LIST OF ONGOING S&T PROJECTS
(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
1.	**Development and Field Trial of 500 T Capacity SAGES-III for Use with Continuous Miners (Phase-III)** [Project code: MT-171] **Implementing Agency:** IIT-ISM, Dhanbad, SECL, Bilaspur, M/s Andhra Pradesh Heavy Machinery & Engineering Limited (APHMEL), Vijayawada and M/s Jaya Bharat Equipment Pvt. Ltd. (JBEPL), Hyderabad **Objectives:** • To design, develop and manufacture of 4 nos. of 500 t capacity Self Advancing Goaf Edge Supports (SAGES) compatible with continuous miners in extraction of coal pillars and field trial of developed SAGES in depillaring operation with continuous miner at one of the underground mines of SECL • To study the techno-economic of deployed SAGES (500 T) with Continuous miner.	01.05.2019	31.12.2023	396.69 IIT-ISM- 85.69 APHMEL- 311.00

LIST OF ONGOING S&T PROJECTS
(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
2.	**Indigenous Development of IoT Enabled Technology for Monitoring, Analysis and Interpretation of Longwall Shield Pressures for Improving Safety and Productivity** [Project code: MT-172] **Implementing Agency:** CMPDI, Ranchi, IIT, Kharagpur & Eastern Coalfields Limited (ECL), Sanctoria **Objectives:** • Indigenous Development of IoT Enabled Technology for Monitoring, Analysis and Interpretation of Longwall Shield • Pressures for Improving Safety and Productivity	01.12.2020	30.11.2023	471.00 IIT-KGP: 367.16, CMPDI: 103.84, ECL: Nil

LIST OF ONGOING S&T PROJECTS
(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
3.	**Establishment of Geo-thermal energy (20KW Cap) power generation Pilot Project at Manuguru area of SCCL Command area based on closed loop Binary Organic Rankine Cycle Process technology** [Project code: CE-33] **Implementing Agency:** Singareni Collieries Company Ltd, Kothagudem and Shiram Institute for Industrial Research (SIIR), New Delhi **Objectives:** • To establish indigenous 20 KW first Pilot Demonstration unit in India based on closed loop Binary Organic Rankine Cycle (ORC) process technology to produce clean, reliable and efficient electricity using Geothermal fluid as heat source at Manuguru, Telangana. • To standardize and optimize the power generation cost using geothermal source independently or in combination to ensure uninterrupted power supply for commercial viability. • To indigenize the process and establish model for scaling up.	01.06.2021	31.08.2023 (Applied for 3 months time extension)	172.28 SCCL, Kothagudem: Nil SIIR, New Delhi: 172.28

LIST OF ONGOING S&T PROJECTS
(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
4.	**Indigenous development of early warning radar system for predicting failures/slope instabilities in open cast mines** [Project code: MT-169] **Implementing Agency:** Society for Applied Microwave Electronics Engineering & Research (SAMEER), Mumbai, Centre of Studies in Resources Engineering (CSRE), Indian Institute of Technology (IIT), Mumbai and Central Mine Planning & Design Limited (CMPDI), Ranchi **Objectives:** • To develop a prototype instrument of SSR system based on GB-SAR principle • To develop an Interferometric Information Generation System (IIGS) • To develop a Control Logic, Archiving and Prediction System (CLAPS) • To develop the Displacement Map Generation System (DMGS) of the SAR processed time series data	01.02.2018	31.10.2023	585.58 SAMEER - 520.58 CMPDI - 65.00

LIST OF ONGOING S&T PROJECTS
(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
5.	**Utilization of low grade coal for production of high quality graphene and carbon nano-particles for energy storage** [Project code: CU-59] **Implementing Agency**: Indian Institute of Technology (BHU), Varanasi, Indian Institute of Petroleum and Energy, Visakhapatnam, Central Coalfields Ltd., Ranchi **Objectives**: • To study the formation of different kinds of graphene and carbon nano particles using lowest grade of Indian coal, (viz. non coking coal G17 grade) and other low grade coal. Synthesis of soluble versions of graphene Nano sheets with smooth edges and excellent photoluminescence properties • Utilization of graphene and carbon nanoparticles synthesized as above for removal and recovery of precious metal ions from acid mine drainage (AMD). • Utilization of graphene in energy storage devices like super capacitors with high energy and power density	15.10.2022	14.10.2024	Rs. 86.61 lakh IIT-BHU: Rs.86.61 lakh IIPE: Nil CCL: Nil

LIST OF ONGOING S&T PROJECTS
(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
6.	**Ultrasonic Washing for Desulphurization of Coal** [Project code: CP-51] **Implementing Agency**: Indian Institute of Technology Guwahati (IITG), Guwahati, Avinashilingam Institute for Home Science and Higher Education for Women (AIHSHEW), Coimbatore, Tamil Nadu, Kuvempu University, Jnanasahyadri, Shankaragatta, Tumkur University, Venkatesh Rao Colony, Tumakuru and NEC, Margherita **Objectives**: • Ultrasound experimental and simulation studies: Optimization studies on the process parameters (ultrasound frequency, particle size, temperature, pH, solvent, residence time etc.) would be performed in a batch reactor. Pressure field and velocity pattern of the solvent feed stream during coal washing would be investigated by CFD studies for the proper location of ultrasonic probes in the reactor to avoid bypassing and short circuiting of feed stream. • Production of low cost solvent: Water soluble alkali would be extracted from the ash content of biomass (water hyacinth, tea wastes etc.). • Treatment of sulfur based effluent: Sulfur containing waste solvent from the ultrasonification reactor would be treated with suitable adsorbents (activated carbon, graphene oxide, etc.) to recover the sulfur for pollution free environment.	15.10.2022	14.10.2024	197.35 IIT, Guwahati: 167.69 AIHSHEW: Rs. 29.66 lakh KU: Nil TU: Nil NEC, Margherita: Nil

LIST OF ONGOING S&T PROJECTS
(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
7.	**Prevention of premature failures and enhancing life of bottom rollers used in bucket wheel excavators.** [Project code: MT-175] **Implementing Agency**: Centre for Applied Research & Development, NLCIL, Neyveli, NIT, Trichy and IISc, Bengaluru **Objectives**: **NLCIL** • To provide base line data for failures and specifications. • To study the environmental characteristics like analysis of soil and water at NLC Mines • To develop appropriate abrasion-corrosion models to test the components with existing material and to propose newly developed material. • Field trial, evaluation and cost benefit. **NIT, Trichy** • To carry out fundamental and systematic study to find out the root cause of the failure modes in components such as track plates, track link, track pin, bottom rollers and top rollers with a primary focus on bottom roller. • To assess the mechanism of wear and corrosion of the components through appropriate laboratory tests	15.10.2022	14.10.2024	188.27 NLCIL: 19.77 NIT, Trichy: 146.77 IISC, Bengaluru: 21.73 (MoC Contr. – 112.97 & NLCIL Contr. – 75.30)

LIST OF ONGOING S&T PROJECTS
(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
	• To prepare suitable alternate substrate material with variation in alloying elements and overlay coatings. • To develop suitable heat treatment processes for track rollers. • To develop suitable hard and wear resistant surfaces for the components (Rollers) by latest heat treatments other than conventional methods. • To conduct field evaluation tests with the components developed/processed. • **IISc, Bengaluru** • Studying the effect of static and dynamic loads on bottom track rollers. • Development of Finite Element models to simulate the stress distribution and maximum value stress on the bottom roller and pin. • Investigating the deformation and wear behaviour of the bottom roller component material at macro and micro scale. • Development of Finite Element models to simulate sliding wear (2 body: between track and roller) and abrasive wear (3 body: between track, roller and silica/clay/mud) of bottom roller.			

LIST OF ONGOING S&T PROJECTS
(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
8.	**Study on Optimal Strategy for Phasing Down Coal Uses in India** [Project code: MT-176] **Implementing Agency**: School of International Studies (SIS), Jawaharlal Nehru University (JNU), New Delhi **Objectives**: • To refine and update the existing integrated assessment model for India for quantitative research and analysis for an in-depth analysis of coal-consuming sectors. • To perform scenario analysis using the model incorporating different storylines and scenarios encompassing alternative energy source-technology combinations to assess implications of coal-phase down under various scenarios. • To provide strategic insights on how India can seamlessly and successfully transition away from coal to other clean energy sources while also ensuring compatibility with India's net zero commitments. • To assess the relative risks and benefits of a transitioning away from coal to arrive at a practical and feasible policy option for phasing down coal while ensuring that interest all impacted stakeholders in the coal sector are not adversely affected. • To provide inputs for practical and feasible coal phase down implementation plan based on prioritization.	15.10.2022	14.10.2024	79.17 JNU, New Delhi: 79.17

LIST OF ONGOING S&T PROJECTS
(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
9.	**Electrostatic deposition and functionalization of multiwalled carbon nanotubes (MWCNTs) for sensitive & selective detection of Coal Mine Methane (CMM)** [Project code: MT-177] **Implementing Agency**: Amity Institute for Advanced Research & Studies (Materials & Devices), Noida & BCCL, Dhanbad **Objectives**: • Synthesis of variety of nanocomposites based on MWCNTs sensitive to methane. Optimization of the composition within nanocomposite for high sensitivity and faster response and recovery. • Fabrication of the prepared nanocomposite as a sensing device on a suitable substrate. Variation in the electrical resistance of the nano- composite film on its exposure to methane will be 10nalysed. • Qualitative as well as quantitative detection of methane. Optimization & calibration of the sensor prototypes developed. Interfacing the prototyped sensor with microprocessor based electronic circuitry to develop it into an efficient and user-friendly sensing module.	15.10.2022	14.10.2024	41.39 Amity, Noida: 41.39 BCCL: Nil

LIST OF ONGOING S&T PROJECTS
(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
10.	**Utilization of Coal Gangue to Develop Porous Adsorbents for CO_2 Capture** [Project code: CU-60] **Implementing Agencies:** Indian Institute of Technology, Kanpur & BCCL, Dhanbad **Objectives**: This study proposes to utilize coal gangue to develop low-cost, porous, solid-adsorbents for CO_2 capture. Thus, this study aims to address the following two challenges: (a) develop adsorbents for CO_2 capture, (b) identify better ways for utilization of coal gangue. The specific objectives of this study are listed below: • Development of low-cost porous solid adsorbents utilizing CG and suitable chemical modifiers for high and low temperature CO_2 capture. • Studying CO_2 capture efficiency of the developed porous adsorbents in cyclic CO_2 capture process. • Cost-benefit analysis of utilizing coal gangue for capturing CO_2 as compared to the existing technique (such as using amine solvents).	29.12.2022	28.12.2024	84.73 IIT, Kanpur - 84.73 BCCL, Dhanbad - Nil

LIST OF ONGOING S&T PROJECTS
(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
11.	**Use of Micro-seismicity as a tool for underground mines hazard monitoring with the motive to enhance safety and production** [Project code: MT-178] **Implementing Agencies:** Indian Institute of Technology, Kharagpur, CMPDI, Ranchi & ECL, Sanctoria **Objectives**: • To monitor the changes in the destressed zone of roof strata in terms of microseismic parameters during coal excavation for ECL Jhanjra Logwall and KumarDih-B. • Understand the mechanisms of cyclic weighting/loading around the longwall tail/ Bord & Pillar through microseismicity and fractal study. • Identification of stressed zones through estimation of correlation integral and fractal dimension. • Monitor the variation of seismic parameters such as b-value, magnitude, apparent volume, energy during coal excavation and dynamic roof displacement from the longwall face. • Identification of precursory signatures of roof fall and mining related activities and making a user friendly display application for automated prediction. • Audio visual alarm before unpredictable/unwanted roof fall 24hrs@365days. • Development of GUI that can be installed on both MacOS/Windows for commercializing of work.	29.12.2022	28.12.2024	199.78 IIT, Kharagpur - 145.50 CMPDI, Ranchi –54.28 ECL, Sanctoria - Nil

LIST OF ONGOING S&T PROJECTS
(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
12.	**Biomethanization of coal** [Project Code- CE-36] **Implementing Agencies:** Institute of Science, BHU, Varanasi **Objectives**: • Biomethanization of various type/grade/rank of coal samples in laboratory condition at bench scale. • To know the most suitable microbes responsible for biomethanization of coal. • Characterization of coal before and after biomethanization and to understand the role of coal composition in biomethanization process.	03.01.2023	02.01.2025	69.94 Institute of Science, BHU - 69.94

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(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
13.	**Reservoir characterization and numerical modelling of coal reservoir for enhanced coalbed methane recovery and prospects for carbon sequestration** [Project Code- CE-35] **Implementing Agencies:** Indian Institute of Technology, Bombay and CMPDI, Ranchi **Objectives**: • A comprehensive petro-physical and geo-mechanical characterization of coal. • Determination of adsorption characteristics of targeted coal seams, including the samples from old workings – using both low pressure and high-pressure adsorption methods. • Multi-phase CO_2 flow and deformation attributes of coal at simulated sub-surface conditions. • Development of complete numerical modelling platform using COMET3 and CMG for reservoir scale simulation of the performance of the ECBMR project. • Indigenous capacity building for continued R&D and exploitation of CBM from other prospective basins.	03.01.2023	02.01.2025	193.77 IIT-Bombay - 170.17 CMPDI, Ranchi –23.60

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(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
14.	**Assessing the Abiotic and Biotic Factors in Pit Lakes for Sustainable Management of Water and Environment** [Project Code- EE-52] **Implementing Agencies:** – BIT, Mesra, CMPDI, Ranchi, CCL, Ranchi, and MCL, Sambalpur. **Objectives**: • Assess the spatial (including depth-wise) and temporal variations of water quality (physico-chemical and biological characteristics) in pit lakes including the effect of surface drainage • Assess the biodiversity of the selected pit lake with reference to the Ramsar convention • Assess the ecosystem services offered by the pit lakes and the value of pit lakes to the local communities with reference to the SDGs • Provide detailed inputs on sustainable usage options and model post-closure practices of pit lakes	01.09.2023	31.08.2025	208.54 BIT, Mesra – 185.41 CMPDI, Ranchi –23.16 CCL, Ranchi – Nil MCL, Sambalpur - Nil

LIST OF ONGOING S&T PROJECTS
(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
15.	**Recycling Coal Mine Overburden To Reuse As A Value Added Building Material To Promote A Circular Economy** [Project Code- EE-53] **Implementing Agencies:** – Jawaharlal Nehru Aluminum Research Development and Design Centre (JNARDDC), Nagpur, BIT, Mesra, Visvesvaraya National Institute of Technology Nagpur (VNIT), Nagpur, and CMPDI, Ranchi **Objectives**: • To develop mix designs from Coal Mine Overburden (CMO) in homogenized slurry form for making building elements by heat treatment and geopolymer processes. • To develop coal mine overburden as a value-added building material in manufacturing different structural (JNARDDC & VNIT) and non-structural (BIT, Mesra & CMPDIL) elements in the construction industry. • Design development of modular construction elements complying with physicomechanical, structural, non-structural, and functional requirements as per the standards. • To analyse the strength of the developed material both structural and non-structural as per the standards and codes. • To demonstrate the developed technology/know-how and to evaluate the performance concerning the base case for speed, cost & energy efficiency of the system for urban & rural housing, EWS mass housing, and rehabilitated housing needs	01.09.2023	31.08.2025	285.92 JNARDDC– 67.38 VNIT, Nagpur –37.64 CMPDI, Ranchi –56.46

LIST OF ONGOING S&T PROJECTS
(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
16.	**Indigenous Development of NIR spectroscope for instant prediction of Coal Quality Parameters** [Project Code- CP-52] **Implementing Agencies:** – Shri Ramdeobaba College of Engineering & Management (RCOEM), Nagpur, CIMFR, Nagpur and SCCL, Kothagudem **Objectives**: • To Develop a NIR Imaging Camera for particular use in instant Coal Quality Prediction	01.09.2023	31.08.2024	110.75 RCOEM, Nagpur – 90.77 CIMFR, Nagpur –19.98 SCCL, Kothagudem - Nil

LIST OF ONGOING S&T PROJECTS
(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
17.	**Setting up a 5G Use Case Test lab in CMPDI for Coal Industry** [Project Code- MT-179] **Implementing Agencies:** – Telecommunications Consultants India Limited (TCIL), New Delhi, CMPDI, Ranchi, and IIIT, Ranchi **Objectives**: • Setting-up of a 5G Use Case Test lab in CMPDI for Coal Industry. (including Supply, Installation & Testing of requisite hardware, software and related equipment's for the Lab) • Testing of the proposed Use Case(s) & applications over 5G Network on lab scale. • Training officials at CMPDI regarding the operation of 5G Use Case Test lab.	01.09.2023	31.08.2024	454.15 TCIL, New Delhi– 350.0 CMPDI, Ranchi –75.00 IIIT, Ranchi – 29.15

LIST OF ONGOING S&T PROJECTS
(As on 01.09.2023)

Sl. No.	Name of the project, Implementing Agency(s) & Objective(s)	Date of Start	Date of Completion	Approved Outlay (Rs.in lakh)
1	*2*	*3*	*4*	*5*
18.	**Development of Synthetic Lightweight Aggregates as Backfilling Material using Hydraulic Stowing Method** [Project Code- MT-180] **Implementing Agencies:** – IIT-ISM, Dhanbad **Objectives**: • To study the physical, mechanical properties, settlement properties, auto- oxidation characteristics, thermal stability, flammability properties, toxicity characteristic leaching procedure (TCLP) of developed SLAs, and comparing with sand, fly ash to select the proportion suitable for backfilling. • To evaluate the Water drainage, water absorption, stowing percentage, coefficient of consolidation of selected SLA proportion using laboratory mine goaf model and assessing critical velocity required for pumping using pre-existing analytical method. • To evaluate the performance of SLAs as backfilling material using a physical mine model and validating using numerical modelling (FLAC-3D).	01.09.2023	31.08.2025	36.47 IIT-ISM, Dhanbad – 36.47