



RESEARCH & DEVELOPMENT

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1. Status of Research Projects under S&T Grant of Ministry of Coal

The Research & Development (R&D) activities in Coal sector are administered through an apex body namely, Standing Scientific Research Committee (SSRC) with Secretary (Coal) as its Chairman. The other members of this apex body include Chairman, Coal India Limited (CIL), Chairman cum Managing Directors (CMDs) of Central Mine Planning and Design Institute (CMPDI), Singareni Collieries Company Limited (SCCL) and NLC India Limited (NLCIL), Director General (DG) of Directorate General of Mines Safety (DGMS), Directors of concerned CSIR Laboratories, Representatives from Department of S&T (DST), NITI Aayog and Research Institutions, Chairman of Technical Sub-committee, etc. The main functions of SSRC are to plan, programme, budget and oversee the implementation of research projects. The SSRC is assisted by a Technical Sub-Committee headed by Head of Department (HoD) (Mining) of IIT- KGP/BHU/ISM on annual rotation basis.

The R&D projects are broadly covered under 7 thematic areas, viz. Advanced technology / methodology for improvement of production & productivity, Improvement of safety, Health and environment, Waste to wealth, Alternative use of coal and clean coal technology, Coal beneficiation and utilization, Exploration, Innovation and

indigenization (Under Make-in-India concept).

CMPDI acts as the Nodal Agency for co-ordination of research activities in the coal sector, which involves identification of 'Thrust Areas' for research activities, identification of agencies which can take up the research work in the identified fields, processing the proposals for Government approval, preparation of budget estimates, disbursement of fund, monitoring the progress of implementation of the projects, etc.

2. Physical performance

The status of Coal S&T projects during 2022-23 (till 31.12.2022) are as under:

Sl. No.	Parameters	Quantity
1	Projects on-going as on 01.04.2022	11
2	Projects completed during 2022-23 (till 31.12.2022)	2
3	Projects terminated during 2022-23 (till 31.12.2022)	1
4	Projects approved by SSRC during 2022-23 (till 31.12.2022)	9
5	Projects on-going as on 31.12.2022	17

3. Financial status

Budget provisions vis-à-vis actual fund disbursement during the period are given below:

(in ₹ Crores)

2021-22				2022-23		
RE	Fund received from MoC	Actual	BE	RE	Fund received from MoC	Actual
11.50	8.35	7.53	10.00	8.35	0.30 (till 31.12.2022)	1.25 (till 31.12.2022)

4.1 Following S&T project were approved during 2022-23 (till 31.12.2022):

- a) Utilization of low grade coal for production of high quality graphene and carbon nanoparticles for energy storage.

Implementing agencies: Indian Institute of Technology (BHU), Varanasi; Indian Institute of Petroleum and Energy (IIPPE), Visakhapatnam and Central Coalfields Limited (CCL), Ranchi.

- b) Ultrasonic Washing for Desulphurization of Coal.

Implementing agencies: Indian Institute of Technology Guwahati (IITG), Guwahati; Avinashilingam Institute for Home Science and Higher Education for Women (AIHSEHW), Coimbatore Kuvempu University, Shimoga, Tumkur University, Tumkur and NEC, Margherita.

- c) Prevention of premature failures and enhancing life of bottom rollers used in bucket wheel excavators.

Implementing agencies: NLCIL, Neyveli; NIT, Trichy and IISc, Bengaluru.

- d) Study on Optimal Strategy for Phasing Down Coal Uses in India.

Implementing agencies: School of International Studies (SIS), Jawaharlal Nehru University (JNU), New Delhi.

- e) Electrostatic deposition and functionalization of multiwall carbon nanotubes (MWCNTs) for sensitive & selective detection of Coal Mine Methane (CMM).

Implementing agencies: Amity Institute for Advanced Research & Studies (Materials & Devices), Noida and BCCL, Dhanbad.

- f) Utilization of Coal Gangue to develop Porous Adsorbents for CO₂ Capture.

Implementing agencies: Indian Institute of Technology, Kanpur and BCCL, Dhanbad.

- g) Use of Micro seismicity as a tool for underground mines hazard monitoring with the motive to enhance safety and production.

Implementing agencies: Indian Institute of Technology, Kharagpur; CMPDI, Ranchi and ECL, Sanctoria.

- h) Biomethanization of coal

Implementing agencies: Institute of Science, BHU, Varanasi.

- i) Reservoir characterization and numerical modelling of coal reservoir for enhanced coalbed methane recovery and prospects for carbon sequestration

Implementing agencies: Indian Institute of Technology, Bombay and CMPDI, Ranchi.

4.2 Following S&T projects were completed during 2022-23(till 31.12.2022):

- a) Capacity Building for extraction of CMM Resource within CIL Command Areas.

Implementing agencies: CMPDI, Ranchi & CSIRO, Australia.

- b) Development of Coal Quality Exploration Technique based on Convolutional Neural Network and Hyper-spectral Images.

Implementing agencies: CIMFR, Nagpur and Shri Ramdeo Baba College of Engineering & Management (RCEM), Nagpur.

5. Status of Research Projects under CIL R&D

For in-house R&D work of CIL, an R&D Board headed by Chairman, CIL is also functioning. CMPDI acts as the Nodal Agency for processing the proposals for CIL approval, preparation of budget estimates, disbursement of fund, monitoring the progress of

implementation of the projects, etc.

In order to enhance R&D base in command areas of CIL, the CIL Board in its meeting held on 24th March 2008 had delegated substantial powers to CIL R&D Board and the Apex Committee of the R&D Board. The Apex Committee is empowered to sanction individual R&D project up to ₹ 5.0 Crore value with a limit of ₹ 25.0 Crore per annum considering all the projects together, whereas CIL R&D Board is empowered to sanction individual R&D project up to ₹ 50.0 Crore.

6 Physical performance

The status of CIL R&D Projects during 2022-23 (till 31.12.2022) are as follows:

Sl. No.	Parameters	Quantity
1	Projects on-going as on 01.04.2022	30
2	Projects sanctioned during 2022-23 (till 31.12.2022)	4
3	Projects completed during 2022-23 (till 31.12.2022)	2
4	Projects terminated as on 31.12.2022	3
5	Projects on-going as on 31.12.2022	29

7 Financial status

Budget provisions vis-à-vis actual fund disbursement during the period are given below:

(₹ in Crores)

2021-22		2022-23	
RE	Actual	RE	Actual
30.00	31.20	67.00	58.33 (Till 31.12.2022)

Following R&D projects were approved during 2022-23 (till 31.12.2022):

- a) Development of tandem approach for Paste Fill Technology and extraction methodology by Continuous Miner (CM) deployment for Shyampur B Colliery of Mugma Area, ECL.

Implementing agencies: ECL, Sanctoria and CIMFR, Dhanbad.

- b) Highwall Mining Feasibility Assessment and Layout Design.

Implementing agencies: CMPDI, Ranchi; CIL (HQ), Kolkata and CSIRO, Australia.

- c) Development of a rational technology for production of ceramic materials from coal mining, washeries and processing wastes (Waste to Wealth).

Implementing agencies: BIT, Mesra and CCL, Ranchi.

- d) Assessment of safe parting thickness and optimal goaf edge support requirement for extraction of pillars under soft cover.

Implementing agencies: IIT, BHU, Varanasi; SECL, Bilaspur; CCL, Ranchi and ECL, Sanctoria.

Following R&D projects were completed during 2022-23 till 31.12.2022:

- a) Bench Scale Study on reducing ash content (mineral matter) from Washery Grade Coking coal and high ash non-coking coal through oil agglomeration.

Implementing agencies: NML, Jamshedpur and CMPDI, Ranchi.

- b) Development of Guidelines for increasing the Height of Overburden Dumps at Opencast Coal Mines in India.

Implementing agencies: CMPDI, Ranchi and IIT, Delhi.

