

CSIR-NML Technologies for deployment under Corporate Social Responsibility (CSR) Funds available with Indian industries to achieve Sustainable Development Goals (SDGs)

SDG NO	Sustainable Development Goals	Technology Type/ (Key Word)	No. of deployable/ already deployed technologies	Title of the technology
3	Good Health and Well-being	Bioimplant	4	<ul style="list-style-type: none"> • Technology for biomimetic hydroxyapatite • Injectable Scaffold derived from Biomimetic Hydroxyapatite Nanoparticles for Orthopaedic, Dental and Craniofacial Reconstructions • Biphasic Calcium Phosphate Blocks • Biomimetic Polymer based Hydroxyapatite Block
6	Clean Water and Sanitation	Water Purification, Reclamation of Mine Water, Drinking Water, Water Harvesting	3	<ul style="list-style-type: none"> • A process for iron and arsenic removal from groundwater using naturally occurring minerals • Process for the reclamation of coal mine water Coal mine • Process for reduction of water consumption in Industrial Processes through dry beneficiation of coal/ iron ores
7	Affordable and Clean Energy	Energy Storage, Energy conversion, Li-ion battery, Energy efficient device	4	<ul style="list-style-type: none"> • Energy Efficient Coke-based Brass and Bell metal melting Furnace • Collagen-graphene composites for energy devices • Synthesis of new 2D materials other than graphene for energy application • Graphene super capacitor with energy density close to Li-ion battery
9	Industry, Innovation, and Infrastructure	Minerals processing, Coating, Advanced materials, High Strength Steel, Iron and Steel Making, Certified Reference Materials, Sensors, Metallurgical Devices	26	<ul style="list-style-type: none"> • Column Flotation Technology • Beneficiation of lean Ores • Materials for Grinding Media Applications • Anti-Tarnishing Lacquer for Silver and Copper-based Alloys • Dip Cleaner cum Brightener for Gold and Diamond • Anti-Corrosive Chemical for Steel Sheet, Rebar and Wire • Cyanide free process for leaching and recovery of gold

				<ul style="list-style-type: none"> • Cyanide free alkaline electrolyte and electrochemical process for rust removal from plain carbon steel components • Coatings for anti-bacterial and fuel tank applications • Nano-composite Hard Coating • Certified Reference Materials • Erosion resistant steel • Graphene coated steel • Synthetic flux and dephosphorization of Steel in Induction Furnace • DRI from mill scale and lean grade non coking coal in Tunnel Kiln • Briquetting of Ore fines • Pellet-sinter composite agglomerate of Iron Oxide fines for use in Blast Furnace • Portable Magnetic Hysteresis and Barkhausen Emissions of Steel Structure/Component • Portable Giant Magneto-Impedance (GMI) based Magnetic Sensing Device for NDE Applications • Cost effective device for defect detection in Wires during cold drawing • Portable nonlinear ultrasonic device • Device for fluid flow rate measurement through a narrow tube • A rapid, reliable, non-invasive technology for iron ore compositional analysis • Portable Automated Ball Indentation System • Annealing Simulator Device • "Closed loop corrosion test rig" Equipment for flow assisted corrosion study
12	Responsible Consumption and Production	Recycling of metals, E-waste, Waste Utilization, Metal recovery, Wealth from Waste	17	<ul style="list-style-type: none"> • Development of technology for production of Electrolytic Zinc powder from Zinc dross • Recovery of metals and spinel refractory from ferrochrome slag • Geopolymer Paving blocks from red mud • Geopolymer Cement • Recovery of metals from spent catalysts • Production of copper sulphate and silica powder from copper slag • Briquetting of bottom and pond ash for environmental friendly transport

				<ul style="list-style-type: none"> • Extraction of tungsten from scraps • Production of Paver blocks and foams from steel slag • Development of value added products from Cement slurry wastes • Recovery of gold from printed circuit boards of mobile phones, medical and telecommunication equipments as well as from the surface of connectors, small electronic devices: • Recovery of valuable metals from black cathodic powder of scrap batteries used in electronic devices: • Recovery of neodymium salt from permanent magnets of hard discs • Precious metals (Au, Ag, Pt & Pd) recovery from integrated circuits found in printed circuit boards of computers • Recovery of lead, tin, copper and epoxy resin from the various depopulated PCBs using organic swelling and advance separation techniques • Recovery of rare earth metals from the phosphor powder of fluorescent lamp • Process for recycling of spent mixed rechargeable Lithium ion batteries
17	Partnerships for the Goals	Research Collaboration, Technology Development, Skill Development	4	<ul style="list-style-type: none"> • John keels Research, Sri Lanka: Development of Collagen-Graphene composites for energy devices and commercialization thereof. • ICSM, France: Agreement for Intellectual Property management plan for Industry-Academia Research & Development Programme • MIDI, Ethiopia: Implement of Twinning Program • KIGAM, Korea: Recovery of Rare Earth Metals and e-waste processing

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