



PROMOTIONAL AND DETAILED EXPLORATION

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1. Promotional Exploration

Mineral Exploration Corporation Limited (MECL), State Governments and Central Mine Planning and Design Institute (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 2018-19, 2019-20, 2020-21, 2021-22, Jan'22-Dec'22 (provisional), Apr'22-Dec'22 (provisional) and Jan'23-Mar'23 (Projected) is given below:

(Drilling in Metre)

Command Area	2018-19 Actual	2019-20 Actual	2020-21 Actual	2021-22 Actual	Jan'22- Dec'22 (Prov.)	2022-23 (Apr'22- Dec'22) (Prov.)	2022-23 Jan'23- Mar'23 (Proj.)	2022-23 (Apr'22- Mar'23) (Proj.)
Drilling in CIL Command Area	91238	70973	111735	155153	85654	48611	16389	65000
Drilling in SCCL Command Area	4747	11210	291	0	0	0	0	0
Drilling in Lignite Areas	43023	33497	22852	13984	1276	0	0	0
Total	139008	115680	134878	169137	86930	48611	16389	65000
Growth %	3%	-17%	17%	25%				

Note: Achievement of target depends upon timely availability of forest clearance to take up drilling in forest areas & favourable law & order condition.

2. Detailed Drilling in Non-CIL Blocks

CMPDI carries out Detailed Exploration in CIL and Non-CIL blocks as per strict time-lines 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 2018-19, 2019-20, 2020-21, 2021-22, Jan'22-Dec'22 (provisional), Apr'22-Dec'22 (provisional) and Jan'23-Mar'23 (Projected) are given below:

(Drilling in Metre)

Command Area	2018-19 Actual	2019-20 Actual	2020-21 Actual	2021-22 Actual	Jan'22- Dec'22 (Prov.)	2022-23 (Apr'22- Dec'22) (Prov.)	2022-23 Jan'23- Mar'23 (Proj.)	2022-23 (Apr'22- Mar'23) (Proj.)
CMPDI (Departmental)	140683	231352	46249	87571	85008	45321	29679	75000
Outsourcing by CMPDI	342926	464806	92782	171762	49505	27589	32412	60000
Total	483609	696158	139031	259333	134513	72910	62091	135000
Growth %	0%	44%	-80%	87%				

3. Drilling Performance in 2022-23:

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, MECL and 6 contractual agencies have also deployed resources for detailed drilling/exploration in CIL/Non-CIL blocks. A total of 100 to 120 drills were deployed in 2022-23, out of which, 67 were departmental drills.

In 2022-23, CMPDI and its contractual agencies took up exploratory drilling in 79 blocks/mines of 17 coalfields situated in 6 States. Out of 79 blocks/

mines, Departmental drills of CMPDI took up exploratory drilling in 53 blocks/mines, whereas, contractual agencies took up exploratory drilling in 26 blocks.

The overall performance of exploratory drilling during 2022-22 (upto Dec'22) is given below:

The overall performance of exploratory drilling during 2021-22 (upto Nov.'21) is given below:

Agency	Detailed Drilling During Apr-22 to Dec-22 (Provisional)			Achieved Prev. Year: Apr-21 to Dec-21	Growth (%)
	Target	Achiev.	Achiev. (%)		
Detailed Drilling undertaken by CMPDI:					
I. Departmental (CIL, Consultancy & Non-CIL)	2.841	2.460	87%	2.580	-5%
II. Outsourcing	1.877	1.482	79%	2.433	-39%
Grand Total	4.718	3.942	84%	5.013	-21%
Promotional Drilling by MECL, GSI, DGM (Nagaland) & DGM (Assam)					
I. COAL SECTOR	0.491	0.486	99%	1.181	-59%
II. LIGNITE SECTOR	0.110	0.000	0%	0.127	-100%
Grand Total	0.601	0.486	81%	1.308	-63%

During 2022-23 (Apr'22 to Dec'22), a total of about 2.46 lakh metre drilling was carried out through Departmental resources. About 1.48 lakh metre drilling was carried out through outsourcing, out of which 0.77 lakh metre drilling was carried out through tendering & 0.69 lakh metre drilling through MoU with MECL.

Shortfall during Apr'22 to Dec'22 was mainly due to reduction of Central Sector Scheme (CSS) fund in BE 2022-23 and discontinuation of scheme upto Sep'22. Exploration was planned in awarded blocks only and drilling was closed in rest of blocks affecting the drilling achievement, which was subsequently restored in October'22. For CSS, enhanced budget in RE 2022-23 had been proposed by MoC for Cabinet approval. Adverse law & order situation and pending forest permissions in few blocks of Odisha and Chhattisgarh also affected drilling productivity.

4. Geological Reports

In 2022-23 (up to Dec'22), 15 Geological Reports have been prepared on the basis of detailed exploration conducted in previous years involving 5.08 Billion Tonnes of Measured (Proven) coal resources category. About 14 GRs are expected to be submitted during Jan'23-Mar'23 with estimated resource of about 10 billion tonnes.

5. Geophysical Studies

(a) 2D/3D Seismic Survey

CMPDI has taken up 2D/3D seismic survey and data acquisition with depth range up to about 1000 metre. During 2021-22, 864.99 line km of 2D/3D seismic survey was achieved. In 2022-23, about 440.57 line km of 2D/3D seismic survey has been carried out, departmentally & through outsourcing upto Dec'22 against the target of 495 line km which is 89% of the cumulative target.

(b) Other Geophysical work

In 2021-22, 1.92 lakh metre of geophysical logging was achieved against a target of 1.55 lakh metre. In

2022-23, 0.89 lakh metre of Geophysical logging has been carried out till Dec'22 departmentally especially for complimenting non-coring drilling. About 25.24 line km of Magnetic survey, about 11.28 line km of Resistivity Survey, and about 204 stations of Gravity Survey were also carried out during this year till Dec'2022.

(c) Hydrogeological Studies

In 2022-23 (till Dec'22), CMPDI prepared 23 nos. of Comprehensive Hydrogeology Report of Coal Mine / Projects for obtaining NoC from Central Ground Water Authority (CGWA), New Delhi. 22 nos. of Groundwater Modelling report have been prepared for compliance and obtaining NoC for Coal mines / Projects from CGWA, New Delhi. 19 nos. of Hydrogeological study report have been incorporated in EIA / EMP studies of Coal mines / Projects. 32 nos. of other hydrogeological studies (i.e., chapter for GR / PR, Piezometers, Pumping Tests, Damage Assessment Reports etc.) has been prepared. Quarterly ground water level & quality monitoring of 4 nos. of Coalfields i.e., ECL, BCCL, CCL & NCL command area including buffer zone has been continued and three quarters of monitoring completed.

Hydrogeology Section of Exploration Division of CMPDI, Ranchi has been awarded as GWCO (Groundwater Consultant Organization) by QCI-NABET and Groundwater Professionals by CGWA, New Delhi during 2022-23 and entered into MoU with 3 nos. of CGWA, New Delhi accredited consultants for preparation of Ground Water Modelling report and is in the process of getting expertise in the Ground Water Modelling domain in near future.

6. COAL RESOURCES

Inventory of Geological Resources of coal in India

As a result of exploration carried up to the maximum depth of 1200m by the Geological Survey of India (GSI), CMPDI, SCCL and MECL, a cumulative total

of 361.41 Billion tonnes of geological resources of coal have so far been estimated in the country as on 01.04.2022. The details of State-wise geological

resources of coal are given below:

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STATEWISE GEOLOGICAL RESOURCES OF COAL IN INDIA

As on 01.04.2022

STATE	Category-wise Coal Resources (in Million Tonnes)			
	Measured (Proved)	Indicated	Inferred	Total
Coking				
Odisha	48573	34080	5452	88105
Jharkhand	53245	28260	5155	86660
Chhattisgarh	32053	40701	1437	74192
West Bengal	17234	12859	3779	33871
Madhya Pradesh	14052	12723	4142	30917
Telangana	11257	8344	3433	23034
Maharashtra	7984	3390	1847	13221
Bihar	310	4080	48	4437
Andhra Pradesh	921	2443	778	4142
Uttar Pradesh	884	178	0	1062
Meghalaya	89	17	471	576
Assam	465	57	3	525
Nagaland	9	22	448	478
Sikkim	0	58	43	101
Arunachal Pradesh	31	40	19	90
Grand Total	187105	147252	27054	361411

Source: Geological Survey of India's Inventory of Geological Resources of Indian Coal as on 1.4.2022. The inventory did not take into account the mined out reserves.

7. 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/measured' category.

The formation-wise and Category-wise coal resources of India as on 1.4.2022 are given in table below:

(Resource in million tonnes)

Formation	Proved/ measured	Indicated	Inferred	Total
Gondwana Coals	186512	147131	26113	359756
Tertiary Coals	594	121	941	1656
Total	187105	147252	27054	361411

The Type and Category-wise resources of India as on 1.4.2022 are given in table below:

(Resource in million tonnes)

Coal Type	Proved/ measured	Indicated	Inferred	Total	% share
Prime Coking	4.67	0.64	0.00	5.31	1.47
Medium Coking	15.67	10.65	1.76	28.08	7.77
Semi Coking	0.53	0.99	0.19	1.71	0.47
Sub-Total of Coking	20.87	12.28	1.95	35.10	9.71
Non-Coking	165.64	134.85	24.17	324.65	89.83
Tertiary Coal	0.59	0.13	0.94	1.66	0.46
Grand Total	187.1	147.26	27.06	361.41	100.00
% share	50.32	41.73	7.95	100.00	

Lignite Reserves in India

Lignite reserves in India have been currently estimated at around 46,204.16 million tonnes as on 01.04.2022. The state wise distribution of lignite reserves as on 01.04.2022 is as follows:

(Resource in million tonnes)

State	Measured	Indicated	Inferred	Total	%
Pondicherry	0.00	405.61	11.00	416.61	0.90
Tamilnadu	4,926.92	21,981.20	9,652.62	36,560.72	79.13
Rajasthan	1,168.53	3,029.78	2,259.41	6,457.72	13.98
Gujarat	1,278.65	283.70	1,159.70	2,722.05	5.89
Jammu & Kashmir	0.00	20.25	7.30	27.55	0.06
Kerala	0.00	0.00	9.65	9.65	0.02
Odisha	0.00	0.00	5.93	5.93	0.01
West Bengal	0.00	1.13	2.80	3.93	0.01
Total	7,374.10	25,721.70	13,108.40	46,204.16	100.00

Promotional Exploration

a) Promotional Regional Exploration:
 During the year 2022-23, no Promotional Regional Exploration has been carried out in Tamil Nadu and Rajasthan under Central Sector Scheme (CSS) of MoC.

b) Detailed exploration by NLCIL under MoC Central Sector Scheme:
 During the year 2022-23, no detailed exploration has been carried out in Tamil Nadu

under Central Sector Scheme (CSS) of MoC.

c) Detailed Exploration under NMET Scheme (MoM):

Under NMET fund, a total meterage of 37,170mts of drilling work is earmarked for MECL to take up detailed exploration in Veeranam Block-4 in Tamil Nadu. During the year 2022-23, MECL completed 10,257.0 mts up to August 2022. The details of work done against the target are given below.

(Resource in million tonnes)

Block / State	Total Meterage (in meters)	Achievement 2022-23 (in meters)	Since inspection (in meters)
Veeranam Block-IV, Tamil Nadu	37,170.00		26113

d) Contractual scheme By NLCIL:
 There was no drilling carried out under contractual scheme of NLCIL.