

Ongoing Projects FY 2021-22

S.No.	Project Title
Collaborative projects	
1	Development of process for real time temperature mapping of 4 faces of the billet mould using densely multiplexed Fiber Bragg Grating (FBG) sensor
2	Investigation on hydrogen trapping characteristics of precipitate/matrix interface in microalloyed steel
3	Effect of microstructure evolution in weld heat affected zone on fracture toughness and fatigue of API steel (X70 / X80) weld joints
4	Replacement of bentonite with alternative binder for iron ore pelletization (Phase 1)
5	Optimization and performance evaluation coking Coal washery through modelling and simulation analysis.
6	Optimisation of FBG sensors requirement for locating the critical zone of Blow pipe
7	Temperature mapping of Down-comers of Pellet plant to identify the critical hot zone to avoid catastrophic failure
8	Sensor and device for on-line Zn weight measurement of GI wires
9	TECHNOLOGY DEVELOPMENT FOR HOLISTIC UTILIZATION OF RED MUD FOR EXTRACTION OF METALLIC VALUES & RESIDUE UTILISATION
10	Effective Utilization of Middlings and Fines of Coking Coal Washery for Recovery of Carbon Values.
11	Study on Performance Improvement of Coking coal Washery under through Modelling and Simulation Analysis.
Consultancy projects	
12	Consultancy on design,erection and commissioning of flotation column at Coal Preparation Plant
13	Development of Indigenous Technology for Production of sodium Metal at Commercial Scale
14	Consultancy on Preparation of Basic Engineering Package for 10,000 TPA EMD Plant
15	Consultancy on improvement in recovery and purity of zinc metal produced from induction furnace dust

Grant in aid projects

16	Development & Fabrication of Cannon Liners for Explosive Testing
17	Amorphous Electrical Steel (AES) for Energy Application
18	Development of cost-effective green technology for pre-reduction of chromite ore in tunnel Kiln & production of high carbon Ferro chrome in SAF
19	upscalling(to 10 tons per day) of red mud containing geopolymers paving blocks process
20	To develop an effective extraction and separation technology to selectively extract rare earth elements - Erbium (Er), Terbium (Tb), Europium (Eu), Praseodymium (Pr) Neodymium (Nd) and Dysprosium (Dy) from WEEE (Waste Electrical and Electronic Equipments)
21	Determination of Anisotropic Elastic Constants and Anisotropic Yield Parameters for Zr 2.5% Nb Pressure Tubes.
22	Development of Magnetostrictive Sensing Device for Structural Integrity Evaluation of Pipes
23	High Temperature Oxidation and Hot Corrosion behavior of selected materials for Clean Coal Technologies for Power Plant Applications
24	Creep-fatigue interaction behavior of ODS-austenitic steels and ODS-iron and nickel aluminides
25	Development of Advanced NDE based Diagnosis and Prognosis Protocols for boilers
26	Development of graphene based membranes from graphite ore for desalination
27	Preparation of Detailed Project Report(DPR) for technological intervention through Technology Facility Centre(TFC) at five numbers of Bell and Brass metal clusters
28	Development of a process for refining of commercial magnesium Metal through Vacuum distillation
29	Development of a Cost-Effective Refractory Lining Materials for Induction Melting Furnace Suitable for Production of Quality Steel: Phase II (Industrial Trials).
30	Structural engineering into 3D macroscopic architecture with hierarchical porosity for real application of energy storage devices
31	Development of Innovative Hydrometallurgical process for extraction of rare earth elements from metallurgical and chemical process wastes (Innova-Rare)
32	Management and operation of CSIR-NML Intellectual Property Facilitation Centre (IPFC) for MSME
33	Hot stage engineering of copper smelter slag for recovery of iron and subsequent use of resulting slag in blended cement

34	Effect of processing parameters on cryo impact properties of cast alloys
35	Investigation of creep crack growth rate and damage micro-mechanism of new generation high temperature material (IN617).
36	Women Technology Park (WTP) for capacity building and entrepreneurship development
37	Development of simple, cost-effective and scalable spray drying based synthetic strategy for inorganic nanostructured materials
38	Civil Estimation /BOQ of four number of DPR for brass and bell metal clusters.
39	Technology development at pilot scale for energy-efficient production of medium carbon ferromanganese in electric arc furnace.
40	Processing of Tin Slag and technological extraction of critical elements for High strength Low Alloy Steels
42	RECYCLING OF GRAPHITE FROM SPENT LITHIUM-ION BATTERIES FOR HIGH ENERGY LI-ION CAPACITORS
Major lab projects	
43	Development of advanced giant magneto-impedance (GMI) based sensor for structural health monitoring of engineering structure with enhanced area coverage.
44	Production of Fe-Ni/Co-Mo metallic alloy & alumina rich slag from Ni-Mo/Co-Mo
45	Development and commercialization of Eco-friendly reagents for limestone and sillimanite flotation
46	Development of CS Analytical and Charpy Impact Toughness Physical Standard (CRM) in Steel
47	Development of close loop process for the recycling of metals/materials from e-waste
48	Development of fire resistant lightweight structural materials by hybridization of inorganic-organic polymers
49	Process development of high quality layered transition metal carbides/nitrides/carbonitrides (MAX)
50	Development of Tin-Selenide (SnSe) based thermoelectric thin films for waste heat recovery in metallurgical and other industries
51	Development of dry beneficiation process technology for low grade iron ore for iron and steel making
52	Big Data Assimilation and Synthesis for material creep degradation.
53	Thermodynamic and kinetic assessment of interfacial equilibrium conditions in multi-component based bulk nano-pearlitic steels.

54	Development of high ballistic strength armour steel with 2 GPa tensile strength and min 50MPam ^{1/2} fracture toughness.
55	Preparation of Coke from non-coking coal
56	Unveiling the abnormal grain growth mechanism in Grain Oriented Silicon steels.
57	Mitigation of Wettability issues during galvanization of advanced high strength (> 1000 MPa) steels in steel industries.
58	Precipitation hardened compositionally complex alloys (CCAs) aided with hetero-deformation induced (HDI) strengthening.
Networking projects	
59	CSIR Integrated Skill Training Initiative of CSIR-NML
Inhouse R&D projects	
60	Development of Low Carbon Bainitic Steels (Module-I)(Module II)(Module III)
61	Microstructural evolution and deformation behaviour of high entropy alloys at ambient and sub-ambient temperatures (Module 1)
62	High Temperature Crack Growth of Cr-Mo Steels
63	Development of carbon based filler immobilized mixed matrix membrane for separation of Heavy Toxic Metals (Focus on Nuclear metals) from dilute effluent/leach solution-(Module-1)
64	Development of inorganic-organic hybrid geopolymers (Module-I)(Module II)
65	Rational Design of Solvent System: A Novel Approach for Recycling Metals from leach solution of Cathode Materials of Lithium-ion Batteries by Solvent extraction.(Module I: Studies on physico-chemical behavior of amines (pri,sec,tert and quert amines)and organophoric compounds (Phosphoric,phosponic and phosphinic acids) for the solvent extraction and separation of Li,Co,Ni and Mn.)
66	Development of high efficiency Tin Selenide based Thermoelectric and optically tunable coatings for alternative energy harvesting from different industrial applications (Module I)
67	Scaling up of the process for the production of iron powder from waste iron oxide fines/slimes using hydrogen gas /natural gas
68	Development of melting-casting facilities and optimization of melting & casting parameters for 3rd generation Al-Li alloys.
69	Characterization of microbubbles and its subsequent application in fine particle separation

70	characterization, Benefication and coke formation studies on low volatile coking coal for metallurgical utility (Module I)
71	Determining the process route parameters of the formation of stable Face Centered Cubic Titanium
72	Precipitation hardened compositionally complex Ni-based alloys aided with HDI strengthening
73	Effect of Electrode Composition on the Mechanical and Corrosion Behaviour of Welded Duplex Stainless Steel in Corrosive Environments.
74	Effect of deformation induced martensite and dislocation density on the hydrogen permeation and hydrogen embrittlement of austenitic steels
75	Discerning the individual and synergistic effect of carbide inhibitors on austenite retention and stability in medium manganese advanced high strength steels.
76	Neural network-based sensitivity analysis and performance optimization of carbon recovery from Blast furnace and Corex plant sludge using froth flotation - A step towards Waste-to-Wealth management.
77	Understanding the phenomenon and enhancement of Anti-icing properties of HVOF deposited coating.
78	The behaviour of mould flux for high AL steels during the continuous casting process. (Module I and Module II)
79	Extraction and recovery of copper from lean grade chalcopyrite
80	Study of Amorphous magnetic alloy flakes for Microwave Absorbing Materials (2-18 GHz)
81	Numerical modelling of heat transfer and fluid flow in Selective Laser Melting (SLM) of SS316L
82	Mitigation of galvanizability of steel surface through adoption of sol-gel pre-coating and improvement in corrosion resistance of galvanizing coating through post intercalated ion conversion method
83	Designing of magneto-plasmonic graphene material and its multimodal application incatalysis
84	Multi Physics and Heat treatment Simulation of Additive Manufacturing Process for property prediction of SS316L
85	Investigations on the NMLS retort technology for magnesium metal production
86	Synthesis and Development of Al-Si-Cu-N Nanocomposite Coatings for Antibacterial Applications
87	Decarburization of high carbon ferroalloys by CO ₂ treatment
88	Production of iron powder/iron nugget from industrial waste by the process of segregation roasting

89	Feasibility study on producing DRI from lumps by using Hydrogen
90	Processing of Glassy Metal Powders through Gas Atomization for Additive Manufacturing Applications
91	Enhancement of molten salt corrosion resistance of thermal energy storage materials in a concentrated solar power plant through dropping inhibitors
92	Development of a hybrid centrifugal separator for application in mineral processing.
93	Investigate NML developed furnace compatibility with IIP bio-pellets
94	Development of electromagnetic sensor for real time health monitoring of structural components exposed to High-temperature (600c) (module I)
95	A study on hydrodynamics characteristics in separation of minerals in a monolithic flotation column (Module-I)
96	Flow Accelerated Pipeline Corrosion (Module-I): Probing the FAC mechanisms of API 5L grade steels through gravimetric and different electrochemical techniques
97	Evaluation of mechanical property across fusion boundaries of dissimilar metal welds materials using ball indentation technique and co-relate with microstructural characteristics (Module 1)
98	Extraction and Separation of Rare Earth Elements through Porous Silica-Grafted Ligands
99	Oxidation and hot corrosion behaviour studies of Amed Inconel 625 & Inconel 718 alloys
100	UPSACALING OF AN ENERGY EFFICIENT PROCESS FOR THE RECOVERY OF METAL VALUE FROM SPENT NdFeB MAGNETS
101	Development of a MoU management System
102	E-ProjectView-One Window for Profiling all Project related Information (Phase I)
Sponsored projects	
103	Metallurgical and Fractographic Examination of the SS304LN and Its Weld Tested Under Cyclic and Monotonic Loading in Air/Water Environment
104	n-line Oxide Scale Removal of Wires using Ultrasonic Assisted Electrochemical Technique (UAET)
105	Metallurgical failure Investigation of boiler tubes
106	FEASIBILITY STUDIES ON BENEFICIATION OF LOW GRADE GOAN IRON ORE

107	Feasibility studies on flotation of High-Magnesia limestone
108	Feasibility studies on flotation of high-Silica limestone
109	Patent Search and analytics services
110	AUSC-5 Evaluation of fracture and fatigue crack growth (FCG) in 10Cr- Alloy 617 BMW weld joint.
111	AUSC-6 Evaluation of fracture and fatigue crack growth (FCG) behaviour of SS304 Hcu base material
112	Effect of creep fatigue interation on Disc Forging
113	Seam overall characteristics of coal sample
114	AUSC 7:Advanced Non-destructive Evaluation techniques for Creep Damage Evaluation of AUSC power power plant materials.
115	Twinning on Capacity Building to Transform Metal Industry Development Institute
116	Sample collection and analysis for determination of quality/grade of slurry/rejects and washed coal powder stocks.
117	Electronic packages for ultrasonic flow meter for on-board propellant gauging of spacecraft
118	Microstructural and mechanical property evaluation of new and used CBC components
119	Coal Characterization of different mines
120	Characterization of Coal mines
121	Seam overall characteristics of coal sample
122	Development of high strength Zn-based biodegradable alloys for orthopedic applications
123	Extraction of rare earth elements from granulated blast furnace slag and evaluation of treated material for possible applications
124	Investigations of Fracture and Fatigue Crack Growth Rate Behaviour of Aero Engine Fan Disk of Ti-6Al-4V Alloy
125	Characterization of Ores, Minerals, Fluxes, granulated BF slag, LD slag, Fe alloy Slag and Fly ash" in terms of chemical composites on, phase analysis, optical & thermal properties
126	Study on Gross Caloric Value in different coal mines

127	Distribution of rare earth elements and trace elements in soil and sediment in India 1.Pulverization of soil and sediment samples 2.Chemical analysis of soil and sediment samples for rare earth elements, trace elements by HG_AAS, ICP-MS and XRF
128	Coal Characteristics
129	Evaluation of Grade mines
130	Chemical Characterisation for the grade declaration of coal
131	Coal Characterisation
132	Coal Characterisation
133	Development of Rapidly Quenched Fe-based Glassy Ribbons for Evaluation of Hydrogen Permeation (SSP-1210)
134	Coal Characterization
135	Study on reducibility index of iron ore pellet
136	To explore product development from waste alumino-silicate fibre material
137	Development of thicker section (> 6 mm) abrasion resistance grade steel with relatively higher coiling temperature
138	Cold Rolling and Annealing of High strength Low Alloy Steel"
139	Assessment of Cr-Mo steel welding joints by NDE methods
140	Cold bonding test work for coke dust
141	Coal Quality Assessment
142	XRF and ICP-MS analysis of coal
143	Development of Briquetting technique for utilization of Steel plant solid waste (Phase 2)
144	De-Siliconization of High Silicon Ferro Chrome in 50 kVA EAF
145	Technology for Process Improvement in Degreasing, Brightening & Passivation Process of Cartridge Case manufacturing of 7.62mm M-80, 7.62mm A-7, 5.56mm & 12.7mm SA Ammunition and process improvement in cleaning & polishing operation of 5.56mm Bullet manufacturing

146	Mechanical and micro-structure assessment of Centre Buffer Coupler (CBC)
147	Studies on beneficiation of bauxite samples
148	Metallurgical failure investigation of penstock steel
149	Geopolymerization for Radioactive Waste Immobilization
150	Condenser tube deposit analysis and cleaning process
151	Continuous pilot scale reverse flotation of 15 tons iron ore
152	Process feasibility for utilisation of low-grade iron ore and slime in shaft based DRI technology
153	Bench-scale study on reducing ash content from washery grade coking coal and high ash non coking coal through oil agglomeration
154	Design and fabrication of FlawGuard VerII for defect characterisation and detection
155	Roasting and Hydrometallurgical Processing of Coal Slag
156	Smelting of Vanadium pentoxide for Preparation of Ferro-vanadium (FeV)
157	Grade Declaration of Referee Samples
158	Evaluation and Characterisation of band by band coal analysis
159	Preparation of Detailed Project Report (DPR) for Silver Cluster
160	Studies on cyclic corrosion behaviour of coated steel samples
161	Evaluation of grade of coal
162	FATIGUE BEHAVIOUR OF PRIMARY PIPING/VESSEL MATERIALS IF INDIAN NPPS UNDER MULTI AXIAL CONDITIONS
163	Dry beneficiation of limestone samples for removal of iron bearing and other magnetic impurities
164	Failure Analysis of Hydrogen Generation Unit-3 (HGU-3) Reformer Tube
165	Residual Life Assessment of Crude and Vacuum heater tubes

166	Material Analysis and Reclamation of Gas Collector for GTG-1250-2E
167	Charges for CREEP TESTING at 600oC, 153 MPa on St9ts (X10CrMoVNb9-1) material for 10000 hrs.
168	Transfer of Technological Know-How for the extraction of Cu, Al and Au from waste PCBs
169	Transfer of KNOW-HOW for the recovery of Co, Li and Mn from Lithium-Ion Batteries (LIBs) with fine tuning"
170	Thermo-Mechanical Processing and Cold Rolling of Medium carbon High Manganese Alloy Steels
171	Evaluation of Binders Properties for Pelletization
172	Development of graphene-based epoxy paint for marine application
173	Study on slag metal interaction in induction furnace
174	Root cause analysis of breakage of runner bucket of unit#1
175	Evaluation of used centre buffer coupler party
176	Development of non-magnetic Fe-Mn biodegradable alloys for biomedical applications
177	Study of mold flux-liquid steel interaction using lifting hearth furnace
178	Lab Scale Study on Reducing Ash Content (Mineral Matter) of coal through Oil Agglomeration
179	Failure analysis of Front Axle Beam
180	Metallurgical Failure analysis of Railway wheel Disc
181	Synthetic Slag Treatment for Desiliconisation of High Carbon Ferrochrome in EAF
182	Recovery of valuable metals from chromite ore overburden by carbothermic smelting in electric arc furnace
183	Pelletization of iron ore concentrate using an organic binder
184	Corrosion behaviour of different rail steels in varied environments
185	Analysis and Upgradation of Subgrade iron ore fines through Fluidized Bed Reduction with separation

186	Development of Rust Converter Composition for Treatment of Rusted Steel
187	Studies on processing of iron ore sample for beneficiation plant
188	Faligue crack growth evaluation steel samples
189	Feasibility study and development of a process for optimisation of reductant blend to partially replace coking coal for production of ferrochrome
190	Characterization of Coal samples
191	Generating Forming Limit Diagram (FLD) of welded and non-welded aluminum sheets using Nakajima Test
192	Transfer of Technology Knowhow for the Magnetostrictive Sensing (MsS) Device for Pipe Inspection (MagStrics).
193	Technology for clearing Ball Jam in Ball Pen Tips.
194	Development of Process for Large Scale Production of Electrolytic Mn Metal(EMM) from MnSO4 Liquors
195	Refining of hot metal in MgO lined induction furnace
196	Metallurgical investigation to explore the damage mechanism of worn out quill shaft.
197	Closed-loop Know-How to recycle spent Lithium-Ion Batteries (LIBs) to produce value added products of Li,Co,Mn,Cu,Ni, saleable plastics nad graphite.
198	Microstructure and mechanical health assessment of center buffer coupler parts
199	Processing of hydrocyclone underflow of Zawar grinding circuit towards recovery of silver through advance gravity separator
200	Technology transfer for recycling lithium ion batteries (LIBS) to recover saleable metal/salts of Li, Co, Mn, Ni, Cu, Al, graphite and plastics.
201	Generating Forming Limit Diagram (FLD) of Hot and Cold Rolled (HR & CR) Steel Sheets using Nakajima Test
202	Destructive test and Analysis for establishing Life Estimation Matrix (LEM) of boiler tubes
Other projects	
205	INVESTIGATION OF FFV SUPPLIED SPOTTED 84MM RLMK-111 BARREL

