Depatment of Science and Technology
METALS INDUSTRY RESEARCH AND DEVELOPMENT CENTER
FY 2023 Major Projects, Programs and Activities, Beneficiaries, and Status of Implementation
(as of August 31, 2023)

Item No.	Title	Duration	Project Type (as source of fund)	Project Objective	Beneficiaries	Implementing Division	Status of Implementation
	A. AGRO-INDUSTRIAL						
1	Design and Development of Conveyorized Okra Dryer	7-March-22 to 7-March-23 Extension 1 8-March-23 to 30-June-23 Extension 2 1-July-23 to 31-Dec-23	GIA	This project aims to develop a conveyorized okra dryer to replace the present manual drying technique used by fresh okra exporters in the country. This project will also benefit the M&E sector, particularly the small equipment fabricators in the country, which forms part of the mandate of DOST-MIRDC.	Metals and Engineering Industry DOST III Jelfarm Fresh Products Enterprise	PD	Ongoing project
2	Design Improvement of Existing Chain Link Fencing Machine to Produce Slope Protection Circular Wire Mesh	1-Apr-22 to 30-June-23 Extension 1 1-Jul-23 to 31-Dec-23	GIA	The joint R&D collaboration project brings together the following parties: Rebtrade International Corporation (RIC) as the private partner and committed adopter of the resulting technology, and the Metals Industry Research and Development Center (MIRDC) of DOST as the technology partner. The project aims to design and fabricate the prototype mold to modify the chain link fencing machine to produce circular wire mesh.	Metals and Engineering Industry Rebtrade International Corporation (RIC)	PD	Ongoing project
3	i-POND: An IoT-based Pond Water Quality Control and Monitoring System for Shrimp Farms	16-October-22 to 16-April-24	GIA	The project aims to design and develop a long-range wide area network (LoRaWAN)-based automated water quality control and monitoring system for shrimp farms.	Metals and Engineering Industry Aqua Tierra Agri-Industrial Farms Inc. (Aqua Tierra) Mindoro State University	PD	Ongoing project
4	Development and Evaluation of an Automated Control and Monitoring System in the Overall Productivity of Recirculating Aquaculture System (RAS)	2-Nov-22 to 30-April-24	GIA	The joint R&D project comprises AGRITEKTURA Enterprises as the private partner and committed adopter of the resulting technology and the Metals Industry Research and Development Center (MIRDC) of DOST as the technology partner. The project aims to design and develop a low-cost automated control and monitoring system for land-based aquaculture.	Metals and Engineering Industry AGRITEKTURA Enterprises	PD	Ongoing project
5	Pre-commercialization of IOT-Based Monitoring System for Machine Shop	1-Feb-23 to 31-March-24	GIA	The project will fabricate and field test five modules of the MIRDC-developed IoT-based machine shop monitoring system, evaluate its performance, and establish its marketability. Market analysis will be conducted to identify the target market and customer willingness to adopt the technology.	Metals and Engineering Industry	PD	Ongoing project

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6	Rapid and Advanced reManufacturing of Marine Propulsion System (RAMMPS)	1-April-23 to 31-March-24	GIA	The project aims to remanufacture marine propulsion system components using advanced hybrid manufacturing processes, with specific objectives to identify failure modalities, adopt an agile manufacturing process, and determine resource savings.	Metals and Engineering Industry DOST-VI Aklan State University	MPRD	Ongoing project
7	Refining Laterite-based Crude Pig Iron for Specific Product Applications	01-Apr-21 to 31-March-23 Extension 1 1-April-23 to 30-June-23	GIA	The project is primarily aimed at establishing the feasibility of increasing the value-added of Philippine ores - that additional processes should be conducted in the Philippines instead of directly shipping them abroad or partially processing them. Higher value adding of Philippine ores and minerals means more revenue for the country and additional employment opportunities for the Filipinos.	Metals and Engineering Industry DOST Mines and Geosciences Bureau (MGB)	MPRD	Completed on 30 June 2023
8	An Experimental Study on the Applicability of an Air-Lift Pump to a Recirculating Aquaculture System (RAS) as an Alternative to a Submersible Pump	1-April-23 to 30-Nov-23	Internal Project	This project aims to provide potential impact to the aquaculture industry in terms of energy efficient system, reducing operating cost, safe and reliable pumping system, and oxygenation and filtration of recirculating water. The study's objective is to set-up and characterize an air-lift pumping system and evaluate its cost-effectiveness to Recirculating Aquaculture System (RAS) as compare to submersible pump.	Metals and Engineering Industry	PD	Ongoing project
9	Development of a Multiparameter Water Quality Sensor Instrument Using Regression Values from Temperature and Acidity Measurements	1-April-23 to 31-Dec-23	Internal Project	This project aims to study and develop a low-cost prototype sensor system that will predict precise ammonia and dissolved oxygen levels through pH and temperature measurements by establishing data correlation between water quality parameters.	Metals and Engineering Industry	PD	Ongoing project
10	Surface Modification thru Anodic Oxidation of Titanium Alloy Fabricated by Direct Metal Laser Sintering	15-May-23 to 14-June-24	Internal Project	This project aims to develop an anodic oxidation process for additively manufactured titanium alloy. The process parameters for titanium anodizing will be established, and the samples will be characterized for their microstructure, morphology, surface roughness, topography, and thickness of anodized layer. The biocompatibility of the anodized sample will be determined by conducting a Body Fluid Simulation test and a Surface Wettability test.	Metals and Engineering Industry	MPRD	On-hold from 1-July-23 until the 3D printers are available / ready to print the samples.

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11	Study on the 3D Printed Assisted Investment Casting for Detailed Ring Designs	15-May-23 to 14-Nov-24	Internal Project	The project aims to incorporate additive manufacturing (AM) methods into the investment casting process for jewelry, specifically focusing on rings. It will investigate variations in casting conditions, including but not limited to dewaxing and shell firing. The study will compare traditional investment casting with the AM-assisted process, considering factors such as production time, rejection rates, post-production treatments like polishing, and the overall quality of the final castings.	Metals and Engineering Industry	MPRD	Ongoing project
12	Comparative Study of Analytical Techniques using hand-held Laser-Induced Breakdown Spectrometer (LIBS) and X-ray Fluorescent Spectrometer (XRF) with spark Optical Emission Spectrometer (OES)	01-March-23 to 28-Dec-23	Internal Project	The project aims to develop an elemental fingerprinting technique applied to Reinforcing Bars in the Philippines.	Metals and Engineering Industry	ATD	Ongoing project
13	Electropolishing Optimization for Additively Manufactured Aluminum Alloy	06-Dec-21 to 6-March-23	Internal Project	The project aims to optimize electropolishing process for additively manufactured Aluminum Alloy Specific Objectives: 1. To determine best conditions for electropolishing such as current density, electrolyte concentration, temperature and time. 2.To characterize surface profile using AFM and Profilometer 3. To characterize the effect of electropolishing in tensile strength and to determine the Corrosion Resistance 4. Comparison of the Test Results of AM & Cast Aluminum Alloy	Metals and Engineering Industry	MPRD	Completed on 6 March 2023
14	Development and Characterization of Hot-dip Aluminized Steel	7-Feb-22 to 6-Jan-23 Extension 1 7-Jan-23 to 06-April-23	Internal Project	This project aims to develop and characterize hot-dipped aluminized steel. Specific Objectives: 1. To establish process parameters for hot-dip aluminizing; 2. To characterize the coating using the following tests: a. Physical/Visual inspection of surface b. Coating Bend test c. Metallography d. SEM/EDS e. Thickness of coating/intermetallic layer 3. To describe and compare corrosion resistance of hot-dip aluminized steel, hot-dip galvanized steel and stainless steel after exposure to salt spray test; 4. To correlate the corrosion resistance effect of aluminum coating on the tensile strength of aluminized steel.	Metals and Engineering Industry	MPRD	Completed on 5 April 2023

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15	Comparative Study of different 3D Printed Injection Mold Inserts for Low Volume Production	15-Feb-22 to 15-Feb-23 Extension 1 16-Feb-23 to 30-Nov-23	Contract Research Project	This is a contract research project between Manly Plastics Inc. and MIRDC that aims to determine the viability of additive manufacturing mold inserts and compare them to the common subtractive manufactured mold inserts.	Metals and Engineering Industry Manly Plastics Inc.	MPRD	Ongoing project
16	Development of Floating Solid Waste Collector System for DENR	16-Jan-23 to 17-Jan-25	Contract Research Project	The project aims to develop a system that will handle the removal of water hyacinth and other floating solid wastes in bodies of water. The system will comprise of a dedicated water hyacinth harvester, a dedicated trash collector and a powered barge for water hyacinth.	Metals and Engineering Industry DENR (EMB-NCR)	PD	Ongoing project
17	Design and Development of Retractable and Deployable Antenna Mast	01-May-23 to 31-Dec-23	Contract Research Project	A contract research project with Advanced Science and Technology Institute (ASTI) that aims to design and develop a 12 meters retractable and deployable antenna mast.	Metals and Engineering Industry ASTI	PD	Ongoing project
18	Study on the Viability of Nested, Additively Manufactured Radiation Dosimeter Security Locks	02-May-23 to 31-Oct-23	Contract Research Project	This project aims to demonstrate the practicality and viability of using additive manufacturing for producing Optically Stimulated Luminescence (OSL) Dosimeter Security Locks in low-to-medium volumes.	Metals and Engineering Industry	MPRD	Ongoing project
19	Study on the Crankpin Fillet Fracture of Aircraft Crankshaft	3-Jan-23 to 3-April-23	Contract Research Project	The project aims to study and establish the possible cause of failure of the fractured aircraft crankshaft. This study will conduct a metallurgical failure analysis on the the fractured aircraft crankshaft of CESSNA-152 requested by FAST Aviation Academy, Inc. and CAAP.	Metals and Engineering Industry FAST Aviation Academy, Inc.	MPRD	Completed on 3 April 2023

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B. DEFENSE AND SECURITY							
1	AeroComp: Enhanced Lightweight Fiber-reinforced Composites Structures for Defense Applications	01-Feb-22 to 31-Jan-24	GIA	The project aims to fabricate different molds needed in the production of ballistic products and to characterize the mechanical properties of the fabricated lightweight fiber-reinforced composite-based ballistic products	Metals and Engineering Industry UP Diliman Dept. of Mining, Metallurgical and Materials Engineering-(UPD-DMMME) Air Force Research and Development Center (AFRDC) Phil-Navy Naval Research and Technology Development Center (NRTDC)	MPRD	Ongoing project
2	Project COBRA (Controller Operated Battle Ready Armament)	01-Jan-23 to 31-Dec-24	GIA	The project aims to improve the firepower capability of armored vehicles of the Philippine Army while also providing a new foundation for future PA defense initiatives.	Metals and Engineering Industry DOST-PCIEERD Philippine Army Mechatronics and Robotics Society of the Philippines (MRSP)	PD	Ongoing project
C. HEALTH							
1	Design Improvement of OstreaVent II Adult Ventilator (Ostreavent 2.2)	15-June-23 to 14-June-24	Contract Research Project	This project aims to develop an improved Ostreavent II commercial prototype for field testing. Its specific objectives are: 1. To evaluate the use of conventional machining using stainless steel for the manifold and additive manufacturing using ASA in the production of the casing of Ostreavent 2.2; 2. To establish production methodology, functional testing, and calibration protocols for the Ostreavent 2.2 prototype; 3. To prepare the ten (10) units of Ostreavent 2.2 for third-party calibration and field testing.	Metals and Engineering Industry Breathe of Life Foundation, Inc.	PD	Ongoing project
D. MASS TRANSPORT SYSTEM							
1	Technical Support and Evaluation of the Hybrid Electric Train Operation	19-Aug-20 to 18-Aug-21 Extension 1 19-Aug-21 to 03-Jan-22 Extension 2 04-Jan-22 to 19-Aug-22 Extension 3 20-Aug-2022 to 19-Feb-2023 Extension 4: 20-Feb-2023 to 19-Aug-2023	GIA	The project aims to provide technical support to PNR for one (1) year year from the start of the HET operation as a revenue train. It also aims to conduct studies that includes: ridership study to establish a revenue model and an actual operational cost for the train; and parametric optimization of the load-sharing mechanism to maximize energy efficiency of HET.	Metals and Engineering Industry Philippine National Railways (PNR)	PD	Completed on 19 August 2023

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2	Design and development of an automated disinfection fogging system for a Hybrid Electric Train (HET)	17-April-23 to 17-Aug-23 Extension 1 18-Aug-23 to 17-October-23	Internal Project	This project aims to use a commercially available fogging system to disinfect train coaches. The proposed system will address the inefficiency of manual cleaning and disinfection. The project will be implemented in the DOST-developed Hybrid Electric Trainset (HET) in Calamba, Laguna.	Metals and Engineering Industry Philippine National Railways (PNR)	PD	Ongoing project
E. CAPABILITY BUILDING							
1	Advancement of Information and Communications Technology (ICT) and Implementation of Information Security Management System (ISMS) in MIRDC – (AIM)	01-Jan-21 to 31-Dec-23	DGIA	The project aims to provide the Center's with innovative and secured S&T services thru ICT and improved information security management capability by ensuring compliance to international and local information security laws and other related policies/agreements, implementation of ISO/IEC 27001 certification standard and establishing highly reliable backup system and appropriate business continuity plan for the Center's main operations.	MIRDC	PMD	Ongoing project
2	Operation and Management of the Mold Technology Support Center (MTSC)	1-Jan-23 to 31-Dec-23	DGIA	The establishment of the MTSC through the ODA has the following goals: 1. To develop the most needed human resources for the local die and mold companies; 2. To encourage the advancement of the Philippine manufacturing industry's competitiveness; and 3. To contribute to the industrial cooperation between the Republic of Korea and Republic of the Philippines	Metals and Engineering Industry	DED-RD / TDD	Ongoing project
3	Establishment of Metals and Engineering Innovation Centers in Cordillera Administrative Region (CAR), Regions I, II, III and X	01-Aug-20 to 31-July-23 Extension 1: 01-Aug-23 to 31-Jan-24	GIA	This project is in connection with MIRDC's desire to be present in the regions to be more responsive to the needs of the metals, engineering and allied industry nationwide. Sec. Fortunato De la Peña of DOST planned to put up different kinds of innovation centers, wherein the innovation center for metals and engineering will be centered around MIRDC. These innovation centers shall serve as venue for the conduct of research studies for the development of new innovative metal parts and components, products, machineries, and other services in collaboration with the academe and industry. It is also envisioned to offer practical solutions to pressing metals and engineering problems encountered in the community or in the region.	Metals and Engineering Industry	DED-RD / TDD	Ongoing Project

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4	Establishment of Metals and Engineering Innovation Centers in Regions IV-A, IV-B, V, VI, VII, VIII, IX, XI, XII and CARAGA	01-July-23 to 30-June-26	GIA	Objectives: 1. To establish Innovation Centers inside the campuses of Batangas State University, Western Philippine University, Bicol State College of Applied Science and Technology, Technological University of the Philippines-Visayas Campus, Negros Oriental State University, Eastern Visayas State University, Zamboanga Peninsula Polytechnic State University, University of Southeastern Philippines, Mindanao State University-General Santos Campus and Surigao State College of Technology for the conduct of research and development in the field of agro-industrial machine development; 2. To develop and strengthen the capability of the manpower resources (faculty members and researchers) of the 10 partner State Universities and Colleges in the field of metalworking processes, and machine design and development; and 3. To increase the pool of accredited experts in the field of metalworking in various regions who will be tapped as consultants and/or resource persons.	Metals and Engineering Industry	TDD	Ongoing Project
5	Smarter Onelab for Industry 4.0 through Testing and Calibration, Education, and Discovery (Onelab for TED)	1-Jan-23 to 31-Dec-25	GIA	The project aims to sustain and level up the services of DOST laboratories to support the transition of MSMEs towards Industry 4.0 to be innovative and globally competitive through provision of high quality laboratory testing and calibration, research and development, and training service	Metals and Engineering Industry	ATD	Ongoing project
6	Technological Readiness and Innovation Through Advanced Manufacturing in the Philippines (TRIAMPH)	1-April-23 to 31-March-26	GIA	The objective of the project is to support the Additive Manufacturing Roadmap through R&D collaborations, education formation, and policy standard formation to ensure the sustainability of AMCen as the national hub for additive manufacturing and provide AM capabilities and consultancy for product and process development	Metals and Engineering Industry	MPRD	Ongoing project
7	Leadership Development System: A Management Strategy for the Effectiveness of Leaders	01-July-23 to 31-October-23	GIA	This is a training program funded by DOST-HRDP that aims to enhance the effectiveness of leaders within the DOST System by developing a comprehensive leadership development system. This system will serve as a strategic management approach, aligning with the organization's business strategies and addressing identified leadership competency gaps.	Leaders within the DOST System	FAD	Ongoing project
8	Developmental Conversation for Leaders (Coaching the Coaches through Developmental Conversations)	01-May-23 to 31-Aug-23	GIA	This is a DOST-HRDP-funded training program that aims to equip leaders within the DOST system with the necessary skills to fulfill their supervisory and managerial responsibilities, specifically in fostering and sustaining a performance-based coaching culture built on developmental conversations.	Leaders within the DOST System	FAD	Completed on August 31, 2023

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9	Establishment of a Mold Technology Support Center (MTSC)	01-Aug-20 to 31-July-23	GIA	The MTSC is an Official Development Assistance (ODA) initiative of the Republic of Korea specifically tailored for the Philippine Die and Mold industry. The MTSC will be established in Cavite Economic Zone (CEZ) to develop the most needed human resources for the local die and mold companies, encourage the advancement of the Philippine manufacturing industry's competitiveness and contribute to the industrial cooperation between the Republic of Korea and Republic of the Philippines.	Metals and Engineering Industry	DED-RD / TDD	Completed on 31 July 2023
F. GAA-LFP PROJECTS							
1	Upgrading of MIRDC Laboratory and Administrative Building	01-Jan-18 to 31-Dec-23	GAA-LFP	To extend the useful life of the ATD Building and ensure long-term safety, reliability and strengthen its seismic resistance required for modern buildings.	MIRDC	FAD	Ongoing project
2	Repair of Perimeter Fence of the Center	01-Jan-18 to 31-Dec-23	GAA-LFP	Repair will upgrade the existing perimeter fence with deteriorated steel fences and collapsing concrete walls in view of wear and tear.	MIRDC	FAD	Ongoing project

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