Minutes of 1st TEC (Technical Evaluation Committee) meeting held under the Chairmanship of Dr Anupam Agnihotri, Director, JNARDDC, A/b of Ministry of Mines on 17th January 2024 at JNARDDC, Nagpur. The list of participants is enclosed in Annexure-A.

1. JNARDDC, Nagpur an autonomous body of Ministry of Mines has been nominated as the implementing agency for implementing the S&T-PRISM on behalf of the Ministry of Mines. Accordingly, JNARDDC made an announcement on 15th Nov 2023 from Start-ups, MSMEs and Individual Innovators for up to 2 years duration, which have direct bearing on mineral and metal sector, applied and sustainable aspect of mining, metallurgy and industrial applications. It covers Mining, Mineral Processing, Metallurgy and Recycling Sectors under Science and Technology (S&T) Program of Ministry of Mines so as to enable them to graduate to a level where they will be able to raise investments from angel/Venture Capitalist or they will reach a position to seek loans from commercial banks/financial institutions.
2. The funding is positioned to act as a bridge between development and commercialization of innovative technologies/products/services in a relatively hassle free manner. Funding support will be in the form of a grant of up to Rs. 50 lakhs for Start-up, Rs. 1 Cr. for MSME and grant up to Rs. 2 Cr. may be considered for technology products requiring higher funding on the recommendation by TEC and approval by Apex Committee.
3. A total of 56 proposals were received by email till the last date viz 15.12.2023.
4. A two-stage review process was adopted to evaluate the proposals for recommendation to Apex Committee. The first stage comprised of preliminary screening of the proposals done by TEC on 8th January 2024 through VC. The TEC shortlisted 16 proposals for physical presentation on 17th Jan 2024 at JNARDDC, Nagpur. The members and PIs attended the meeting. The proposals were evaluated as per the terms of reference of the S&T PRISM Scheme and details are given in the succeeding paragraphs.
5. Finally, 6 proposals are being recommended to Apex committee and applicants are advised to resubmit the proposal with modifications suggested by the TEC wherever applicable.

Final recommendations of TEC

Seq No	1
Internal Ref No	34
Proposal Title	Robot assisted abrasive suspension waterjet system for remotely operated mining application
Company Name	Guhan Industrial and Manufacturing Solutions Pvt. Ltd, Chennai, Tamil Nadu
Category	MSME
Advisor / Mentor	Prof. N Ramesh Babu, Prof. Satynarayana Sheshadri, Prof. T.M Muruganandam (IIT Madras)
Domain / Thrust Area	Robot assisted abrasive suspension waterjet system for remotely operated mining applications
Details of product / solution	Robot assisted abrasive suspension waterjet system for remotely operated mining applications • Water jet technology or waterjet assisted mechanical devices can be a promising alternative, offering a more efficient and environmentally friendly solution for rock cutting in mining. • Compared with conventional mechanical machine tools and continuous waterjet, a robot assisted suspension water jet is much more effective in terms of rock breakage, because of high intensity, short duration, transient stress pulses with a peak amplitude and low-intensity stationary stress at a stagnation pressure.
Name Of Presenter	Guhan Gunasekaran, Mobile: 9840993730 Email-ID: guhanmech89@gmail.com
Proposed Budget	Rs 200 Lakhs
Remarks **Not Recommended**	• Technical feasibility: Proof of Concept for mining application was missing • The proposal doesn't address mining sector and it's more focussed on cutting applications • Commercialization strategy was missing
Seq No	2
Internal Ref No	51
Proposal Title	AI-powered Robotic Swarm for Extreme Terrain Exploration through Heterogeneous Sensors
Company Name	Mach33.aero (DYAU Robotics), Bengaluru, Karnataka
Category	Startup
Advisor / Mentor	Prof. Angel Abbud-Madrid (Colorado school of mines), Dr. Benjamin Morrell (NASA Jet Propulsion Laboratory), Karhik Nair and Praveen Sinha
Domain / Thrust Area	Exploration and development of new technology (Mining automation)
Details of product / solution	**Problem/Opportunity** • Exploration/prospecting in mining has largely been done manually or by semi-autonomous, wheeled ground vehicles, which show limited mobility & adaptability when it comes to unknown, low-lit, unstructured terrain and sloped areas. • Even the most advanced robotic systems in existence currently could get stuck in mine terrains. **Solution:** • Our Extreme Terrain Autonomy (ETA) software transforms multi-modal robotic platforms (e.g. ANYmal) into fully autonomous systems to scout various environments effectively, while gathering valuable information about them at low-cost

	• AI-driven solutions use advanced perception, actuation and new control algorithms for inspection, mapping, in-situ resource utilization, sustainable exploration, and long-term habitation providing increased productivity.
Name Of Presenter	Pradyumna Vyshnav, Mobile: 9980156486 Email: pradyumna@gmail.com
Proposed Budget	Rs 150 Lakhs
Remarks **Not Recommended**	• Technical feasibility: No Proof of concept. It was more of R&D proposal than a start-up. • Commercialization strategy was missing
Seq No	3
Internal Ref No	37
Proposal Title	Revolutionizing Sustainable Marine Chemicals Production: Khosmic's Innovative Approach
Company Name	Khosmic Magnesium And Marine Chemicals Private Limited, Madurai, Tamil Nadu
Category	Startup
Advisor / Mentor	NA
Domain / Thrust Area	Metal Production: Production of Magnesium oxide of various grades & Magnesium Metal, Potassium Sulphate and Lithium salts.
Details of product / solution	**Problem definition** • The global demand for Liquid Bromine, Magnesium Metal and Lithium exceeds supply. The need for sustainable and responsible feed stock supply management is rising. • Environmental concerns surrounding the disposal of waste salt pan residue. **Solution** • Khosmic utilizes advanced technology to extract valuable metals, minerals and chemicals from seawater and from waste salt pan residue, ensuring zero waste discharge. • Our innovative approach enhances the supply of Liquid Bromine, Magnesium Metal and Lithium while reducing environmental impact.
Name Of Presenter	R. Manivannan, Mobile No +91 9443674959 E-mail manivannan@khosmic.org
Proposed Budget	Rs 200 Lakhs
Remarks **Not Recommended**	• Technical feasibility: The proposal was based on lab scale studies without proper material balance. The extraction technology is not clearly specified. • Novelty: The proposal lacks novelty since, the technology / process for desalination is already available in the market. • Commercialization strategy: The PI informed that the firm is already in the process of full-scale commercialization including acquiring land from Tamil Nadu Govt. Hence, not a startup.
Seq No	4
Internal Ref No	38
Proposal Title	Establishment of Pilot Plant (TRL-7) for Extraction of Neodymium - Praseodymium (Nd-Pr) metal from Neodymium - Praseodymium oxide (Nd-Pr oxide) through Calcio-thermic reduction route for NdFeB Base Permanent Magnet Application
Company Name	Ashvini Rare Earth Pvt. Ltd., Pune, Maharashtra

Category	MSME
Advisor / Mentor	NA
Domain / Thrust Area	Development of new alloys and metal related products, etc
Details of product / solution	• Scaling up technical know-how for conversion of Nd-Pr oxide to Nd-Pr • System development for evaporation of Calcium fluoride impurities and refining of reduced Nd-Pr metal • Design, Development and procurement of special purpose resistance heating furnaces, vacuum induction melting furnace, water cooled copper moulds for extraction and refining of Nd-Pr metal at a scale of 3 tons per month capacity
Name Of Presenter	Mr Vikram Ajit Dhoot, Mobile No: 9325422113 E-mail: vikram@ashvinimagnets.com
Proposed Budget	Rs 204 Lakhs
Remarks **Recommended with modifications**	• Technical feasibility: Proposal was based on know-how acquired from BARC. • Potential impact: The outcomes of the project would lead to import substitution of high-purity Nd-Pr Metal • Proposal to be resubmitted with revised overall budget not exceeding Rs 150 lakhs before Apex committee meeting • AREPL has already submitted a proposal to DST for Nd-Pr extraction in association with ARCI.
Seq No	5
Internal Ref No	31
Proposal Title	Lithium ion-electro fusion reactor for alkali metals
Company Name	Saru Smelting Pvt Ltd., Meerut, UP
Category	MSME
Advisor / Mentor	Riju Bhatnagar, Technical Advisor, Retd. Scientific Officer 'H', (Heavy Water Board, DAE)
Domain / Thrust Area	Metals and alloys (Lithium production)
Details of product / solution	**An Electro Fusion Reactor for Alkali Metals (Lithium) which will operate on Fused Salt Electrolysis** • For the Pilot, a Single Cell System Capable of Processing of 20 Kg/Batch in 72 hours of Lead Lithium $Pb_{83}Li_{17}$ is proposed • The Lab Scale Technology has been Developed By BARC and Saru Smelting Pvt Ltd (SSPL) has entered into a Technology Transfer Agreement with BARC. • The detailed plant engineering has been developed by SSPL under the guidance of Technical Advisor – Mr. Riju Bhatnagar, Technical Advisor and has been approved by the BARC, Materials group. • BARC will continue to hand hold SSPL. as a mentor & incubating partners by providing their continued technical resources for trouble solvingh, testing & qualification besides also providing inter disciplinary expertise in fields of science & technology
Name Of Presenter	Shashank Jain/Rijju Bhatnagar, Mobile No 9837041182 E-mail shashank@sarumetals.com
Proposed Budget	Rs 116.5 Lakhs

Remarks **Recommended with modifications**	• Technical feasibility: Proposal was based on know-how acquired from BARC • Potential impact: The project proposal targets strategic area • Commercialization strategy: The project aims for a pilot scale plant in Meerut. As BARC is the only prospective buyer for the developed product, a **commitment letter** from BARC that they will buy their final product is to be submitted before Apex committee meeting.
Seq No	6
Internal Ref No	32
Proposal Title	Deep-Sea Mining Exploration using Low-Cost Portable Mini–Autonomous Underwater Vehicle (AUV) with Indigenous Components
Company Name	Planys Technologies Pvt Ltd, Chennai, Tamil Nadu
Category	MSME
Advisor / Mentor	Dr. Prabhu Rajagopal (IIT Madras), Prof. Krishnan Balasubramanian (IIT Madras)
Domain / Thrust Area	Development of new technology for mineral exploration and mining in deep sea to categorize, locate and exploit existing/ new mineral resources.
Details of product / solution	• A first-of-its-kind Indian autonomous underwater vehicle (AUV) capable of deep-sea mining exploration applications is proposed. • This AUV would deploy a novel method of deep-sea exploration to greatly simplify deep-sea engineering complications, thereby reducing costs significantly. • This advancement also improves product endurance by around 30% compared to other commercially available products, which are not optimised. • The AUV's development would also be in line with the nation's goals of indigenisation of deep tech products, especially in the deep sea mining industry, which heavily lacks such indigenous capabilities
Name Of Presenter	Vineet Kumar Upadhyay, Mobile No +91 94455 05731 E-mail vineet@planystech.com
Proposed Budget	Rs 125 Lakhs
Remarks **Not Recommended**	• Technical feasibility: Technical challenges are associated with deep sea exploration and proof of concept for deep sea mining is missing. • Validation cannot be carried out in the country • Commercialisation strategy was missing
Seq No	7
Internal Ref No	17
Proposal Title	Hydrological Risk Management for Opencast Mines
Company Name	Climate-B Ventures Pvt Ltd., Chennai, Tamil Nadu
Category	Startup
Advisor / Mentor	Prof Dheeraj Kumar, Mr Apruban Mukherjee
Domain / Thrust Area	Research in mining methods. This includes rock mechanics, mine designing, mining equipment, energy conservation, environmental protection, and mine safety Mine Safety/Hydrology
Details of product / solution	• Our solution helps opencast mines improve their safety with regard to water-related risks.

	• The highlight of our offerings is the integrated hydrological-hydrodynamic modelling done on high resolution DEM obtained from a drone survey. • The solution estimates the runoff volume and flood risk to a mine based on various rainfall scenarios and helps determine the appropriate location & design of settling ponds, garland drains, retaining walls and other such hydraulic structures. • An additional feature of our solution is also the development of Emergency Action Plan for tailing dam breach for select metal mines.
Name Of Presenter	Barath Mahadevan, Mobile No: 8376934926 Email ID: bmahadevan@climatebventures.com
Proposed Budget	Rs 50 Lakhs
Remarks **Not Recommended**	• There was no novelty and similar softwares are already existing in the market • Company was advised to directly approach the mining industries.
Seq No	8
Internal Ref No	8
Proposal Title	Efficient and Sustainable Production of Alumina Hydrates by Electrolysis of Sodium Carbonate and Produce Hydrogen.
Company Name	LN Indtech Services Pvt Ltd, Bhubaneswar, Odisha.
Category	MSME
Advisor / Mentor	Mr.D.B. Mohanty, Ex-Hindustan Copper and Hindustan Zinc; Mr. Rakesh Chandra Mittal, Ex-MECON, BALCO & NALCO
Domain / Thrust Area	Decarbonisation and development of green technology in mineral based industries
Details of product / solution	Efficient and Sustainable Production of Alumina Hydrates by Electrolysis of Sodium Carbonate and Produce Hydrogen. • The process is tested using aluminium dross rejects in which the rejects are leached with alkali (NaOH) to produce Ammonia, Hydrogen, residual alumina (95-98% Al2O3) and aluminate liquor. • The aluminate liquor is treated with sodium bicarbonate to produce Alumina Hydrate and Sodium Carbonate. • Sodium carbonate is then electrolyzed to regenerate Sodium bicarbonate and alkali for recycle with generation of Green Hydrogen.
Name Of Presenter	Dr. Subash Chandra Mallick, Mobile No +91-9922498715 Email ID lnindtech@gmail.com
Proposed Budget	Rs 43 Lakhs
Remarks **Recommended**	• Technical Feasibility: Proof of concept was performed on lab scale and has a good potential for production of high purity alumina grades. • Potential Impact: Aluminium Industry Waste Utilisation • Novelty: Low CAPEX alternative process for alumina hydrate • JNARDDC will be incubator
Seq No	9
Internal Ref No	39
Proposal Title	Intelligent coagulant Flocculant Management System
Company Name	Bariflo Labs Private Limited, Rourkela, Odisha
Category	MSME

Advisor / Mentor	Dr. M Murali (Principal Scientist, CSIR-NIO), Dr Mrutyunjay Suar (Professor, KIIT), Dr Amit Kumar Mishra (Professor, KIIT)
Domain / Thrust Area	WASTEWATER MANAGEMENT OF MINERAL PROCESSING
Details of product / solution	• Intelligent flocculation-coagulation system which decides the amount of the reagent requirement based on changes in input water quality condition by sensing COD, pH, BOD, TSS. • It also predicts the intensity of turbulence needed for the rapid mixing through our in-house developed vertical flapping mixing device with aeration for maximizing the floc strength. • Reduces energy cost of aeration & reagent cost by 25%; henceforth GHG emission by 35%
Name Of Presenter	Mrutyunjaya Sahu, Mobile No 7328021033 Email ID Mrityunjay.sahu@bariflolabs.com
Proposed Budget	Rs 125 Lakhs
Remarks **Not Recommended**	• Deviation from the original submitted proposal • Technical Feasibility: The proposer has not identified the industry / mines for carrying out the project • Proposal lacks novelty and the technology is already established in HZL and some other industries
Seq No	10
Internal Ref No	26
Proposal Title	Pilot scale production(25kg/Day) of high purity battery grade silicon material for lithium-ion battery anode
Company Name	Cellark Powertech Pvt. Ltd., Cuttack, Orissa
Category	Startup
Advisor / Mentor	Dr. Soobhankar Pati (IIT Bhubaneswar)
Domain / Thrust Area	Develop new metal related product, R&D to establish circular economy and use of recycled materials in mineral based industry
Details of product / solution	• Production of high purity nano porous silicon material for lithium-ion battery anodes • Globally we need 2035 GWh/Year of batteries to meet the energy storage demand by 2030 • Adding small amount of silicon with natural/synthetic carbon is a proven strategy to increase the specific capacity of full cell, however there is a threshold limit to the amount of silicon addition considering the effect on cycle life and mechanical swelling of the battery • Graphite is a proven anode material which is being used since the inception of LIB (Lithium-ion battery) technology • Micron size porous silicon material can mitigate both the volume expansion due to void available inside the particle to provide for volume expansion as well as handling the problem associated with SEI and ICE due to it micrometer level size.
Name Of Presenter	Ashwani Kumar Pandey, Mobile No +9194541694743 E-mail cellarktechnologies@gmail.com
Proposed Budget	Rs 187 Lakhs
Remarks **Recommended with modifications**	• Technical feasibility: Proof of concept was presented. • The outcome will lead to pilot scale production for high purity battery grade silicon. • The proposal is novel.

	• Proposal to be resubmitted with revised manpower budget not exceeding Rs 35 lakhs before Apex committee meeting.
Seq No	11
Internal Ref No	35
Proposal Title	CarbonOne
Company Name	Caliche Private Limited, Shillong, Meghalaya
Category	Startup
Advisor / Mentor	Dr. Bernadette Lyngdoh, Prof. S.R. Joshi (Northeast Hill University, Shillong)
Domain / Thrust Area	Decarbonisation and development of green technology in mineral based industries
Details of product / solution	• CarbonOne technology is at the forefront of green innovation, utilizing autotrophic bacteria to effectively capture and convert CO2 emissions in mineral-based industries, including steel, aluminum, cement etc. • This microbial carbon capture solution demonstrates remarkable versatility across emission sources. • Beyond its primary role in emission reduction, CarbonOne goes further by contributing to sustainable practices, yielding high-value byproducts suitable for pharmaceuticals, nutraceuticals, and cosmetics. • This innovative approach aligns seamlessly with the thrust of decarbonization, offering an economically viable and environmentally sustainable pathway for mineral industries to meet their green technology goals. • By addressing challenges in emission-heavy sectors and providing valuable outputs, Carbon One stands as a comprehensive and impactful solution for the evolving landscape of sustainable industrial practices.
Name Of Presenter	Anandh Mathew & Amit Priyadarshan, Mobile No +91-9089204360 E-mail: amitpriyadarshan@calicheglobal.com
Proposed Budget	Rs 180 Lakhs
Remarks **Recommended with modifications**	• Technical Feasibility: Proof of concept is established at TRL 5 in BPCL. • Potential Impact: The project aims for deploying microorganisms to capture and convert CO_2 emissions in mineral-based industries. • Proposal to be resubmitted with revised overall budget not exceeding Rs 120 lakhs before Apex committee meeting. Suggested to revise the R&D component. • An endorsement from Vedanta is to be submitted before Apex committee meeting. • JNARDDC will be incubator
Seq No	12
Internal Ref No	45
Proposal Title	GARBH - A Software for Exploration of Rare-earth-elements
Company Name	Caliche Private Limited, Shillong, Meghalaya
Category	Startup
Advisor / Mentor	Dr. Bernadette Lyngdoh, Prof. S.R. Joshi (North East Hill University, Shillong)
Domain / Thrust Area	Prospecting/exploration for strategic rare and rare earth minerals

Details of product / solution	GARBH is a specialized software solution tailored for the mining industry, with a primary focus on geological and mine planning tasks. • It serves as a comprehensive tool for geologists and mining professionals by offering functionalities such as geological modeling, resource estimation, and mine planning. • The software enables the creation of detailed geological models, aiding in the interpretation of features like ore bodies and faults. • It plays a crucial role in estimating the quantity and quality of mineral resources, supporting decisions on the economic viability of mining projects. • GARBH assists in designing and optimizing mining operations, including drill and blast planning, to maximize resource recovery. • Its advanced 3D visualization capabilities enhance the interactive analysis of geological and mining data. • The software integrates diverse data types, such as geological, geophysical, and drilling data, providing a holistic view of the subsurface.
Name Of Presenter	Ashutosh Kumar & Amit Priyadarshan, Mobile No +91-9089204360 E-mail: amitpriyadarshan@calicheglobal.com
Proposed Budget	Rs 170 Lakhs
Remarks **Recommended with modifications**	• Technical Feasibility: The prototype of the software has been demonstrated to the Directorate General of Hydrocarbons for application in Oil and Gas industry. • Potential Impact: The outcome would lead to a comprehensive tool for geologists aiding in mineral exploration, mine planning, optimizing mining operations. • Proposal to be resubmitted with revised overall budget not exceeding Rs 120 lakhs before Apex committee meeting. Suggested to revise the operational, marketing, Software development & deployment components. • With baseline and other data to be supplied by GSI / AMD, the company has to demonstrate applicability in Mineral exploration / REE exploration which will be endorsed by GSI or AMD before Apex committee meeting.
Seq No	13
Internal Ref No	52
Proposal Title	AI-driven automatic mineral liberation analyzer
Company Name	Zwilling Labs Pvt. Ltd, Mumbai, Maharashtra
Category	MSME
Advisor / Mentor	Dr. Vishal Agarwal, Dr. Anurag Tewari, Lt. Col Narendra Tripathi, Dr. K. Balasubramanian, Director (NFTDC)
Domain / Thrust Area	Improve efficiency in process, operations, recovery of by-products, and reduction in the specification and consumption
Details of product / solution	• A system based on machine learning is being developed, which would provide an automatic mineral liberation analysis (AMLA). • This would perform automatic beam scanning control of electron microscope and EDS to create input data, which will be fed into artificial intelligence to perform mineral liberation analysis. • The artificial intelligence algorithm will be trained on a combination of theoretical data and a large variety of experimental SEM data
Name Of Presenter	Prof. Asim Tewari, Mobile No: +91 99300 57521

	Email ID: asim.tewari@zwillinglabs.ai
Proposed budget	Rs 180 Lakhs
Remarks **Not Recommended**	• Technical Feasibility: Proposal lacks proof of concept and is a standalone software. Mineral ores are highly heterogenous and difficult to quantify and the proposed solution may be mineral-specific. • Novelty is missing as similar softwares are already available in market and there may be compatibility issues with SEM's OEMs.
Seq No	14
Internal Ref No	28
Proposal Title	Development of sustainable bio-hydrometallurgical process to recover rare earths (Nd, Dy, Pr) from e-waste
Company Name	Prasinos Tech Innovations Pvt. Ltd., Mallapur, Telangana
Category	Startup/MSME
Advisor / Mentor	Dr Sudharshan Neogi, Dr Anirudh Pandit
Domain / Thrust Area	Evolve low capital and energy saving processing systems, Production of materials of high purity, Focus on extraction of strategic, critical and REE at elemental level
Details of product / solution	A pilot scale (50- 100 L) biohydrometallurgical approach through hydrodynamic cavitation assisted mechano-chemical pre-treatment to leach REEs (Nd, Pr, Dy) from e-waste (wPCBs and wPMs). • The REE enriched sample will be subjected for batch microbial leaching at varied operating conditions to standardize the parameters. • The REEs (Nd, Pr, Dy) will be selectively recovered by membrane solvent extraction. • Large scale 50-100 L capacity bioreactor studies will be carried out to treat 15-30 Kg of wPCBs and wPMs at higher S/L ratios. • The left-out sludge and wastewater will be used in bioleaching process closing the material flow loop.
Name Of Presenter	Dr. Aditi Mullick & Dr. Anupam Mukherjee, Mobile No: 9836741330 Email: aditi@prasinostech.co.in
Proposed budget	Rs 160 Lakhs
Remarks **Not Recommended**	• Technical Feasibility: Proof of concept was not up to the mark, as actual e-waste was not used. Also, the recovery projected was too low and proper mass balance was missing. • Commercialisation Strategy: The cost-economics was not worked out properly
Seq No	15
Internal Ref No	41
Proposal Title	Real-Time Continuous Temperature Monitoring of Aluminium Pot Shell in an Aluminium Smelter using Novel Ultrasonic Waveguide-Based Technique
Company Name	XYMA Analytics Private Limited, Chennai, Tamil Nadu.
Category	Startup
Advisor / Mentor	Prof. Krishnan Balasubramanian, Prof. Prabhu Rajagopal (IIT Madras)
Domain / Thrust Area	Sensors - Continuous monitoring of critical industrial parameters such as temperature, viscosity, density, level, corrosion, etc.
Details of product / solution	The objectives set of this project proposal is as follows; to develop • A cost-effective solution to reduce the downtime in potlines and to predict as well as eliminate potline accidents.

	• A remote, automated, continuous monitoring system replacing the periodic manual approach for temperature measurement. • An IoT-based system to monitor all collector bar, side shell temperature of a pot shell instead of manual measurement at selected locations through our distributed sensing solution with customized AI dashboard.
Name Of Presenter	Aswin Kumar Kathirvel & Dr. Nishanth Raja, Mobile No +91 9442949347 Email ID nishanthraja@xyma.in
Proposed budget	Rs 50 Lakhs
Remarks **Not Recommended**	• Technical Feasibility: Proof of concept was not established • Not ready for immediate prototyping or pilot scale demonstration. More R&D work is needed in this regard.
Seq No	16
Internal Ref No	22
Proposal Title	Reduction and Beneficiation of Low-Grade Iron Ore, Iron ore Fines, Slimes and Laterites by Biomass Assisted in situ generated Hydrogen in Fluidised Bed Reactor
Company Name	LN Indtech Services Pvt Ltd, Bhubaneswar, Odisha
Category	Startup
Advisor / Mentor	Mr. D.B. Mohanty (Ex-Hindustan Copper, Hindustan Zinc), Mr. Rakesh Chandra Mittal (Ex- Mecon, BALCO & NALCO)
Domain / Thrust Area	Research in metallurgy and mineral beneficiation techniques to utilise lower grade and finer size ores
Details of product / solution	Objectives of the project • Characterization of Raw materials and products • Biomass-assisted hydrogen generation • Study the reduction kinetics, evaluating the beneficiation efficiency, and characterizing the metallurgical properties of the reduced iron ore products. • Economic feasibility and process optimization to assess the cost-effectiveness and viability of the biomass-assisted reduction process compared to traditional beneficiation methods
Name of Presenter	Dr. Subash Chandra Mallick, Mobile No +91-9922498715 Email ID lnindtech@gmail.com
Proposed budget	Rs 46 Lakhs
Remarks **Not Recommended**	• Technical Feasibility: There is no clarity regarding sources of input bio-mass material. • Also, in-view of current scarcity of bio-mass material for industrial processes, success of this proposal is uncertain. • There is no clarity regarding the grade of iron ore used for beneficiation.

Annexure – A

S&T PRISM (Ministry of Mines-JNARDDC)
Technical Expert Committee (TEC) members

S.N.	Name	Organization
1.	Dr Anupam Agnihotri	Director, JNARDDC & Chairman (TEC)
2.	Shri R N Chouhan	Sr Pr Scientist JNARDDC & Member Secretary (TEC)
3.	Shri Debkumar Bhattacharyya	DDG (RSAS), GSI
4.	Dr B.K. Satpathy	Ex-ED, NALCO
5.	Dr D S Subrahmanyam	Scientist & Head (Geotechnical Engg), NIRM
6.	Dr EVSSK Babu	Sr Chief Scientist, CSIR-NGRI,
7.	Dr Kali Sanjay	Chief Scientist, CSIR-IMMT
8.	Shri V Jayaraman	Head of Corporate Services, HZL
9.	Dr Rajesh B. Biniwale	Chief Scientist, CSIR-NEERI
10.	Dr Dillip Ranjan Kanungo	Director (OD), IBM
11.	Shri Deepak Hazra	DDG, GSI Nagpur
12.	Shri R.P. Gupta (Joined online)	Director, MoM
13.	Dr Pramod Shankar (Joined online)	Scientist D, Technical Translation & Innovation, DST
14.	Prof R K Sinha (Joined online)	Associate Professor, IIT (ISM) Dhanbad
15.	Shri Bibhu Mishra (Joined online)	Advisor, HINDALCO

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