



COORDINATING MINISTRY FOR ECONOMIC AFFAIRS
THE REPUBLIC OF INDONESIA



NATIONAL ECONOMIC COUNCIL
REPUBLIC OF INDONESIA



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INCLUSIVE ENERGY TRANSITIONS IN SOUTHEAST ASIA AND BEYOND

Cross-Regional Learning from South Asia

10–12 February 2026 • Jakarta, Indonesia



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INCLUSIVE ENERGY TRANSITIONS IN SOUTHEAST ASIA AND BEYOND

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PHILIPPINES

Education and Skills Ecosystem for JET

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Tri-focalized Education System

**CHED |
State
Universities
& Colleges**

Future
industry
and work

Future
knowledge

**TESDA |
TVET**

Future
Skills

**DepEd |
K-12**

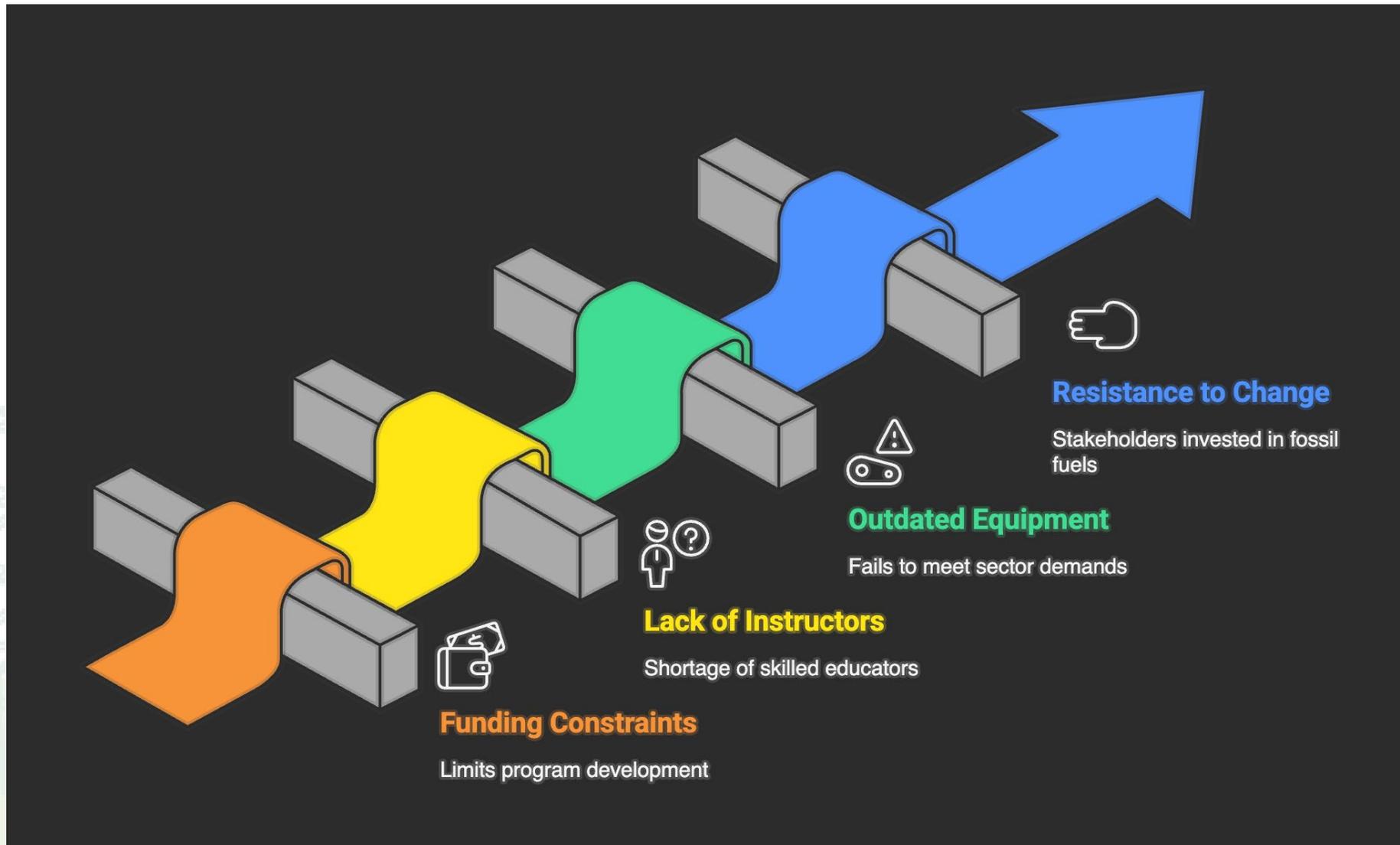
Education, Skills, and Jobs Agenda

- **Trabajo Para Sa Bayan Employment Plan 2025–2034:** 13 priority sectors, addressing gaps in legislation and research agenda to generate quality jobs while fostering competitiveness and innovation in the private sector
- **National Education and Workforce Development Plan,** five sectors with high value-addition and job creation potential, to target absorption.
- **Enterprise-based Education and Training Act,** to facilitate on the job training, transfer of new skills and know-how, and increase career advancement. Immediate apprenticeship and on the job training options for workers.

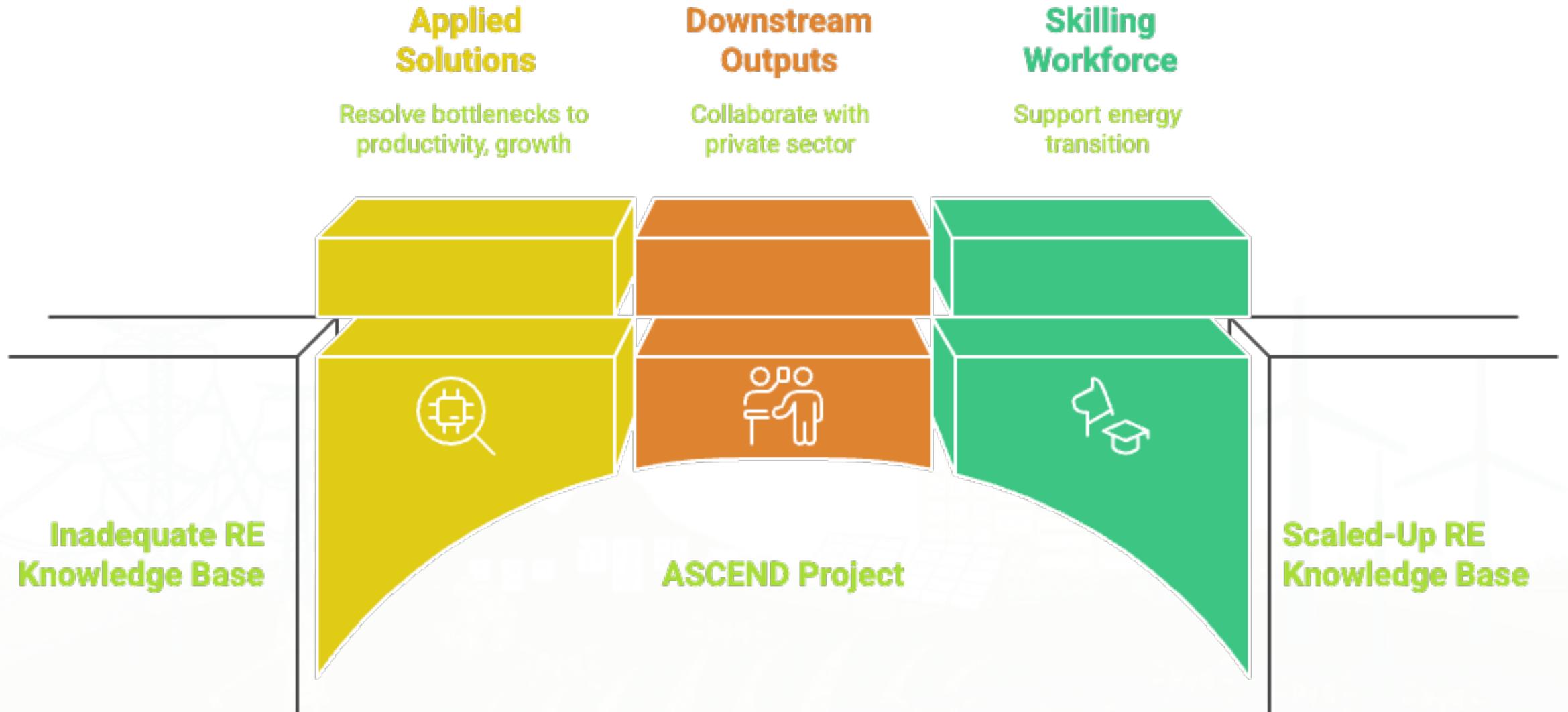
Example of Priority, shortage, and urgency of skills for battery manufacturing

Operational areas	Skills areas	% of firms indicating as priority skill	% of firms reporting skill shortage	% of firms requiring skills immediately
Battery Design & Materials	Electrochemistry knowledge	44%	63%	58%
	Materials science (cathode/anode)	71%	77%	51%
	Lithium-ion cell productions	60%	76%	42%
	Solid-state cell production	33%	61%	44%
	Battery management systems (BMS)	13%	43%	43%
Production & Assembly Operations	Dry room operations	40%	59%	50%
	Humidity control protocols	71%	51%	41%
	Cell stacking and formation	40%	67%	33%
	Automation and control systems for battery production	25%	86%	50%
Testing, Software & Safety	Battery testing and validation	29%	44%	63%
	Electrical load cycling tests	44%	58%	38%
	Thermal management systems	58%	56%	47%
	BMS software programming	36%	70%	50%
	Safety protocols for chemical handling	29%	63%	31%
Recycling & End-of-Life	Recycling process expertise	22%	75%	50%
	Battery recycling processes	49%	59%	52%
	Battery end-of-life management	45%	68%	44%

Commonly found issues



ADB's work with GOP to resolve these barriers



Technical Education And Skills Development Authority (TESDA)

Jacqueline Ali
Chief TESD Specialist

Context



“The Philippines’ renewable energy sector is set for rapid growth, creating opportunities for green jobs and sustainable economic development. However, a limited and under-skilled workforce risks constraining this expansion.” (Bayan Innovation Group, 2025)

National Renewable Energy Program (NREP) targets to meet climate and energy goals:

35 %
2030

50 %
2040

Projected Labor Demand (ILO projection)

2023 → Target (2030)
~120,000 4x Growth **~470,000**

In-Demand Occupations and Skills in RE by 2030



Solar PV Installers & Technicians



Turbine Technicians



Power Plant Maintenance Engineers



Project Managers & Site Supervisors



Battery Energy Storage Systems (BESS) Specialists



Environmental & Social Safeguards Specialists



Finance & Policy Experts

Bayan Innovation Group. (2025). Green jobs renewable energy industry sectoral skills situation report (Unpublished report).

Gaps/Challenges



Limited Standards/Curricula



Limited developed TRs/CS, higher & diploma on green energy-related



Limited of fully assessable green TVET programs



Trainer Capacity



Small pool of certified green skills trainers



Many trainers lack utility-scale RE site experience



Limited industry-to-training pipeline



Equipment and Facilities



Limited training centers with panels, inverters, mounting systems & other required equipment



No access to grid-tie equipment for practice



Insufficient test & measurement tools



Geographic Mismatch



Training centers concentrated in urban areas (Metro Manila, Cebu)



Solar projects located in rural provinces (Central Luzon, Ilocos)



Urgent need for mobile units & community-based programs



Limited Industry Engagement



Employers are often not involved in designing courses and curriculum



Training programs disconnect behind current industry needs



Weak apprenticeship & OJT systems



Limited Innovation and Resource Constraints



Limited access to funding/financing support



Weak applied innovation and prototyping spaces



Limited industry-driven co-creation



Low capacity to localize and adapt solutions

Snapshot Example of Gap

7 Training Regulations (TRs)

- Biogas Plant Installation NC III
- PV System Design NC III
- PV Systems Installation NC II
- PV System Servicing NC III
- Electrical Installation and Maintenance NC II
- Electrical Installation and Maintenance NC III
- Electrical Installation and Maintenance NC IV

2 Competency Standards (CS)

- Wind Turbine Maintenance Services III
- Energy Efficiency and Conservation IIII

3 TESDA Online Program Course

- Photovoltaic Systems Installation NC II
- Energy Efficiency and Conservation II
- Solar Night Light Assembly

Electrical Installation and Maintenance (EIM)

120 Number of Registered Institutions

Number of Persons Certified

Program	Female	Male	Total
EIM II	2,505	30,010	32,515
EIM III	34	560	594
EIM IV	3	7	10

Photovoltaic (PV)

54 Number of Registered Institutions

Number of Persons Certified

Program	Female	Male	Total
PV System NC III	0	0	0
PV Installation NC II	102	775	877
PV Servicing NC III	1	3	4

Automotive

54 Number of Registered Institutions

Number of Persons Certified

Program	Female	Male	Total
Automotive Painting NC II	0	1	1
Automotive Servicing (Chassis Repair) NC II	26	550	576
Automotive Servicing (Electrical Repair) NC II	14	471	485
Automotive Servicing (Engine Repair) NC II	91	2,928	3,019
Automotive Servicing NC I	470	10,878	11,348
Automotive Servicing NC III	4	107	111
Automotive Servicing NC IV	7	63	70
Automotive Wiring Harness Assembly NC II	66	55	121

ITESDA. (2025, October). Compendium of registered programs (Internal document).

TESDA, Certification Office. (n.d.). Number of persons certified by sector by qualification, January 1–April 30, 2025 (T2MIS-generated RWAC data; Internal document).

Stakeholders at the Center of Transition



Learners & Workers

The heart of the transition;
beneficiaries of mobility.



Trainers & Assessors

Frontliners delivering skills
and ensuring quality.



Industry & Employers

Defining needs and
providing green jobs.



TVET Institutions

Public & private providers
of skills development.



Government

Enabling policy
frameworks and financing.



Human-Centered



**Equitable, Inclusive
& Accessible**



Relevant & Meaningful



**Quality-assured,
Reliable & Credible**

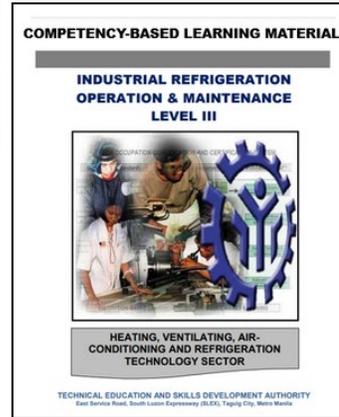
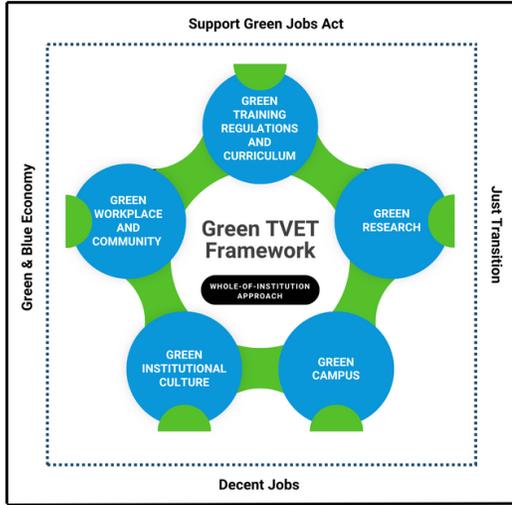


Sustainable & Regenerative



**Ethical, Just,
Responsible & Lawful**

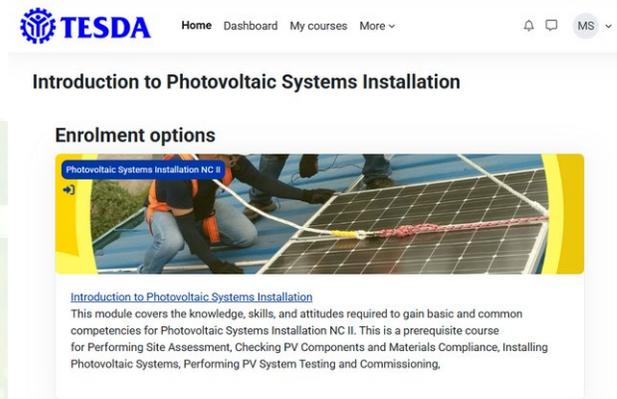
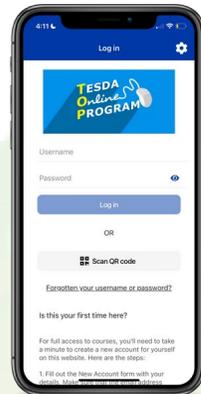
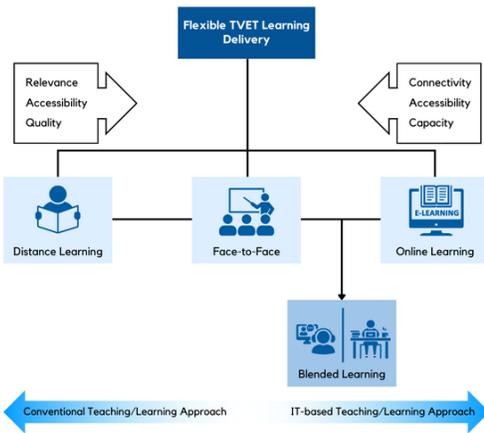
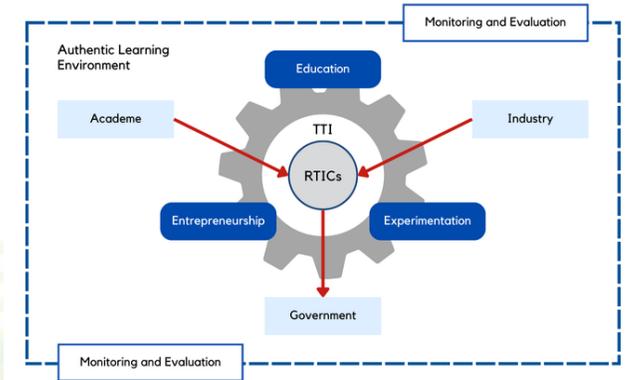
TESDA Initiatives



TESDA Women's Center



INNOVATION FRAMEWORK



Partners:



Developing the Green Skills Framework: SustainABLE Project



Understanding Needs

Labor Market Information (LMI), auditing the ecosystem, and stakeholder consultations

Project:

SustainABLE Project : Building Capacity for a Greener Workforce

6 Identified Priority Jobs:

- Solar PV Installer / Technician
- Wind Turbine Technician
- Battery Energy Storage System (BESS) Specialist
- Renewable Energy Project Engineer
- SCADA / Grid Modernization Technician
- Energy Conservation Officer (ECO)

8 TRs and CS aligned to Priority Jobs

- PV System Design NC III
- PV Systems Installation NC II
- PV System Servicing NC III
- EIM NC II, III, and IV
- Wind Turbine Maintenance Services III
- Energy Efficiency and Conservation IIII

30 Identified Green Skills

- PV-specific Safety Protocols (Arc-flash, DC isolation)
- Waste Handling (packaging, damaged panel disposal)
- Basic PV production simulation (yield estimation)
- Composite Materials Repair (blades), etc.

Recommendation:

- Industry-specific skilling through Enterprise-Based Education and Training (EBET)

Recommendations:

- Implement micro-credentials for skilling and upskilling
- Enable stacking on existing qualifications
- Develop stackable learning pathways
- Support integrative, contextualized, and personalized TVET

Bayan Innovation Group. (2025). Technical Working Group Meeting 1 Renewable Energy Sector (Unpublished report).

TVET Initiatives

Framework Development

Developing the **Green TVET Skills Framework** to support the Green Jobs Act.

Strategic Outcome

Effectively **matching skills** with actual labor market needs to ensure employment and productivity.

Energy as a Critical Connector

Energy is not just a sector; it **fuels all industries**.

Interconnected Roles: Skills in energy apply across construction, transport, and manufacturing, etc.

Mobility: Ensuring learners and workers can move easily in education and career paths and across the green jobs ecosystem.

Tangible Outcomes: Accessible green skills that lead to real employment, livelihoods, innovation and felt impact for all.



Mariano Marcos State University

Dr. Virgilio Julius Paraoan Manzano Jr
University President

National Renewable Energy Program (NREP) Goals & Objectives



Energy Security

Accelerate exploration and development of RE resources to achieve energy self-reliance and reduce dependence on fossil fuels.



Sustainable Development

- Contribute to the SGD Goals
- Balance economic growth with protection of health and environment



Climate Change Mitigation

Reduce Greenhouse Gas and other harmful emissions.



Capacity Building

Institutionalize the development of capabilities in the use of RE systems.



Inclusive Growth

Catalyze solutions to cross-cutting social issues including poverty, gender, and access to basic needs.



National Renewable Energy Program 2020 - 2040



*In Pursuit of Energy Security
and Sustainable Future!*

35% RE Share
in the power generation
mix by 2030

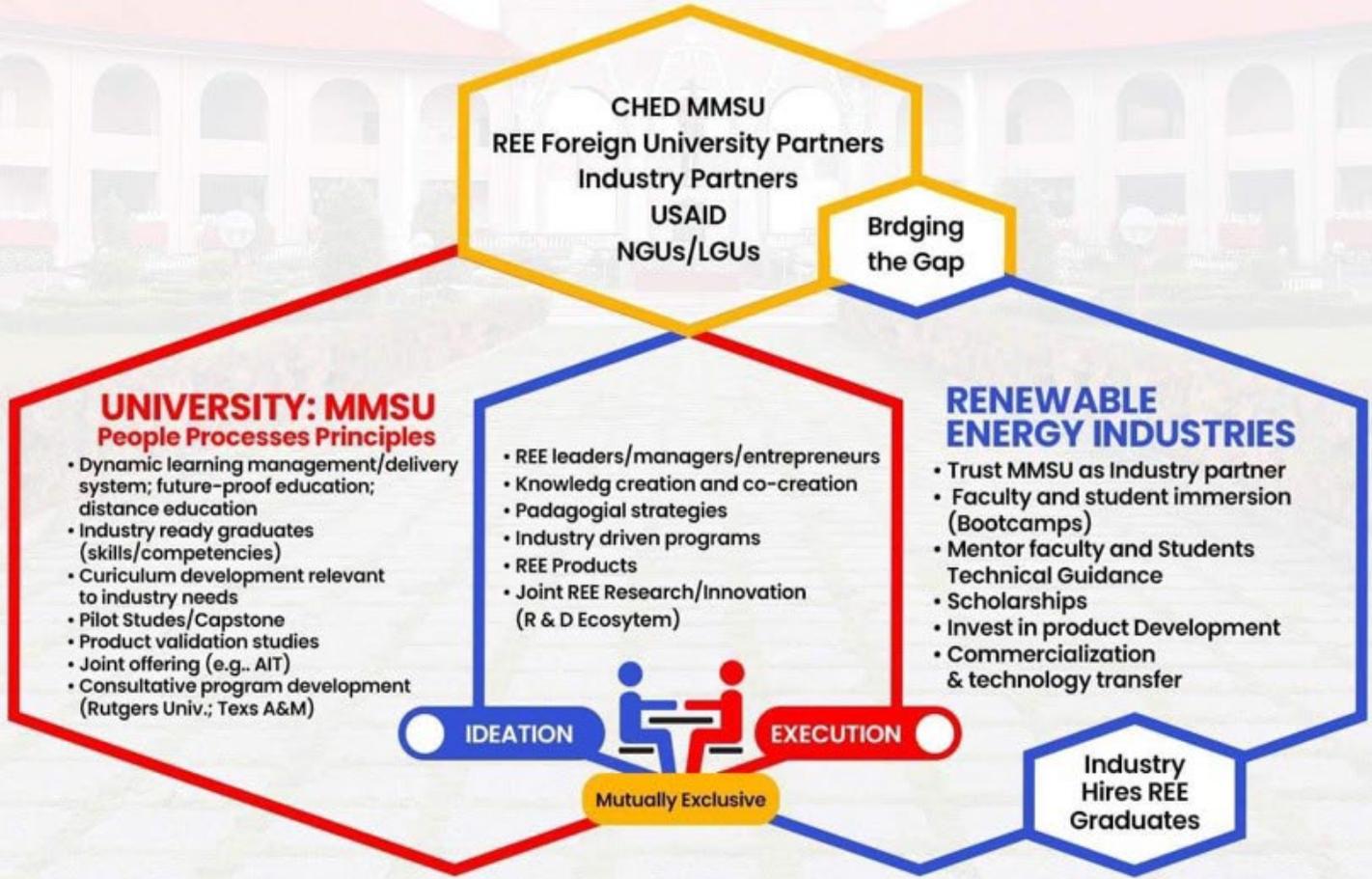
NREP works to drive
**RE Share to greater
than 50% by 2040**

Key innovation hubs:

- **NBERIC (National Bioenergy Research and Innovation Center)**
- **AREC (Affiliated Renewable Energy Center)**



PROFESSIONAL SCIENCE MASTERS - RENEWABLE ENERGY ENGINEERING (PSM-REE)

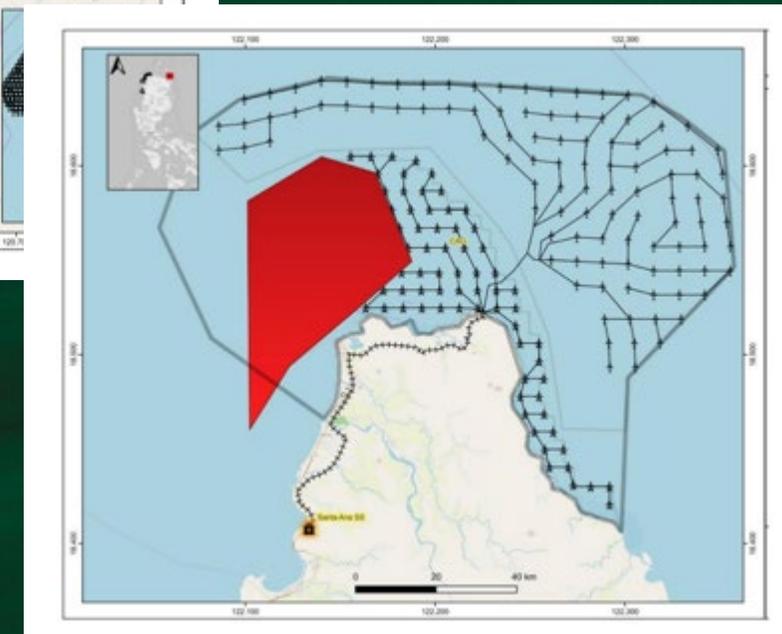
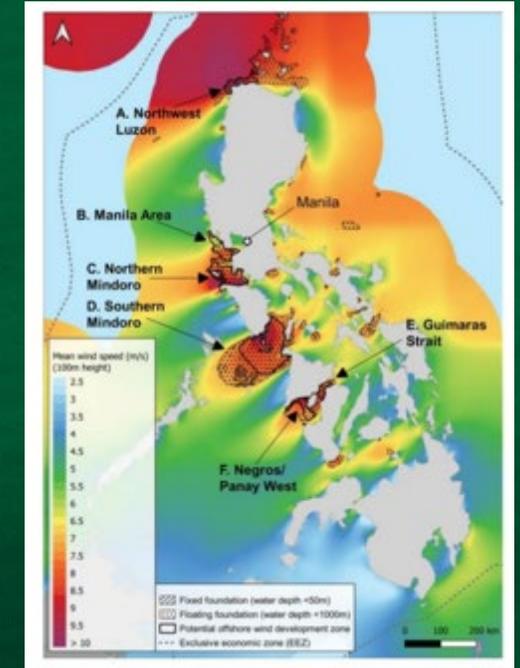
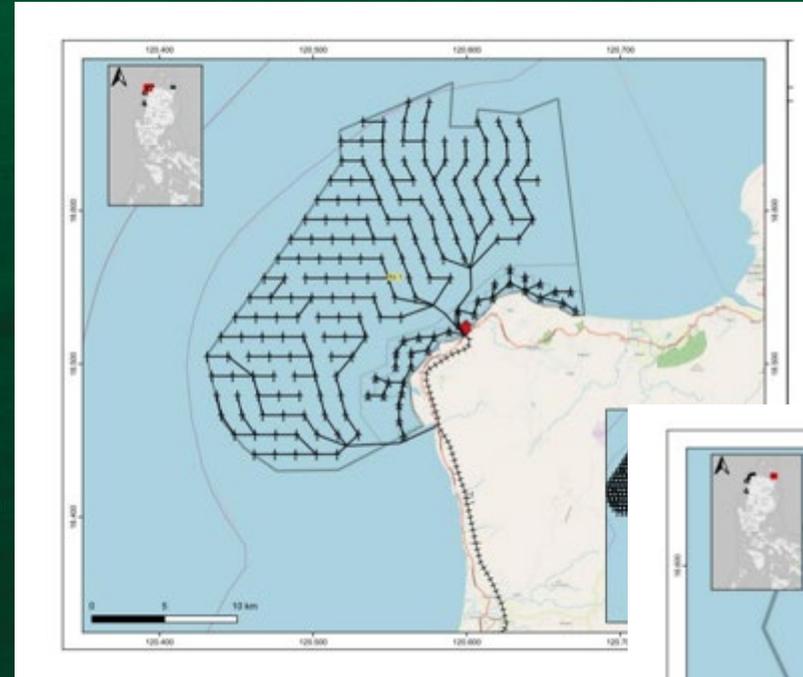
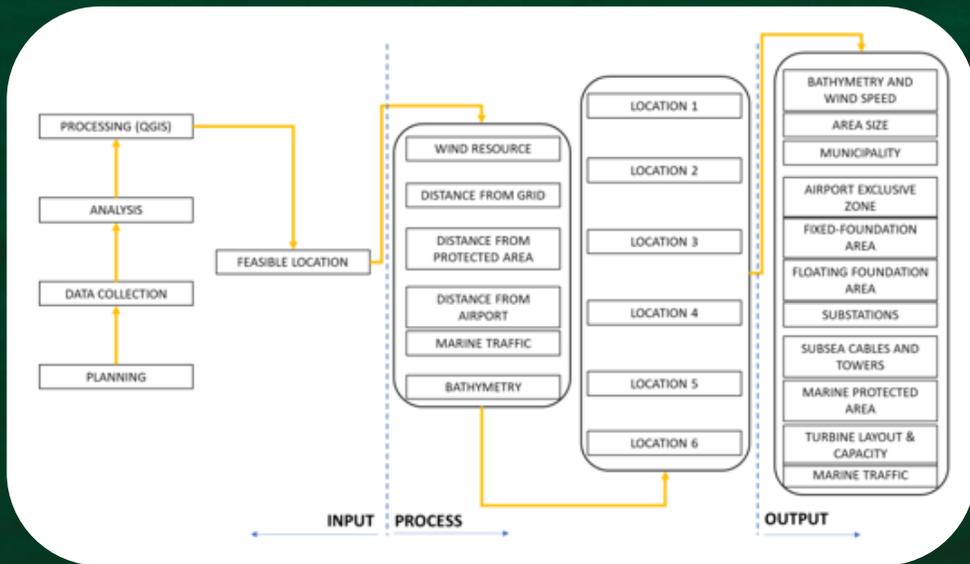


PROFESSIONAL SCIENCE MASTERS - RENEWABLE ENERGY ENGINEERING (PSM-REE)



PSM-REE Capstone Projects

Assessing the Viability of Offshore Wind Farms in Northern Luzon for Renewable Energy Production in the Philippines by Richard Elbert Don T. Ignacio



PSM-REE Capstone Projects

Optimization of Safety Management
Protocols of Selected Solar PV Operating
Plants in Luzon, Philippines

by Cheryll M. Ignacio



Figure 10. Signages Found at the Laguna Solar Farm.
(April 15, 2023, Laguna Solar Plant)

▶ Public education for:

- Farmers
- Youth
- Local officials



▶ DOE-designated extension arm in Northern Luzon



MMSU



MMSU, DOE train LGU executives on renewable energy governance

▶ Training for LGUs on RE Planning and Budgeting



▶ Established Ilocos Norte Solar PV Homeowners Association

▶ Advocated Net Metering Policy reform

Result: Permanent rollover of solar energy credits
Institutionalized via DOE Circular (August 2024)



CHED-funded Project:

Development of Degree Programs in Advanced Energy and Green Building Technologies (AEGBT) in support to RA 11393

Implementation Period: October 2023 – June 2024

Expected Outputs:

- Enhanced PSM-REE Program
- Approved degree programs: BS REE (ladderized), MS AEGBT



MMSU RENEWABLE ENERGY PATHWAYS

BSREE & PSMREE + Microcredentials

(A pathway from degree programs and stackable microcredentials to a job-ready renewable energy workforce)

Academic Programs

BS Renewable Energy Engineering (BSREE)

RE fundamentals, power systems, thermodynamics, design projects.

- Builds core RE engineering skills.
- Host program for entry-level workforce.

PSM Renewable Energy Engineering (PSMREE)

Advanced RE systems, TEA, policy, modeling, industry immersion.

- Bridges technical and managerial roles.
- Prepares leaders for RE projects.

Stackable Learning

Senior HS → BSREE

↓ Microcredentials (Solar, Wind, Biomass, EEC)

→ PSMREE → Industry Roles

Microcredentials (Stackable and Standalone)

Solar Energy Systems

TESDA and NABCEP certification

PV design, sizing, storage, safety, installation, grid/off-grid integration.

- BSREE – PV Systems Installation (TESDA)
- PSMREE - PV Systems Design and Installation (NABCEP)

Wind Energy Systems

TESDA and GWO certification

Wind resource basics, turbines, O&M, Safety.

- BSREE: Wind tech intro • PSMREE: Resource analysis & wind portfolios

Biomass & Bioenergy Systems

AEE certification

Feedstock, Processing, Thermal Conversion, Basic TEA.

- BSREE: Bioenergy applications • PSMREE: WtE design & full TEA

Energy Efficiency and Conservation

DOE and AEE certification

Energy audit methodology, energy management systems (ISO 50001/50002), monitoring & control, energy conservation planning.

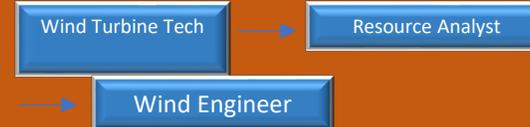
- BSREE: Energy Audit • PSMREE: Energy Manager

Workforce Pathways

Solar Path



Wind Path



Biomass Path



EEC Path



Outcomes

Job-ready RE technicians and engineers.

Aligned with global norms (TESDA, NABCEP, GWO, AEE).

Supports PH clean energy and RA 11393 goals.

Collaborative Initiatives and Partnerships



Texas A&M prof wraps up balik-scientist service in MMSU

Just like his previous engagements with the Mariano Marcos State University, Dr. Sergio C. Capareda has productively completed his 46-day stint as balik-scientist. He helped the university boost its biomass renewable energy production.



MMSU, US Grains Council sign MOU to advance PH's biofuels industry

The United States Grains Council (USGC) has partnered with the Mariano Marcos State University to position the National Bioenergy Research and Innovation Center as a hub for a sustainable biofuels industry in the Philippines and in Asia.



BALIK SCIENTIST PROGRAM EXIT CONFERENCE OF DR. FIORELLO B. ABENES

NBERIC CONFERENCE HALL
DECEMBER 6, 2022 | 1:30 PM



DR. FIORELLO B. ABENES
Balik-Scientist
Professor Emeritus
California Polytechnic University, USA



UK-based firm presents nanoparticle solar cells to MMSU researchers, students

Regius Energy Corporation, a global multi-energy company based in the United Kingdom, has introduced the nanoparticle thin film solar cells to Mariano Marcos State University in a seminar held yesterday, June 7, at the Center for Flexible Learning.

Image Source: MMSU Facebook Page

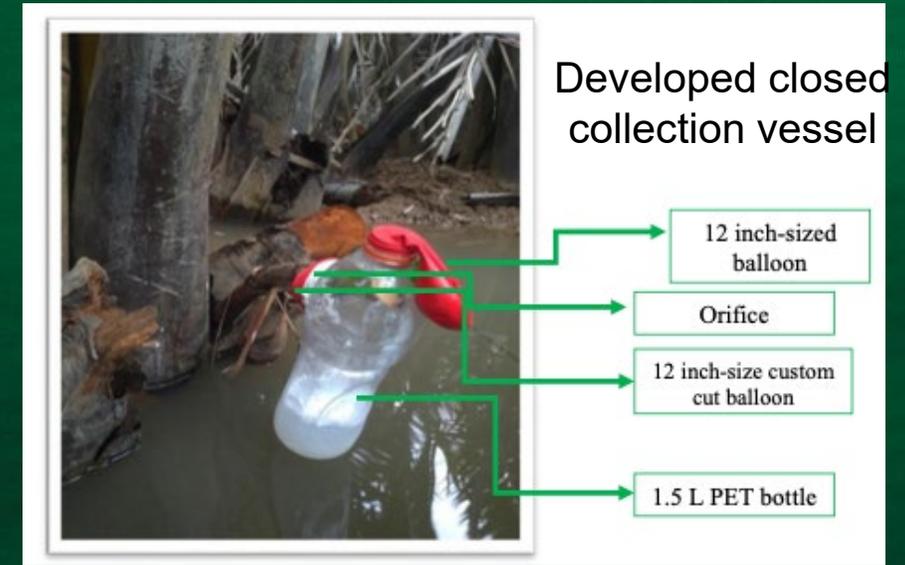


What we Propose

- **To upskill human capital in the RE to achieve the Philippines' energy transition goals effectively:**
 - **Co-design micro-credentials & internships with industry/NGOs**
 - **Need for increased capacity building and education, collaboration, research, and innovation**
 - **Fund more living-labs and trainer-training**
 - **Place graduates in pilot sites; measure jobs created & kW installed**
 - **Need for sustained efforts for a sustainable energy future**
 - **Implement soonest the Accelerating Sustainable and Clean Energy Development (ASCEND) project**



MMSU-NBERIC Technologies to produce 95% Hydrous Bioethanol



Anaerobic-anaerobic collection trial





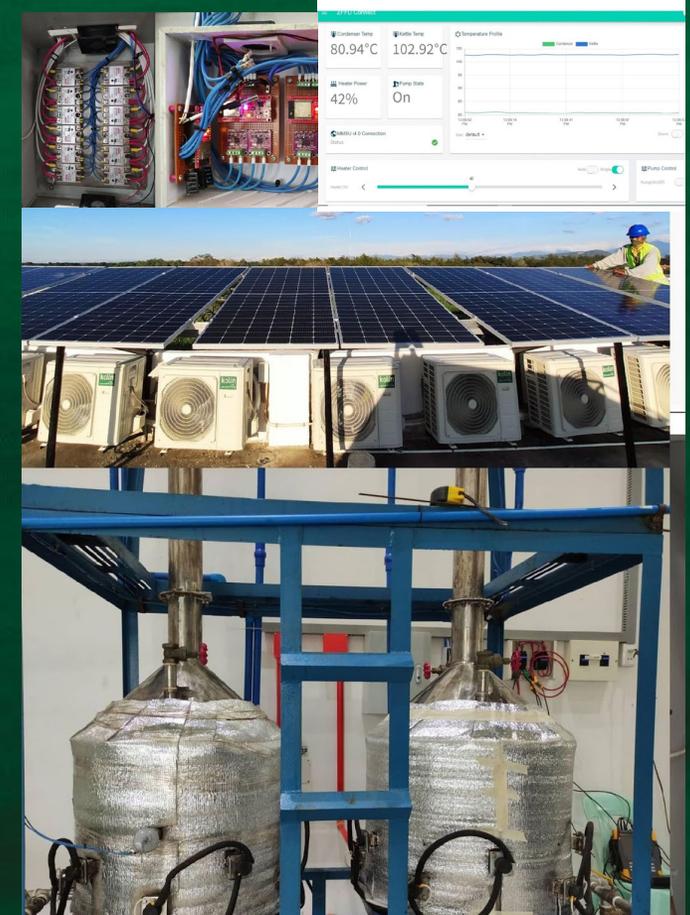
MMSU-NBERIC Technologies to produce 95% Hydrous Bioethanol



Traditional lambanog technology



Multi-feedstock Bioethanol Distilling Facility



Zero-fossil fuel Bioethanol Distilling Facility



Adoption of 95% Hydrous Bioethanol as Fuel-Blend

Table 5. Estimated Impact on Gasoline price using Anhydrous Ethanol Blend

	I	II	III	IV	V
Anhydrous Ethanol Blend, %	10%	15%	20%	25%	30%
Gasoline, ₱/liter	62.08	58.63	55.18	51.73	48.28
Ethanol, ₱/liter	5.56	8.07	10.59	13.1	15.62
Total Cost of Anhydrous-Gasoline Blend per liter	67.64	66.7	65.77	64.83	63.9
*Estimated Impact to Gasoline, ₱/liter	-1.34	-2.28	-3.21	-4.15	-5.08

*Cost of 100% Gasoline 68.98 ₱/liter

Source: June 21, 2022 presentation on Biofuel Committee hearing.

Legend: *DOE-OMB monitored 2022 First Quarter, average.

Table 6. Estimated Impact to Gasoline price using MMSUhBE95

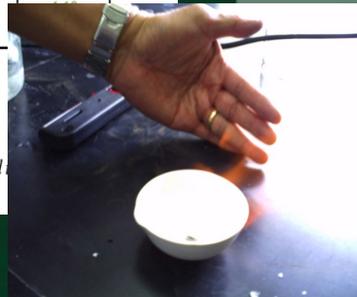
	I	II	III	IV	V
MMSUhBE95	10%	15%	20%	25%	30%
Gasoline	62.08	58.63	55.18	51.73	48.28
**ETOH	4.38	6.89	9.41	11.92	14.44
Total Cost of Anhydrous-Gasoline Blend per liter	66.46	65.52	64.59	63.65	62.72
*Estimated Impact to Gasoline Price per liter	-2.52	-3.46	-4.39	-5.33	-6.26
Advantage of Gasoline price using MMSUhBE95% over Anhydrous ethanol blend	1.18	1.18	1.18	1.18	1.18

*Cost of 100% Gasoline 68.98 ₱/liter

Legend:

*DOE-OMB monitored 2022 First Quarter, average.

**Far East Alcohol, Corporation. ₱1.18 dehydration cost per liter which can be deducted dehydrating hydrous ethanol into anhydrous.





MMSU-NBERIC Bioethanol-Based Products





MMSU-NBERIC Towards Net-Zero Facility





Community EMPOWERMENT through Government-distributed Bioethanol Facilities





NBERIC's Straight Direct Talk tackles renewable energy and sustainability

STRAIGHT DIRECT TALK with NBERIC

SESSION 3
ENERGIZING YOUNG MINDS FOR RENEWABLE ENERGY AND A SUSTAINABLE FUTURE

RESOURCE SPEAKER
DR. IAN DOMINIC F. TABAÑAG
Science and Technology Fellow
DOST-PCIEERD

NBERIC AUDITORIUM
NOVEMBER 26, 2025
9:00 AM - 4:00 PM

FOLLOW US NOW
NBERIC.MMSU

STRAIGHT DIRECT TALK with NBERIC
SECOND EDITION

SESSION 1
BIOLOGICAL AND THERMOCHEMICAL CONVERSION OF BIOMASS

RESOURCE SPEAKER
DR. HYUNGSEOK NAM
Associate Professor,
School of Mechanical Engineering
Kyungpook National University,
South Korea

NBERIC AUDITORIUM
JANUARY 09, 2026
9:00 AM - 12:00 NN

FOLLOW US NOW
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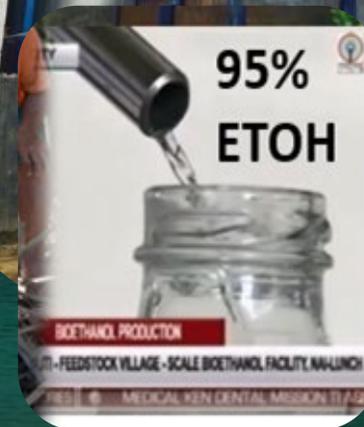




Vertical INTEGRATION OF COMMUNITY in the Mainstream Bioethanol Industry



Fuel-grade bioethanol will be sold to large-scale industries through a partnership agreement with SRA BRDE through EPAP



UNIVERSITY OF SCIENCE & TECHNOLOGY OF SOUTHERN PHILIPPINES

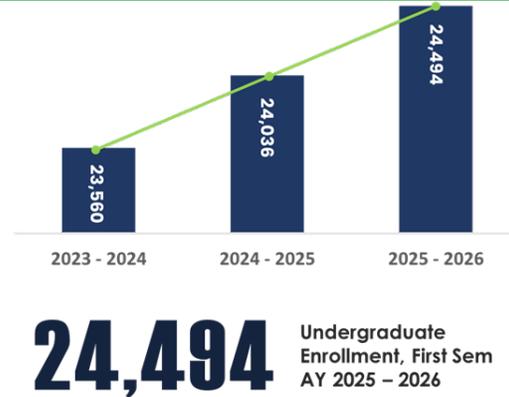
Dr. AMBROSIO CULTURA
University President

USTP's Profile and its Initiative in Energy Transitions



1000-1500th overall ranking
2024 Times Higher Education (THE)
Impact Rankings

USTP is located in Southern part of the Philippines, in Mindanao, which offers a strategic locational advantage for the institution to train and develop students from all the other regions in Southern Philippines. USTP is **one of the 19 leading universities in the Philippines**



1,184
Total Number
of Teaching Personnel
across USTP System

24,494 Undergraduate Enrollment, First Sem AY 2025 - 2026

Some of the USTP's Energy Transitions Completed Projects

1. Installation and Operation of Hybrid Renewable Energy Systems (25kW)
2. Capacity Building of the Installation of Solar PV Systems (RE start ups)
3. Offering of Courses Related to Renewable Energy (Graduate and Undergrad courses)
4. Modular Courses in Energy for Power Engineers
5. Evaluation, Monitoring and Assessment of Household Electrification Project



USTP ranks in 3 World University Rankings for Innovation (WURI) Categories for 2024



Platinum Awardee
3rd ITSO
President's
Summit



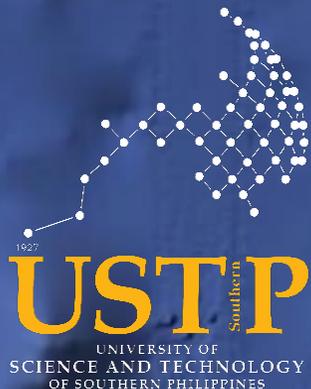
PCIEERD KABALIKAT
AWARD
University TBI
Awardee for 2020



Philippines Top
10,000 Scientists
AD Scientific Index
2024

USTP: Trailblazing the Energy Transition in Northern Mindanao

Northern Mindanao is the Coal Power Hub of Mindanao – making it a strategic Region for managing both energy security and the energy transition



GN Power Kauswagan Power Plant 552MW

LAGUINDINGAN AIRPORT

PROPOSED LAGUINDINGAN TECHNOPARK

PROPOSED AYALA LAND PREMIER

AGROPOLIS S&T PARK (USTP CLAVERIA)

GINGOOG CITY

Balingasag Power Station (Minergy) 165 MW

FDC Misamis Coal Units 135 MW

VILLANUEVA S&T PARK (USTP VILLANUEVA)

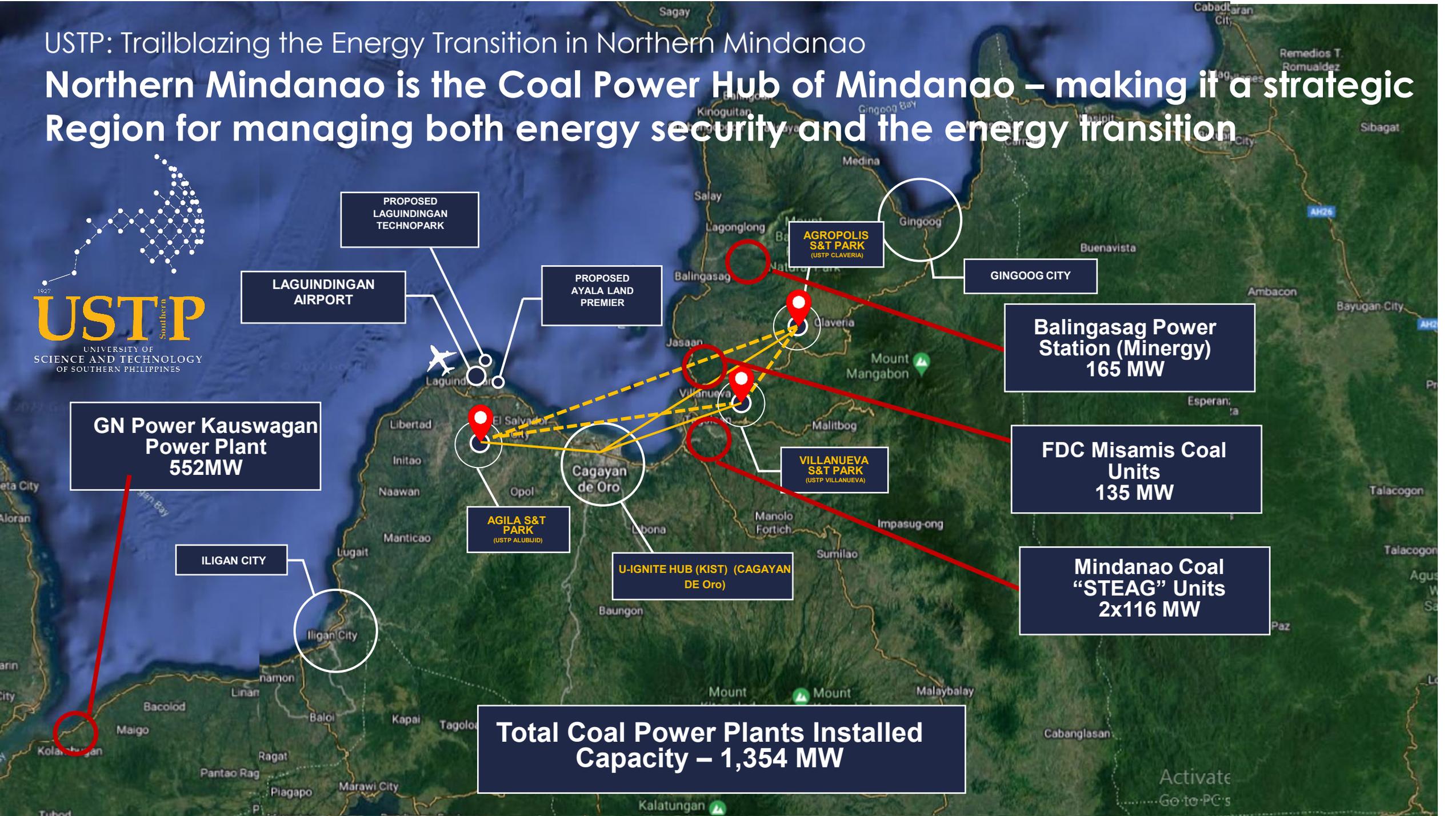
AGILA S&T PARK (USTP ALUBUIJID)

U-IGNITE HUB (KIST) (CAGAYAN DE Oro)

Mindanao Coal "STEAG" Units 2x116 MW

ILIGAN CITY

Total Coal Power Plants Installed Capacity – 1,354 MW



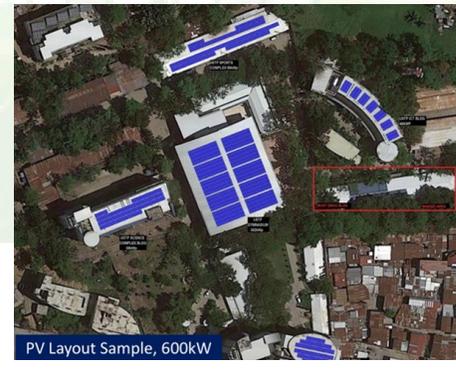
USTP's Ongoing and Proposed Projects for Energy Transition in Northern Mindanao

Ongoing Projects/Initiatives:

1. Establishment and Accreditation of the Center for Affiliated Renewable Energy (CARE)
2. Comprehensive regional energy study in the Philippines (CRESP) biomass potential, solar PV deployment, and policy gaps for sustainable energy transition in Mindanao
3. Reducing Electricity Cost, Accelerating Energy Transition and Decreasing CO2 Emission
4. USTP Alubijid Pico-hydro Project

Proposed Projects:

1. Proposal in Installation of Solar Farm (10MW) at the Main Alubijid Campus
2. Project proposal: USTP solar power purchase agreement (ppa) with solar energy providers for financial, research, and educational purposes
3. Project proposal on availing retail competition open access (RCOA) – to obtain lower electricity cost and fund energy efficiency measures
4. Capacity Building – Students and Solar Start up Companies



Advancing Skills, Competitiveness, and Enterprise Development (ASCEND) Project: A Proposal to Strengthen the Innovation Ecosystem (ADB & USTP proposal)

Project Rationale:

Advancing Skills, Competitiveness, and Enterprise Development (ASCEND) project identifies and addresses underlying constraints and resource requirements for industry transformation and global competitiveness of the Philippine economy.

The project will support the PDP to revitalize the industry through an innovation-driven industrialization policy and accelerate innovation and entrepreneurship.



Proposed Solutions:

Impact: (a) Transform production sectors to generate more quality jobs, and competitive and higher value products (PDP 2023-2028); (b) Moving up the value chain achieved (Chapter 6, Outcome 2); (c) innovation and entrepreneurship accelerated (chapter 8, Outcome 4)

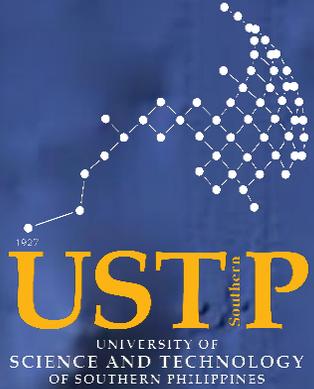
Outcome; Quality and relevance of industrial transformation through knowledge-based solutions, innovation and skills development strengthened

Three outputs;

- 1.) Innovation ecosystem for industries and enterprises development, digital transformation and energy transitions improved.
- 2.) Research, skills development and innovation infrastructure for industrial transformation and energy transitions in select sectors to support MSME's established
- 3.) Capacity building on Energy Transition and Digital Transformation

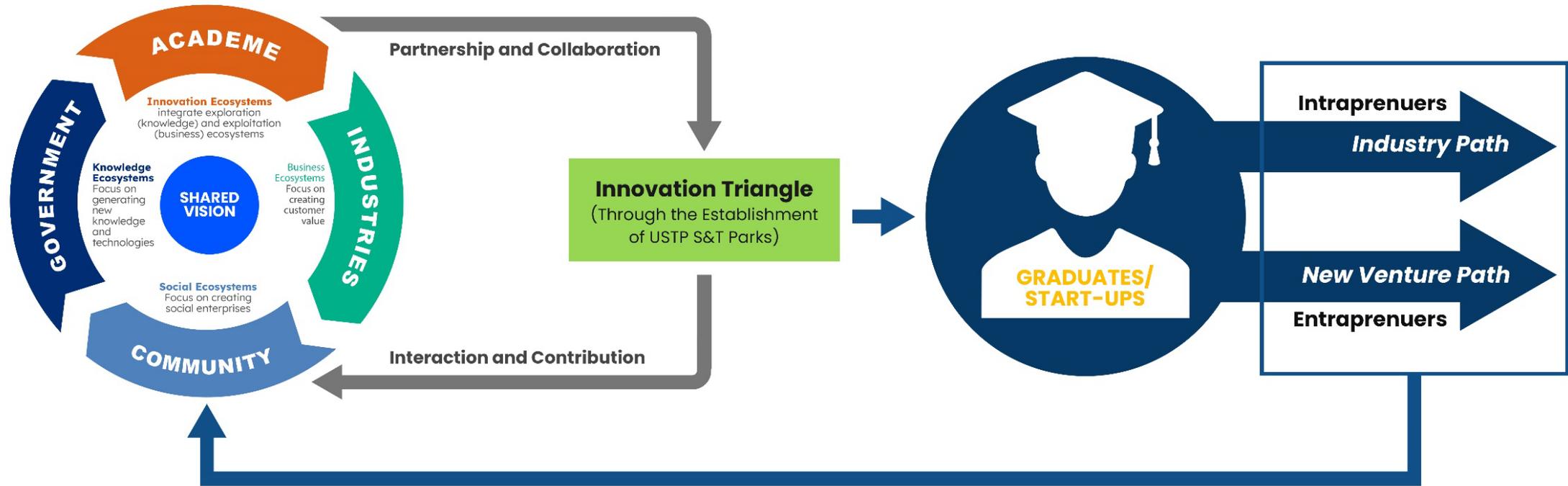
USTP: Trailblazing the Innovation Ecosystem in Northern Mindanao

Open Innovation – U-IGNITE Hub of the University of Science and Technology of Southern Philippines CDO KIST Project



OPEN INNOVATION – KIST (KNOWLEDGE, INNOVATION, SCIENCE AND TECHNOLOGY)

Theory of Change/ Framework: Science, Technology and Innovation to drive inclusive and sustainable transformation (A Case of USTP)



INPUT

- Financial resources (internal/external)
- Human Resources
- Research infrastructure and facilities
- Academic and industry expertise
- Entrepreneurial and innovation programs
- Policy and regulatory support framework

PROCESS

- Conducting targeted, interdisciplinary research
- Delivering comprehensive innovation and end entrepreneurship training
- Facilitating ideation sessions and hackathons
- Providing incubation services for niche startups
- Engaging in technology matchmaking and industry forums
- Strengthening Partnership and Collaboration

OUTPUT

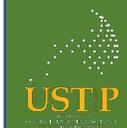
- Developed and tested innovative prototypes
- Validated business concepts for startups
- Intellectual Property (IP) filing and protections
- Established partnerships with industry stakeholders
- Launched startups in strategic niche sectors

OUTCOME

- Increased startup success and growth rates
- Enhanced industry adoption of innovative solutions
- Strengthened academia-industry collaborations
- Improved access to venture capital and funding
- Expanded market for innovative products and services

IMPACT

- **Economic:** Enhanced regional growth, job creation, and sector competitiveness
- **Societal:** Improved living standards with innovative healthcare, education, and environmental solutions.
- **Sustainability:** Advanced sustainable practices, green tech adoption, and circular economy transition



INDUSTRY TRANSFORMATION MAP

VISION



Transform this industry sectors to generate quality jobs, produce high value products and services accelerating innovation and entrepreneurial ventures.

HUMAN RESOURCES

- Ready-for-work graduates
- Empower the workforce with green and digital skills
- Graduates with entrepreneurial endeavors
- Skills to support the shift to greater value creation.
- Improve graduate outcomes and effective knowledge transfer

PRODUCTIVITY AND DIGITALIZATION

- Quality and relevant research with commercial value
- Shift towards higher-value added activities
- Optimized internal processes
- Customer-centricity transformation
- Industrial digital transformation



ENTREPRENEURSHIP AND INNOVATION

- Leverage technology to drive innovation and value creation
- Build enterprise capabilities and sector infrastructure
- Develop own products and brands
- Technology solutions to pressing industry problems
- Funding and investment opportunities for startups

INTERNATIONALIZATION

- Availability of accredited labs and certification bodies
- Develop core of globally-competitive local enterprises
- Access global markets through digital channels
- Leverage international networks for market access



KEY OUTCOMES

-  Strategies that provide integrated assistance across domains
-  Stronger support for innovation and internationalization
-  Increased Efficiency and productivity
-  Aligning the product or service with customer need to establish a strong market demand.
-  Consistently generating income to support business growth and development.
-  Efficiently attracting and retaining customers to build loyal and expanding user base
-  New and re-designed jobs with better wages
-  More new opportunities and career paths local & overseas
-  Stronger support for upgrading and skills deepening

6 INDUSTRY SECTORS

METALS ENGINEERING INNOVATION • BAMBOO PRODUCTS INNOVATION AND COMMERCIALIZATION
 • ENERGY TRANSITIONS SUSTAINABLE FOOD CIRCULAR ECONOMY • DIGITAL TRANSFORMATION AND INNOVATION • MICRO ELECTRONICS

THANK YOU!



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