

### Completed Project During April 2024-March 2025

| Project Title   | Start Date | End Date   | Contract Value (Rs. in Lakhs) |
|---|------------|------------|-------------------------------|
| <b>COLLABORATIVE PROJECTS</b>   |            |            |                               |
| Effective Utilization of Middlings and Fines of Coking Coal Washery for Recovery of Carbon Values.  | 10-12-2021 | 31-08-2024 | 126.52000                     |
| <b>GRANT-in-AID PROJECTS</b>  |            |            |                               |
| High Temperature Oxidation and Hot Corrosion behavior of selected materials for Clean Coal Technologies for Power Plant Applications  | 01-11-2018 | 25-09-2024 | 138.49200                     |
| Creep-fatigue interaction behavior of ODS-austenitic steels and ODS-iron and nickel aluminides  | 01-11-2018 | 25-09-2024 | 295.59400                     |
| Development of Advanced NDE based Diagnosis and Prognosis Protocols for A-USC Power Plants  | 01-11-2018 | 25-09-2024 | 209.75000                     |
| Hot stage engineering of copper smelter slag for recovery of iron and subsequent use of resulting slag in blended cement  | 15-10-2020 | 31-03-2025 | 83.90639                      |
| Women Technology Park (WTP) for capacity building and entrepreneurship development  | 17-07-2021 | 27-12-2024 | 52.60654                      |
| Development of Novel Hydrometallurgical Technological process for extraction and separation of Scandium from Tin Slag   | 01-06-2022 | 31-05-2024 | 40.00000                      |
| Investigation on weldability of 8 and 20 mm thick high nitrogen steel with strength of about 800-1200 MPa   | 01-07-2022 | 31-03-2025 | 85.98100                      |
| Eco-Friendly Solution with Metal Recovery and Value Added Products from Stainless Steel Spent Pickle Liquor: A Zero Waste Business Model.   | 01-05-2023 | 31-03-2025 | 67.72400                      |
| <b>CSIR PROJECTS</b>  |            |            |                               |
| Replacement of Toxic Cadmium Coatings by Electrodeposited Al/Zn-Mn Coatings on High Strength Steels   | 16-02-2022 | 15-02-2025 | 76.94000                      |
| High Entropy Alloys for hydrogen storage application operable at Room Temperature (HEART)   | 01-04-2022 | 31-03-2025 | 75.00000                      |
| Development of large scale synthesis process for transition metal nano-composite based efficient and stable bifunctional electrocatalyst for anionic membrane alkaline water electrolyzer | 01-04-2022 | 31-03-2025 | 53.63000                      |
| Recovery of Lithium from Potential Indian Primary Resources for Battery Applications  | 01-10-2023 | 31-03-2025 | 176.16500                     |
| Electrodeposition of corrosion resistant Cr-carbide coatings on SS 316L for Sink Roll applications in Continuous Galvanizing Lines  | 08-09-2022 | 07-09-2024 | 40.00000                      |

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| Self-healing coating for corrosion protection of structural steel  | 01-08-2022 | 31-07-2024 | 76.00000  |
| Technology development for Holistic utilization of Red Mud for extraction of Metallic values & residue utilization   | 03-10-2022 | 01-10-2024 | 176.26005 |
| Holistic utilization of zinc dross for recovery of high value zinc products  | 08-09-2022 | 07-09-2024 | 145.00000 |
| Scale up study for the recovery of potash fertilizer and iron oxide from Indian glauconitic rocks  | 08-09-2022 | 07-09-2024 | 54.00000  |
| Indigenous Development of Benzoic Acid Reference Material for Calorimetry Analysis   | 08-09-2022 | 07-09-2024 | 54.40000  |
| CSIR Integrated Skill Training Initiative of CSIR-NML  | 01-04-2020 | 31-03-2025 | 395.75000 |
| <b>IN-HOUSE PROJECTS</b>   |            |            |           |
| A study on hydrodynamics characteristics in separation of minerals in a monolithic flotation column  | 01-11-2021 | 30-09-2024 | 2.70000   |
| Flow Accelerated Pipeline Corrosion (Module-I): Probing the FAC mechanisms of API 5L grade steels through gravimetric and different electrochemical techniques<br>Flow Accelerated Pipeline Corrosion (Module-II): Microstructure & FAC behavior correlation in API 5L grade steels; Effect of different Fe-C phases & phase fractions<br>Flow Accelerated Pipeline Corrosion (Module-III): Microstructure, Inhibitor performance & FAC behavior correlation in API 5L grade steels; Effect of Microstructural Constituents on Inhibitor's Effectiveness | 01-11-2021 | 30-09-2024 | 5.55000   |
| Near net shape 3D manufacturing of Inconel 718 by optimizing controlled parameters of wire arc additive manufacturing with Cold metal transfer process.(Module I)(Module II)(Module III)   | 14-04-2022 | 31-03-2025 | 5.70000   |
| Microstructural evolution of Superalloy Inconel 740H during Thermomechanical Processing(Module I)(Module II)(Module III)   | 14-04-2022 | 31-03-2025 | 1.71000   |
| (Module - I) Thermodynamics and Kinetic Investigation on the Gas-Solid reduction of premixed lean grade Mn/Fe Ores (Module - II)Thermodynamic and Kinetic investigation on the Gas-Solid reduction of premixed lean grade Mn/Fe ores   | 01-12-2022 | 30-09-2024 | 6.65000   |
| Microstructure and Mechanical Property evolution of WAAM-ed Inconel 625 (Module-I + Module-II)   | 01-12-2022 | 30-09-2024 | 1.70000   |
| Analytical strategies for elimination of Memory effect in ICP-MS for the quantification of mercury (Hg) in Coal and fly ash samples  | 01-05-2023 | 30-04-2024 | 10.66000  |

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| Understanding the occurrence of Rare Earth Elements and Yttrium within coal beds, partings, and overburden (Module-1)(Module-2)             | 15-05-2023 | 31-03-2025 | 3.97500   |
| To Explore Ferrochrome Slag as a Protective Coating Material to Prevent Corrosion of Caster Rolls   | 01-01-2024 | 30-09-2024 | 9.10000   |
| Deposition and Characterization of Antimony Chalcogenide-based Light Absorbers Coatings for Photovoltaic Applications                       | 01-11-2023 | 30-09-2024 | 20.50000  |
| Development of Eddy Current sensor for crack detection in bilayer riveted engineering structures  | 01-11-2023 | 30-09-2024 | 9.40000   |
| Development of indigenous Coal CRMS for different grade of Ash, VM & GCV in Indian coal   | 01-11-2023 | 30-09-2024 | 3.27000   |
| Design of efficient corrosion inhibitor for mild steel surfaces using density functional theory and reactive molecular dynamics simulations | 15-11-2023 | 30-09-2024 | 2.30000   |
| Zirconium rich alloys for Dental implant  | 01-05-2024 | 31-07-2024 | 36.99000  |
| Column flotation for Indian copper sulphides.   | 01-05-2024 | 31-03-2025 | 6.70000   |
| Design and Development of a novel innovative reactor for the production of Magnetite powder from iron oxide fines                           | 01-05-2024 | 31-03-2025 | 17.17500  |
| Thermal Performance Analysis of Additively Manufactured Liquid Cold Plate for EV Battery  | 01-05-2024 | 31-03-2025 | 5.54000   |
| Development of a Data Server , Report Management System & One window access to varied Project Information including APP                     | 01-05-2024 | 31-03-2025 | 4.90000   |
| <b>SPONSORED PROJECTS</b>   |            |            |           |
| Electronic packages for ultrasonic flow meter for on-board propellant gauging of spacecraft   | 01-09-2018 | 31-12-2024 | 49.72520  |
| Investigations of Fracture and Fatigue Crack Growth Rate Behaviour of Aero Engine Fan Disk of Ti-6Al-4V Alloy                               | 04-02-2019 | 31-12-2024 | 95.96383  |
| Coal Characterization of Eastern Coalfields   | 11-04-2022 | 31-03-2025 | 170.15600 |
| Evaluation of grade of SECL mines   | 15-12-2021 | 31-03-2025 | 97.00001  |
| Fatigue Behaviour Of Primary Piping/vessel Materials If Indian Npps Under Multi Axial Conditions (Ssp 1267)                                 | 11-02-2021 | 31-12-2024 | 44.48600  |
| Characterization of Coal samples supplied by M/s Adani Power Ltd.   | 10-02-2022 | 08-05-2024 | 18.45722  |
| Refining of hot metal in MgO lined induction furnace  | 06-01-2022 | 19-10-2024 | 21.24000  |
| Microstructure and mechanical health assessment of center buffer coupler parts  | 20-01-2022 | 31-03-2025 | 70.21000  |

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| Chemical Characterisation for the grade declaration of Eastern Coalfields Limited                                  | 11-04-2022 | 25-03-2025 | 117.99999 |
| Grade Declaration of Referee Samples of MCL on the Basis of GCV  | 15-07-2022 | 31-12-2024 | 100.00534 |
| Thermo-Mechanical Processing and Heat treatment  | 01-05-2022 | 30-04-2024 | 56.87954  |
| Pilot scale trial from oily bubble flotation of coal   | 10-10-2022 | 30-04-2024 | 23.60000  |
| Chemical Analysis and Characterization of Band by Band Coal of Ib Valley Coalfield                                 | 15-07-2022 | 31-03-2025 | 119.99997 |
| Analysis and evaluation of GSI NGCM -J soil and sediments samples  | 01-11-2022 | 31-03-2025 | 7.77174   |
| Distribution of Hg in soil and sediment samples  | 20-01-2023 | 31-12-2024 | 26.55000  |
| Influence of the weld microstructure on hydrogen permeability and trapping behaviour in the API line pipe steel    | 14-11-2022 | 14-05-2024 | 11.80000  |
| Evaluation of Performance of Newly Developed Flotation Reagents  | 05-10-2023 | 04-10-2024 | 11.80000  |
| Metallurgical Failure analysis of SS sheet used in 2.8 MW Permanent Magnet Synchronous Wind Mill Turbine Generator | 11-03-2024 | 10-03-2025 | 5.90000   |
| Exploratory Studies On Beneficiation Of Low Grade Quartzite  | 29-05-2024 | 29-09-2024 | 11.80000  |
| Feasibility Studies On The Flotation Of Celestite Ore  | 14-06-2024 | 14-03-2025 | 7.08000   |
| Microstructural characterization of fire exposed steel columns   | 18-06-2024 | 06-08-2024 | 5.90000   |
| Beneficiation study of quartzitic sand to produce a sand glass grade   | 10-02-2023 | 31-08-2024 | 17.70000  |
| Metallurgical Failure Investigation of Line Pipe Steel API 5LX70M PSL2   | 09-05-2023 | 08-05-2024 | 11.21000  |
| Metallurgical Investigation to explore the root cause of U1 Boiler SH Tube Failure                                 | 19-05-2023 | 18-05-2024 | 5.90000   |
| Development of corrosion resistant spray coatings for TMT rebars   | 01-07-2023 | 30-06-2024 | 11.80000  |
| Processing and Property Optimization of Iron based Soft Magnetic Nanocrystalline Alloys                            | 02-06-2023 | 01-06-2024 | 10.00640  |
| Root Cause Analysis of failure of the reheater tube and economizer tube.   | 20-06-2023 | 19-06-2024 | 9.44000   |
| Salvaging Lithium mixed metal oxide and converting into value added product from spent Li-ion Battery              | 01-08-2023 | 31-12-2024 | 21.24000  |
| Smelting Studies for Nickel Laterite Briquettes in Electric Arc Furnace.   | 03-07-2023 | 02-07-2024 | 17.70000  |

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| Pre-reduction and smelting studies of biochar for ferroalloy production  | 03-07-2023 | 31-03-2025 | 13.27500 |
| Transfer of technological Know-How to recycle spent lithium ion batteries (LIBS) to produce value added products of Li, Co, Mn, Cu, Ni as metals/salts, saleable plastics and graphite | 01-08-2023 | 30-11-2024 | 25.00000 |
| Transfer of technological Know-How for the extraction of Cu, Al and Au as metals/salts from waste PCBs   | 01-08-2023 | 30-11-2024 | 25.00000 |
| Up-scaling of process for production of Electrolytic Mn Metal from MOIL MnSO <sub>4</sub> solution   | 01-09-2023 | 31-08-2024 | 48.04960 |
| Evaluation of debonding area in Con rods using Ultrasonic Imaging  | 30-08-2023 | 31-12-2024 | 6.19500  |
| Work package to upscale, characterize and realize the properties in Complex concentrated alloys (CCA).   | 12-07-2023 | 31-12-2024 | 40.56861 |
| Feasibility Studies on the Preparation of Zirconium Iron Alloy   | 09-09-2023 | 03-09-2024 | 8.85000  |
| Creep behavior of different grades of stainless steels and nickel-based super alloys   | 08-09-2023 | 31-03-2025 | 14.27800 |
| Metallurgical Failure Investigation of the Blasted Oxygen Cylinder   | 31-07-2023 | 30-07-2024 | 7.67000  |
| Technology transfer of a sensing device Zincometer for Zinc coating weight measurement in GI line  | 06-10-2023 | 31-10-2024 | 9.44000  |
| Corrosion Damage Analysis of steel pipelines and material selection for Ammonia Distillation Unit  | 12-01-2024 | 11-01-2025 | 8.68480  |
| Transfer of Know-how/Technology for the development of Ti <sub>3</sub> AlC <sub>2</sub> MAX phase  | 01-02-2024 | 31-01-2025 | 5.90000  |
| Simulation analysis for the grinding circuit for Ambaji Project  | 09-02-2024 | 09-10-2024 | 11.80000 |
| Metallurgical investigation of fractured rails involved in derailment of NE Express  | 22-02-2024 | 21-02-2025 | 23.60000 |
| AC Core-loss Studies on Additively Manufactured FeSi Toroidal Cores  | 05-03-2024 | 31-03-2025 | 10.32500 |
| Metallurgical Failure Analysis of KSA Clamp of MIG-29 Aircraft   | 01-05-2024 | 30-10-2024 | 3.25000  |
| Corrosion assessment of anti-corrosion coating for TBSPL   | 20-03-2024 | 19-09-2024 | 8.52550  |
| Pilot scale flotation of coal using a synthesized collector reagent  | 01-01-2024 | 31-03-2025 | 31.86000 |