the request of DGH in January 2014, CMPDI is examining possibility of carving out blocks in the area relinquished by the CBM operators. The Data-Dossiers on the blocks, if feasible, will be prepared by assimilating data generated by CBM Operators.

4.8.4 CBM/Shale gas Specific Data Generation during XII Plan

4.8.4.1 CBM Specific Data Generation

CMPDI is carrying out studies related to "Assessment of Coal bed Methane Gas-in-Place Resource of Indian Coalfields/Lignite fields" through boreholes being drilled under Promotional Exploration since X Plan period and CBM related studies has been completed in 94 boreholes (67 by CMPDI & 27 by GSI) since X Plan period in different Coal/lignite fields. This study will enlarge the CBM resource base of the country and facilitate delineation of more blocks for CBM development.

A total of 60 boreholes (40 by CMPDI and 20 by GSI) are to be taken up for CBM related studies during XII plan period and for the purpose ₹ 13.46 Crore under PRE funding has been allocated. During the period from April, 2012 to March, 2014, a total of 23 boreholes (16 by CMPDI and 7 by GSI) and during the year 2013-14, 15 boreholes (8 by CMPDI and 7 by GSI) have been tested for CBM related studies. The status of boreholes tested during January 2013 to March, 2014 is given below:

Period	Progress made
01.01.2013 to 31.03.2013	7 Boreholes were undertaken for CBM related studies (4 completed by CMPDI and 3 in progress by GSI).
01.04.2013 to 31.12.2013	12 Boreholes were undertaken and completed for CBM related studies (6 by CMPDI and 6 by GSI)
01.01.2014 to 31.03.2014	3 boreholes have been undertaken for CBM related studies (2 completed by CMPDI & and 1completed by GSI).

4.8.4.2 Shale Gas Specific Data Generation

CMPDI is carrying out studies related to "Assessment of Shale Gas In-place Resource of Indian Coal/Lignite fields" through boreholes being drilled under Promotional Exploration under PRE funding since XII Plan period and for the purpose ₹ 7.75 Crore has been allocated. This study will identify and enlarge the Shale Gas resource base of the country and facilitate delineation of more blocks for Shale gas development.

A total of 25 boreholes by CMPDI are to be taken up for Shale gas related studies during XII Plan period from April 2012. During this plan period, from April 2012 to March 2014, a total of 10 boreholes and during the year 2013-14, 6 boreholes have been tested for Shale Gas related studies by CMPDI. The status of boreholes tested during January 2013 to March, 2014 is given below:

Period	Progress made
01.01.2013 to 31.03.2013	4 Boreholes were undertaken and completed by CMPDI for Shale Gas related studies.
01.04.2013 to 31.12.2013	5 Boreholes were undertaken and completed by CMPDI for shale gas related studies
01.01.2014 to 31.03.2014	1 Boreholes is under progress by CMPDI for shale gas related studies

4.8.5 Development of CMM within CIL mining leasehold areas

Development of CMM within CIL mining leasehold areas is a priority area for MoC and CIL in view of the advantages accrued on the issues related to safety of mines, environment etc. MoC has made CMPDI as a Nodal agency for development of CMM within the country.

To prove the efficacy of CMM development in Indian geo-mining condition, a UNDP/GEF/MoC funded project was successfully implemented

in Moonidih mines of BCCL. Further, CMPDI has completed a CIL R&D project for delineation of prospective CMM blocks in BCCL and CCL areas of CIL wherein 5 prospective CMM blocks have been identified and data dossiers on the blocks were prepared indicating Coal and gas resources in addition to furnishing details on geology, mining details, reservoir characteristics etc.

Under the aforesaid background, actions for commercial development were initiated and on behalf of CIL/concerned Coal Company consent, CMPDI had floated Global Tender for selection of suitable Developer for commercial development of CMM in 5 identified blocks (3 in BCCL and 2 in CCL) in April 2011 which could not be proceeded further in view of certain issues regarding mechanism of operationalization were raised by MoP&NG.

4.8.6 CIL-ONGC Collaborative Project on CBM

4.8.6.1 Jharia CBM Block

As per Govt. of India CBM policy, consortium of CIL and ONGC was allotted 2 blocks on nomination basis – one each in Raniganj and Jharia Coalfields and entered into a contract with Govt. of India for development of Coal bed methane. The Govt. of Jharkhand granted the Petroleum Exploration License (PEL) for Jharia CBM block in August'2003. Slimhole drilling in the block commenced from Dec.'2004 and all the 8 slimholes involving 8703.65 metre were completed by CMPDI. A report on assessment and compilation of data generated during slimhole drilling was submitted by CMPDI in Feb.'2008. ONGC drilled two exploratory wells, six vertical pilot wells and two Horizontal Multi seam Multilateral wells (HMMW) in the CBM block. Further, sale of incidentally produced gas from Jharia CBM block is going on in line with the approval of the Govt.

CMPDI has carried out deep slim hole drilling (depth range 1000 to 1400m) wherein, CBM related parametric data were generated. A report based on this drilling and other available drilling and gas related data has been prepared by CMPDI and submitted to ONGC which facilitated ONGC to drill exploratory and pilot wells.

Consequent to the completion of envisaged work in the exploratory and pilot phases, consortium of CIL & ONGC has submitted a development

plan of the block having a budgetary outlay of ₹ 1137 Crore for the approval of Government. The development plan was deliberated in the Steering committee meeting and government approval has been accorded vide letter no. DGH/CBM/MoPN&G/ONGC/2013 dated 2nd July, 2013.

Further, CIL has conveyed ONGC about its intention of increasing its Participating Interest (PI) from existing 10% to 26% from Development Phase onwards for this block in pursuance to the decision of CIL Board. The matter regarding operationalisation issues and future course of action was deliberated in the meeting of CIL Board wherein it was observed that there is lack of transparency from ONGC for sharing information and the Board directed that CIL to withdraw from Joint Operation.

4.8.7.2 Raniganj CBM Block

The Govt. of West Bengal granted the Petroleum Exploration License (PEL) for Raniganj CBM block in June'2004. CMPDI has carried out deep slimhole drilling (depth range 800 to 1100m) wherein, CBM related parametric data were generated. A report based on this drilling and other available drilling and gas related data has been prepared by CMPDI and submitted to ONGC which facilitated ONGC to drill exploratory and pilot wells. ONGC has drilled one exploratory well and two pilot wells in the CBM block.

Consequent to the completion of envisaged work in the exploratory and pilot phases, consortium of CIL & ONGC has submitted a development plan of the block having a budgetary outlay of ₹ 957 Crore for the approval of Government. The development plan was deliberated in the Steering committee meeting and government approval has been accorded vide letter no. DGH/CBM/MoPN&G/ONGC/2013 dated 2nd July, 2013.

Further, CIL has conveyed ONGC about its intention of retaining 26% Participating Interest (PI) in this block from Development phase onward in pursuance to the decision of CIL Board. The matter regarding operationalisation issues and future course of action was deliberated in the meeting of CIL Board wherein it was observed that there is lack of transparency from ONGC for sharing information and the Board directed that CIL to withdraw from Joint Operation.

4.8.7 Establishment of CBM/CMM Clearinghouse

A CMM/CBM clearinghouse was established at CMPDI, Ranchi under the aegis of Ministry of Coal and United States Environmental Protection Agency (US EPA) on 17th Nov.'08 for a period of three years. The clearinghouse has been functioning as the nodal agency for collection and sharing of information on CMM/CBM related data of the country and help in the commercial development of CMM projects in India by public/ private participation, technological collaboration and bringing financial investment opportunities.

As envisaged in the work programme of the clearinghouse, the clearing-house website is being maintained and updated on regular basis. Close co-ordination is being maintained with US EPA for development of CMM/ VAM etc. and for the purpose a team of CIL/CMPDI officials visited operat-ional CMM sites in US during June'10 and October'11 for getting first hand experience in this field. The term of the Clearinghouse has been extended for another three years in pursuance to the approval of MoC and USEPA.

An international workshop on "Development of Non-conventional Energy resource in India" has recently been organized at CMPDI, Ranchi in Nov'13 under the aegis of India CMM/CBM Clearinghouse.

4.8.8 EU funded Research Project titled "Greenhouse Gas Recovery from Coal Mines and Un-minable Coal beds and conservation of Energy" (GHG2E)

The above multi-organization multi-country project has been approved under partial funding scheme of European Union Research Commi-ssion and partially by CIL R&D. CMPDI and IIT, Kharagpur are the participating organization from India amongst 11 other organizations.

The project is under implementation as per the schedule and CMPDI has submitted the envisaged work in October 2012 and January 2013 on "Geology and CMM resources of Moonidih Mining Block, Jharia Coalfield" and financial report to the Project Coordinator from Imperial College, London.

The implementation of the project was deliberated in a Project Review meeting held in November 2013 at

Ranchi wherein in addition to several issues planning for generation of additional data in Moonidih mine was carried out.

4.9 UNDERGROUND COAL GASIFICATION (UCG)

In India, UCG was taken up in mid 1980's by ONGC and CIL under technical collaboration with erstwhile USSR. Although one lignite block "Merta Road" in Rajasthan was found suitable, pilot appraisal could not be taken up due to apprehension of contamination of ground water.

Subsequently, consequent to signing of MoU between CIL & ONGC in November'2005 for taking up pilot scale studies for UCG, CMPDI prepared data packages for 5 prospective UCG sites. Out of the five sites, one Kasta West block in Raniganj Coalfield was selected by the consultant engaged by ONGC. As required, drilling of slimholes for generation of additional data was completed in Kasta block for examining possibility of taking up pilot scale UCG project and an assessment report was prepared and submitted to ONGC for their examination. The said MoU has since expired. The possibility of further continuing the UCG project in Kasta West block in Raniganj Coalfield through CIL-ONGC collaboration under National Clean Energy Fund of Govt. of India is under deliberation with ONGC.

Further, two blocks namely Kaitha in Ramgarh Coalfield (within CCL command area) and Thesgora "C" in Pench-Kanhan Valley Coalfield (within WCL command area) were identified for commercial development of UCG.

CMPDI has invited on-line bids on 20th January'2014 for the e-Tendering portal https://Coalindiatenders.gov.in for Selection of "Developer for Commercial Development of Underground Coal Gasification (UCG)" in Kaitha Block of Central Coalfields Limited (CCL) and Thesgora "C" Block of Western Coalfields Limited (WCL). Five firms participated in the pre bid meeting held on 3rd Feb'2014. The due date for submission of offer has been extended from 10th March'2014 to 17th April, 2014.

4.10 DELINEATION OF SHALE GAS BLOCKS

4.10.1 CMPDI was entrusted the job of preparing data dossiers on 06 prospective Shale Gas blocks in Gondwana basin by Directorate general of Hydrocarbons (DGH). The data dossiers on Raniganj, Jharia, Bokaro, South Karanpura, North Karanpura and Sohagpur basins were finalized and submitted to DGH in March 2013. This is the first systematic shale gas assessment study carried out by CMPDI in the Gondwana basin.

4.10.2 CIL R&D project titled "Assessment of prospect of Shale Gas in Gondwana basin with special reference to CIL areas"

A project titled "Assessment of prospect of Shale Gas in Gondwana basin with special reference to CIL areas" has been approved by CIL R&D for ₹ 400 lakh. The project is under implementation by CMPDI from 1st April 2011 with an approved duration of 2½ years where Advance Resources International, USA is the sub-implementing agency.

Three officials from CMPDI have visited different shale gas sites / Lab in USA under this project in June, 2012. Identification of study areas in BCCL and CCL command areas and generation of requisite parametric data from the collected shale samples has been completed and the assessment report is under preparation.

One of the equipment for parametric data generation (TOC analyzer) for assessment of shale gas potentiality has been procured and is installed in CBM lab, CMPDI. In view of the escalation of price due to foreign exchange component for Procurement of Rock Eval equipment, the project cost was enhanced to ₹ 496 lakh with extension of time up to July, 2014 by R&D Board of CIL in January 2014. Supply Order for procurement of the Rock Eval equipment has been issued in March 2014.

4.10.3 CIL R&D Project titled "Studies on shrinkage swelling characteristics of some Indian Coals to ascertain recoverability of CBM from deep seated Coal and shale resources"

CIL R&D project titled "Studies on shrinkage swelling characteristics of some Indian Coals to ascertain recoverability of CBM from deep

seated Coal resources" work is in progress. The project duration is 2 years starting from March 2013 with IIT Kharagpur as collaborator in the project. Design and fabrication of the instrument is under progress at IIT Kharagpur. Design of Sample Cell and Experimental Cell completed and report submitted on 27th January, 2014. Procurement of High Pressure fittings and testing of instrument is under progress at IIT Kharagpur.

4.10.4 S&T Project titled "Shale Gas Potentiality Evaluation of Damodar Valley Basins of India"

A S&T project regarding "Shale gas potentiality of Damodar basin of India" at an investment of ₹ 16.87 Crore under S&T plan of Ministry of Coal (MoC) is under implementation with the objective to evaluate Damodar basin for their shale gas potentiality through integrated geophysical, geological, geo-chemical and petro-physical investigations which are in progress as per schedule. The project is jointly under implementation by National Geophysical Research Institute (NGRI), Hyderabad, Central Mine Planning & Design Institute Ltd. (CMPDI), Ranchi and Central Institute of Mining and Fuel Research (CIMFR), Dhanbad. The project duration is of three years. The instrument "Automatic Porosimeter cum Permeameter" is under procurement. Areas have been identified in Jharia and Raniganj Coalfields for generation of data/ studies and shale samples have been collected from Jharia Coalfield for generation of requisite data.

4.10.5 S&T Project titled "CBM reserve estimation for Indian Coalfields"

A S&T project regarding "CBM Reserve estimation for Indian Coalfields" at a cost of ₹ 2069.91 Lakhs has been approved under EoI of Coal S&T project by MoC in Feb, 2014. The project is of 3 years duration with effect from 24th March, 2014. Action has been initiated as per the approved project proposal.

4.11 CBM LAB SERVICES

CMPDI has established state-of-the-art laboratory facilities in 2008 for conducting CBM related studies like Desorption studies, Gas composition etc, which are essential inputs for CBM resource assessment and forecasting production potential of a

CBM reservoir. It has also added Adsorption Isotherm Setup, which can measure adsorptive capacity of Coal samples up to a pressure as high as 20 Mpa (corresponding to approximately 2000 m strata depth). This lab has gas Chromatograph also for analyzing gas composition of desorbed gas as well as mine air samples which helps in taking decisions related to mine safety.

Facilities for generation of suit of parametric data for Shale gas potentiality & producibility assessment are also under development in this lab and ToC (Total Organic Carbon) Analyzer has been already commissioned. The instrument "Rock Eval Analyszer" required for assessing shale gas prospectivity for which supply order has been placed and procurement of the instrument "Automatic Porosimeter cum Permeameter" is under process.

CBM Lab, CMPDI has carried out the field desorption studies at the borehole sites in 8 boreholes during 2013-14 and has generated total gas content and gas composition data. In addition, studies have been carried out in 6 boreholes for assessment of shale gas potentiality. CBM lab has carried out Adsorption Isotherm (AI) test for 20 numbers (17 Coal and 3 Shale) of samples during 2013-14 through the in-house facility created in CMPDI in addition to carrying out Total Organic Carbon (TOC) analysis on 110 number of shale samples. Analysis of 913 mine air samples, received from different collieries of CCL, was also carried out and the results have been submitted.

4.12 REVISION OF RATES OF ROYALTY ON COAL AND LIGNITE

Based on the recommendations of the Study Group constituted on 04.02.2010 for revision of royalty on Coal and lignite, the Government after having detailed discussions and deliberations with all the stakeholders had switched over to ad-valorem regime in Coal and lignite sector from the earlier, fixed and variable component of royalty. Accordingly royalty on Coal and lignite has been fixed @ 14% and @ 6% ad-valorem respectively. The new royalty rates have been notified vide GSR No. 349 (E) dated 10.5.2012.

Royalty paid by CIL, SCCL and NLC from 2011-2012 to 2013-14 is as under:-

Royalty paid by CIL (₹ in Crore)

States	2011-12	2012-13	1.1.2013 – 31.3.2014
West Bengal	9.48	11.15	14.60
Jharkhnad	1430.54	1916.05	2587.62
Odisha	1027.77	1225.06	1675.16
Maharashtra	526.30	704.23	962.18
Madhya Pradesh	1012.79	1488.29	1957.46
Chhatisgarh	1100.80	1624.16	2212.78
Uttar Pradesh	181.94	236.98	353.91
Assam	25.52	42.69	52.86
Total	**5315.14**	**7248.61**	**9816.57**

Royalty paid by SCCL (₹ in Crore)

State	2011-12	2012-13	1.1.2013 – 31.3.2014
Andhra Pradesh	769.06	1142.90	1559.57

Royalty paid by NLC (₹ in Crore)

States	2011-12	2012-13	1.1.2013 – 31.3.2014
Tamil Nadu	171.87	214.61	299.92
Rajasthan	5.57	7.70	10.99

4.13 REVIVAL OF SICK PSUs

Eastern Coalfields Limited (ECL):

Regarding revival of sick companies viz ECL and BCCL, a meeting of Board for Reconstruction of Public Sector Enterprises (BRPSE) was held on 30.10.2012 to review the status of implementation of revival scheme of ECL/BCCL. BRPSE has recommended measures to come out of the BIFR status. A review meeting with representatives of ECL and BCCL was also held in the Ministry on 19.11.2012. On the recommendations of BRPSE, CIL was requested for taking appropriate action. Effective steps have been taken to implement the revival plan and it is expected that the ECL will come out of BIFR by 2015-16.

Bharat Coking Coal Ltd (BCCL):

BCCL is a Schedule B company, subsidiary of Coal India Ltd., incorporated on 01.01.1972 entrusted with mining of Coal and allied

activities in the Jharia and Raniganj Coalfields. BCCL produces almost 50% of the total prime coking Coal requirement of the integrated steel sector. Presently, the Company operates 66 Coal mines which include 27 underground, 19 opencast & 20 mixed mines as on 01.04.2013.

BCCL was de-listed from the list of sick industries (BIFR case no. 502/2001) which was informed in the BIFR (Bench Monitoring-II, MA 372/BC/2012) hearing of 03.01.2013.

Data pertaining to BCCL is as follows:

(₹ in Crore)

	2009-10	2010-11	2011-12	2012-13	1.1.2013– 31.3.2014
Profit before taxes	794.19	1093.69	822.36	1709.06	2089.01
Profit after taxes	794.19	1093.69	822.36	1498.80	1714.35
Net Worth	-5402.88	-4309.19	-3486.83	550.97	2265.32