

Department of Science and Technology
METALS INDUSTRY RESEARCH AND DEVELOPMENT CENTER
FY 2022 Major Projects, Programs and Activities, Beneficiaries, and Status of Implementation
(as of February 28, 2022)

Item No.	Title	Duration	Project Type (as source of fund)	Project Objective	Beneficiaries	Implementing Division	Status of Implementation
A. AGRO-INDUSTRIAL MACHINERY							
1	Establishment of the Advanced Mechatronics, Robotics and Industrial Automation Laboratory (AMERIAL) in Support of the Metals and Engineering Industries	01-Jan-19 to 31-Dec-21 Extension 1 01-Jan-22 to 30-June-22	GIA	The AMERIAL is envisioned to create a pool of skilled and highly qualified workforce, and to become an accredited training and development facility in industrial automation. Through its service offerings such as the conduct of training programs, development of automation applications, promotion of research collaborations, and automation development for the MSMEs, the AMERIAL also aims to increase the manufacturing industry's productivity and raise the country's awareness of Industry 4.0 and its benefits.	Metals and Engineering Industry	PD	<ol style="list-style-type: none"> 1. AMERIAL Facility Launching June 16, 2021 2. Ongoing development of training curriculum in coordination with TESDA 3. Conduct of assessment activities in different regions (2021: Pangasinan, La Union, Kalinga, Isabela, Benguet, Mindoro, Laguna, Cavite, and Batangas) 4. Established 15 partnerships with different universities and industry 5. Conducted trainings on Introduction to PLC and Introduction to Automation Studio
2	Research on Advance Prototyping for Product Innovation and Development Using Additive Manufacturing Technology (RAPPID ADMATEC)	01-Jan-19 to 31-Dec-21 Extension 1 01-Jan-22 to 31-Dec-22	GIA	The project aims to increase the country's technical readiness, business sophistication, and innovation ratings by introducing one of the emerging (disruptive) technologies which is the Additive Manufacturing or AM. The project is foreseen to greatly contribute in the country's goal of becoming globally competitive and to prepare the industry and the academe for increased research and development activities, production of obsolete parts to increase availability and reliability of equipment, as well as improving manufacturing strategies and product quality. The established facility will be utilized in the research and development of products and materials while at the same time providing product development services, consultancy and training in additive manufacturing.	Metals and Engineering Industry	MPRD	<ol style="list-style-type: none"> 1. AMCen building inaugurated on June 14, 2021 2. Acquired various additive manufacturing technologies 3. Conducted Research and Development activities <ul style="list-style-type: none"> - 9 R&D Projects Completed - 12 Publications in Academic Journals and conferences – 2 published, 8 presented, 2 Submitted - 3 IP applications – 1 approved, 2 filed 4. Developed training programs for additive manufacturing <ul style="list-style-type: none"> - Train the trainers program – 15 Certified Participants of the ASTM AM General Certification course (9 – AMCen, 2 – Academe, 4 – DOST RO Representatives) 5. Added strategies for the operation and sustainability of RAPPID-ADMATEC and AMCen facility

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3	Development of Automatic Trash Rake (ATR) for Malabon	01-Feb-18 to 30-Nov-19 Extension 1: 1-Dec-19 to 31-March-20 Extension 2: 1-April-20 to 30-Sept-20 Extension 3: 1-October-20 to 31-Dec-20 Extension 4: 1-Jan-21 to 30-June-21 Extension 5: 1-July-21 to 31-Dec-21 Extension 6: 1-Jan-22 to 31-March-22	GIA	The project aims to install/establish ATR which is designed as an alternative measure to improve flood control operation through better trash collection rate with a capability to lift large-sized trash along the creek and de-clog drainage systems, along MaNaTuTi River System.	Metals and Engineering Industry	PD	1. Completed the following activities: -Installation of electrical works -installation of motors -reinstallation of rakes 2. The following activities are ongoing: - installation of controls - installation of chain guide -drafting of operations and maintenance manual
4	Refining Laterite-based Crude Pig Iron for Specific Product Applications	01-Apr-21 to 31-March-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	MPRD	1. Design and fabrication of the lab-scale crude pig iron refining equipment is 100% completed. 2. Production of Iron and Slag (1,000kgs) is 100% completed. 3. Production of dummy Pig Iron (943kgs) is 100% completed.
5	Study on the Suitability of Acrylonitrile Styrene Acrylate (ASA) as Material for a 3D-Printed Statue	01-Oct-21 to 30-Sep-22	GIA	The project aims to study the performance of Acrylonitrile Styrene Acrylate (ASA) as a suitable material for a 3D printed statue for local outdoor conditions.	Metals and Engineering Industry	MPRD	Unveiled the Dr. Jose P. Rizal, the Filipino Scientist Monument on December 30, 2021
6	Design and Development of Conveyorized Okra Dryer	01-Jan-22 to 31-Dec-22	GIA	This project aims to develop a conveyorize 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	PD	1. Conducted plant/site visit to finalize the layout of Conveyorized Okra Drying System 2. Submitted required documents to PSTC-Tarlac prior to project implementation

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7	A Pilot Application of IoT for Machine Shop Monitoring System of MIRDC	01-Aug-21 to 31-Mar-22 Extension 1: 01-Apr-22 to 30-June-22	Internal Project	This pilot project aims to provide the industry a locally developed machine shop monitoring system that will become a stepping stone for them towards Industry 4.0. This project is proposed to adapt and promote the use of Industry 4.0 technologies in the local industry to ensure efficient and accurate monitoring of selected equipment and machine shop operations, thus, optimizing shop capacity and increasing customer satisfaction.	Metals and Engineering Industry	PD	<ol style="list-style-type: none"> 1. Programming for machine monitoring system – ready for deployment 2. Ongoing design of control panel of tablets and microcontrollers 3. Ongoing programming of Web application
8	Formulation, Development and Characterization of Improved Pattern Wax Material for Investment Casting	01-Dec-21 to 30-Nov-22	Internal Project	This project will explore on introducing fillers such as Polyethylene, Ethyl Cellulose and Ethylene Vinyl Acetate for improved pattern wax material.	Metals and Engineering Industry	MPRD	Ongoing literature review and procurement of materials
9	Electropolishing Optimization for Additively Manufactured 316L Stainless Steel	06-Dec-21 to 06-Oct-22	Internal Project	This study aims to optimize electropolishing process for additively manufactured 316L Stainless Steel	Metals and Engineering Industry	MPRD	<ol style="list-style-type: none"> 1. Ongoing review of related literature and procurement of needed chemicals. 2. Ongoing Identification of parameters to be used
10	Development and Characterization of Hot-dip Aluminized Steel	07-Feb-22 to 06-Jan-23	Internal Project	This study will explore on an alternative process called hot-dip aluminizing (HDA). The researchers will focus on establishing process parameters and characterize the intermetallic layer formed. Tests to be conducted in the characterization are physical/visual test, coating bend test, tension test, metallography, identification of phases of the intermetallic layer using Scanning Electron Microscope (SEM) and Energy-Dispersive X-ray Spectroscopy (EDS), thickness of coating, and salt spray test.	Metals and Engineering Industry	MPRD	<ol style="list-style-type: none"> 1. Completed cutting of 100x75x4mm steel substrates 2. Ongoing chemical analysis of steel substrates using Optical Emission Spectroscopy
11	Three-dimensional printing of micron-sized glass by direct ink writing	01-Jan-22 to 30-June-22	Internal Project	The study will compare the porosity and optical transparency (reflectivity and optical clarity) of printed fused silica glass to those of commercial fused silica glass, including smooth surface value. This study broadens the range of materials available for 3D printing by allowing the production of arbitrary macro- and microstructures in fused silica glass for a variety of applications in industry and academia.	Metals and Engineering Industry	MPRD	Completed crushing and grinding of glass samples completed

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12	Design Improvement of Gear Shifting Mechanism for Riding-Type Rice Transplanter	01-Jan-22 to 31-Dec-22	Joint Research	The project is part of a tripartite agreement between PhilRice, MIRDC and Rollmaster Machinery and Industrial Services Corp that aims to improve the gear shifting mechanism of the riding-type rice transplanter transmission system.	Metals and Engineering Industry	PD	1. Awaiting for the signed MOA from PhilRice 2. Visited Rollmaster for the evaluation of existing transmission design
13	Development of Local Electric Kick Scooters (LEKS)	01-March-21 to 28-Feb-22 Extension 1: 01-March-22 to 30-June-22	Contract Research Project	The project aims to develop a prototype local electric kick scooter with locally developed security features and dynamic power adjustment which can serve as an alternative means of transportation during the new normal and post new normal periods.	Metals and Engineering Industry	MPRD	1. 3D printing of patterns for casting is ongoing 2. Casting of parts is ongoing
B. DEFENSE AND SECURITY							
1	Design Improvement and Sea Testing of a Remote-Controlled Weapons System (RCWS)	15-Jan-22 to 15-Oct-22	GIA	The project is an offshoot of the BUHAWI project. It aims to optimize the functionality and operation, such as charging and firing mechanisms to ensure the BUHAWI's dependability and efficiency.	Philippine Navy	PD	Integrated the control and mechanism system and mounted in a vessel for testing Target Tracking and Locking on simulations.
2	Rapid Prototyping of an Enclosure for a Large Surveillance Camera System	01-May-21 to 31-July-21 Extension 1 1-Aug-21 to 31-Dec-21 Extension 2: 01-Jan-22 to 31-May-22	Internal Project	The project aims to design and develop a functional prototype for an enclosure for Project BUHAWI's optical system using additive manufacturing technologies. The project is an Internal R&D funded by the AMCEN and BUHAWI project.	Metals and Engineering Industry	MPRD	1. Printed the parts for the surveillance camera 2. Ongoing revision for some parts 3. Conducted functional test

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C. HEALTH							
1	Development of Locum Artificial Body for Radiation Analysis and Testing (LAB-RAT)	01-Aug-21 to 31-July-22	Joint Research	This project aims to design and fabricate mouse models for use in radiation research. Specific objectives includes the development of two (2) whole-body mouse models with x-ray radiation properties close to that of an actual live mouse; and evaluation of the fabricated mouse phantoms in terms of x-ray radiation properties.	Metals and Engineering Industry	MPRD	<ol style="list-style-type: none"> 1. Conducted material evaluation 2. Finalized 3D models for the mouse 3. Conducted trial fabrication of mouse phantoms 4. Printed several molds for the mouse phantoms
2	Development of a Mechanical System for Connected Oxygen Concentrator	1-Aug-21 to 31-Jul-22	Internal Project	The project aims to to produce a locally developed oxygen concentrator, patent an industrial design, and collaborate among the participating institutions. The project is focused on the development and fabrication of a mechanical system for connected oxygen concentrators. The device has a goal to produce a flow of 10 liters per minute of oxygen enriched air by means of a system that entraps nitrogen content with zeolite granules.	Metals and Engineering Industry	MPRD	<ol style="list-style-type: none"> 1. Mechanical bench type system transferred to EPDC 2. Ongoing integration of electronics 3. Ongoing integration of zeolite
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 30-June-22	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	PD	2nd Free-Ride Operation of the HET from November 11 to December 03, 2021. The Project Team has finalized with PNR Management the resumption of the HET operation. The validation testing commenced on November 11 until December 3, and the six (6) loops per day to and from Calamba and Biñan Stations completed the required 150-hour testing

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E. CAPABILITY BUILDING							
1	Advancement of Information and Communications Technology (ICT) and Implementation of Information Security Management System (ISMS) in MIRDC – (AIM) - Year 2	01-Jan-22 to 31-Dec-22	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	<p>1. Information System Analyst (ISA) hired on Jan. 3, 2022. Computer Maintenance Technologist and Project Assistant hired on Jan. 24, 2022. Hiring process completed with coordination and assistance from FAD HR.</p> <p>2. The out-sourced system was presented on Feb 21, 2022. Overall accomplishment as of Mar. 1, 2022 is 80% completed.</p> <p>3. Fixed/resolved requirements based on Jan. 14, 2022 meeting update. Stock card feature completed, subject for presentation to end-users within first week of March 2022</p> <p>4. Prepared/submitted Project Procurement Management Plan (PPMP) FY 2022. Prepared/submitted Purchase Request (PR) for equipment outlay. Revised/Submitted PPMP per current requirements.</p> <p>5. Presented the new version of OneShop on Feb. 22, 2022. Prepared/Updated the user manual to be completed on March. To be scheduled for presentation with TSSS.</p> <p>6. PR up to PO for the repair of LAN in Copper has been completed. The supplier started the LAN expansion/upgrade in Copper building and will be finished once the cubicle (c/o MPRD construction project) has been installed.</p>

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2	Establishment of a Mold Technology Support Center (MTSC) -Year 2	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	Total MTSC Trainees for 2022 Q1 of 2022 (Local MTSC Trainers) - 837 Q1 of 2022 (Foreign MTSC Trainers) - 0 Total 837 Ongoing construction of MTSC Building
3	Establishment of Metals and Engineering Innovation Centers in Cordillera Administrative Region (CAR), Regions I, II, III and X - Year 2	01-Aug-20 to 31-July-22	GIA	<p>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.</p> <p>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.</p>	Metals and Engineering Industry	DED-RD / TDD	1. Ongoing Fabrication and Design Drawings and Finalization of R&D Designs and Drawings of DMMMSU, CSU, USTP, IFSU, and NEUST. 2. Canvassing of the materials is ongoing both on the near proximity area and Metro Manila. 3. Ongoing procurement of materials and consumables of DMMMSU, CSU, USTP, IFSU, and NEUST 4. Ongoing preparations for the pilot testing (brochures, survey forms, video materials) for the market study in IFSU, DMMMSU, UST, CSU, and NEUST by the MEIC project staffs. 5. Conducted face to face technical trainings on Machine Shop Operations at DMMMSU and IFSU

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4	Towards Leveling-Up Onelab for Research and Innovation	01-Feb-21 to 31-Jan-22 Extension 1: 01-Feb-22 to 30-Apr-22	GIA	The project aims to enhance the capabilities of DOST laboratories to provide higher level of service offerings and better support the needs of the MSMEs. Specific Objectives: The project specifically aims to: 1. Level-up laboratory services through provision of shop floor R&D and innovation activities 2. Sustain delivery of laboratory services backed-up with secured IT-based laboratory information management system 3. Strengthen the Onelab network through robust referral system 4. Draw up sustainability options and future direction of DOST laboratories	Metals and Engineering Industry	ATD	<p>1. Status of Three (3) R&D activities:</p> <p>a.) Characterization of Intramedullary Nails used in the Philippines through Mechanical and Chemical Properties Determination submitted in Malaysian Orthopedic Journal last December 2021.</p> <p>b.) Effects of Machining Parameters on the Mechanical Properties of AISI 4340 Material will be submitted for publishing (Non Peer) at Phil Metal.</p> <p>c.) Technical Support and Evaluation of the Hybrid Train (HET) was extended until July 3, 2022.</p> <p>2. Three (3) R&D related trainings via web were attended by five (5) ATD staff last March, May and October 2021. MIRDC has accomplished 125% of the target for training.</p> <p>3. Conducted an on-line survey to determine the services being availed. Out of 180 respondents only 38 or (21%) responded. These were the feedback from ATD'S customer on how they encountered issues in availing laboratory services and on how MIRDC can serve them better as well as the purpose of availing the services.</p> <p>4. Physical targets of all indicators were attained.</p>
5	Strengthening the S&T Technical Services in the National Capital Region through Capacity Building on Metals and Engineering	02-Nov-21 to 31-Oct-22	GIA	The project will provide series of technical trainings and immersions which aims to capacitate SETUP Beneficiaries in the Metals and Engineering Sector and the DOST NRC's personnel from the Clustered Area Science and Technology Center (CASTC) who facilitates the conduct of Technology Needs Assessments (TNA).	Metals and Engineering Industry	TDD	<p>1. No. of Meetings Conducted: 2 meetings</p> <p>2. No. of Webinars Conducted</p> <p>a.) Non-Technical Training Programs – 4 Webinars</p> <p>b.) Technical Training Programs – 11 Webinars</p>



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6	Competency Management System and Assessment (CMSA) for DOST-MIRDC	01-Sep-21 to 31-Aug-22	GIA	The project's goal is to help DOST-MIRDC transition to a competency-based HR system by bringing in subject matter experts to help in the development and design of competency assessment instruments and systems.	Metals and Engineering Industry	FAD	CMSA Ph II Accomplishments: 4 Webinar Sessions were conducted highlighting the ff: Review of PD Position Profiles and SG 24 across MIRDC; crafting of General Description of the Division; Functional Description of the Section and Basic Purpose of the Positions; The concept of Linear Analysis which is vital in coming up with the Major Duties and Responsibilities were discussed. During the workshops, participants presented their outputs and were validated by the Consultant.
F. GAA-LFP PROJECTS							
1	Upgrading of MIRDC Laboratory and Administrative Building	01-Jan-18 to 31-Dec-22	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	Upgrading of MIRDC Laboratory and Administrative Building 2020-LVSG Ph. I - 100% 1. Completed the construction of Powerhouse (Transformer vault and LVSG Room). 2. Completed the supply and installation of all switchboard, panelboard, raceway and cables and concrete encasement. 2021-LVSG Ph. II - 95% 1. Completed all the supply and installation of all raceway and cables to each electrical panel board inside Gold Building. 2. Awaiting for the transformer to be delivered by Meralco, prior cable termination of each panel board (remaining 5% works).

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2	Repair of Perimeter Fence of the Center	01-Jan-18 to 31-Dec-22	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	<ul style="list-style-type: none"> 1.) Conducted Site preparation such as survey layout, trimmings and stake out. 2.) Excavation Works done for 2 lengths . (11.5m & 15.9m) 3.) Conducted lean concrete pouring for 15.9m length 4.) Rebar works for footing and ongoing vertical & horizontal bars for walls 5.) Installation and dismantling of Formworks of footing 6.) Concrete pouring of footing

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