

CHAPTER

11



PROMOTIONAL AND DETAILED EXPLORATION

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1. Promotional Exploration

Mineral Exploration Corporation Limited (MECL), State Governments and CMPDI are conducting Promotional Exploration under the Ministry of Coal's

Plan scheme of “Promotional Exploration for Coal & Lignite”. The summary of Promotional Drilling carried out in coal & lignite during the period 2016-17, 2017-18, 2018-19 and 2019-20, Jan'20-Dec'20 (provisional) and Jan'21-Mar'21 (Projected) is given below:

(Drilling in Metre)

Command Area	2016-17 Actual	2017-18 Actual	2018-19 Actual	2019-20 Actual	Jan'20-Dec'20 (Provisional)	2020-21 (Apr'20-Dec'20) Provisional	2020-21 Jan'21-Mar'21 (Projected)
Drilling in CIL Command Area	49043	92787	91238	70973	65526	49560	35000
Drilling in SCCL Command Area	0	0	4747	11210	1352	291	2000
Drilling in Lignite Areas	55624	41894	43023	33497	24328	14363	13000
Total	104567	134681	139008	115680	91206	64214	50000
Growth %	-6%	28%	3%	-17%			

*Achievement of target depends upon timely availability of forest clearance to take up drilling in forest areas, local support and occurrence of lignite in identified blocks.

2. Detailed Drilling in Non-CIL Blocks

CMPDI carries out Detailed Exploration in CIL and Non-CIL blocks as per strict timelines to bring resources falling in indicated and inferred category into the

measured (proven) category. The exploratory drilling in non-CIL/captive Mining blocks is taken up under the Ministry of Coal's Plan scheme of “Detailed Drilling in Non-CIL Blocks”.

The details of actual drilling in Non-CIL/Captive Mining Blocks during the period 2016-17, 2017-18, 2018-19, 2019-20, 2020-21 (Apr'20 – Dec'20) and projected achievement for 2020-21 (Jan.'21-Mar.'21) are given below:

(Drilling in Metre)

Command Area	2016-17 Actual	2017-18 Actual	2018-19 Actual	2019-20 Actual	Jan'20-Dec'20	2020-21 Apr'20-Dec'20 Provisional	2020-21 (Jan'21-Mar'21) Projected
CMPDI (Departmental)	57663	113228	140683	231352	224269	121051	140000
Outsourcing by CMPDI	251044	372661	342926	464806	458417	307620	160000
Total	308070	485889	483609	696158	682686	4,28,671	300000
Growth %	7%	57%	0%	44%			

CMPDI has substantially improved its capacity of drilling during the XI & XII plan period.

As against the achievement of 2.09 lakh metre in 2007-08, CMPDI achieved 4.98 lakh metre in 2011-12, 13.60 lakh metre in 2018-19 and 12.94 lakh metre in 2019-20 and 7.91 lakh metre in 2020-21 (from Apr'20 to Dec'20) and 4.27 lakh metre projected for Jan'21 to Mar'21 through Departmental resources and outsourcing. For capacity expansion through modernization of departmental drills, 39 new Mechanical drills and 26 Hydrostatic drills have been procured since 2008-09, out of which 15 have been deployed as additional drills and 33 as replacement drills. CMPDI has also replaced 38 mud pumps and 74 trucks in last nine years.

To meet the increased work load, recruitment has been taken up through campus interviews/open examinations. 259 Geologists, 34 Geo-physicists and 20 Mechanical Engineers as drilling Engineers have joined CMPDI since 2008-09. About 1240 non-executive staffs have also been inducted for exploration work. Out of this, 45 Geologists, 7 Geo-physicists, 5 Mechanical Engineers & 14 non-executives have resigned.

During 2020-21 (April'20 to December'20), a total of about 2.85 lakh metre drilling was carried out through Departmental resources, about 5.06 lakh metre drilling was carried out through outsourcing, out of which 1.73 lakh metre drilling was carried out through tendering & 3.33 lakh metre drilling through MoU with MECL.

3. Drilling Performance in 2020-21

CMPDI deployed its departmental resources for detailed exploration of CIL/Non-CIL blocks, whereas, State Govt. of Odisha deployed resources in CIL blocks only. In addition, six other contractual agencies have also deployed resources for detailed drilling/exploration in CIL/Non-CIL blocks. A total of 130 to 150 drills were deployed in 2020-21, out of which, 71 were departmental drills.

Apart from the above, CMPDI continued the technical supervision of Promotional (Regional) Exploration work undertaken by MECL in coal Sector in 8 blocks, DGM (Nagaland) in 1 block & Outsourced Agencies in 3 blocks. CMPDI has also taken up promotional drilling in 2 blocks. Promotional Exploration work was undertaken by MECL in Lignite Sector in 9 blocks. A total of about 0.64 lakh metre of Promotional (Regional) drilling was carried out in Coal (0.50 lakh metre) & Lignite (0.14 lakh metre) during 2020-21 (April'20 to December'2020).

In 2020-21, CMPDI and its contractual agencies took up exploratory drilling in 132 blocks/Mines of 19 coalfields situated in 14 States. Out of 132 blocks/mines, Departmental drills of CMPDI took up exploratory drilling in 61 blocks/mines, whereas, contractual agencies took up exploratory drilling in 71 blocks.

The overall performance of exploratory drilling during 2020-21 (upto Dec.'20) is given below:

Agency	ACHIEVEMENT DURING APR'20-DEC'20 (Provisional)			Achieved Apr'19- Dec'19	Growth (%)
	Target	Achiev.	Achiev. (%)		
Detailed Drilling undertaken by CMPDI :					
I. Departmental (CIL, Consultancy & Non-CIL)	3.214	2.849	89%	3.211	-11%
St. Govts. (CIL)	0.028	0.001	4%	0.013	-92%
MECL-MOU(CIL/Non-CIL)	2.717	3.330	123%	3.257	2%
Tendering(CIL/Non-CIL)	1.413	1.733	123%	2.421	-28%
II. Sub-Total Outsourcing:	4.158	5.063	122%	5.691	-11%
Grand Total (I+II)	7.372	7.912	107%	8.902	-11%
Promotional Drilling by MECL, GSI, DGM (Nagaland) & DGM (Assam)					
I. COAL SECTOR					
MECL	0.345	0.396	115%	0.538	-26%
DGM (Nagaland)	0.010	0.007	69%	0.005	40%
DGM (Assam)	0.020	0.000	0%	0.000	
CMPDI	0.127	0.096	76%	0.099	-3%
Total COAL	0.502	0.499	100%	0.642	-22%
II. LIGNITE SECTOR					
MECL	0.186	0.144	77%	0.240	-40%
Grand Total (I+II)	0.688	0.643	94%	0.882	-28%

In 2020-21 (up to Dec'20), CMPDI achieved 107% of its overall drilling targets. The negative growth is mainly due to COVID-19 lockdown, local law & order problem, pending forest permission & no bid/ high rate in tendering. MECL and CMPDI could not achieve the targets of Promotional (Regional) drilling due to revision of guidelines by Ministry & re-tendering, less deployment of drills because of priority in detailed

drilling and DGMs (NER) could not deploy its rigs due to adverse law & order condition, forest cover & special tenancy Act.

4. Geological Reports

In 2020-21 (up to Dec.'20), 11 Geological Reports have been prepared on the basis of detailed exploration conducted in previous years. About 6.87 Billion Tonnes

of coal resources under Measured (Proven) category have been added. About 15 GRs are expected to be submitted during Jan'21-Mar'21 with estimated resource of about 3.8 billion tonnes.

Geophysical Studies

Using Departmental resources, HRSS Survey has been carried out in Northern Part of North of Arkhapal Block, Talcher Coalfield, and the survey is under progress in Senduri Block, Sohagpur Coalfield & Nigawani Bakeli-A Block, Sohagpur Coalfield to cover a sum total of 100 line km during 2020-21.

8 blocks have been successfully outsourced till December 2020 to increase the pace of exploration by using 2D/3D Seismic survey along with drilling to achieve a target of 400 line km seismic survey during 2020-21. Overall, about 70 line km of Seismic survey (provisional) achieved till Dec'20 against the target of 500 line km for 2020-21. About 1.57 lakh meter of Geophysical logging (provisional) carried out till Dec'20 departmentally especially for complimenting non-coring drilling.

Hydrogeological Studies

Hydrogeological studies of 17 number of mining projects/mines taken up for preparation of 'Groundwater

Clearance Application' for CGWA approval and 07 nos. of Hydrogeological report for EMP Clearance. CMPDI is carrying out groundwater monitoring of MoEF cleared projects (74 nos. of mines of WCL area, 12 nos. of Clusters of ECL, 10 nos. of Projects of NCL and 15 nos. Cluster of Mines in BCCL area). Total 70 nos. of Hydrogeological studies on GR/PR/Piezometers have been completed and other 24 nos. of Reports are in progress.

Hydrogeological studies in Fly Ash disposal at Gorbi mines voids for NTPC, Vindhyachal, Singrauli in under progress.

5. Coal Resources

Inventory of Geological Resources of coal in India

As a result of exploration carried upto the maximum depth of 1200m by the GSI, CMPDI, SCCL and MECL, a cumulative total of 326.496 Billion tonnes of geological resources of coal have so far been estimated in the country as on 01.04.2019. The report as on 01.04.2020 is yet to be published by Geological Survey of India.

The details of State-wise geological resources of coal are given below:

STATEWISE GEOLOGICAL RESOURCES OF COAL IN INDIA AS ON 01.04.2019

STATE	Category-wise Coal Resources (in Million Tonnes)				
	Measured (Proved)	Indicated	Inferred (Exploration)	Inferred (Mapping)	Total
WEST BENGAL	14219	12847	4624		31690
BIHAR	310	1513	11		1834
JHARKHAND	48032	30400	6074		84506
MADHYA PRADESH	12182	12736	3875		28793
CHHATTISGARH	21446	36260	2202		59908
UTTAR PRADESH	884	178	0		1062

STATE	Category-wise Coal Resources (in Million Tonnes)				
	Measured (Proved)	Indicated	Inferred (Exploration)	Inferred (Mapping)	Total
MAHARASHTRA	7573	3257	1847		12677
ODISHA	39654	33473	7713		80840
ANDHRA PRADESH	97	1078	432		1607
TELANGANA	10622	8565	2652		21839
SIKKIM	0	58	43		101
ASSAM	465	57	1	3	525
ARUNACHAL PRADESH	31	40	13	6	90
MEGHALYA	89	17	28	443	576
NAGALAND	9	22	118	298	446
GRAND TOTAL	155614	140501	29631	750	326496

Source: Geological Survey of India's Inventory of Geological Resources of Indian Coal as on 01.04.19. The inventory did not take into account the mined out reserves.

6. Categorization of Resources

The coal resources of India are available in older Gondwana formations of peninsular India and younger tertiary formations of north eastern region. Based on the results of Regional/Promotional Exploration, where the boreholes are normally placed 1-2 Km apart, the

resources are classified into 'Indicated' or Inferred' category. Subsequent Detailed Exploration in selected blocks, where boreholes are less than 400 meter apart, upgrades the resources into more reliable 'Proved' category. The formation-wise and Category-wise coal resources of India as on 01.04.2019 are given in table below:

(Fig. in million tonnes)

Formation	Proved	Indicated	Inferred	Total
Gondwana Coals	155021	140379	29472	324872
Tertiary Coals	594	121	909	1624
Total	155614	140501	30381	326496

The Type and Category-wise resources of India as on 01.04.2019 are given in table below:

(In million tonnes)

Coal Type	Proved	Indicated	Inferred	Total
Prime Coking	4668	645	0	5313
Medium Coking	14876	11245	1863	27984
Semi Coking	519	995	193	1708
Sub-Total of Coking	20063	12885	2056	35004
Non-Coking	134958	127494	27416	289868
Tertiary Coal	594	121	909	1624
Grand Total	155614	140501	30381	326496