

**NEW
ENERGY
NEXUS**
Philippines

IT TAKES A VILLAGE: GROWING AN ECOSYSTEM TO SUPPORT PHILIPPINES' CLEAN ENERGY STARTUPS

The 2024 Clean Energy Ecosystem Report

SEPTEMBER 2024

Executive Summary

In 2020, New Energy Nexus (NEX) Philippines launched the New Energy Ecosystem Mapping project, creating an interactive map and database of key players and indicators in the Philippine energy landscape. The report became a valuable resource for stakeholders such as startups, NGOs, investors, companies, and researchers to identify market opportunities, innovations, and potential collaborations in renewable energy and energy-smart technologies.

Four years later, NEX Philippines updated the map and report to reflect emerging trends and shifts in stakeholder dynamics, utilizing the Philippines Clean Energy Ecosystem Mapping Framework, which includes indicators such as nascent energy initiatives, financial mechanisms, enabling environments, energy companies, and networking assets. A specialized Energy Innovation Ecosystem Maturity (EIEM) Framework, adapted from the Innovation Ecosystem Maturity Model (IEMM), was also used to assess the ecosystem's maturity. Key stakeholders validated these indicators during a roundtable discussion in March 2024.

The report provides an overview of the energy transition in the Philippines, highlighting key stakeholders integral to the energy innovation ecosystem. It details each stakeholder's role in advancing the shift from heavy reliance on fossil fuels and imported energy sources to renewable energy. The report underscores the necessity of cross-sectoral collaboration among these stakeholders to achieve a sustainable and impactful energy transition.

The report provides a macro view of the ecosystem's progress since the initial assessment, highlighting improvements in the Clean Energy Ecosystem Framework. It details new clean energy startups, research institutions, funding mechanisms, investment successes, and relevant policies. The report also covers project developers contributing to national energy goals and outlines networking assets to foster collaboration among stakeholders.

The report includes a detailed discussion of the maturity assessment results using the EIEM Framework, outlining the key indicators that reflect the assessment's findings:

- The first factor examines funding and research-and-development (R&D) expenditures, assessing the availability and accessibility of different funding sources and mechanisms for stakeholders. Mature ecosystems have strong investment landscapes that support startups and established companies. The Philippines' ecosystem is at **Level 2 - Builder**, reflecting emerging government grants and private investments in new energy startups.



Executive Summary

- The second factor assesses human capital and the right mindset as crucial drivers in a mature ecosystem. Successful ecosystems attract and retain top talent through strong educational institutions, a high quality of life, and supportive immigration and workforce policies. A culture that values risk-taking, collaboration, and continuous learning enhances human capital. The Philippines' ecosystem is at **Level 2 - Builder**, reflecting a growing number of skilled professionals in new energy technologies and a shift towards innovation and sustainability. Additionally, academic institutions are increasingly incorporating sustainable energy innovations and entrepreneurship into their curricula.
- The third factor analyzes government support and policies, emphasizing the need for minimal bureaucracy and an entrepreneur-friendly environment. The government plays a critical role in driving human development and technological advancement. The Philippines has established several policies and regulations to support renewable energy projects and entrepreneurship. Various incentives are available for clean energy initiatives, placing this factor at **Level 3 - Experimenter**.
- The fourth factor evaluates the historical success of new energy projects and the culture of knowledge sharing among stakeholders. While progress has been made, there is room for improvement in interconnectedness and resource sharing. The Philippines' ecosystem is at **Level 1 - Beginner**, with limited successful project implementations and a need for better stakeholder engagement and knowledge transfer practices. As the ecosystem is still new, there is ample time to experiment, understand what works, and develop lessons learned to share with the community.
- The last factor reviews the ecosystem's network, focusing on stakeholder engagement and collaboration. A mature ecosystem features strong ties and open communication among stakeholders. The Philippines' ecosystem is at **Level 2 - Builder**, with increasing collaboration among startups, government, ESOs, and others. There are now avenues and events promoting networking, facilitating introductions to community players in the new energy ecosystem.

The report delves into the assessment with evidence and case studies, highlighting key players in the new energy ecosystem, including startups, investors, ESOs, academic institutions, the private sector, government, nonprofits, and civil society organizations. It discusses the challenges these stakeholders face and identifies opportunities to support them. The final section provides recommendations and actionable steps for each stakeholder to foster continuous improvement and support the energy transition in the Philippines.

Recommendations include experimenting with diverse funding mechanisms and de-risking strategies to create a more investor-friendly environment for both institutions and innovators.

Academic institutions should update their curricula to integrate energy innovation and entrepreneurship topics, fostering a culture of innovation in various settings, including the workplace. The government should streamline processes to reduce bureaucracy and enhance support for entrepreneurs in market access, commercialization, and scaling up. Improving the ecosystem's interconnectedness through regular sharing of successes, lessons learned, and collaboration opportunities is crucial, as is involving grassroots communities. Additionally, regular community gatherings and networking activities at local and national levels are recommended to strengthen connections among ecosystem players and promote mutual learning.

Message of Support

At the outset, the DOE would like to commend and support the ongoing and proposed energy initiatives spearheaded by your esteemed office, as outlined in the **2024 Philippine Clean Energy Ecosystem Report**. These efforts align with the DOE's goals embodied in the Philippine Energy Plan 2023-2050, particularly in engaging finance and charting the energy transition.

The report underscores the necessity of cross-sectoral collaboration among energy stakeholders to achieve a sustainable and impactful energy transition. By shifting from heavy reliance on fossil fuels and imported energy resources to renewable energy, and by leveraging funding mechanisms, investment institutions, successful funding rounds, and supportive laws and policies, these initiatives are seen to significantly reduce carbon emissions, enhance energy efficiency, and promote the widespread adoption of renewable energy. The impact of these efforts will resonate across various sectors, driving innovation, creating jobs, and ensuring a cleaner environment for future generations.

The Department recognizes the critical importance of these initiatives in shaping the country's energy landscape. New Energy Nexus - Philippines' collaborative approach to engaging a diverse array of stakeholders, including government agencies, private sector, and local communities, demonstrates a comprehensive strategy in delivering positive outcomes.

Thank you for your dedication to such a vital cause. We look forward to the successful implementation of these efforts.

Felix William Fuentebella
Undersecretary, Department of Energy

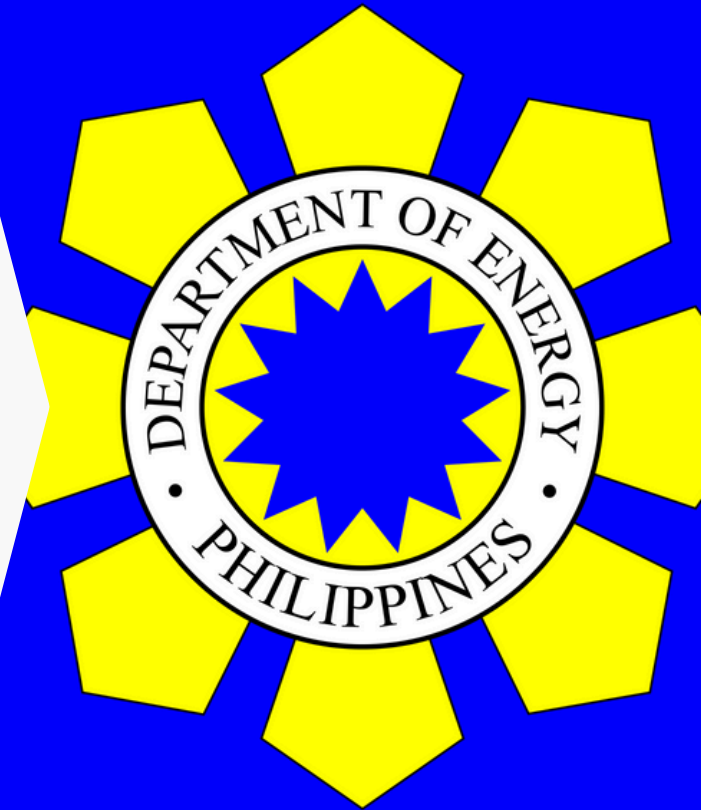


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List of Abbreviations

ADB	Asian Development Bank
ADDU	Ateneo de Davao University
AI	Artificial Intelligence
BNEF	Bloomberg New Energy Finance
CALABARZON	Cavite, Laguna, Batangas, Rizal and Quezon
CAR	Cordillera Administrative Region
CATCH-ALL	Contactless Apprehension of Traffic Violators
CEO	Chief Executive Officer
CharM	Charging in Minutes
CRADLE	Collaborative Research and Development to Leverage Philippine Economy
CRAFT	Center for Renewable Energy, Automation, and Fabrication Technologies
CSO	Civil Society Organizations
CSP	Concentrated Solar Power
CSR	Corporate Social Responsibility
CSU	Caraga State University
DBM	Department of Budget and Management
DENR	Department of Environment and Natural Resources
DICT	Department of Information and Communications Technology
DOE	Department of Energy
DOST	Department of Science and Technology
DTI	Department of Trade and Industry
ECCP	European Chamber of Commerce of the Philippines
EEC	Energy Efficiency and Conservation
EIEM	Energy Innovation Ecosystem Maturity
EPIRA	Electric Power Industry Reform Act
ESCO	Energy Service Companies
ESO	Entrepreneur Support Organization
ESP	Energy Secure Philippines
EV	Electric Vehicle
EVAP	Electric Vehicle Association of the Philippines

List of Abbreviations

EVIDA	Electric Vehicle Industry Development Act
FabLab	Fabrication Laboratory
FASTRAC	Funding Assistance for Spinoff and Translation of Research and Advancing Commercialization
GALING	Grants and Assistance to Leverage Innovations for National Growth
GDP	Gross Domestic Product
GOAB	Geeks on a Beach
GW	Gigawatt
HEI	Higher Education Institution
IEA	International Energy Agency
IEMM	Innovation Ecosystem Maturity Model
IoT	Internet of Things
IPO	Initial Public Offering
ISED	Innovation, Science and Economic Development
JCEC	Joint Congressional Energy Commission
kWh	Kilowatt Hour
LGU	Local Government Unit
LoH	Light of Hope
MAIN	Manila Angels Investors Network
MO	Manila Observatory
MoRE	Monitoring Renewable Energy Implementation in the Philippines Project
MPIC	Metro Pacific Investments Corporation
MSEgyE	Masters of Science in Energy Engineering
MW	Megawatt
NCR	National Capital Region
NDC	National Development Company
NEX	New Energy Nexus
NGO	Non-Governmental Organization
OT	Operational Technology
PAEF	Philippine - American Education Foundation
PCARRD	Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development
PCIEERD	Philippine Council for Industry, Energy and Emerging Technology Research and Development

List of Abbreviations

PERPI	Philippine Energy Research and Policy Institute
PE2	Philippine Energy Efficiency Alliance
PHSW	Philippine Startup Week
PLIC	Packaging and Labelling Innovation Center
PV	Photovoltaic
QC	Quezon City
R&D	Research and Development
RA	Republic Act
RDI	Research and Development Institute
RE	Renewable Energy
ReSEED	Regional Startup Enabler for Ecosystem Development
RETF	Renewable Energy Trust Fund
SDG	Sustainable Development Goals
SOCCKSARGEN	South Cotabato, Cotabato, Sultan Kudarat, Sarangani, and General Santos
SP	Solar Philippines
SPNEC	Solar Philippines New Energy Corporation
SUC	State Universities and Colleges
SVF	Strategic Venture Fund
TAPI	Technology Application and Promotion Unit
TBI	Technology Business Incubator
UNDP	United Nations Development Programme
UP	University of the Philippines
USAID	United States Agency for International Development
USHER	Universal Structure Health Evaluation and Recording System
VCCI	Venture Capital Catalyst Initiative
WWF	World Wide Fund

Glossary of Terms

Clean Energy Entrepreneurship

Involves creating and scaling businesses that develop innovative, sustainable energy solutions, such as solar, wind, and other renewable technologies. These entrepreneurs drive the transition to a low-carbon economy by promoting environmentally friendly practices, reducing reliance on fossil fuels, and often addressing energy access issues in underserved communities. Through innovation and collaboration, they play a crucial role in building a more sustainable and equitable energy future.

Some of the technologies and solutions around clean energy includes:

Sustainable Transport

Sustainable transport refers to transportation systems and technologies that minimize environmental impact by reducing greenhouse gas emissions, air pollution, and resource consumption. This includes the use of electric vehicles, public transit powered by renewable energy, cycling infrastructure, and alternative fuels like hydrogen, all designed to create efficient, low-carbon mobility solutions.

Circular Economy

The circular economy is an economic model that emphasizes the reuse, recycling, and regeneration of materials and products to minimize waste and resource consumption. In the context of clean energy, it involves designing products for longer life cycles, repurposing waste materials, and creating systems that use resources efficiently, contributing to sustainable energy practices and reducing environmental impact.

Energy Efficiency

Energy efficiency involves using technology and practices that require less energy to perform the same function, thereby reducing overall energy consumption. This includes optimizing buildings, industrial processes, and appliances to use less energy for heating, cooling, lighting, and manufacturing, ultimately leading to lower energy costs and reduced carbon emissions.

Energy Access

Energy access refers to the availability of reliable, affordable, and sustainable energy services to all people, particularly in underserved and remote areas. It involves expanding access to clean energy sources such as solar, wind, and microgrids, enabling communities to power homes, schools, and businesses, and improving quality of life while supporting economic development.

Glossary of Terms

Renewable Energy Generation

Renewable energy generation is the process of producing energy from naturally replenishing sources, such as sunlight, wind, water, and geothermal heat. These technologies convert renewable resources into electricity or other forms of energy, providing a sustainable alternative to fossil fuels and playing a key role in reducing greenhouse gas emissions and combating climate change.

Enabling Environment

This encompasses a set of favorable conditions, including supportive policies, regulations, business incentives, and local characteristics, that collectively foster the growth and development of clean energy initiatives and technologies. It involves the adoption and promotion of clean energy through relevant policies, business incentives for key players, and the commitment of local government units, along with their initiatives, to adopt and mainstream clean energy innovations.

Clean Energy Ecosystem Maturity Framework

The framework developed by New Energy Nexus Philippines, adapted from the Tel Aviv Innovation Ecosystem Maturity Model, evaluates the maturity of the Philippines' Energy Innovation Ecosystem across five key dimensions: Money (funding and R&D expenditures), People (human capital with the appropriate mindset), Government (a minimal bureaucracy and entrepreneur-friendly political environment), Know-How (cumulative experience and expertise), and Network (ecosystem growth through stakeholder engagement). Each dimension is assessed across five maturity levels—Beginner, Builder, Experimenter, Connector, and Expert—ranging from one as the lowest to five as the highest. These levels provide specific characteristics to guide the evaluation of the ecosystem's current state in each dimension.

Energy Transition

Energy transition refers to the global shift from reliance on fossil fuels, such as coal, oil, and natural gas, to cleaner, renewable energy sources like wind, solar, and hydropower. This transition aims to reduce carbon emissions, combat climate change, and create a more sustainable and resilient energy system for the future.

The Philippine energy transition refers to the country's strategic shift from a predominantly fossil fuel-based energy system to one that increasingly relies on renewable energy sources like solar, wind, and hydroelectric power. This transition is driven by national laws and policies, such as the Renewable Energy Act of 2008, aiming to reduce greenhouse gas emissions, enhance energy security, and achieve a more sustainable energy mix. The government's goals include increasing the share of renewables to 35% by 2030 and 50% by 2040, reflecting a commitment to a low-carbon future.

Glossary of Terms

Innovation Ecosystem Maturity Model

A framework designed to assess and guide the development of innovation ecosystems. It evaluates an ecosystem's maturity across multiple dimensions, such as funding (Money), human capital (People), government support, knowledge (Know-How), and networking (Network). Each dimension is measured across five maturity levels—Beginner, Builder, Experimenter, Connector, and Expert—providing a structured approach to understanding the strengths, weaknesses, and growth potential of an innovation ecosystem. This model helps stakeholders identify areas for improvement and strategies for fostering a more robust and dynamic innovation environment.

Investors and Financing Mechanisms

This refers to individuals, organizations, and systems that provide the financial resources and support necessary for the development and expansion of new energy projects and initiatives. These include grant and loan providers, venture capital firms, and impact investors, who play a crucial role in enabling the growth and commercialization of emerging energy technologies. By offering various forms of funding, such as grants, venture capital, and crowd-sourced funds, these entities are key drivers of innovation and ecosystem development in the energy sector.

Nascent New Energy Indicators

This refers to emerging indicators and factors that signal the growth and development of new and innovative energy initiatives, technologies, and projects within the country. These indicators include startups, research institutions, relevant university programs, and media coverage of energy innovations, all of which provide insights into potential advancements and expansion within the energy sector.

Networking Assets

These are events, entities, and platforms that facilitate communication and collaboration among stakeholders within the clean energy ecosystem. Examples include incubators, accelerator programs, pitch and demo events, and networking activities. These assets are crucial for connecting startups, researchers, investors, and industry players, fostering idea exchange, and enhancing partnerships and innovation within the clean energy sector in the Philippines.

New Energy Companies

These entities specialize in the development, installation, maintenance, and operation of innovative energy technologies and systems. They include businesses focused on distributed renewable energy solutions, such as solar photovoltaic (PV) installations, utility-scale renewable energy projects, and Energy Efficiency and Conservation (EEC) services, including ESCOs and EEC technology providers. These companies are essential in advancing the Philippines' energy transition goals by driving the adoption of sustainable energy practices and technologies.

Glossary of Terms

Clean Energy Ecosystem

This refers to the interconnected network of stakeholders, resources, policies, and infrastructures that collectively foster the development, commercialization, and adoption of innovative energy technologies and solutions. This ecosystem includes research institutions, startups, established companies, government agencies, investors, and support organizations, all working together to drive advancements in energy efficiency, renewable energy, energy storage, and other sustainable practices. The goal of the Clean Energy ecosystem is to accelerate the transition to a sustainable, low-carbon energy future by encouraging collaboration, knowledge sharing, and the creation of new business opportunities.

Philippine Energy Plan

The Philippine Energy Plan (PEP) is a comprehensive policy framework that outlines the country's energy strategies and objectives for ensuring a reliable, sustainable, and competitive energy sector. It sets specific targets for increasing the share of renewable energy in the national energy mix, enhancing energy efficiency, and improving energy access. The PEP aims to guide the development and implementation of energy policies and initiatives to support the country's economic growth and environmental goals.

Technology Business Incubators

Technology Business Incubators (TBIs) are specialized organizations designed to support the growth and development of early-stage technology-based startups. They provide a range of services, including mentorship, access to funding, office space, and business development resources, to help startups refine their technologies, develop their business models, and scale their operations. TBIs play a crucial role in fostering innovation by nurturing new ventures and facilitating their transition from concept to market-ready products.

Program starts @
8:30 AM



Nat Gas
19%

Biomass/
Biogas
1%

Solar
1%

Wind
1%

Agricultural
residue

Production/s
of crops
cultivated in
greenhouse

Sale to
general use

METHODOLOGY METHODOLOGY

Methodology

The Clean Energy Ecosystem Mapping project by New Energy Nexus, in collaboration with various stakeholders, aims to create an ecosystem map, report, and database of key players and indicators in the Philippines energy landscape. Since the original map in 2020, significant progress in sustainable development requires periodic updates to capture emerging trends, innovations, and stakeholder dynamics. These updates provide current information to entrepreneurs, investors, support organizations, and stakeholders for informed decisions and driving sustainable energy transformation. The foundation of the Ecosystem Mapping Framework is based on two fundamental frameworks: the clean energy innovation ecosystem and the startup ecosystem.

The clean energy ecosystem is defined as the convergence of emerging clean energy assets, financing mechanisms, and related companies situated within a geographically concentrated area fostering an enabling environment through supportive clean energy policies. This environment encourages commercialization and the presence of networking assets to amplify communication and collaboration opportunities.¹ This ecosystem's conceptual basis draws inspiration from Michael Porter's cluster theory of competitive advantage, a regional strategy for economic development introduced in 1990.

On the other hand, a startup ecosystem is a dynamic interaction of individuals, startups in diverse stages, and various types of organizations within a physical and/or virtual location. This collective forms a system that nurtures the creation of new startup companies.² These organizations can be classified into universities, funding agencies, support entities (such as incubators, accelerators, co-working spaces, etc.), research laboratories, service providers (such as legal and financial services), and large corporations delivering specific support tailored to startups' developmental stages.

The Clean Energy Ecosystem Mapping Framework is the result of combining these two essential frameworks. In this framework, there are five components of the Clean Energy ecosystem map: **nascent new energy indicators**, **investors and financing mechanisms**, **enabling environment**, **networking assets**, and **new energy companies**. **Nascent new energy indicators** refer to emerging and promising signs, elements, or factors that signify the growth and development of new and innovative energy initiatives, technologies, and projects within the country. These indicators encompass various aspects such as the presence of startups, research institutions, universities offering renewable energy-related programs, and media coverage of innovative developments in energy. Nascent new energy indicators provide insights into the early stages of Clean Energy and serve as markers of potential growth and impact in the energy landscape of the Philippines. **Investors and financing mechanisms** refer to individuals, organizations, and systems that provide financial resources, support, and mechanisms for funding the development, implementation, and expansion of new energy projects and initiatives. These entities play a pivotal role in enabling the growth and commercialization of nascent new energy assets by offering various forms of funding, such as grants, venture capital, crowd-sourced funds, and other financial mechanisms.

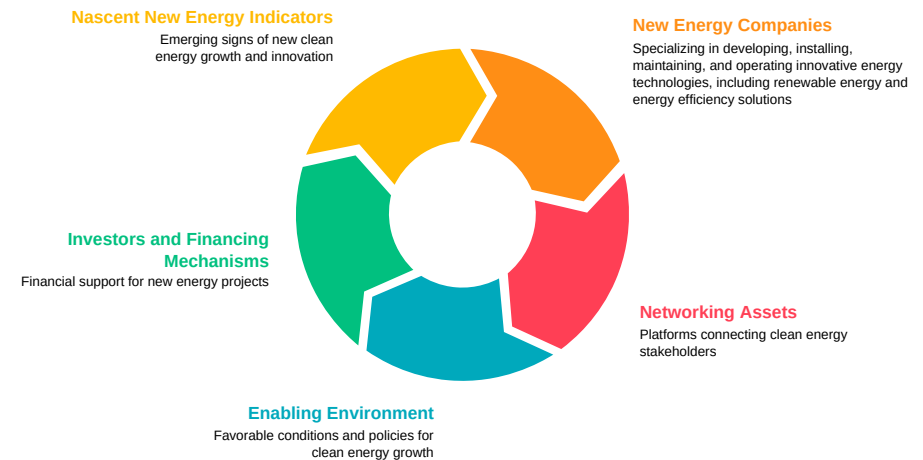


Figure 1: The Philippines Clean Energy Ecosystem Mapping Framework

¹ Lin, J., Chinthavali, S., Duniyan Stahl, C., Stahl, C., Lee, S., & Shankar, M. (2016, October). Ecosystem discovery: Measuring clean energy innovation ecosystems through knowledge discovery and mapping techniques. *The Electricity Journal*, 29(8), 64-75. ScienceDirect. <https://doi.org/10.1016/j.tej.2016.09.012>

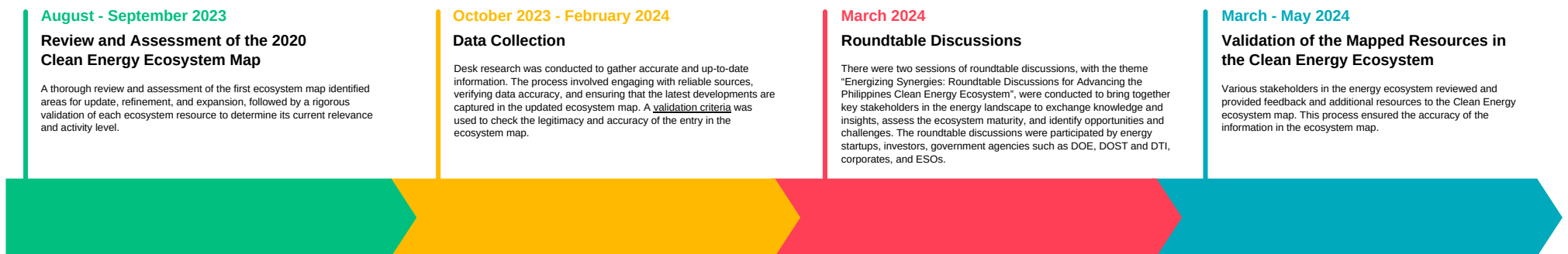
² Startup Commons. (2014, May 14). What is Startup Ecosystem? Startup Commons. <https://www.startupcommons.org/what-is-startup-ecosystem.html>

Methodology

Enabling environment refers to the set of favorable conditions, policies, regulations, and local characteristics that create a supportive framework for the growth and development of clean energy initiatives and technologies. This includes factors such as government incentives, certification bodies, business incentives, subsidies, and other measures that encourage the adoption and integration of renewable energy and energy-efficient solutions. **Networking assets** are events, entities, and platforms that facilitate communication, collaboration, and interaction among various stakeholders within the clean energy ecosystem. These assets play a crucial role in connecting startups, researchers, investors, industry players, and other participants, fostering the exchange of ideas, knowledge, and opportunities. ¹Networking assets enhance partnerships, innovation, and the overall dynamism of the clean energy landscape in the Philippines. New energy companies refer to entities or companies that specialize in providing services related to the development, installation, maintenance, and operation of new and innovative energy technologies and systems. **New energy companies** encompass businesses engaged in distributed renewable energy products (e.g. solar photovoltaic installation), utility-scale renewable energy projects, and Energy Efficiency and Conservation (EEC) services, including ESCOs and EEC technology providers.

Furthermore, to assess the maturity of the Philippines energy ecosystem, the Energy Innovation Ecosystem Maturity framework was adapted from the Innovation Ecosystem Maturity developed by the [CREATORS Innovation Lab](#) in Tel Aviv. In this framework, there are five critical relevant categories in order to build a simple yet actionable “Innovation Ecosystem Maturity Spectrum,”³ the funding and R&D expenditures allocated in new energy startups (**MONEY**), projects and initiatives, the human capital combined with the right mentality (**PEOPLE**), the presence of minimum bureaucracy and entrepreneur-friendly political and government environment (**GOVERNMENT**), cumulative experience of successful new energy startups, robust mechanisms for documenting and sharing knowledge and widely available mentorship in the energy space (**KNOW-HOW**), and the ecosystem growth brought by different stakeholders engagement (**NETWORK**).

This report provides comprehensive analysis and insights on the Clean Energy ecosystem mapping results, maturity level assessments, challenges, and recommendations in the energy landscape. The process of producing the report involved the following major phases:





ENERGY TRANSITION
ENERGY TRANSITION

Energy Transition in the Philippines

The Philippines is undergoing a significant energy transition, driven by the need to address climate change, achieve energy security, and foster sustainable economic growth. Clean energy entrepreneurship plays a pivotal role in this transition,⁴ creating jobs, stimulating economic activity, and providing energy access to unserved and underserved communities. By mapping the energy innovation ecosystem, stakeholders can gain valuable insights to better understand and support the growth of the clean energy sector.

The energy innovation ecosystem in the Philippines encompasses a wide range of climate-tech ventures.⁵ While deep tech startups focus on cutting-edge technologies like advanced solar technologies and long-duration energy storage solutions are crucial, the current ecosystem extends beyond them. It includes companies specializing in renewable energy project development, energy efficiency solutions, e-mobility, and smart grid technologies. In addition, startups working on circular economy solutions, waste management, and sustainable agriculture are integral to the broader clean energy landscape.

Moreover, inclusivity and diversity are also essential elements of a thriving ecosystem. Women-led startups, businesses owned by marginalized groups and those focused on empowering local communities are increasingly making significant contributions to the energy transition. It is crucial to create a more inclusive environment that supports the leadership and participation of women and marginalized groups.⁶ By ensuring diverse representation and participation, the sector can tap into a wider range of perspectives and ideas, leading to more innovative and impactful solutions.

The collective impact of the clean energy sector is substantial, providing employment opportunities across various skill levels. The growth of clean energy businesses stimulates economic activity, contributing to the country's gross domestic product (GDP). Moreover, the clean energy transition aligns with the Sustainable Development Goals (SDGs), particularly SDG 7 (Affordable and Clean Energy) and SDG 13 (Climate Action).

⁴ GLOBAL IMPACT REPORT 2023. (n.d.). Retrieved June 27, 2024, from https://www.newenergy-nexus.com/wp-content/uploads/2024/03/NEX_Global_Impact_Report_2023.pdf#:~:text=URL%3A%20https%3A%2F%2Fwww.newenergy-nexus.com%2Fwp

⁵ Teves, G., Muralla-Palustre, H., Saulo, C., Pajutan, J., Jordan, M., Ili, F., & Vandenberg, P. (2023). THE PHILIPPINES' ECOSYSTEM FOR TECHNOLOGY STARTUPS. <https://www.adb.org/sites/default/files/publication/884641/philippines-ecosystem-technology-startups.pdf>

⁶ Women leaders needed for a just transition to clean energy in Asia, panel says. (2023, July 19). UN Women – Asia-Pacific. <https://asiapacific.unwomen.org/en/stories/news/2023/07/women-leaders-needed-for-a-just-transition-to-clean-energy-in-asia>



Energy Transition in the Philippines

Various stakeholders play critical roles in this ecosystem. Startups are at the forefront of innovation, bringing new ideas and technologies that can revolutionize the energy landscape. Researchers in universities and research institutions contribute to scientific advancements, conducting studies, developing prototypes, and providing valuable knowledge and expertise to support the growth of the sector. New energy companies, ranging from small enterprises to large corporations, offer a wide array of products and services that enable the adoption and integration of clean energy solutions.

Investors and financing mechanisms, including venture capitalists, impact investors, and government funds, provide the necessary capital to fuel the growth of these ventures, enabling them to scale and achieve commercial success. Government agencies play a crucial role in setting and implementing policies, regulations, and incentives that create an enabling environment for the sector to thrive.

Non-governmental organizations (NGOs) and civil society groups advocate for sustainable energy policies, raise awareness about the benefits of clean energy, and often work directly with communities to implement clean energy projects. Each stakeholder brings unique strengths and perspectives for driving the energy transition forward.

Collaboration among various stakeholders is crucial for driving meaningful and sustained engagement and impact in the energy transition. Government agencies, private sector companies, NGOs, academia, and local communities need to work together to create a supportive and thriving ecosystem. By embracing clean energy entrepreneurship, fostering inclusivity, and working together towards shared goals, the country can achieve a sustainable energy future that benefits its economy, environment, and most importantly, its people.





CLEAN ENERGY ECOSYSTEM CLEAN ENERGY ECOSYSTEM

This section of the report provides an overview of the energy ecosystem at a macro level, offering a quick look at factors that indicate growth and a thriving energy landscape in the Philippines. Please note that while the database referred to in this report aims to be comprehensive, the proponents acknowledge that there may be other institutions and organizations not included. If you are aware of any such institutions or organizations that are not mentioned or listed, please feel free to reach out to us at philippines@newenergynexus.com.

Nascent New Energy Indicators

The **Nascent New Energy Indicators** highlight early signs of growth and development in innovative energy initiatives within a country. These indicators include startups, research institutions, relevant university programs, and media coverage of energy innovations, providing insights into potential growth in the energy sector. The report will highlight the growing presence of clean energy and climate startups across the country, as well as the academic institutions and research labs that support these entrepreneurs through various means such as research and development, access to facilities, among others.

After four years, there has been a staggering increase in the number of startups in the Philippines, rising from just 15 active startups to 91 operating in the clean energy and climate sector. Interestingly, only 9% of these startups were composed of teams with student members, while the remainder consisted of professionals from various backgrounds and industries.

Most of these new ventures have participated in various programs of New Energy Nexus Philippines, which are specifically designed to support clean energy and climate startups. Only 6% of these startups did not participate in any of the NEX Philippines programs. According to its data, out of the 85 startup companies it has supported, there are 178 startup founders or entrepreneurs, with 21% of them being female.

While the majority of these startups were based in the National Capital Region, notable representation is also emerging from Northern Mindanao and the CALABARZON (Cavite, Laguna, Batangas, Rizal, Quezon) regions. However, certain regions in the Philippines, such as the Cordillera Administrative Region, Region 2 (Cagayan Valley), Region 8 (Eastern Visayas), and Region 12 (SOCCSKSARGEN which refers to South Cotabato, Cotabato, Sultan Kudarat, Sarangani and General Santos), still lack any presence of climate and clean energy solutions. This underscores the need for action from various institutions and entrepreneur support organizations to focus on these regions, fostering community building and activating entrepreneurial spirit. By harnessing local talents and promoting awareness of the energy crisis and entrepreneurial opportunities in the sector, these regions can also benefit from clean energy technologies and solutions.

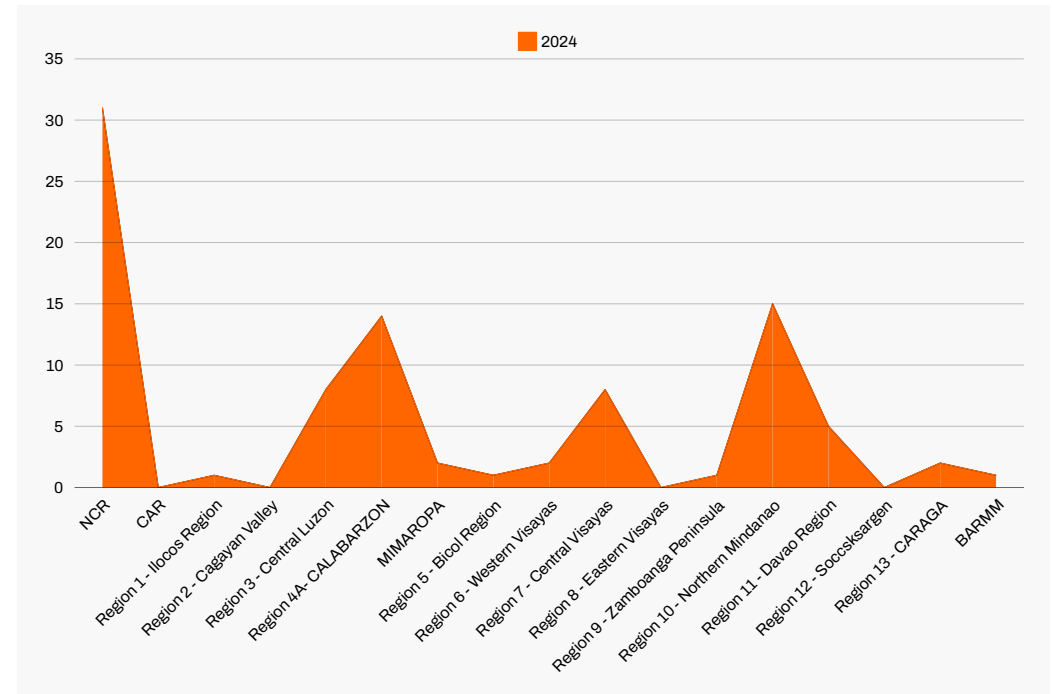


Figure 2: Increase in the Number of Energy Startups in the Philippines

Nascent New Energy Indicators

The top three industries for climate and clean energy startup companies and enterprises in the Philippines are as follows: nearly half (49%) are in the renewable energy generation sector, specifically solar and mini-hydro systems. Tied for second place, each comprising 8%, are the sustainable transportation / e-mobility sector and the energy access sector. Waste management holds the third spot at 7%.

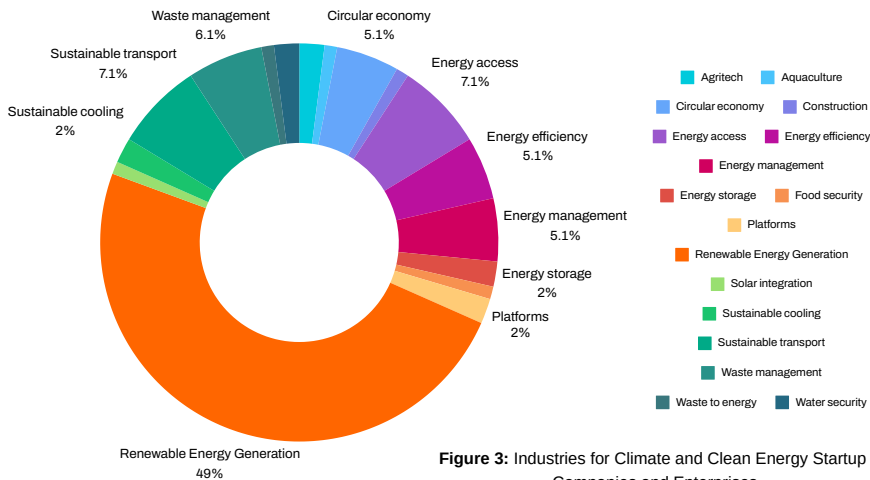


Figure 3: Industries for Climate and Clean Energy Startup Companies and Enterprises

Fundraising is vital for startups to capitalize on customer demand, secure necessary resources before cash runs out, and gain essential support and mentorship from experienced investors to navigate growth challenges effectively.⁷

Solely based on records from NEX Philippines, 18 startup companies have successfully fundraised a cumulative amount of almost 1.3 million US dollars.

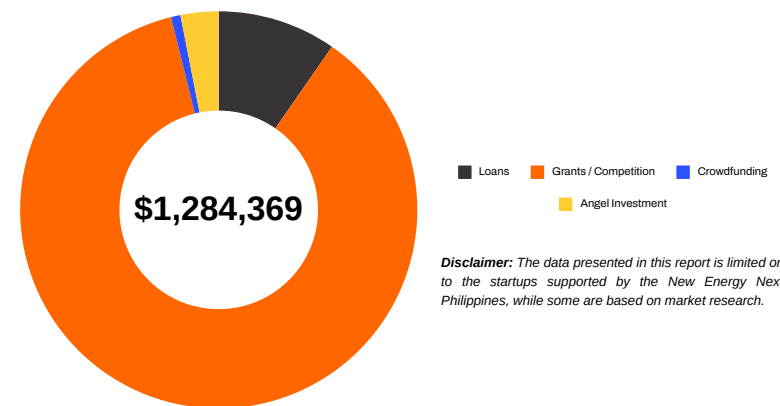


Figure 4: Cumulative Amount Fundraised by Startups

Disclaimer: The data presented in this report is limited only to the startups supported by the New Energy Nexus Philippines, while some are based on market research.

Nascent New Energy Indicators

Indication 1:

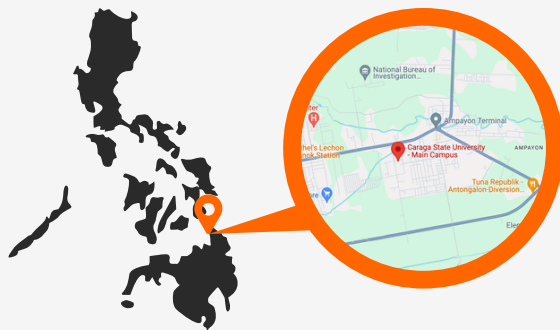
The increase in the number of startups, particularly those emerging from NEX Philippines, clearly indicates that if more Entrepreneur Support Organizations (ESOs) begin supporting and offering programs specifically for climate and clean energy startups within the next two years, the ecosystem will likely see a continuous surge of innovative solutions capable of addressing the energy crisis in the Philippines.

Indication 2:

Active startups in the climate and clean energy sector are primarily concentrated in the National Capital Region, with notable representation from Northern Mindanao and CALABARZON. However, there is a lack of representation from the Cordillera Administrative Region (CAR), Cagayan Valley (Region 2), Eastern Visayas (Region 8), and SOCCSKSARGEN (Region 12). This highlights the need for special focus on these areas in the coming years, in order to leverage local talent and ensure these communities benefit from clean energy solutions.

Another factor in this indicator is the presence of different research laboratories. They play a crucial role in supporting startups by providing essential resources, expertise, and collaboration opportunities. They offer startups access to advanced facilities and equipment, enabling the development and testing of new technologies.⁸ Additionally, research labs often foster strong industry connections, which can facilitate partnerships, mentorship, and funding opportunities for startups, ultimately helping them accelerate innovation and growth.⁹

Of the 11 research laboratories identified in the initial mapping, only seven remain active after four years. This report does not assert that the operations of the inactive facilities have entirely ceased but rather bases their activity status on their online media presence over the past five years. The inactive establishments may still be operational but have not shared updates on various online platforms such as social media, websites, or press releases. Additionally, two new research laboratories have been identified.



Center for Renewable Energy, Automation, and Fabrication Technologies (CRAFT)

Caraga State University (CSU)
Ampayon Campus, Butuan City, Agusan del Norte

CRAFT's main initiatives focus on the promotion of groundbreaking innovations regarding sustainable development and renewable technologies, and providing access to key stakeholders through showcasing their work in conferences, open-houses, and extension services within the community. Some of their facilities and projects, such as the Packaging and Labelling Innovation Center (PLIC), CSU Fabrication Laboratory (FabLab), and the award-winning SMART Mines project, aim to revolutionize different sectors of Philippine society and industry in disciplines as diverse as mining, renewables, materials science, and automation, and are done in collaboration with various government agencies and local units.

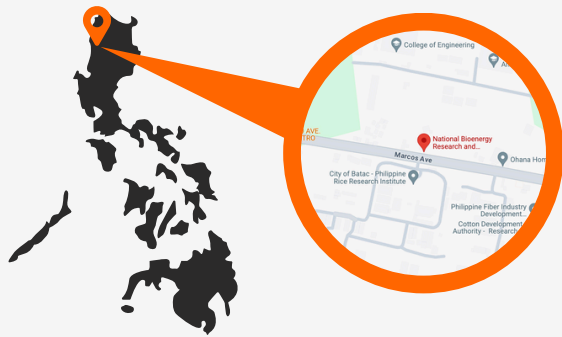
The Center has undertaken research titled "RS Program on Producing Alternative Clean Energy and Power in Partnerships with LGU in Caraga" in 2021, supported by local research funds from CSU. This initiative aims to advance various research components aimed at diversifying clean energy resources. A notable extension of this effort is the 2022 project "Development of a Smart Pico-Hydro System for Electricity Generation," which specifically focuses on harnessing energy from water runoff in rivers and canals.¹⁰

⁸ Springer. (2020). Innovation, entrepreneurship, and the research labs: transforming ideas into startups. Springer. Retrieved from <https://link.springer.com/article/10.1007/s11628-020-00415-7>

⁹ Embry-Riddle Aeronautical University. (2023). Aerospace Industry Leaders Boeing, Embry-Riddle Partner to Support Tech Startups at Research Park. Embry-Riddle Aeronautical University. Retrieved from <https://news.erau.edu/headlines/aerospace-industry-leaders-boeing-embry-riddle-partner-to-support-tech-startups-at-research-park>

¹⁰ CSU thru CRAFT FORGES MoA with DOST Caraga and LGU Partner | Caraga State University. (n.d.). <https://www.carsu.edu.ph/?q=news/csu-thru-craft-forges-moa-dost-caraga-and-lgu-partner>

Nascent New Energy Indicators



National Bioenergy Research and Innovation Center

Don Mariano Marcos Memorial State University
Batac, Ilocos Norte

The center, a research unit under the Office of the President of the Mariano Marcos State University System, consists of four sections: (1) The Research and Innovation Section, which focuses on bioenergy, renewable research studies, feedstock sustainability, environmental and residue utilization research, technological innovations, and product development; (2) The Technical and Testing Services Section, which serves as the central division for analytical, testing, and technical support, housing state-of-the-art laboratories for analytical services, motor vehicle and machinery testing, and more; (3) The Socioeconomic, Technopreneurship, and Partnership Section, which handles social and economic research, industry and community engagement, and supports studies related to socioeconomics and techno-business; and (4) The Fabrication Section, responsible for the design, development, and manufacturing of distillation and various renewable energy facilities.

The center's overarching goal is to foster a synergistic community of interest and practice in bioenergy research, development, extension, education, and technopreneurship for sustainable development and energy self-sufficiency. Since 2012, the NBERIC has conducted numerous research and extension projects, partnering with entities such as the Department of Energy (DOE), United States Agency for International Development (USAID), and the Department of Environment and Natural Resources (DENR), among others.¹¹

Academic institutions such as State Universities and Colleges (SUCs) and Higher Education Institutions (HEIs) are essential in every startup ecosystem. They serve as crucial talent reservoirs and facilitate knowledge transfer, incubation, and networking. These institutions play a vital role in fostering innovation by commercializing cutting-edge research and technologies.¹²

From the initial seven universities identified in the mapping process, two were classified as inactive, defined as institutions lacking online media presence in their relevant program offerings over the last five years. On a positive note, four additional universities have been included in the updated list, all of which have also begun offering postgraduate courses related to energy.

Central Luzon State University

(Distance, Open and Transnational University)

- Master of Science in Renewable Energy Systems

Batangas State University

- Master of Science in Energy Engineering

University of Science and Technology of Southern Philippines

Cagayan de Oro Campus

- Professional Science Masters in Power Systems Engineering and Management
- Doctor of Philosophy in Energy Engineering

Ateneo de Davao University

- Master of Engineering in Renewable Engineering

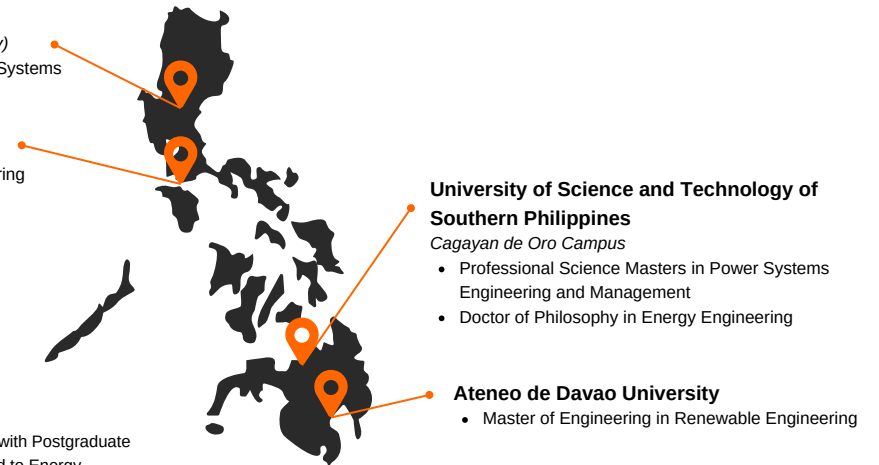


Figure 5: Universities with Postgraduate Courses Related to Energy

¹¹ Cabugon, R. (n.d.). Research and Development Directorate of Mariano Marcos State University. <https://research.mmsu.edu.ph/centers/nberic/>
¹² Enginsay, S. (2023, September 25). Role of universities in startup ecosystems. StartupBlink Blog. <https://www.startupblink.com/blog/role-of-universities-in-startup-ecosystems/#:~:text=Universities%20are%20key%20players%20in,and%20technology%20cannot%20be%20overstated.>

Nascent New Energy Indicators



What we really need are experts and technical know-how. Unless we can come up with an army of experts and technical people to focus on this, nothing will happen to us," he added.

Producing these experts was the rationale for the university's doctorate program on Energy Systems Engineering and its Master in Renewable Energy Engineering, which are the first in the country, according to Espina.

One project proposed for funding through MREC was the production of PV cells, he said.

"Our plan was to localize the solar cell technology," he said. "The advantage of localization is we can customize the size and we can decide for ourselves and tailor it to our needs. We are no longer dependent on what is available in the market."

Excerpt from the article "Regreening Mindanao Grid" ¹³



It discussed the initiatives in Mindanao to transition from fossil fuels to renewable energy sources, focusing on efforts by Ateneo de Davao University (ADDU). It highlights the university's integration of renewable energy, with over 2,500 solar photovoltaic panels installed on its rooftops, significantly contributing to its electricity supply. The article also details ADDU's commitment to renewable energy research in technologies such as concentrated solar power (CSP) and ocean energy, with the goal of making these technologies more accessible and affordable for local communities.

ADDU's vision of localizing and customizing renewable energy solutions tailored to the nation's specific needs is the rationale behind introducing a doctorate program in Energy Systems Engineering and a Master in Renewable Energy Engineering—marking the first such programs in the Philippines. They aim to develop local expertise in renewable energy technologies, addressing the need for specialized knowledge and technical skills in the country.

Investors and Financing Mechanisms

Another indicator is the Investors and Financing Mechanisms which refer to individuals, organizations, and systems that provide essential financial support for developing and expanding new energy projects. They enable the growth and commercialization of these assets through various funding forms, including grants, venture capital, and crowdfunding. This aspect is crucial in any startup ecosystem as it is one of key drivers of ecosystem development.

Venture capital and other funding sources are essential to enable startups to grow, innovate, and succeed, which in turn stimulates economic activity and encourages further entrepreneurial ventures. By providing crucial capital and support, these mechanisms help to build a robust and dynamic startup ecosystem, fostering a cycle of innovation and growth.¹⁴

The investment landscape for energy startups in the Philippines is improving, driven by increasing interest in renewable energy and supportive government policies. Although venture capital and private equity are becoming more active, the market remains less developed compared to more mature regions. Despite this progress, startups still face challenges such as high capital requirements and regulatory hurdles, which create opportunities for innovative financing solutions.

A challenge in the current landscape of funding mechanisms in the Philippines is the difficulty small-scale and early-stage startups face in accessing and utilizing these opportunities. Typically, only large companies can meet the eligibility requirements of funding institutions, while most startups are not yet mature enough to be commercially viable on a large scale.

Case Study 1: Solar Philippines Secures Major Funding for Expansion

Solar Philippines¹⁵, Southeast Asia's largest solar company with over 1,000 employees across numerous project sites, has successfully secured funding from a major investment institution. The company, which has 400 megawatt (MW) in projects either operating or under construction and a multi-gigawatt (GW) pipeline, aims to make low-cost, reliable electricity universally accessible. Solar Philippines is known for pioneering the world's largest off-grid solar projects and offering the lowest cost Solar Power Purchase Agreements in East Asia.

As part of its mission to end poverty and climate change while enabling emerging economies to leapfrog development, Solar Philippines is currently undergoing a significant business expansion program. This program is designed to ensure the supply of cheap, clean, and reliable energy to more Filipinos.

The investment institution, Metro Pacific Investments Corporation (MPIC), has acquired substantial positions in Solar Philippines (SP)¹⁶. This includes a 2 billion peso infusion for 1.6 billion common shares in SP New Energy Corporation. Additionally, key figures from MPIC, such as Manny V. Pangilinan, who serves as SPNEC's Chair, Chief Executive Officer (CEO), and President, are leading the charge in this strategic partnership. This funding and leadership support are pivotal in driving Solar Philippines' expansion and its mission to provide sustainable energy solutions.



¹⁴ Sharma, A. (2021). Entrepreneurial Finance: External Financing Mechanisms of Start-ups with Special Emphasis on the Role of Venture Capital in the Indian Startup Ecosystem. *International Journal of Scientific and Management Research*, 04(08), 32–47. <https://doi.org/10.37502/ijsmr.2021.4803>

¹⁵ Solar Philippines. (n.d.). Retrieved July 29, 2024, from <https://www.solarphilippines.ph/>

¹⁶ Chandak, P. (2023, March 29). Metro Pacific Investments to invest 2 billion pesos in SP New Energy. *SolarQuarter*.

¹⁷ Rivas, R. (2023, December 28). Manny Pangilinan takes helm of Leandro Leviste's SP New Energy Corporation. *RAPPLER*. <https://www.rappler.com/business/manny-pangilinan-takes-helm-leandro-leviste-sp-new-energy-corporation/>

Investors and Financing Mechanisms



There should be continuous funding mechanisms that support startups at different stages of their ventures. If the challenge is ensuring the continuity of the project after the funding period, especially for early-stage startups, funding could be issued through tranche releases based on milestones and deliverables, with strict adherence to this requirement. If the projected deliverables and impact are not met, the startup would not receive the next tranche of funding.

Noel Victorino
SolX Technologies

Funding institutions typically target startups in the Seed to Series B stages, particularly within sectors like technology, energy, and healthcare, which present substantial market opportunities through innovative solutions. Beyond evaluating technical aspects and financial models, these institutions place significant emphasis on the leadership and expertise of the founding teams. They seek startups with distinctive value propositions, defensible market positions, well-defined investment plans, and realistic exit strategies to ensure potential for robust growth and significant returns. For the Philippine new energy ecosystem to make significant progress, it is essential to establish a comprehensive funding support mechanism that caters to startups at all stages of their development.

Case Study 2: Investment Boost for SolX Technologies, Inc. in Digital Energy Solutions

SolX Technologies, Inc.¹⁸, specializing in energy efficiency and conservation (EEC), has secured significant investments to advance its mission of simplifying energy management through digital platforms. The company operates an end-to-end digital energy solutions platform designed to help businesses manage and optimize their energy costs. Their platform offers services such as energy data analytics, market intelligence, and procurement solutions, enabling clients to understand their energy consumption, identify savings opportunities, and make informed decisions.

SolX simplifies complexity in energy procurement, management processes, and efficiency reporting. As of 2023, they have served approximately 50 corporate customers, generating over PHP 400 million in savings. Their diverse client portfolio includes manufacturing and telecommunications firms. SolX has also partnered with Ateneo de Manila University to support the institution's transition to 100% renewable energy. The company currently employs around 20 full-time staff and plans to expand further.

In 2023, SolX received PHP 11 million from the National Development Company (NDC) through its Strategic Venture Fund (SVF) and an equivalent amount from Real Tech Holdings, a Japanese venture capital firm. These investments are critical for enhancing SolX's digital platform and continuing to support businesses in optimizing their energy efficiency.



Photo courtesy: orangemagazine.ph

¹⁸ SolX. (n.d.). <https://www.solx.ph/>

¹⁹ Philippine News Agency. (2024, July 20). NDC backs energy tech startup with PHP22M investment. Retrieved from <https://www.pna.gov.ph/articles/1212445>

Enabling Environment

The Enabling Environment refers to creating favorable conditions and policies that support the growth and adoption of clean energy technologies and initiatives, providing a supportive framework for implementing and integrating renewable energy sources and energy-efficient technologies across various sectors of society. The report will highlight relevant national-level laws, business incentives, and commitments and initiatives within local government units.

Since the initial release of the first ecosystem report, several additional laws have been enacted related to the promotion and adoption of renewable energy sources. Republic Act (RA) No. 11646 of 2022, known as the "Microgrid Systems Act," aims to promote clean energy innovation in the Philippines by incentivizing and supporting renewable energy projects, including solar, wind, and hydroelectric power. The other law, Republic Act No. 11697 of 2022, titled the "Electric Vehicle Industry Development Act," supports the nationwide establishment of charging infrastructure to facilitate electric vehicle adoption. By promoting sustainable transportation solutions, this law aims to reduce carbon emissions, improve air quality, and advance the country's transition to cleaner energy sources.

Another important piece of legislation, Republic Act No. 11572 of 2021, known as the "Philippine Energy Research and Policy Institute Act," establishes the Philippine Energy Research and Policy Institute (PERPI). PERPI is tasked with conducting multidisciplinary energy research and policy development to enhance the country's energy security, sustainability, and affordability, providing evidence-based recommendations to guide national energy policies and strategies. Additionally, Republic Act No. 11571 of 2021, the Joint Congressional Energy Commission (JCEC) Enhancement Act, strengthens the oversight and policy-making functions of the JCEC. It ensures effective monitoring and evaluation of the implementation of energy laws, regulations, and policies, promoting transparency, accountability, and sustainability in the Philippine energy sector. RA 11571 specifically enhances the functions and roles of the JCEC as initially outlined in Republic Act No. 9136, known as the Electric Power Industry Reform Act of 2001 or the EPIRA Law.

Microgrid Systems Act of 2022 (RA No. 11464)

Aims to promote clean energy innovation in the Philippines by incentivizing and supporting renewable energy projects, including solar, wind, and hydroelectric power

Electric Vehicle Industry Development Act of 2022 (RA No. 11697)

It supports the nationwide establishment of charging infrastructure to facilitate electric vehicle adoption and aims to reduce carbon emissions, improve air quality, and advance the country's transition to cleaner energy sources.

Philippine Energy Research and Policy Institute Act of 2021 (RA No. 11572)

Establishes the Philippine Energy Research and Policy Institute (PERPI) – tasked with conducting multidisciplinary energy research and policy development to enhance the country's energy security, sustainability, and affordability, providing evidence-based recommendations to guide national energy policies and strategies.

Joint Congressional Energy Commission (JCEC) Enhancement Act of 2021 (RA No. 11571)

It ensures effective monitoring and evaluation of the implementation of energy laws, regulations, and policies, promoting transparency, accountability, and sustainability in the Philippine energy sector

Enabling Environment

Together with existing legislation, these laws provide financial incentives, streamlined regulations, and market opportunities that benefit energy startups in the Philippines. They support renewable energy projects, electric vehicle development, and innovation in clean technologies, enabling startups to lower costs, navigate regulatory challenges more efficiently, and capitalize on an expanding market for sustainable solutions. Moreover, these legal frameworks foster an environment conducive to research, development, and collaboration, empowering startups to innovate and play a significant role in driving the nation's energy transition forward.

The policies and incentives created by the government are crucial components of an enabling environment, yet the government's role extends far beyond legislation. Beyond enacting laws and regulations, governments can drive the transition through several key strategies. These include: (1) developing detailed action plans with clear accountability for achieving sustainability goals, (2) boldly incentivizing markets and mandating transformative change, and (3) increasing funding to stimulate innovation. Moreover, governments can foster a whole-of-society, people-centered approach by promoting and leading green initiatives with improved design and implementation. Importantly, governments should serve as role models for other sectors of the economy²⁰, demonstrating commitment to sustainable practices and inspiring broader adoption.

Several local government units (LGUs) across the Philippines have actively integrated clean energy commitments and initiatives into their operations, policies, and plans. These initiatives collectively aim to foster a more sustainable and resilient future by addressing environmental challenges, promoting the adoption of renewable energy sources, and enhancing environmental governance at the local level. The majority of these commitments originate from LGUs in Luzon, including the National Capital Region (NCR), Cordillera Administrative Region (CAR), Region 3 (Central Luzon), Region 4A (CALABARZON), and Region 5 (Bicol Region). Most focus on procurement, establishment, and utilization of renewable energy sources, predominantly solar and occasionally hydro and hybrid. Others involve integrated green initiatives that encompass energy efficiency, waste management, and green building practices. Additionally, there are programs promoting sustainable transportation solutions such as electric vehicles and initiatives like car-free days aimed at reducing carbon emissions.

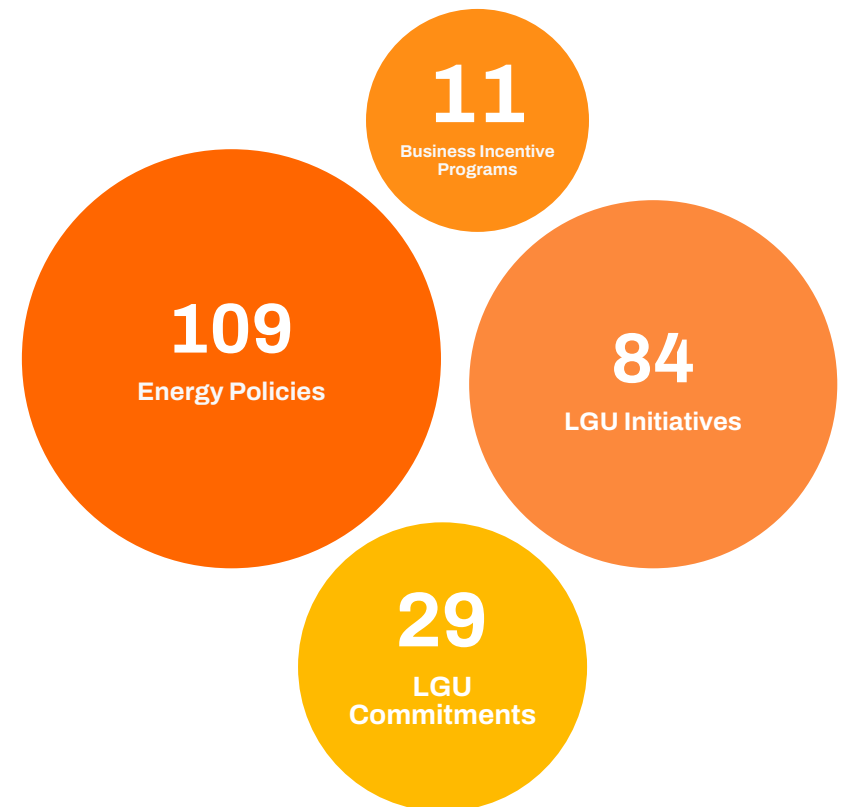


Figure 6: 2024 Government Initiatives and Policies

²⁰ EY. (2022, May 13). Six ways that governments can drive the green transition. EY Global. Retrieved July 16, 2024, from https://www.ey.com/en_gl/insights/government-public-sector/six-ways-that-governments-can-drive-the-green-transition

Enabling Environment

The article titled “Iloilo City Hall Goes Green, Adopts Solar Power”²¹, discusses Iloilo City Hall’s initiative to transition to renewable energy by installing solar panels on its building. This move is part of the city’s broader efforts to promote sustainable energy practices and reduce its carbon footprint. The installation of solar power aims to cut electricity costs, enhance energy efficiency, and serve as a model for other institutions and communities to adopt similar green practices. The article likely highlights the benefits of this initiative and its potential impact on the city’s environmental sustainability goals.



SOLAR POWER. Iloilo City Hall adopts solar energy. The power generated by the 134 solar panels is expected to generate 60 kilowatts a day and will provide around one-third of the power demand at the city hall. PNA PHOTO

Indication 3:

The enactment of various laws and regulations that support various sectors and industries, alongside the streamlined processes, incentives, and market opportunities can stimulate innovators and entrepreneurs to create solutions that promote renewable energy adoption and sustainability. This can lead to an ecosystem with a diverse range of solutions that address the different challenges and gaps in the country’s transitions towards sustainability.

Indication 4:

The commitments and initiatives of LGUs signal their openness to participate in the movement for sustainability. This openness is promising and may potentially extend to collaborating with startup companies in the future, fostering innovation and advancing sustainable solutions at the local level.



New Energy Companies

The New Energy Companies are entities specializing in developing, installing, maintaining, and operating innovative energy technologies and systems. These include businesses focused on distributed renewable energy products like solar photovoltaic (PV) installations, utility-scale renewable energy projects, and Energy Efficiency and Conservation (EEC) services, such as ESCOs and EEC technology providers.

The difference between distributed renewable energy companies and utility-scale renewable energy (RE) companies lies in the project's scale and deployment. Distributed RE Companies focus on smaller, localized energy systems installed near the point of use, such as solar panels on rooftops or small wind turbines for communities. These installations enhance energy security for local areas and reduce transmission losses. In contrast, Utility-scale RE Companies develop large-scale renewable projects like solar farms, wind farms, and geothermal plants, which generate substantial amounts of electricity for the grid. These large projects benefit from economies of scale, making electricity generation more cost-effective and significantly contributing to the national energy supply.

These companies play a crucial role in helping the Philippines achieve its goal of having renewable energy account for 35% of the energy mix by 2030 and 50% by 2040, as outlined in the Department of Energy's Philippine Energy Plan. Their contributions are vital for diversifying the country's energy sources and enhancing energy security and sustainability.

According to the Bloomberg New Energy Finance (BNEF) Climatescope 2023 report, the Philippines ranks fourth among the most attractive emerging markets for renewable energy. This high ranking is attributed to the country's supportive policies and programs, including auctions, feed-in tariffs, net metering schemes, and tax incentives. Additionally, the Philippines' limited restrictions on foreign ownership make the renewable energy sector particularly appealing for investments.

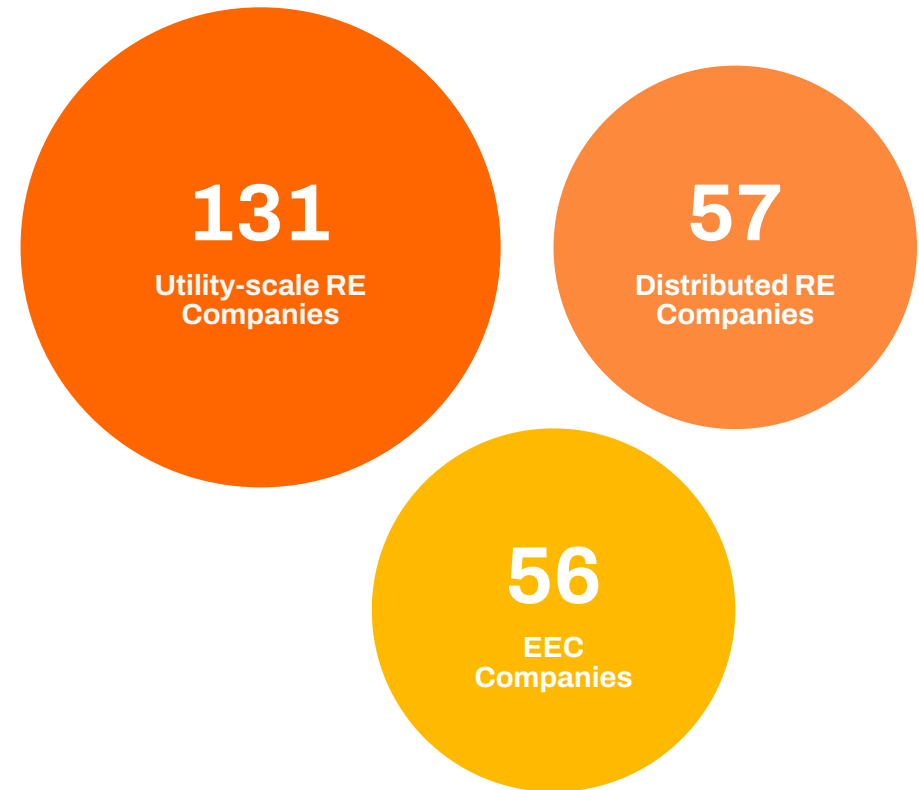


Figure 7: 2024 New Energy Companies

New Energy Companies



USAID ESP: Energy Efficiency and Conservation Incubation Program for Startups and RE Companies in Northern Mindanao

CULMINATING ACTIVITY

May 24, 2024
N Hotel, Cagayan de Oro City

From the New Energy Nexus Philippines Facebook page: On May 24, 2024, a culmination activity marked the end of the 16-week incubation program for eight companies. These companies underwent rigorous training, several learning sessions, and mentorship on transitioning to providing solutions and technologies for energy efficiency and conservation.

The enactment of Republic Act No. 11285, also known as the Energy Efficiency and Conservation Act of 2018, has significantly increased the presence of service providers and companies offering energy efficiency solutions and technologies, promoting sustainable energy use and reducing overall energy consumption in the Philippines. The law requires designated establishments (establishments with an annual energy consumption of at least 100,000 kWh but less than 500,000 kWh) in the Philippines to conduct regular energy audits and submit an annual energy audit report.²³ These reports must detail energy usage, efficiency measures implemented, and the results achieved. This law aims to improve energy efficiency across various sectors, with the Department of Energy overseeing compliance and providing support to ensure establishments meet their energy management obligations.

New Energy Nexus Philippines, funded by the United States Agency for International Development - Energy Secure Philippines (USAID-ESP), designed a two-year project to accelerate the utilization and implementation of the EEC law in Northern Mindanao entitled **Establishment of an Energy Efficiency Incubation Hub in Northern Mindanao**. The project involves two main activities: (a) establishing an Energy Efficiency and Conservation (EEC) incubation hub in the region and (b) launching an open-source EEC curriculum for adoption by higher education institutions (HEIs) and other institutions in Mindanao. The project trained at least 50 individuals and professionals in introductory EEC opportunities, both professional and entrepreneurial. It also trained local incubators to support future EEC startups and encourage various establishments to adopt the EEC curriculum. Additionally, a 16-week incubation program was implemented and supported eight enterprises who were startup companies with EEC solutions and renewable energy companies with plans to expand into the EEC sector. A policy paper documenting the project's impact and the activities of the incubation hub will also be produced.

²³ Republic Act No. 11285. (n.d.). https://lawphil.net/statutes/repacts/ra2019/ra_11285_2019.html#:~:text=%2DEstablishments%20with%20an%20annual%20energy,50001%20or%20any%20similar%20framework

²⁴ Energy Efficiency and Conservation (EEC) program for startups and renewable energy companies in Northern Mindanao - New Energy Nexus. (n.d.). New Energy Nexus. <https://new.newenergynexus.com/program/energy-efficiency-and-conservation-eeec-program-for-startups-and-renewable-energy-companies-in-northern-mindanao/>

Networking Assets

The networking assets are events, entities, and platforms that connect stakeholders within the clean energy ecosystem, fostering communication, collaboration, and innovation. They enhance partnerships and the exchange of ideas among startups, researchers, investors, and industry players in the Philippines.

Startup incubators and accelerators are vital to the entrepreneurial ecosystem, aiding ventures from ideation to viable businesses. Incubators provide long-term support with space, mentorship, and resources, allowing startups to grow organically. On the other hand, accelerators offer intensive, short-term programs focused on rapid growth, scaling operations, and preparing for investor pitches.²⁵ As of 2022, there are 54 technology business incubators (TBIs) in the Philippines. Out of these, 32 are funded by the Department of Science and Technology - Philippine Council for Industry, Energy and Emerging Technology Research and Development (DOST-PCIEERD), while the remaining 22 are supported by the Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (PCAARRD).



Figure 8: TBIs in the Philippines as of 2022

Despite the growing number of incubators in the Philippines, only seven have supported energy startups: iDEYA: Center for Innovation and Technopreneurship at Mindanao State University - Iligan Institute of Technology, Dado Banatao Incubator at the Asian Institute of Management, UPSCALE at the University of the Philippines - Diliman, Center for Technopreneurship and Innovation at Batangas State University, Green Technology Business Incubation at West Visayas State University, QBO Innovation Hub, and Cerebro Labs. It is important to note that these findings are based on the proponents' research, primarily through desk research, and may be limited to programs with a strong online presence. More comprehensive research might be required to obtain accurate figures.

Through its extensive work with various incubators across the country, New Energy Nexus Philippines has identified several common challenges faced by these incubators in supporting energy startups. These challenges include a lack of knowledge among program staff about the energy entrepreneurship landscape, including understanding the eligibility criteria and nature of energy startups. Program staff often lack awareness of the specific policies and regulations that energy entrepreneurs must navigate, which are not typically required for startups in other sectors. These incubators also often have a shortage of networks and connections to industry experts who can offer guidance and mentorship to startups. They also are in need for training on how to design and implement incubation programs specifically tailored to the needs of energy entrepreneurs.

²⁵ FasterCapital. (n.d.). The role of incubators and accelerators in startup development. FasterCapital. Retrieved July 12, 2024, from <https://www.fastercapital.com/content/The-Role-of-Incubators-and-Accelerators-in-Startup-Development.html>

Networking Assets

Aside from the increasing number of entrepreneur support organizations, there are now several networking opportunities in the country, many of which are regular annual events that entrepreneurs from various sectors can look forward to. These networking events come in different formats, including trade shows and conferences like PhilEnergy, awareness and advocacy events such as Energy Efficiency Day, regional forums like Power Up Western Visayas Energy Forum 2024, international forums such as ASEAN Clean Energy Week, and industry-specific conferences like the Energy Smart Forum and the Electric Vehicle Association of the Philippines (EVAP) Summit.

Networking is crucial in a startup ecosystem because it facilitates connections with potential investors, partners, and customers, which can significantly accelerate business growth.

It provides startups with opportunities to share ideas, gain insights, and collaborate with industry experts, which can lead to valuable partnerships and new business opportunities. Effective networking also helps startups stay informed about industry trends and best practices, enhancing their ability to adapt and innovate. Ultimately, strong networking can open doors to funding, mentorship, and strategic alliances that are essential for scaling and succeeding in a competitive global market.²⁶

In 2019, three key national agencies in the Philippines – the Department of Trade and Industry (DTI), the Department of Information and Communications Technology (DICT), and the Department of Science and Technology (DOST) – joined forces to launch the inaugural Philippine Startup Week. Now an annual event every November, it has become one of the country's largest startup conferences, dedicated to celebrating and advancing the vibrant startup ecosystem in the Philippines.

I believe there are already a lot of innovators out there that want to come up with disruptive technologies and want to explore the energy sector. It's just that the energy sector is very bureaucratic and heavily regulated with policies and regulations that may hinder the progress and scaling up of these innovators. Such complexity often creates significant roadblocks. These hurdles can demotivate startups, making it challenging for them to progress and scale. As incubators, we also face difficulties in guiding them through these challenges, often lacking the deep expertise needed to navigate these obstacles effectively

Ceej Brasileño
iDEYA:CIT



Networking Assets

Another significant networking opportunity for startups, particularly those in solar energy and energy storage solutions, is Solar and Storage Live PH (formerly known as the Future Energy Show). This event gathers key stakeholders across the energy value chain, bringing together innovators and disruptors to showcase cutting-edge technologies and service solutions essential for driving change in this crucial period.



The event was a fantastic platform to showcase our solution and connect with industry leaders, potential partners, and forward-thinking professionals.

The high level of discussions and enthusiasm for sustainable energy technologies highlighted the vibrant growth and opportunities in the renewable energy sector. As a participating exhibitor, we were impressed by the diverse range of attendees, from government officials to tech enthusiasts, all dedicated to advancing the future of energy. Engaging with such a passionate audience and exploring new collaborations was both inspiring and valuable. Overall, the event significantly boosted our market presence and reinforced our commitment to driving positive change in the energy landscape.

Project revEARTH
Future Energy Show 2023



ECOSYSTEM MATURITY ASSESSMENT

ECOSYSTEM MATURITY ASSESSMENT

ENERGY INNOVATION ECOSYSTEM MATURITY

(adapted from Innovation Ecosystem Maturity Model created by CREATORS)



Money

Ecosystem Maturity Assessment: Level 2 Builder

*Business funding and support for R&D are crucial for innovation and growth, providing the capital needed to develop and scale new technologies. In mature ecosystems, a mix of private investors, government grants, and corporate partnerships helps overcome the high costs and risks of research and development. For energy innovations, where technology development is extensive and market dynamics are complex, sustained investment is vital to advancing innovations from the lab to commercial success, fostering a thriving and dynamic innovation environment.*²⁷

Government funding has been available to innovators and inventors for several decades now. The Department of Science and Technology (DOST), for example, has a long-standing history of supporting Filipino inventors through multiple grant opportunities. Established in 1987, the Technology Application and Promotion Institute (TAPI) under DOST has been instrumental in advancing the interests of local inventors. TAPI administers various programs like the Invention Development Assistance Fund, the i-INVENT campaign, and the Grants and Assistance to Leverage Innovations for National Growth (GALING) program. These initiatives provide financial and technical support for developing, prototyping, and commercializing inventions, thereby fostering a robust environment for innovation in the country.²⁸

DOST TAPI has been an active supporter of innovations in energy. In fact, energy has been one of our priority industries ever since, and we have supported several energy startups and have invested in experimental projects, primarily from researchers and academic outputs.

Dir. Cezar Arceo
DOST - TAPI



In energy specifically, Energy Startup Founders Louie Villalon, Patrick de Guzman, and Leo Villalba are prominent examples of innovators who have benefited from the support provided by DOST-TAPI. Louie Villalon, the inventor of VORTEX, a vertical wind turbine, received assistance from TAPI's concept prototyping program, which helped him scale up his prototype and make it more practical for widespread use. Similarly, Patrick de Guzman, who invented the Marissa Turbine—a tidal energy generator—was supported by DOST-TAPI's concept prototyping program, allowing him to develop his invention for off-grid communities reliant on diesel-based electricity. Leo Villalba's innovation, a back-to-back voltage source power converter, also received crucial support from TAPI, facilitating the integration of renewable energy systems²⁹ into the grid. These examples highlight the vital role of government grants and programs in nurturing early-stage innovations and startups in the energy sector.

Recent developments highlight a growing trend in private investment in new energy and climate startups in the Philippines. For instance, the National Development Company (NDC) and Realtek Ventures have jointly invested PHP 11 million in SolX Technologies Inc., a startup providing a digital energy solutions platform aimed at reducing energy costs for businesses by optimizing power contract choices.³⁰ Additionally, Mober, an electric vehicle logistics startup, secured a substantial PHP 350 million investment from Clime Capital, a Singapore-based firm focused on supporting the transition to a low-carbon³¹ economy. These investments are evidence of a strong and emerging support system for innovative energy solutions and sustainable technologies in the country.

²⁷ Atlantic Council Global Energy Center (2021). Mapping Green Innovation Ecosystems, <https://www.jstor.org/stable/resrep31088>

²⁸ Inventors' Programs in Time of Pandemic | TechTrans. (2020, July 30). Techtrans.gov.ph. <https://techtrans.gov.ph/how-we-serve/news-and-updates/inventors-programs-time-pandemic>

²⁹ Lawrence San Diego. (2023, August 23). These Inventors Found Their Trusted Innovation Partner in DOST-TAPI. <http://www.tapil.dost.gov.ph/news/327-these-inventors-found-their-trusted-innovation-partner-in-dost-tapi>

³⁰ NDC, Realtek co-invest in digital energy solutions platform. (2023). Manila Bulletin. <https://mb.com.ph/2023/10/1/ndc-realtek-co-invests-p11-m-for-digital-energy-solutions-platform>

The future looks promising with the expected increase in allocation of funds for research and development in the energy sector. The Department of Energy (DOE) and the Department of Science and Technology (DOST) of the Philippines are collaborating to enhance renewable energy (RE) research and development. This partnership, formalized through a memorandum of agreement, focuses on leveraging the strengths and resources of both agencies to drive innovation and tackle challenges in the RE sector. This initiative aims to increase the efficiency, affordability, and scalability of RE technologies. The collaboration is supported by the Renewable Energy Trust Fund (RETF), established under the Renewable Energy Act of 2008, which finances the research, development, and promotion of renewable energy systems.³²

While the government, through agencies like the DOST, has been proactive in investing in experimental and innovative energy projects, the ecosystem's progress in terms of funding and investment for new energy startups is still at a nascent stage. To truly claim that the ecosystem has reached a mature level in terms of money and funding, it needs to demonstrate a growing number of successful funding rounds for new energy startups, as well as attract serial investors to actively invest in these innovative ventures.

Despite the availability of funding sources, it has been apparent that the current investment readiness of energy entrepreneurs in the country do not fully align with the existing opportunities. This is also validated through conversations with commercial investors and private investors. As the ecosystem continues to evolve, fostering a pool of investment-ready startups and nurturing a robust investor community focused on sustainable energy innovations remain crucial endeavors. These efforts will play a pivotal role in unlocking the full potential of the Philippines' burgeoning new energy sector and accelerating its transition towards a more sustainable future.



The issue is not a lack of funds but the availability of the right talent-- or investment ready energy startup founders. It's a fact that startups in other industries can raise funds more easily compared to those in the energy sector

Ping Mendoza
PSSEA, Yuda.ph

³¹ Manila Standard Business, (2024, June 6). EV startup Mober secures P350-m Clime Capital investment - <https://www.manilastandard.net/business/314456263/ev-startup-mober-secures-p350-m-clime-capital-investment.html>

³² DOE and DOST collaborate for renewable energy research and development | Department of Energy Philippines. (2024, April 3). <https://doe.gov.ph/press-releases/doe-and-dost-collaborate-renewable-energy-research-and-development>


³³ Rozalska-Lilo, M. (2019, May 22). Innovation Ecosystem Maturity. Medium. <https://medium.com/creatorsrad/innovation-ecosystem-maturity-3775812b3d3e>



People

Ecosystem Maturity Assessment: Level 2 Builder

Human capital, when paired with a proactive and innovative mentality, is a cornerstone of a mature ecosystem. Skilled workers, researchers, and entrepreneurs are indispensable for driving technological advancements and maintaining competitive edge. Ecosystems that attract and retain top talent are often characterized by strong educational institutions, attractive quality of life, and policies that support immigration and workforce development.³⁴ Further, the right mentality—one that embraces risk, encourages collaboration, and fosters a culture of continuous learning and adaptation—amplifies the impact of human capital. This combination not only enhances productivity and innovation but also ensures that the ecosystem remains resilient and responsive to changes in the global market.



Whether we like it or not, the workplace is changing towards sustainability.

The society and economy we try so hard to maintain is nested within the planetary boundaries of our only home. Disregarding that fact undermines the ecosystems that give us the very resources we need for economic growth and social well-being as well as the weather cycles that dictate the pace of our day-to-day. This is why innovation in alternative means of production and supply-chain that is socially conscious and environmentally friendly is required to shift our economy from simply being extractive to something that is regenerative. There is a growing interest in fostering a culture of sustainability and innovation in many workplaces, recognizing the importance of integrating these values into the core of business practices.

David Pagulayan
Sustainable PH



During the assessment of this aspect in the energy innovation ecosystem, the Philippines is making progress in cultivating a skilled workforce equipped to drive the transition towards sustainable energy solutions. Academic institutions are playing a pivotal role in this endeavor by introducing specialized degree programs and fostering an entrepreneurial mindset among students. For instance, Mapúa University launched in 2023 a Bachelor of Science in Energy Engineering, the first and only Energy Engineering³⁵ program for undergraduates in the country. Batangas State University, offers a³⁶ Master of Science in Energy Engineering (MSEgyE) ; and Ateneo School of Government launching an Energy Transitions Track in the Masters in Public Management Degree in 2021. An impressive development from several years back when the only formal academic degrees on energy were the graduate degrees in Energy Engineering from the University of the Philippines Diliman and Mariano Marcos State University.

³⁴ Atlantic Council Global Energy Center (2021). Mapping Green Innovation Ecosystems, <https://www.jstor.org/stable/resrep31089>

³⁵ Mapua University. (2023). <https://www.mapua.edu.ph/pages/academics/undergraduate/intramuros-campus/school-of-mechanical-manufacturing-and-energy-engineering/bachelor-of-science-in-energy-engineering>

³⁶ Batangas State University The National Engineering University. (2021, June 30). Master of Science in Energy Engineering (MSEgyE) <https://batstateu.edu.ph/master-of-science-in-energy-engineering-msegye/>

³⁷ ASOG welcomes new students in the Master in Public Management Energy Transitions Track | Ateneo de Manila University. (2021). Ateneo de Manila University. <https://www.ateneo.edu/news/2021/09/23/asog-welcomes-new-students-master-public-management-energy-transitions-track>

People

Moreover, community groups consisting of professionals in the sustainability industry are emerging and gaining momentum, further fueling the shift towards a more sustainable mindset. One notable example is Sustainable PH, a Facebook community with over 13,000 followers to date, which serves as a platform for sharing ideas, best practices, and networking opportunities within the sustainable development sphere.³⁸

The government's recent agreements with organizations like the Philippine-American Educational Foundation (PAEF) and the United States Agency for International Development (USAID) underscore the commitment to capacity building and workforce development in the energy sector. These collaborations will facilitate scholarships, research opportunities, and knowledge-sharing initiatives, enabling Filipinos to access advanced training programs and educational exchanges in the United States.³⁹

The collective efforts of academic institutions, private companies and individuals, community groups, and government agencies are gradually shifting the mindset of the Philippine workforce towards sustainability and innovation. As more skilled professionals enter the renewable energy sector, the country is better positioned to achieve its targets, such as increasing the share of renewable energy in the power generation mix.

³⁸ Sustainable PH. (n.d.). Facebook community page. Retrieved from <https://www.facebook.com/sustainablephofficial>

³⁹ DOE. (2024). DOE inks accords to boost capacity building and workforce development in the Philippine energy sector and advance clean energy goals. Retrieved from [Clean energy technology innovation and the vital role of governments – Clean Energy Innovation – Analysis - IEA. \(n.d.\). IEA.](#)

Government

Ecosystem Maturity Assessment: Level 3 Experimenter

The government plays a vital role in society, driving human development and technological advancement. Its support is essential for a thriving innovation ecosystem, especially in the heavily regulated energy sector governed by national policies and laws.

Government involvement goes beyond funding R&D or creating incentives; it plays a crucial role in driving advancements. The success of solar photovoltaic (PV) systems, for example, was propelled by government actions such as accelerating development, partnering with the private sector, and scaling market demand. Incorporating solar technology into global development plans significantly facilitated its adoption.⁴⁰

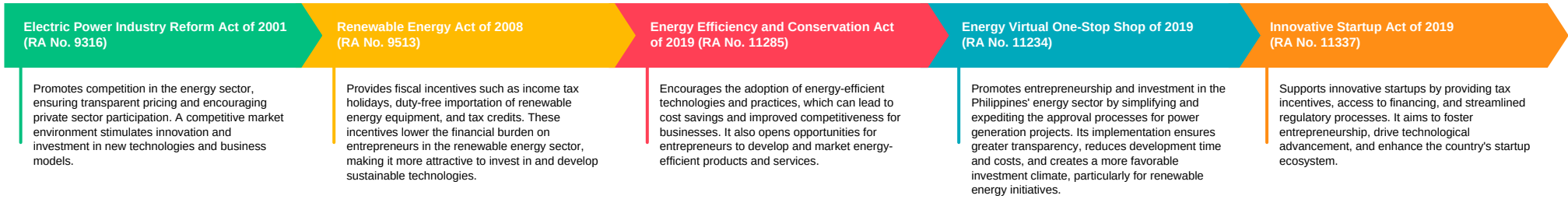
Technological advancements benefit both the government and citizens by improving services and conserving resources. Thus, the government must support research and development, ensure innovations are utilized, and provide knowledge transfer and incentives to encourage ongoing innovation and market growth.⁴¹

Governments are often called “enrichers” in innovation ecosystems due to their roles as policy enablers, infrastructure builders, public-private partnership initiators, and shapers of technological progress and economic development.⁴²

During the assessment, it is evident that the government has taken proactive steps in formulating policies to support entrepreneurship in the energy sector, particularly through incentives aimed at fostering clean energy initiatives. There are already several existing laws and policies in the Philippines that create a supportive environment for entrepreneurship by providing financial incentives, streamlining business processes, encouraging innovation, promoting knowledge transfer, and facilitating market access. Among those are the following:



Brenda Valerio
New Energy Nexus PH



⁴⁰ Clean energy technology innovation and the vital role of governments – Clean Energy Innovation – Analysis - IEA. (n.d.). IEA. <https://www.iea.org/reports/clean-energy-innovation/clean-energy-technology-innovation-and-the-vital-role-of-governments>

⁴¹ DOE and DOST collaborate for renewable energy research and development | Department of Energy Philippines. (2024, April 3). <https://doe.gov.ph/press-releases/doe-and-dost-collaborate-renewable-energy-research-and-development>

⁴² Cao, Yuhua & Dong, Jieli & Cantwell, John & Sun, Sunny & Zhang, Yanli. (2019). Enriching innovation ecosystems: The role of government in a university science park. Global Transitions. https://www.researchgate.net/publication/334107522_Enriching_innovation_ecosystems_The_role_of_government_in_a_university_science_park

Government



Joseph Amiel Camingal
Hive Energy PH

Several startups, such as Hive Energy PH founded by Joseph Amiel Camingal, have already benefited from these policies. Hive Energy PH specializes in solar-powered battery systems, providing backup power to mitigate intermittent electricity supply. The company was recognized as an awardee of the Startup Grant Fund totaling to Php1,000,000.00.

While it is true that several policies and programs are in place, entrepreneurs' access to them is still a challenge, hindered by rigorous requirements, navigating inter-agency processes, and integrating existing incentives from different agencies. Director Cezar Arceo from DOST-TAPI emphasized during the round table discussion their commitment to improving processes, stating, "We plan to revisit the guidelines and remove unnecessary requirements in the eligibility criteria to simplify access."

The government continues to develop programs aimed at supporting the adoption of clean energy technologies in the country and incentivizing innovators, including startups. Senate Bill No. 157, titled the Energy Transition Act, seeks to accelerate the transition to renewable energy sources. Proposed by Senator Win Gatchalian, the bill includes provisions for incentives designed specifically for renewable energy startups and technological innovations within the sector. Senator Gatchalian highlighted in a press release⁴³, "The data clearly shows that developing renewable energy offers the most benefits for our consumers, given its lower generation costs."

Furthermore, the Department of Science and Technology (DOST) continues to expand its network of technology business incubators (TBIs) nationwide, aimed at supporting researchers and innovators in developing groundbreaking solutions and technologies for commercialization. These TBIs serve as pivotal incubation hubs, providing early-stage technology startups with essential support and resources. They offer mentorship, access to workspace, state-of-the-art equipment, and facilitate valuable networking opportunities with industry experts and potential investors. TBIs also conduct specialized training programs and workshops to strengthen startup founders' capabilities in business development, fundraising, and market strategy. With more than 50 incubation hubs established across the Philippines, the initiative aims to foster the growth of innovative ventures. Collectively, these TBIs have supported nearly 1,400 startups, resulting in the creation of over 5,000 jobs and the attraction of over P1.7 billion in private investments, contributing to a total of P766.7 million in generated private investments.⁴⁴

⁴³ Gatchalian, W. (2023, August 20). Gatchalian pushes for Energy Transition Act to lower generation cost [Press release]. Senate of the Philippines. Retrieved from https://legacy.senate.gov.ph/press_release/2023/0820_gatchalian1.asp

⁴⁴ DOST highlights growth of startups, TBIs in Philippine Startup Week 2022. (2022, December 16). Manila Bulletin.



Know-how

Ecosystem Maturity Assessment: Level 1 Beginner

The Philippines' new energy ecosystem is currently at an early stage, with stakeholders across various sectors working to overcome challenges and foster growth. Evidence suggests that while there is progress, the interconnectedness and sharing of knowledge and resources among stakeholders still have room for improvement.

7

One of the primary challenges facing the clean energy sector, particularly for electric vehicle (EV) makers, is the classic "chicken and egg" dilemma.

Infrastructure development is heavily dependent on demand, which in turn requires existing infrastructure to grow. This situation necessitates collaborative efforts in developing minimum viable products and exploring innovative solutions. Additionally, the preference for foreign-made products due to economies of scale and reseller advantages poses a challenge for local manufacturers.

The privatized nature of the energy sector in the Philippines presents both opportunities and obstacles. While it allows for market-driven innovation, it also requires careful review and potential amendments to relevant laws.⁴⁵ There is a growing recognition of the need to explore avenues for government investment, including structural improvements, to support the emerging clean energy ecosystem.

Startups in the sector face unique challenges, particularly in demonstrating the efficiency of their solutions. The lack of necessary testing equipment and facilities, which are more readily available in other countries, hinders their ability to validate their technologies and attract investors. Furthermore, the competitive dynamics among startups sometimes impede collaborative efforts, which could otherwise accelerate innovation and market adoption.

The absence of comprehensive baseline data, such as information on solar rooftop installations, presents another hurdle for the ecosystem. Compiling and sharing such industry data could significantly benefit all stakeholders and inform better decision-making. Some stakeholders have proposed establishing a centralized certification agency to address issues related to product quality and market trust, especially for newer energy technologies and innovations.

There is ongoing debate about the current status of the ecosystem, with some arguing it has reached Level 2 due to previous support for ventures and successful implementations of energy projects. However, others maintain that it is still at Level 1, citing the subjective nature of success and the tendency of Filipinos to optimize existing resources rather than innovate, contributing to the country's relatively low innovation index score.⁴⁶

As the ecosystem continues to evolve, maintaining stakeholder engagement and sharing successful stories and learnings from new energy startups will be crucial. By addressing these challenges and fostering a more interconnected and collaborative environment, the Philippine new energy ecosystem can work towards achieving higher levels of maturity and success.



Launching a hardware manufacturing startup in the vehicle industry is no easy feat, especially when competing with foreign giants capable of mass production.

Local hardware startups face a longer road to success, but the journey is undeniably worth it to introduce groundbreaking innovations to the Philippines. Despite the challenges, this pursuit holds the promise of creating impactful success stories that will inspire and transform our ecosystem.

Jaggy Gangat
Lycan Motors

> Network

Ecosystem Maturity Assessment: Level 2 Builder

This factor assesses the ecosystem growth and stakeholder engagement in the new energy sector, focusing on the collaboration and interconnectedness among various actors. It examines the relationships between startups, government agencies, corporations, funders (investors and financial institutions), energy service companies (ESCOs), non-governmental organizations (NGOs) and civil society organizations (CSOs), established energy companies, and other industry players. Additionally, it evaluates the presence of platforms and events that facilitate networking and knowledge exchange within the new energy ecosystem.

A mature ecosystem in terms of network exhibits strong ties and open communication channels between these stakeholders. This interconnectedness fosters collaboration, knowledge sharing, and resource pooling, which are essential for accelerating innovation and effectively addressing the challenges and opportunities presented by the energy transition.

The current assessment of the Philippines' new energy ecosystem network maturity is at level 2. This level indicates increasing collaboration between the aforementioned stakeholders, with emerging platforms and events supporting networking and knowledge exchange.

An interview with Capili sheds light on the importance of networking and collaboration for a startup's growth and development. Capili Trading is a social enterprise that collects, processes, and transforms waste human hair into usable materials for various industries.

Capili's membership in the European Chamber of Commerce of the Philippines (ECCP) has been instrumental in expanding their network. After being invited by ECCP to be a member, their involvement with ECCP has provided regular social networking opportunities with members across various regions, enhancing their visibility and connectivity within the industry.

Through membership and participation in social networking events, Capili connected with the Association of Industrial Companies in Northern Mindanao, leading to potential procurement opportunities. Another event also led to valuable connections to academic institutions when they participated in the ASEAN Blue Innovation Challenge of the United Nations Development Programme (UNDP). Capili's connection with a University of the Philippines (UP) - Visayas consultant to oil spill issues led them to learn critical insights into the regulatory landscape of the Philippines. After the discussion, they learned to navigate the accreditation process and commercialize their product effectively.



> Network



Continuous participation in social activities also led Capili to have engagements such as online podcasts and radio guesting. This helps the startup raise awareness about their mission and products. These platforms offer startups an avenue to share their stories, attract potential clients, and gain industry recognition. Capili's networking efforts have led to not only tangible sales leads but also strategic partnerships.

Other startups like all.g, Verne, VORTex share the same perspectives, from attending various events like academic conferences, startup conferences, forums, and competitions. They find these events grounding and enlightening, helping them stay informed about sector developments, while also emphasizing the importance of strategic attendance to avoid burnout. They also acknowledge some barriers in forging partnerships through networking events when one is a small enterprise with time constraints.

Despite the growing collaboration within the startup community, the broader energy sector in the Philippines still lacks the same level of integration and cooperation among its diverse stakeholders. This can slow down progress and innovation in the energy sector, particularly in adopting and scaling new clean energy technologies.

The startup community is characterized by strong connections and frequent interactions among its members. Startups, incubators, and investors often work closely together, attending events, sharing knowledge, and collaborating on projects. This close-knit network fosters a supportive environment for innovation and growth within the startup community. The Philippine Startup Week (PHSW) is a pioneering, large-scale initiative led by a collaboration of government agencies DOST, DTI, and DICT, QBO Innovation Hub, and private organizations. It aims to highlight the Filipino startup community through simultaneous events held across the nation. PHSW19, for instance, spanned 11 cities and featured a diverse range of activities, including a 3-day Main Summit, over 60 community events, and 4 night fests. This comprehensive 5-day conference provided numerous opportunities for participants to explore the latest technological advancements, connect with influential figures in the startup ecosystem, and interact with the country's most promising startups.

Network

Another initiative organized by GeeksPH and DICT is the Geeks on a Beach (GOAB), an international conference that unites startups, tech enthusiasts, and design professionals. GOAB fosters collaboration and innovation within the Philippine startup ecosystem and globally, showcasing the Philippine startup scene and facilitating connections between local and international players. It highlights technology's potential to drive economic and social development in the Philippines.

In contrast, the Philippine energy sector can be described as fragmented, with various stakeholders such as government agencies, think tanks (research organizations), and NGOs (non-governmental organizations) often operating independently. This fragmentation creates barriers to communication and collaboration, hindering sector development. The Asian Development Bank (ADB) has emphasized the need for better coordination among these groups to accelerate renewable energy deployment in the Philippines.⁴⁷

Despite this fragmentation, there are numerous networking and knowledge-sharing events organized throughout the year. Events like "PhilEnergy," "Energy Efficiency Day," "Solar and Storage Live PH," and the "Energy Smart Forum" offer valuable platforms for stakeholders to connect, collaborate, and stay informed about the latest energy developments and innovations. These initiatives contribute to the ongoing exchange of ideas and advancements within the Philippine energy sector.

The "Energy Efficiency Day" organized by the Philippine Energy Efficiency Alliance, Inc. promotes energy efficiency as a crucial component of the country's energy strategy. "Solar and Storage Live PH" by Terrapinn brings together stakeholders from across the energy value chain to showcase innovative technologies and solutions. Additionally, the "Energy Smart Forum" by ECCP engages policymakers, experts, and high-level delegates in dialogues on the current status, opportunities, and trends in the Philippine energy sector.

Despite the increasing number of networking and potential collaboration events, dedicated energy startup gatherings are notably absent from the current ecosystem. While general startup events offer valuable insights, a focused platform for energy-specific challenges and opportunities is crucial. Such an event could serve as a catalyst for concentrated innovation, fostering deeper collaboration, and accelerating the development of solutions to pressing energy issues in the country. By bringing together investors, policymakers, researchers, and entrepreneurs under one roof, the energy startup community can collectively address barriers, identify new market opportunities, and drive the energy transition forward.



⁴⁷ PHILIPPINES ENERGY SECTOR ASSESSMENT, STRATEGY, AND ROAD MAP PHILIPPINES. (2018). <https://www.adb.org/sites/default/files/publication/463306/philippines-energy-assessment-strategy-road-map.pdf#:~:text=URL%3A%20https%3A%2F%2Fwww.adb.org%2Fsites%2Fdefault%2Ffiles%2Fpublication%2F463306%2Fphilippines>



CHALLENGES & OPPORTUNITIES

CHALLENGES & OPPORTUNITIES



Startups

During the March 2024 Roundtable Discussions that were conducted as part of the development of this report, startups emphasized the need for funding mechanisms across all venture stages. This echoes the findings from the 2023 Asian Development Bank (ADB) Study⁴⁸ on the Philippine Startup Ecosystem. This study identified access to capital as the primary challenge for all tech startups (not just energy and climate), with the funding gap most pronounced at the pre-Series A stage.

Organizations like the Manila Angels Investors Network (MAIN) aim to bridge this gap by connecting high-net-worth individuals with startups. However, such networks remain scarce, particularly in the energy and climate sector. Angel investors often shy away from this field due to its technical complexity and specialized nature, further amplifying the funding challenge for clean energy and climate-focused ventures.

On government support programs for startups, the ADB Study also noted that while government support has improved significantly over the past decade, most programs target early-stage startups. Startups interviewed in the ADB study suggested developing more advanced support programs for growth and scaling stages. However, information gaps still exist regarding participation in these available government programs. Both startups and ESOs agree on the need to increase awareness of these support initiatives. ESOs often serve as intermediaries, promoting ongoing programs and application opportunities to their current and former cohorts.

Moreover, in our experience in New Energy Nexus in supporting early-stage clean energy and climate startups, those who are ready to scale still struggle with customer access. This bottleneck often stems from founders' technical backgrounds, leaving gaps in marketing and customer development skills. Small team sizes complicate outsourcing these crucial functions, while finding suitable co-founders or employees remains difficult.

Policy-dependent startups face an additional hurdle: lack of customer awareness of relevant regulations. For instance, startups like Soltera, GAIA, and SolX leverage the Energy Efficiency and Conservation Law (RA 11285), yet many potential clients remain unaware of its incentives and penalties. During the March 2024 Roundtable Discussion, SolX highlighted their additional role as advocates, educating potential customers about RA 11285's benefits to drive adoption.

Energy and climate startups in the pilot phase often struggle to secure opportunities with potential partners, particularly private companies, due to founders' limited networks. This networking challenge drives many to join incubator or accelerator programs. The ADB Study survey revealed that over 70% of startups cited access to customers and partners as the primary benefit of these programs.

However, the study also highlighted shortcomings in some incubators, especially those operated by universities or located in provinces. Some of these programs lack well-developed curricula, sufficient funding, or robust industry networks. This gap in incubator quality and effectiveness creates an additional hurdle for startups seeking to overcome their initial networking and partnership challenges.

Startups



NEXPH 2024 Roundtable Discussions

Furthermore, energy and climate startups in the concept and prototyping stage face dual funding challenges: financing both prototyping and customer development activities. While government programs offer support for prototyping, they often lack provisions for crucial customer development tasks like interviews, surveys, and field studies. Even when prototyping funds are available, startups report obstacles in meeting program requirements and enduring lengthy application processes. This delay can be critical, as startups may deplete their financial resources before decisions are made.

To address these challenges, the ecosystem can collaborate with startups in several ways. Large corporations and government agencies can expand their pilot programs and innovation challenges, offering startups crucial real-world testing opportunities and customer connections. While programs like the DICT's Philippine Startup Challenge and SMART/PLDT Enterprise's Startup Innovation Challenge exist, increasing their number and diversity would greatly benefit the ecosystem. Particularly impactful would be the introduction of energy and climate-themed challenges. This focus would not only address pressing global issues but also provide specialized support for startups in this sector.

Additionally, ecosystem players can work towards streamlining and centralizing information about available support programs, funding opportunities, and relevant policies. This could involve creating a comprehensive online platform or regular networking events that bring together startups, investors, corporates, and government representatives. Such initiatives would not only increase awareness of existing resources but also foster the connections necessary for startups to scale effectively in the energy and climate sector.



Investors

The startup investing landscape in the Philippines, particularly in the energy and climate tech sectors, has evolved over time but continues to face significant challenges that hinder scaling.

One of the primary obstacles is the limited exit opportunities for investors. The clean energy sector, being relatively new and niche, offers fewer potential buyers or initial public offerings (IPO) opportunities compared to more established tech sectors like fintech or e-commerce. This often results in longer holding periods for investments and potentially lower returns, requiring investors to adopt a more patient approach.⁴⁹

Regulatory hurdles and policy dependence further complicate the investment landscape. The energy sector is typically heavily regulated, and clean energy startups face additional challenges in navigating these regulations. Investors must be prepared for potential delays and complications arising from regulatory compliance, which can significantly affect the growth trajectory and profitability of their investments. Moreover, the success of clean energy startups often relies heavily on government policies and incentives, making it crucial for investors to stay informed about the policy landscape and anticipate potential changes that could impact the viability of their investments.



What I've noticed is that there's a huge dependency on the government when it comes to access to funding opportunities. The current funding landscape is heavily influenced by government regulations and funding decisions. This means that startups and investors alike often find themselves at the mercy of policy changes and government priorities.

John Altomonte
Verne Energy Solutions



In my observation, most startups are not yet ready for the type of funding that's currently available. We have to recognize that many of these companies are still at an early stage in their development. I do want to acknowledge the valuable support that's already being provided by organizations like DOST and NDC. Their efforts are making a real difference, but there's still more work to be done to create a truly nurturing ecosystem for our startups.

It's crucial that we provide support at every stage of a startup's journey, not just when they're ready for significant investment.

Rachel Santiago-Sacro
ClimeCap

Access to capital remains a significant challenge in the Philippine startup ecosystem, particularly for clean energy projects that often require substantial upfront investments. The general scarcity of capital, combined with the capital-intensive nature of clean energy projects, poses a significant hurdle for both startups and investors. As a result, investors may need to be prepared to provide more substantial funding or assist their portfolio companies in securing alternative financing sources. This financial landscape necessitates a more hands-on approach from investors, often extending beyond mere capital provision.

⁵⁰ van den Heuvel, M., & Popp, D. C. (2022). The Role of Venture Capital and Governments in Clean Energy: Lessons from the First Cleantech Bubble. SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.4082589>

⁵¹ Bipartisan Policy Center. (2024, May). From Idea to Impact: A Climate-Tech Startup Story. <https://bipartisanpolicy.org/report/climate-tech-startup-story/>

⁵² RA 11697 EVIDA Law: Electric Vehicle Industry Development Act Philippines. (2023, February 5). LTO Portal PH. <https://ltoportal.ph/evida-law-electric-vehicle-industry-development-act/>

⁵³ Comprehensive Roadmap for the Electric Vehicle Industry | Department of Energy Philippines. (2023). Doe.gov.ph. <https://doe.gov.ph/energy-efficiency/comprehensive-roadmap-electric-vehicle-industry-0>

Investors

Technical and market-related challenges also play a crucial role in shaping the investment landscape. Clean energy startups frequently deal with complex technologies, leading to additional hurdles in product development and commercialization.⁵⁰ Investors may need to provide more technical support or facilitate partnerships with research institutions or larger energy companies to overcome these obstacles. Furthermore, clean energy solutions often require changes in infrastructure or consumer behavior, potentially resulting in slower market adoption rates-- especially with new and innovative solutions and business models.⁵¹ This can affect the growth and profitability of investments, underscoring the need for investors to have a deep understanding of both the local startup ecosystem and the specific nuances of the clean energy sector. Despite these challenges, the global push towards sustainable energy solutions presents significant opportunities for patient investors who can successfully navigate this complex landscape.

Opportunities:

Driven by a rapidly developing economy, a burgeoning population concentrated in urban areas, and a pressing need for sustainable energy, the new energy sector in the Philippines is ripe for transformation. This report explores the exciting potential for investors in three key upcoming industries:

Clean Mobility

Rising transportation costs and worsening air quality pose significant challenges for Philippine cities. This harsh reality is creating fertile ground for startups developing innovative clean mobility solutions. From electric vehicle (EV) manufacturers and charging infrastructure providers to developers of smart mobility platforms, the market potential in this sector is enormous.

The Philippine government actively supports the adoption of EVs, with policies like the Electric Vehicle Industry Development Act (EVIDA) providing tax breaks and incentives for manufacturers and consumers.⁵² Additionally, the Department of Energy (DOE) has established a roadmap for the deployment of charging infrastructure across the country.⁵³ This government backing, coupled with a growing consumer awareness of environmental issues, creates a strong foundation for clean mobility startups to thrive.

Startups include Mober⁵⁴, CHR⁵⁵, and Lycan Motorcycles.⁵⁶

Energy Efficiency

The Philippines faces significant energy security challenges, with a need to reduce dependence on imported fossil fuels and improve grid stability. This creates a crucial market for energy efficiency solutions.⁵⁷ Building retrofits that incorporate energy-efficient materials and appliances can drastically reduce energy consumption and its associated environmental impact.

The Department of Energy's Green Building Code⁵⁸ and the Energy Efficiency and Conservation Law⁵⁹ provide a solid policy framework for the growth of this sector. Additionally, the increasing cost of traditional energy sources makes energy-efficient solutions even more attractive for businesses and homeowners. This confluence of factors, along with technological advancements in smart building management systems, paints a bright picture for the growth of energy efficiency startups.

Startups include Verne Energy Solutions⁶⁰ and Bayoa Analytics.

Data & Technology

The rise of big data and advanced analytics is revolutionizing the energy sector globally. Startups leveraging data analytics to optimize energy grids, predict demand patterns, and facilitate smart meter integration⁶¹ have immense potential in the Philippines. Additionally, blockchain applications can enhance transparency in energy transactions, fostering trust and security in the market.

The government's focus on fostering a digital society aligns seamlessly with the growth of data-driven energy technologies.⁶² Initiatives promoting the development of a robust data infrastructure and the adoption of Internet of Things (IoT) solutions create a supportive ecosystem for these startups. The potential for these technologies to optimize resource allocation, improve grid resilience, and drive a significant shift towards a more sustainable energy landscape is vast.

Startups include SolX⁶³ and Soltera.⁶⁴

⁵⁴ Mober Green+Tech Logistics. <https://www.moberdelivery.com/>

⁵⁵ CHR⁵⁵. (2022). CHR⁵⁵. <https://www.chrg.tech/>

⁵⁶ Lycan Motorcycles Inc. (2016). Lycan Motorcycles. [CHR⁵⁵. \(2022\). CHR⁵⁵. <https://www.chrg.tech/>](https://www.chrg.tech/)

⁵⁷ Diagnostic Review and Analysis of Energy Efficiency Development in the Philippines. (n.d.). Retrieved June 24, 2024, from [Lycan Motorcycles Inc. \(2016\). Lycan Motorcycles. <https://www.lycan.com.ph/>](https://www.lycan.com.ph/)

⁵⁸ Department of Public Works and Highways. (2015). The Philippine green building code https://www.dpw.gov.ph/dpwh/sites/default/files/laws_codes_orders/PgbBooklet23March.pdf

⁵⁹ Republic Act No. 11285 | Department of Energy Philippines. (2023). [Doe.gov.ph. <https://doe.gov.ph/energy-efficiency/EEC-Act>](https://doe.gov.ph/energy-efficiency/EEC-Act)

⁶⁰ Verne Energy Solutions. (2022). <https://verne.solutions/>

⁶¹ Innovation landscape for a renewable-powered future. (2019). Irena.org. <https://www.irena.org/publications/2019/Feb/Innovation-landscape-for-a-renewable-powered-future>



ESOs

Entrepreneur-Support-Organizations

Entrepreneur Support Organizations (ESOs) act as hubs, connecting entrepreneurs to essential skills, training, and valuable networks. They build strong relationships and partnerships that would be otherwise out of reach, fostering a thriving entrepreneurial ecosystem. ESOs ensure sustainable growth for both individuals and businesses by providing the right resources. In the dynamic energy sector, where innovation is key, ESOs play a critical role in supporting energy entrepreneurs. However, ESOs in the Philippines face distinct challenges in this domain.

A major hurdle is the lack of specialized expertise in the energy sector. Unlike general tech startups, energy innovations necessitate deep technical knowledge in areas like renewable technologies, grid systems, electric vehicles, and energy efficiency.⁶⁵ This makes it difficult for ESOs to offer tailored mentorship and guidance specific to the energy sector. While many mentors have general business development experience, finding those with both entrepreneurial and technical expertise in energy innovation is a challenge.⁶⁶ Furthermore, industry-agnostic incubators and accelerators struggle to accurately assess and select promising energy startups for their programs. The complexities of energy technologies and regulations make it difficult for generalists to evaluate the potential and viability of energy innovation projects.

The regulatory landscape of the Philippine energy sector presents another significant challenge. ESOs need specialized legal and regulatory knowledge to navigate the intricacies of processing permits, licenses, and compliance specific to the energy industry.⁶⁷ Supporting energy innovators also requires access to research laboratories, specialized facilities, and energy infrastructure like power grids and generation plants. This is particularly challenging due to the limited number of such facilities in the Philippines, even within universities. Unlike software startups that can easily deploy and test their products, energy innovations often require access to physical infrastructure for testing and validation. Creating partnerships with research labs and infrastructure providers requires significant time, effort, and the ability to navigate complex corporate and regulatory landscapes. This makes it difficult for ESOs to arrange access to these facilities for their energy startups. Coordinating pilot projects for energy startups is another hurdle. It requires collaboration with a multitude of stakeholders, including regulators, utilities, and end-users.⁶⁸ Without specialized expertise and connections within the energy sector, ESOs find it difficult to manage these projects effectively.

Despite these challenges, ESOs play a pivotal role in building and strengthening the energy ecosystem and promoting enabling policies in the Philippines. By strategically leveraging their strengths, ESOs can create a more robust, sustainable, and thriving energy future. They can develop and offer specialized training programs related to energy, or collaborate with universities to implement energy entrepreneurship curricula, creating a new generation of energy innovators. ESOs can connect energy startups with university researchers for collaborative research projects, and establish joint innovation labs between universities and energy companies. Acting as facilitators, they can provide support for commercialization. Regional incubators and accelerators can partner with local government units to develop regional energy innovation hubs and create programs that foster a culture of sustainability and innovation in the energy sector. This will help shape public perception at the grassroots level.

⁶² The Philippines: NICT Month to Empower a Digital Nation – OpenGov Asia. (2024, May 17). <https://www.opengovasia.com/2024/05/17/the-philippines-nict-month-to-empowering-a-digital-nation/>

⁶³ Solx. (2024). Solx.ph. <https://www.solx.ph/>

⁶⁴ Soltera Energy. (2023). Your Energy Savings Tool. <https://soltera.ph/>

⁶⁵ Gabriel, C.-A. (2016). What is challenging renewable energy entrepreneurs in developing countries? *Renewable and Sustainable Energy Reviews*, 64(2016), 362-371. Elsevier. <https://doi.org/10.1016/j.rser.2016.06.025>

⁶⁶ Zozzaro, J. (2023). The Power of Focus: Why Industry-Specific Incubators Outshine Industry-Agnostic Incubators. LinkedIn. <https://www.linkedin.com/pulse/power-focus-why-industry-specific-incubators-outshine-john-zozzaro/>

⁶⁷ Navarro, A., & Camara, J. E. L. (2023, December). Mapping the Energy Sector Issues in the Philippines. (DISCUSSION PAPER SERIES NO. 2023-50 ed.). Philippine Institute for Development Studies. <https://pidswebs.pids.gov.ph/CDN/document/pidsdps2350.pdf>

⁶⁸ Narasimharao, G. (2024, March 20). Overcoming Challenges in Renewable Energy Deployment: Lessons from the Startup World. LinkedIn. <https://www.linkedin.com/pulse/overcoming-challenges-renewable-energy-deployment-narasimharao-nexgo/>

Academe & Research

Academic institutions play a crucial role in the innovation ecosystem by fostering research and development, providing education and training for the next generation of innovators, and facilitating technology transfer through partnerships with industry. They act as hubs of knowledge creation and dissemination, driving economic growth and technological advancements.⁶⁹ In the Philippines, universities have evolved to meet the growing demands of a knowledge-based society, leading to the emergence of their third mission – academic entrepreneurship.⁷⁰

Several programs also promote the transition of research outputs into spin-off projects. Among these is the FASTRAC or the Funding Assistance for Spinoff and Translation of Research and Advancing Commercialization program of the Department of Science and Technology - PCIEERD. It is a "researcher/technology-focused" program established to bridge the gap between research-and-development and commercialization of DOST PCIEERD-funded technologies. The program is designed to translate research outputs into market-ready products or simulate startup operations through spin-off projects over a one-year period.

Accordingly, five DOST-PCIEERD-funding technologies are in the transition phase to becoming spin-off companies.⁷¹ These companies are the Contactless Apprehension of Traffic Violators (CATCH-ALL)⁷² of De La Salle University and the Universal Structure Health Evaluation and Recording System (USHER)⁷³ of Mapua University. The remaining three is from the University of the Philippines - Diliman which are the following: Charging in Minutes (CharM)⁷⁴, FISH-I⁷⁵, and Smart Surface⁷⁶.

While the culture of transitioning research outputs to commercial ventures is on the rise, and support programs are in place, the actual number of commercialized research outputs from academic institutions remains low. This slow progress can be attributed to several factors, including the personal disposition and culture among academic researchers. Many prioritize their teaching responsibilities over entrepreneurship and often halt at presenting their findings rather than pursuing commercialization and bringing their innovations to market.

Scaling is a challenge for all startup enterprises, regardless of the industry, founders' professional backgrounds, or financial capabilities. This difficulty is even more pronounced for academic researchers interested in commercializing their research outputs. Their academic responsibilities and limited institutional support often serve as major roadblocks, causing them to view the commercialization process as an additional workload rather than an opportunity. Additionally, these researchers often lack the necessary business skills and acumen, as their training is focused on conducting research and developing new technologies rather than on entrepreneurship.

Another significant challenge is the limited energy literacy in the Philippines, extending beyond the academic sector. Energy literacy encompasses not only understanding energy systems and technologies but also comprehending various policies and regulatory frameworks, market trends, and the impact of energy use on the environment and economy. In academic institutions, there is still limited integration of energy topics in the curriculum, and many educational resources are outdated. Energy literacy should be approached as an interdisciplinary discipline, involving economics, environmental science, public policy, and other fields, rather than being confined to a single department's curriculum.

⁶⁹ National Research Council. (2013). Best practices in state and regional innovation initiatives: Competing in the 21st century. The National Academies Press. <https://doi.org/10.17226/18509>

⁷⁰ Novino, M. (2020). Academic Entrepreneurship of Mindanao State University-Iligan Institute of Technology: Determinants and ... ResearchGate. https://www.researchgate.net/publication/34401679_Academic_Entrepreneurship_of_Mindanao_State_UniversityIligan_Institute_of_Technology_Determinants_and_Mediating_Effects_of_Entrepreneurial_Intention_Antecedents

⁷¹ ITAdministrator. (2019a, October 10). DOST PCIEERD Strengthens Technology Transfer and Commercialization Efforts through its FASTRAC Program. <https://pcieerd.dost.gov.ph/news/latest-news/360-dost-pcieerd-strengthens-technology-transfer-and-commercialization-efforts-through-its-fastrac-program>

⁷² CATCH-ALL. (n.d.). DOST Technology Transfer. <https://tapitechtransfer.dost.gov.ph/technologies/it-development/catch-all>

⁷³ HOME -. (2024, March 15). - USHERPH. <https://usher.ph/>

⁷⁴ CHRGE Electric Vehicle Technologies Inc. | Philippines. (n.d.). CHRGE. <https://www.chrg.tech/>

⁷⁵ Fish-I. (n.d.). Fish-I | Smart Solutions for Sustainable seas. <https://fishi.ph/>

⁷⁶ ITAdministrator. (2019, October 10). UP-developed portable interactive screen soon to hit PH Market. <https://pcieerd.dost.gov.ph/news/latest-news/364-up-developed-portable-interactive-screen-soon-to-hit-ph-market>

Additionally, the lack of faculty members with specialized expertise in energy-related fields poses a challenge that can hinder the depth and breadth of education in this area. The limited focus, insufficient funding, and lack of support for energy-related research and development projects further restrict both students and faculty from engaging deeply with energy issues. Moreover, the lack of awareness of the vast opportunities in the energy sector among academic institutions and educators contributes to the limited attention given to this field, preventing educators from encouraging students to explore energy-sector research.

Strengthen academe-industry partnerships, focus on energy-related research and projects.

While there are several instances of academic institutions partnering with industries for research and development projects, there is still a need for improvement and increased support through regulatory measures and various incentive schemes. One existing support mechanism is the DOST's Collaborative Research and Development to Leverage Philippine Economy (CRADLE) program. CRADLE aims to foster technological advancement and innovation among local companies and support the growth of the Philippine innovation ecosystem.

In this program, a private sector industry identifies a specific problem within their field, and the State Universities and Colleges (SUCs), Higher Education Institutions (HEIs), or Research and Development Institutes (RDIs) undertake the necessary research and development to find solutions. This collaboration supports both fundamental R&D and the transition of research results to real-world applications in the industry, benefiting the academic sector through enhanced R&D capabilities and the industrial sector through innovative market advantages.⁷⁷

Such programs can be replicated and tailored to focus specifically on clean energy research initiatives and projects. The Fraunhofer Institutes in Germany exemplifies successful collaboration between academia and industry, working closely with industries on applied research projects that emphasize renewable energy, energy efficiency, and other energy technologies. Their model demonstrates how strategic partnerships can advance technological innovations and facilitate the practical application of research outcomes. A notable case study is the TransDIB project, which focuses on developing sustainable dual-ion batteries for stationary energy storage to enhance the utilization of renewable energies. Funded by the German Federal Ministry of Education and Research, this project is a collaborative effort involving various industry partners and research institutes.

Strengthening academe-industry partnerships focused on energy-related research and projects is essential for accelerating the translation of academic research into market-ready solutions, driving innovation, and addressing complex energy challenges. These collaborations ensure that research aligns with industry needs and societal goals while providing students and researchers with valuable industry experience to meet future energy demands.

Establish innovation clusters and networks to improve collaboration in the ecosystem.

Addressing complex problems typically necessitates the combined expertise of diverse individuals. Therefore, establishing innovation clusters and networks can significantly enhance collaboration within the ecosystem, leading to improved research outputs and more effective solutions.

The Energy Cluster Denmark⁸⁰ is a good reference for this strategy – it is an innovation cluster that facilitates collaboration and drives technological advancements within Denmark's energy sector. It connects universities, companies, and public institutions to promote the development and commercialization of innovative energy solutions. One of its projects is the EnergyLab Nordhavn which is a large-scale ambitious project that utilizes Copenhagen's Nordhavn as a full-scale smart city energy lab and demonstrates how electricity and heating, energy-efficient buildings and electric transport can be integrated into an intelligent, flexible and optimized energy system.⁸¹

An example of innovation clustering in the Philippines is the DOST's Regional Startup Enabler for Ecosystem Development (ReSEED) Program.⁸² This initiative aims to strengthen regional innovation ecosystems by establishing and supporting local technology business incubators (TBIs). The ReSEED Program focuses on creating a network of TBIs across various regions, enhancing startup growth, fostering collaboration among stakeholders, and driving regional economic development.

While the Philippines has specialized centers focusing on specific research areas like renewable energy or IT, innovation clusters and networks offer a broader approach by connecting multiple centers and stakeholders. This interconnected model fosters cross-disciplinary collaboration, enhancing research impact and accelerating technological advancements across various fields, while also supporting balanced regional development.

Establishing innovation clusters and networks within the academe can greatly boost collaboration and drive progress. By forging stronger connections with industry, government agencies, and international research organizations, this approach enhances innovation and entrepreneurship. It also strengthens academic-industry partnerships and supports balanced regional development, ultimately advancing the nation's research and technological capabilities.

⁷⁷ Department of Science and Technology Region 5. (2022, April 7). DOST pushes for academe-industry partnerships thru CRADLE program. <https://region5.dost.gov.ph/archives/308-dost-pushes-for-academe-industry-partnerships-thru-cradle-program>

⁷⁸ Homepage Fraunhofer-Gesellschaft. (n.d.). Copyright. <https://www.fraunhofer.de/en.html>

⁷⁹ 16.10.2023 News: Sustainable energy storage for renewable energies - Fraunhofer IKTS. (2023, October 16). Fraunhofer Institute for Ceramic Technologies and Systems IKTS. Homepage Fraunhofer-Gesellschaft. (n.d.). Copyright. <https://www.fraunhofer.de/en.html>

⁸⁰ Energy Cluster Denmark. (2024, January 22). Energy Cluster Denmark | <https://www.energycluster.dk/en/>

⁸¹ EnergyLab Nordhavn. (2020, March 27). State of Green. <https://stateofgreen.com/en/solutions/energylab-nordhavn/>

⁸² Lem. (2023, November 24). DOST allots P120M to establish regional startup ecosystem consortia. <https://icseed.dost.gov.ph/news/latest-news/539-dost-allots-p120m-to-establish-regional-startup-ecosystem-consortia>



Private Sector

Corporate-startup engagement in the energy sector faces several significant challenges primarily due to cultural and operational differences, as well as the inherent scale and complexity of energy companies. Large energy incumbents, with their established value networks and slow reaction times, often frustrate startups accustomed to a more dynamic and flexible approach.⁸³ This cultural clash can hinder effective collaboration, as startups may view corporate processes as excessively bureaucratic, while corporations may see startups as too hasty and unstructured. Additionally, the risk-averse nature of incumbents, who prefer incremental innovations over radical changes, further complicates these engagements.

The vast size, intricate supply chains, and established processes of energy companies create inertia, making it difficult to integrate new technologies and adapt to the faster-paced, agile nature of startups. The heavily regulated and capital-intensive nature of the energy sector fosters a risk-averse culture, where corporations may hesitate to adopt untested solutions from startups, thus hindering the potential benefits of collaboration. This conservatism, coupled with the need for extensive regulatory compliance, stifles the adoption of new technologies, making it challenging for startups to penetrate the market and scale their innovations.⁸⁴

Additionally, a communication gap often emerges due to differing priorities and cultures. Startups prioritize rapid innovation and adaptability, while corporations focus on stability and proven solutions, creating misunderstandings that hinder effective collaboration.⁸⁵ Energy companies are particularly interested in technologies that can reduce costs per barrel or cubic foot of production, placing pressure on startups to demonstrate clear, tangible business outcomes. This focus on cost-saving requires startups to have a deep understanding of the industry's pain points and to speak the language of their potential corporate partners. Despite these hurdles, the potential rewards for successful engagements are significant, as corporations can provide startups with the resources, market access, and industry expertise needed to scale their innovations and drive sector-wide advancements.

1882 ENERGY VENTURES

An AboitizPower Company



1882EV has adopted a more agile culture, focusing intensely on customer needs, which has helped them seek solutions externally and work closely with startups.

One of the biggest challenges in identifying and sourcing innovative startups within the energy sector in the Philippines is finding the right founder talent and the absence of a mature ecosystem that supports energy startups. Communication gaps between energy companies and startups often arise when startups present solutions without fully understanding the specific challenges or needs of the company, leading to misalignment. To overcome these challenges, corporations aiming to build successful partnerships with energy startups should maintain open communication, be flexible, provide clear expectations, and be willing to adapt to the innovative methods that startups bring.

1882 Energy Ventures

⁸³ El-Bidawi, A., & Jensen, E. (n.d.). Energizing the energy sector with startups <https://www.diva-portal.org/smash/get/diva2:840088/FULLTEXT01.pdf>

⁸⁴ Coleman, S. & Lewis, P. (2019, October 29). Ignition Partners. <https://www.ignition.vc/blog-feed/advice-for-startups-focused-on-the-energy-sector>

⁸⁵ Popescu, C.-D., Uta, A.-M., Mitu, M., & Anghel, A. (2024). Corporate venturing in the energy sector: A literature review. UPG Bulletin of Science and Engineering, 31(1), 33-42. https://upg-bulletin-se.ro/wp-content/uploads/2024/04/3.Popescu_Uta_Mitu_Anghel.pdf

Private Sector

Opportunities for Corporate-Startup Engagement

To foster successful corporate-startup engagements in the energy sector, corporates should strategically engage with startups that can directly impact their bottom line, particularly through cost reduction. Given the industry's economic pressures, solutions that decrease the cost per barrel or cubic foot of production are highly valued. Startups should emphasize the cost-saving aspects of their technologies when pitching to energy companies and develop a deep understanding of the sector's specific challenges and terminology. This approach ensures that startups can drive tangible business outcomes, rather than just showcasing advanced technology. Additionally, there's a significant opportunity for startups offering operational technology (OT) solutions, especially in areas like cybersecurity for field operations and control systems.⁸⁶

To increase their chances of success, startups must be prepared to prove their ability to scale and meet the needs of large energy corporations. When engaging with energy companies, startups should be cautious about agreeing to multiple pilot projects after a successful proof of concept, as this can lead to resource drain without progressing towards actual implementation. Instead, they should push for paid engagements and full-scale deployments once they've demonstrated their value. Despite these challenges, the potential rewards of corporate-startup engagement in the energy sector are significant. Startups are at the forefront of developing new technologies for renewable energy, grid management, and energy efficiency. Corporations can leverage these advancements to meet sustainability goals, reduce operational costs, and gain a competitive edge.

Furthermore, the current paradigm shift towards decentralized energy production presents ripe opportunities for collaboration. Startups like Greenely and Expektra, which align their business models with technological advancements and decentralization trends, offer modern solutions that complement the evolving energy market.⁸⁷ Artificial intelligence (AI) - powered solutions from startups can optimize drilling processes or streamline data analysis for better decision-making within corporations. These partnerships enable startups to access resources such as funding, established market positions, and customer bases, which are critical for overcoming the liability of newness and smallness.⁸⁸ Additionally, corporations provide valuable industry expertise and facilitate access to new markets, accelerating growth for startups. By pooling resources and expertise, both startups and corporates can drive innovation and address the challenges posed by new market dynamics, ultimately contributing to a more resilient and sustainable energy sector.

⁸⁶ Coleman, S. & Lewis, P. (2019, October 29). Ignition Partners. <https://www.ignition.vc/blog-feed/advice-for-startups-focused-on-the-energy-sector>

⁸⁷ El-Bidawi, A., & Jensen, E. (n.d.). Energizing the energy sector with startups <https://www.diva-portal.org/smash/get/diva2:840086/FULLTEXT01.pdf>

⁸⁸ Global Venturing. (2024, February 14). Global venturing. Corporate venturing in energy and natural resources. <https://globalventuring.com/>

Private Sector



Hive Energy PH: Pioneering Custom Battery Solutions for Electric Vehicles

Amiel Camingal, the founder of Hive Energy PH, began his journey by creating and selling solar battery packs for households in Calapan, Mindoro Oriental, an area prone to frequent power interruptions. Hive Energy PH has now evolved into a provider of modular energy storage solutions for a variety of applications.

Currently, Hive is engaged in a groundbreaking project to create customized lithium battery packs for an electric vehicle (EV) prototype. Unlike the commonly used lead-acid batteries in the local market, Hive's expertise in lithium battery technology gives them a competitive edge. The partnership, characterized by extensive experimentation and negotiation, took over 12 months from the initial discussion to the first trial order. The detailed discussions encompassed not just pricing but also capacity, features, lifespan, and maintenance of the battery packs.

This partnership is a significant milestone for Hive Energy PH, marking their entry into the EV market. The success of the pilot project has the potential to open doors for future orders and establish a new product line, driving growth and innovation in the Philippine energy storage sector.



Capilli Trading: Advancing Circular Economy with Hair Mats

Harold Laborte, co-founder of Capilli Trading, is revolutionizing waste management in Northern Mindanao through a circular economy enterprise that transforms waste human hair into hair mats. These mats are used for applications such as oil and chemical absorption and in agriculture.

Capilli Trading recently initiated discussions with an international energy generation company operating in Mindanao. The corporate partner provided valuable feedback on improving the hair mats to meet industry standards. Despite the challenges, including the delay in fund disbursement due to the lack of a corporate bank account, the partnership has been immensely beneficial. The corporate partner introduced Capilli to their network, enhancing Capilli's credibility and opening new business opportunities.

Harold advises startups to build relationships with industry champions and smaller, innovative companies rather than directly targeting large corporations. He emphasizes the importance of adaptable partnership models and managing expectations to foster successful corporate-startup collaborations.



Light of Hope (LoH): Bridging Clean Energy Gaps in Off-Grid Communities

Jovie Gil Montajes founded Light of Hope (LoH) to bring clean energy solutions to low-income households in off-grid communities across Visayas and Mindanao. LoH collaborates with various private companies, integrating their efforts into the companies' Corporate Social Responsibility (CSR) initiatives. These companies provide funding, while LoH manages the distribution of clean energy units to the target communities.

However, LoH faces challenges in maintaining these partnerships. Some corporate partners demand exclusivity agreements despite placing insufficient orders to sustain LoH's operations. Additionally, the rigorous accreditation processes required by private companies consume significant resources.

Despite these challenges, Jovie notes that once accredited, the process becomes smoother, and the reporting requirements are less demanding compared to grant-giving entities or foundations. Successful accreditation often leads to faster payment processing, enabling LoH to continue their impactful work in providing clean energy solutions to off-grid communities.



Government

The Philippine government plays a pivotal role in shaping the trajectory of the country's clean energy landscape. By crafting supportive policies, allocating adequate resources, and fostering collaboration, government agencies can accelerate the transition to an innovative and sustainable energy future. However, the transition to clean energy and fostering innovation in the Philippines is complex. Government agencies such as the DOE, DOST, and DTI face multifaceted challenges, including financial constraints, bureaucratic hurdles, and the limited technical and commercial readiness of startups and researchers.

Government agencies like the DOE, DOST, and DTI face several challenges in implementing policies and programs related to clean energy and energy innovation. One challenge for DOST is that it often has limited budget and faces bureaucratic hurdles, such as complex approval procedures and stringent requirements, making it difficult to provide adequate financial support and slow down the implementation of clean energy projects. The DOST receives one of the lowest funding allocations from the Department of Budget and Management (DBM). This can hinder the scaling up of innovative technologies and solutions and discourage innovation.

A significant hurdle in the Philippine clean energy and innovation landscape is the gap between research and commercialization. This manifests in two key areas: startups and innovators often lack the deep technical knowledge and commercialization skills needed to transform ideas into marketable products, while a large proportion of research proposals submitted to DOST, although numerous, fall short in demonstrating the technical feasibility and market potential necessary for successful commercialization. This imbalance is further compounded by the tendency of Filipino researchers to focus on basic research over applied research, which, while valuable, may have less immediate impact on technology development and innovation. As a result, the DOST faces the dual challenge of refining its selection process to identify the most promising projects and fostering an environment where research is more closely aligned with market needs and national priorities.

The quality of research is one of the reasons why we are also lagging in terms of commercialization of locally developed technologies

Department of Science and Technology

Many startups supported by DTI lack sufficient technical expertise, hindering their ability to effectively communicate their value proposition and attract investors. Those that graduate from programs by DICT and DOST are not yet ready for commercialization, requiring further support from DTI in areas like business model development and partnership building.

Another challenge can also be conflicting policies and lack of coordination between different government agencies, as well as between national and local governments. The development and implementation of policies and regulations can also be slow. These factors combined can create confusion, delays in project implementation, uncertainty and hinder investment in the sector. Lastly, given the capital-intensive nature of the energy sector, there is also a challenge of shifting priorities especially within the DOE regarding directing substantial financial resources for infrastructure and technologies.

Government

Despite these challenges, the government can strengthen their current policies and programs, and even explore new opportunities. A significant opportunity lies in streamlining bureaucratic processes and diversifying funding sources to foster innovation and attract new players in the energy sector. This entails simplifying procedures for startups to access grants and incentives, reducing regulatory bottlenecks in project implementation, and exploring innovative funding mechanisms beyond traditional government grants. Collaboration with private investors, impact funds, and international organizations can create a more dynamic funding landscape.

Bridging the gap between research and commercialization through targeted support programs presents a significant opportunity for government agencies as well. This involves investing in initiatives that not only fund research but also equip startups and innovators with the necessary technical and commercialization skills. Mentorship programs, incubation facilities, and access to industry experts can be instrumental in guiding startups through the challenging process of bringing their ideas to market.

Harmonizing policies and strengthening collaboration among government agencies, startups, investors, and communities, can unlock significant opportunities in the clean energy sector. This involves aligning national and local policies, ensuring consistency in regulations and incentives, and establishing clear channels of communication to facilitate seamless project implementation. One example of intergovernmental collaboration to bolster the startup ecosystem is the partnership between the Department of Trade and Industry (DTI) and the Quezon City (QC) government. Launched in October 2022, the Startup QC Program provides comprehensive support to startups, including mentorship, funding, and market access. This initiative aligns with Quezon City's broader commitment to innovation, as outlined in Ordinance No. SP-3109, S-2022, which was enacted in response to the Innovative Startup Act. By combining resources and expertise, the DTI and Quezon City aim to create a thriving startup environment that drives economic growth and sustainable development.

Lastly, long-term planning and strategic investments in the energy sector emerge as a crucial opportunity for government agencies. This involves developing a comprehensive roadmap for the clean energy transition, outlining clear targets, and identifying priority areas for investment. By adopting a long-term perspective, government agencies can create a stable and predictable environment for investors, encouraging them to participate in clean energy projects at different scales. Additionally, fostering public-private partnerships can leverage the expertise and resources of both sectors, accelerating the deployment of clean energy technologies and driving economic growth.



Nonprofits & Civil Society

NGOs play a multifaceted role in the clean energy innovation ecosystem in the Philippines. They act as facilitators, advocates, and even educators, bridging gaps between various stakeholders and driving the transition towards a sustainable energy future. The World Wide Fund for Nature (WWF) Philippines, for example, actively works on promoting renewable energy adoption in the country. Their ongoing project called Monitoring Renewable Energy Implementation in the Philippines Project (MoRE Project) plays a crucial role in tracking and evaluating the progress of renewable energy adoption in the country. By collecting and analyzing data on renewable energy installations, policies, and market trends, the MoRE Project provides valuable insights into the growth and impact of the renewable energy sector.

The Philippine Energy Efficiency Alliance (PE2) is another non-profit organization that plays a crucial role in driving energy efficiency and conservation efforts in the Philippines. PE2 actively promotes the implementation of energy efficiency policies and programs, provides technical expertise and guidance, and facilitates the exchange of knowledge and best practices among its members. By fostering partnerships and advocating for energy-efficient technologies and practices, PE2 significantly contributes to reducing energy consumption, lowering greenhouse gas emissions, and enhancing energy security in the Philippines.

Despite strong collaboration among the government, private sector, and non-profit organizations, the role of startups in the clean energy innovation collaboration in the Philippines remains largely untapped. From the perspectives of NGOs like Oxfam and WWF, collaborating with startups in the clean energy sector presents a unique set of challenges. For NGOs and CSOs, there is a difficulty in knowing which startups to approach for potential partnerships. This can be due to the large number of startups in the energy sector and the lack of information about their specific focus areas and expertise. These organizations may not always have a clear understanding of the specific needs and priorities of startups, making it difficult to tailor their support and collaboration efforts effectively. This can lead to mismatched expectations and missed opportunities for collaboration.

Building upon the challenge of identifying suitable startup partners, NGOs also face difficulties in aligning startup solutions with specific community needs. This requires a thorough understanding of both the startup's capabilities and the community's requirements. Also, the affordability of clean energy technologies and solutions is a critical factor for NGOs, as they often work with communities with limited resources. Other factors that influence decision-making include the technology's ability to address specific livelihood issues and its overall impact on the community. Despite these challenges, NGOs in the clean energy sector can leverage several opportunities to enhance their impact and contribute to the growth of the ecosystem. NGOs that play a role in raising awareness about the benefits of clean energy and educating the public about sustainable practices can also help create a more conducive environment for clean energy adoption and drive demand for innovative solutions. Leveraging their expertise and networks to advocate for policies and regulations, they can specifically contribute to the development of standards and certifications for clean energy technologies.


There is a huge opportunity for partnerships for projects led by non-profits as well. One example of this is RENDER, the renewable energy transition platform of the Manila Observatory (MO). They recently had a climate and energy convening in Dumaguete and in La Union helping cities and communities transition to renewable energy sources and reduce their carbon footprint. The USAID-supported project "Enabling a Sustainable Energy Transition in Dumaguete City," led by Manila Observatory, focuses on creating a Sustainable Energy Transition Roadmap. This roadmap aims to guide Dumaguete City in reducing per capita emissions and achieving Net-Zero emissions by 2050. One of the contributors to this report is a startup founder, John Altomonte of Verne Energy Solutions. This approach enables the delivery of evidence-based solutions that effectively address complex challenges at the local level.

The collaboration between startups and NGOs in capacity building and mentorship is becoming increasingly vital. Startups, often equipped with business acumen and technological know-how, can help NGOs professionalize their operations, enhance their strategies for reaching target beneficiaries, and secure sustainable funding. In return, NGOs, deeply rooted in local communities and with extensive experience in social issues, can guide startup founders in understanding the socio-cultural context of the Philippines, ensuring ethical practices, and creating solutions with genuine community impact. This reciprocal exchange of knowledge and skills, as highlighted by the Asian Development Bank (ADB) in their report on social entrepreneurship in the Philippines, fosters a thriving ecosystem where innovation and social responsibility unite.⁹⁰

In conclusion, NGOs play a pivotal role in shaping the clean energy landscape in the Philippines. By acting as catalysts, advocates, and knowledge brokers, they contribute significantly to the growth of the renewable energy sector. While challenges exist in collaborating with startups, the potential benefits of such partnerships are immense. By fostering a collaborative environment, addressing shared challenges, and leveraging their respective strengths, NGOs and startups can create a synergistic relationship that accelerates the transition to a sustainable energy future. To fully realize this potential, strategic partnerships, policy support, and capacity building initiatives are essential.



RECOMMENDATIONS
RECOMMENDATIONS



> Money

During the March 2024 Roundtable Discussions that were conducted as part of the development of this report, startups emphasized the need for funding mechanisms across all venture stages. This echoes the findings from the 2023 Asian Development Bank (ADB) Study on the Philippine Startup Ecosystem. This study identified access to capital as the primary challenge for all tech startups (not just energy and climate), with the funding gap most pronounced at the pre-Series A stage.

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To enhance the funding landscape for energy innovation in the Philippines, it is crucial to adopt a multifaceted approach that addresses the unique challenges faced by startups in this sector. Based on insights from both literature and focus group discussions, the following three recommendations stand out as pivotal:

- **Integrate Diverse Funding Mechanisms** Exploring and integrating a range of funding mechanisms, including public-private partnerships, venture capital, and crowdfunding, can significantly bolster financial support for energy innovation. Public-private partnerships leverage the strengths of both sectors, providing stable funding and strategic support from the government alongside the efficiency and innovation capacity of the private sector. For instance, public-private partnerships have been successfully used to fund renewable energy projects in various countries, as seen in the European Union's Horizon 2020 program which emphasizes collaboration between public entities and private companies to drive innovation in clean energy.⁹¹ Venture capital offers critical early to mid-stage funding, allowing startups to develop and scale their technologies. Research has shown that venture capital investment is positively correlated with innovation and growth in the clean energy sector. Crowdfunding, on the other hand, can engage the public and generate additional capital while raising awareness about innovative energy solutions. This diversified funding approach can mitigate the risks associated with reliance on a single source of capital, ensuring a more robust and resilient financial foundation for energy startups.

Straw Innovations is a sustainability-focused company tackling the issue of rice straw waste. To fund its operations and scale its technology, the company has employed a multi-faceted funding strategy. Impact investors and grant providers have been instrumental in supporting research and development, given the environmental and social benefits of their work. Debt financing has also played a crucial role in managing operational expenses and working capital. As the company grows, revenue generated from the sale of its products and services is reinvested for further expansion. This strategic combination of funding sources has enabled Straw Innovations to make significant strides in transforming rice straw waste into valuable resources.

- **Tie Funding to Specific Impact Milestones** Ensuring that funding is contingent upon the achievement of specific impact milestones can drive measurable progress and accountability. This performance-based funding model encourages startups to focus on clear, attainable goals, aligning financial support with actual advancements in technology and market deployment. By tying continued investment to the demonstration of tangible results, funders can ensure that their resources are used effectively, supporting projects that show real promise and delivering value in terms of energy innovation and sustainability. For example, a study on the effectiveness of milestone-based funding in the energy sector found that projects with clear, measurable goals were more likely to achieve successful outcomes and attract subsequent rounds of investment.⁹²
- **Providing De-risking Mechanisms to Attract Investment** Implementing de-risking mechanisms such as first-loss guarantees can significantly attract more investors to the energy innovation sector. These mechanisms reduce the perceived risks associated with investing in energy projects, making it more appealing for venture capitalists and other private investors to commit their funds. A first-loss guarantee is a financial tool where an entity (usually a government or development bank) agrees to cover the initial losses of an investment, thereby protecting other investors from the brunt of financial risk. By providing a safety net, first-loss guarantees can lower the barriers to entry for investment, stimulating greater financial inflows into the sector and supporting the growth and scalability of energy startups. Studies have shown that de-risking mechanisms effectively attract private investment into high-risk sectors like renewable energy, thereby facilitating more significant capital flows into innovative projects.

Canada Fosters Innovation with First-Loss Guarantees

Canada is actively fostering a thriving startup ecosystem through its Innovation, Science and Economic Development Canada (ISED) agency. One key initiative is the Venture Capital Catalyst Initiative (VCCI). This program tackles the challenge of financing high-risk, early-stage technology companies by offering a de-risking mechanism: a first-loss guarantee. Through the VCCI, the government co-invests alongside venture capital funds, taking on a portion of the initial investment risk. This first-loss guarantee, ranging from 20% to 40% of the total investment, incentivizes venture capitalists to invest in promising but riskier startups, promoting innovation and potentially fueling the next generation of Canadian technology leaders.⁹³

⁹² Gaddy, B. E., Sivaram, V., Jones, R., & Wayman, L. (2017). Venture Capital and Cleantech: The Wrong Model for Clean Energy Innovation. MIT Energy Initiative. Retrieved from <https://energy.mit.edu/>

⁹³ Innovation, Science and Economic Development Canada (ISED). (2024, April 1). Venture Capital Catalyst Initiative (VCCI). <https://ised-isde.canada.ca/site/sme-research-statistics/en/venture-capital-catalyst-initiative>

⁹⁴ International Energy Agency. (2020). Energy Technology Perspectives 2020. Retrieved from <https://www.iea.org/reports/energy-technology-perspectives-2020>

In addition to these recommendations, continuous support across all stages of development is crucial for fostering a thriving energy innovation ecosystem. Startups often face a range of challenges as they progress from early-stage development to market entry and scalability. Providing tailored support at each stage ensures that they can overcome these hurdles and achieve sustained growth. For instance, early-stage startups benefit from seed funding and incubator programs that provide the initial capital and mentorship necessary for developing their ideas. As they progress, access to venture capital and growth-stage funding becomes essential for scaling operations and entering new markets. A study by the International Energy Agency highlights the importance of stage-specific support in accelerating clean energy innovation, emphasizing that different types of funding and assistance are needed at various development phases to ensure project success and sustainability.⁹⁴

Investment readiness training for startups is another critical component. Many energy startups have innovative technologies but lack the business acumen to attract and manage investment effectively. Training programs that focus on financial management, business planning, and investor relations can significantly improve their chances of securing funding. According to a report by the Global Green Growth Institute, investment readiness programs have been shown to enhance the ability of green startups to attract investment by improving their business models and presentations to potential investors.⁹⁵

Disseminating success stories is also vital for creating a positive narrative around energy innovation. Highlighting successful startups and their achievements can inspire other entrepreneurs and attract more investors to the sector. Success stories serve as proof of concept, demonstrating that investments in energy innovation can yield substantial returns. A study published in the *Journal of Cleaner Production* found that showcasing successful case studies in clean energy not only boosts investor confidence but also encourages replication of best practices across the industry.⁹⁶

⁹⁴ GRATITUDE, RESILIENCE, IMPACT AND OPPORTUNITY ACCELERATING GREEN GROWTH. (n.d.) from https://gggi.org/wp-content/uploads/2023/06/GGGI_AnnualReport2022.pdf

⁹⁶ Boons, F., & Lüdeke-Freund, F. (2013). Business models for sustainable innovation: State-of-the-art and steps towards a research agenda. Retrieved from https://www.researchgate.net/publication/258023864_Business_Models_for_Sustainable_Innovation_State_of_the_Art_and_Steps_Towards_a_Research_Agenda



People

To advance the maturity of this indicator within the energy innovation ecosystem in the Philippines, several key recommendations were identified during the round table discussion with stakeholders. These recommendations are aimed at establishing well-developed education and training programs, fostering a strong culture of innovation, and integrating energy literacy and entrepreneurship into academic curricula.

Academic and training institutions should proactively incorporate comprehensive energy-related subjects into their curriculums. This includes modules on new energy technologies, sustainable energy innovations, and energy entrepreneurship. This integration will ensure that graduates possess the necessary skills and knowledge to contribute effectively to the energy sector. For instance, countries like Germany and Denmark have successfully embedded such programs in their educational systems, resulting in a well-equipped workforce ready to tackle energy transition challenges.⁹⁷

Second, **deliberate efforts are needed to encourage innovation within the workplace.** This can be achieved through fostering a culture that values adaptability, creativity, and continuous learning. Organizations can look to the approaches taken by companies in the United States, where federal initiatives like the Infrastructure Investment and Jobs Act and the Inflation Reduction Act are driving green workforce development through extensive training and upskilling programs.⁹⁸ These programs highlight the importance of aligning workforce capabilities with the evolving demands of the energy sector.

Additionally, **expanding training programs, standards, and certifications for specific energy technologies is crucial.** By segmenting technologies such as solar, wind, and geothermal, it becomes easier to identify areas where skill growth is occurring and where more support is needed. This targeted approach ensures that training programs are relevant and effective. Insights from the World Economic Forum's Future of Jobs Report (2023) suggest that focusing on high-growth areas like renewable energy engineering and sustainability roles can significantly boost workforce readiness for the energy transition.

Lastly, **identifying the specific skills required in each segment of the energy industry is essential.** This involves collaboration between educational institutions, industry leaders, and policymakers to align training programs with industry needs. A notable example is the International Energy Agency's (IEA) emphasis on developing robust educational and skills training programs to support workforce transitions in the clean energy sector (International Energy Agency, 2022). This alignment ensures that the talent pipeline is well-matched with the job market's demands, facilitating a smoother transition to sustainable energy practices.

⁹⁷ International Energy Agency. (2022). Skills Development and Inclusivity for Clean Energy Transitions. Retrieved from <https://www.iea.org/reports/skills-development-and-inclusivity-for-clean-energy-transitions>

⁹⁸ Muro, M., Tomer, A., Shivaram, R., & Kane, J. (2023). Unlocking new federal infrastructure funding to drive green workforce development. Brookings Institution. Retrieved from https://www.brookings.edu/wp-content/uploads/2019/04/2019.04_metro_Clean-Energy-Jobs_Report_Muro-Tomer-Shivaram-Kane.pdf

⁹⁹ World Economic Forum. (2023). The Future of Jobs Report 2023.



Government

Based on the framework used in assessing the Philippines' Energy Innovation Ecosystem Maturity, advancing to the next ranking requires establishing an efficient and supportive regulatory environment for new energy ventures, alongside comprehensive government support programs tailored to the energy innovation ecosystem.

Drawing from insights shared during the round-table discussion, the following recommendations are proposed to enhance the government's support and role in fostering a robust energy innovation ecosystem in the Philippines:

Streamlining of policies and funding processes

While various government agencies offer startup funding programs, regulations and processes often hinder access and utilization. Simplifying these procedures and requirements is essential to support startups and encourage innovation. The traditional government system further complicates matters, highlighting the need for reducing barriers and incorporating feedback from key players.

Improving transparency, reducing red tape, and enhancing efficiency in funding allocation can address bureaucratic hurdles. Additionally, flexible funding mechanisms are crucial to adapt to the capital-intensive nature of the energy sector and facilitate quicker priority shifts.



The government still operates within a traditional system that acts as a barrier for startups. To better support these ventures, the government needs to modernize its processes, making them simpler and more accessible. Being open to criticism from key players and making necessary changes is essential.

QBO Innovation Hub

Enhancing support for market access, commercialization, and scaling up

One of the major challenges for startups is commercializing their innovations. Strengthening efforts to support these startups through targeted resources is crucial. This includes facilitating access to international markets, providing market intelligence, offering abundant networking opportunities, and assisting with regulatory requirements both locally and internationally.

The government can play a vital role in improving market access for startups by identifying and prioritizing scalable and growth-oriented markets as identified by key stakeholders, including government agencies, industry players, and local government units. Additionally, incorporating clean energy innovation and technologies into development plans and prioritizing them can significantly enhance market access for startups.

The energy sector is inherently capital-intensive, particularly for tech- and R&D-heavy startups. To address scaling challenges, the government can offer targeted support through dedicated funding streams, infrastructure, and tailored incubation programs focused on hardware development and scaling issues.



For energy-related startups, many of them (at least those encountered by DTI) focus on hardware. The challenge for hardware startups is scaling their products because there is still limited support. One challenge for DTI is figuring out how they can support hardware startups and those heavily involved in R&D.

Department of Trade and Industry

Spearhead cross sectoral and inter-agency collaboration.

A key indicator of a vibrant ecosystem is evident collaboration among its key stakeholders. The government can leverage its influence to act as the lead convenor, bringing together various industry players and stakeholders. By improving coordination among government agencies, local government units, and non-tech organizations, the government can foster a supportive ecosystem for the clean energy transition.

The government can encourage collaboration between tech and non-tech sectors to leverage technological innovations for community empowerment and humanitarian impact.



As a non-tech organization, our challenge is identifying which organizations to approach and who are key influencers in the clean energy transition with a clear humanitarian focus. While there are many startups, we are unsure which ones can best empower the communities we support. Additionally, we are very much interested about addressing the affordability of these technologies and their potential to address community problems through clean energy solutions.

Cheng Pagulayan, Oxfam Pilipinas

Know-how

For this indicator within the Philippine Clean Energy ecosystem, several strategic recommendations emerged from a round table discussion with stakeholders from the government, private sector, and NGO sector. The next maturity level aims to showcase successful implementations of new energy startups and initial efforts in knowledge sharing and collaboration among stakeholders.

The following recommendations are proposed to reach this level:

Campaigns on Spreading Success Stories and Frequent Convenings

One of the key strategies to enhance the Know-how indicator is to launch campaigns that highlight the success stories of new energy startups. These campaigns can serve as inspirational benchmarks for emerging entrepreneurs and stakeholders, showcasing the tangible benefits and impacts of innovative energy solutions. By disseminating these stories through various media channels, stakeholders can build momentum and foster a culture of innovation and success within the ecosystem. Regular gatherings, such as conferences, workshops, and seminars, should be organized to facilitate the sharing of the latest news, developments, and best practices within the energy sector. These events will provide platforms for stakeholders to network, collaborate, and stay updated on cutting-edge technologies and solutions. Additionally, they can help identify and address common challenges, paving the way for collective problem-solving and progress.

Improving Interconnectedness and Cross-Sectoral Collaboration

Enhanced interconnectedness among stakeholders is crucial for the ecosystem's growth. Stakeholders should be encouraged to be more open and transparent in their communications, fostering a collaborative environment. This interconnectedness can be further strengthened through platforms and networks that facilitate seamless information exchange and cooperation across different sectors and regions.¹⁰¹ Organizations within the ecosystem should strike a balance between exploring various areas of the ecosystem and maintaining a focus on niche expertise. This approach ensures that efforts are not diluted and that specialized knowledge crucial for innovation is developed. Facilitating partnerships between startups and NGOs can tap into a diverse range of technologies and solutions, enhancing the overall capabilities of the ecosystem. These collaborations can bridge gaps in expertise and resources, leading to more comprehensive and innovative energy solutions.¹⁰²

Involvement of Grassroots Communities and Addressing Academic Curriculum Gaps

Engaging underserved communities and grassroots levels through continuous dialogue and outreach programs can significantly amplify the impact and inclusivity of the ecosystem. Additionally, addressing gaps in the academic curriculum ensures that future leaders are equipped with the necessary skills and knowledge to advance energy innovation. Enhancing knowledge sharing through regular conferences, business model compendiums, and educator training can further strengthen the ecosystem. Legal frameworks should be established to prevent the centralization of control within the ecosystem, promoting diversity and innovation by ensuring no single entity can dominate.

Bangalore's Buzzing Tech Hive: Where Talent Meets Opportunity

India's Silicon Valley, Bangalore, is a prime example of a thriving innovation ecosystem. Here, a powerful mix of stakeholders fuels a constant flow of ideas and advancements. Renowned institutions like the Indian Institute of Science churn out a steady stream of brilliant minds, readily absorbed by the city's vibrant startup scene. Multinational giants like Google and Microsoft establish research centers in Bangalore, creating a bridge for knowledge exchange and collaboration with local ventures. This dense network is further fueled by government initiatives like Startup India, offering vital funding, mentorship, and infrastructure specifically for young companies. The presence of a robust investor network rounds out the ecosystem, providing the financial muscle for promising ventures to take flight. Bangalore's interconnectedness fosters a dynamic environment where talent flourishes, ideas take shape, and innovation thrives, propelling India's position as a global tech leader.¹⁰³

¹⁰⁰ George, G., Schillebeeckx, S. J., & Liak, T. L. (2021). The management of natural resources: An overview and research agenda. *Journal of Management Studies*, 58(6), 1450-1473.

¹⁰¹ Hopkins, M. M., Crane, P., Nightingale, P., & Baden-Fuller, C. (2022). Innovation ecosystems and the pace of knowledge creation: How smart cities transform the landscape of knowledge production. *Research Policy*, 51(2), 104425.

¹⁰² Siegel, D. S., & Wright, M. (2020). From entrepreneurship to microfoundations of strategy: A review and research agenda. *Journal of Management Studies*, 57(6), 1317-1350.

¹⁰³ Ram, S. (2023, September 16). Why Bangalore is a Global Hub For Start-ups. Address Advisors. <https://addressadvisors.com/blog/commercial-blog-list/why-bangalore-is-a-global-hub-for-start-ups>



Network

The future vision for ecosystem maturity is one of robust collaboration and knowledge-sharing across all sectors, from startups and government agencies to established energy companies and NGOs. Regular industry events and conferences will foster networking and facilitate cross-sector partnerships, driving innovation in the new energy space. Engaging in a variety of events—from academic and startup conferences to mentorship programs—provides unique opportunities for learning, networking, and showcasing innovations. Each event type offers different benefits, contributing to the holistic development of startups.

Ultimately, the goal is to establish the Philippines as a recognized global hub for Clean Energy and collaboration, regularly hosting major international events and conferences in the energy sector. This vision emphasizes a thriving ecosystem characterized by strong connections, open communication, and a shared commitment to advancing clean energy solutions.

One recommendation that can be explored to increase energy-focused gathering for startups is creating both physical and virtual spaces to facilitate these connections. Physical spaces, such as co-working spaces, incubators, and industry events and conferences, provide opportunities for face-to-face interactions, networking, and relationship building. Virtual spaces, such as online forums, platforms, and social media groups, offer a more accessible and scalable way for stakeholders to connect, share information, and collaborate on projects. This can foster a more inclusive and dynamic, where innovation can thrive through the collective efforts of diverse stakeholders.

"Regarding networks, I agree with the idea of a conference where everyone can participate. Even if we have smaller hubs or networks, they don't need to be completely separate. Instead, they should be interconnected, with multiple circles linked together.

This means that even if you belong to a specific group or network focused on a particular ecosystem, you're still connected to individuals and organizations in other groups. As long as these interconnected circles are linked and there's a space, whether physical or virtual, for everyone to connect, it creates a unified ecosystem. This allows everyone, from university startups to established organizations, to easily connect with the entire ecosystem, regardless of their entry point." - Noel Victorino

Another recommendation is to have a more localized approach. This could mean organizing smaller-scale gatherings and meetings at the local or regional level instead of focusing solely on national-level initiatives. These convenings would bring together key stakeholders specific to that region, such as local startups, investors, government officials, NGOs, and academic institutions. By tailoring the discussions and activities to the unique context and needs of each region, these convenings can address specific challenges and opportunities more effectively.

The importance of identifying and empowering "champions" within each region has been emphasized as well. These champions would be individuals or organizations passionate about promoting energy innovation and collaboration in their local communities. They would take the lead in organizing and facilitating the localized convenings, ensuring that relevant stakeholders are engaged and that discussions are productive.

Network

The primary goal of these localized convenings is to build stronger networks at the grassroots level. By bringing together stakeholders who may not have had the opportunity to interact before, these events can foster new relationships, spark collaborations, and facilitate knowledge sharing. This can lead to the development of local projects, initiatives, and solutions that address the specific energy challenges faced by each region.

As these local networks grow and mature, they can be connected with each other to form a broader national network. This would create a platform for sharing best practices, scaling successful local initiatives, and advocating for policy changes at the national level. By starting at the local level and gradually building towards a national network, the energy innovation ecosystem can become more inclusive, resilient, and responsive to the diverse needs of different regions across the Philippines.

The experiences of Capili and other startups also underline the importance of tailored support based on the stage of development. Advanced-stage startups benefit significantly from platforms like ECCP that provide access to potential clients and partners. Early-stage startups, however, may face challenges such as burnout due to limited resources and should receive targeted support to optimize their participation in networking events. It's evident that strategic and selective event attendance is crucial for startups. This helps in avoiding burnout and ensuring efficient use of time and resources while still benefiting from networking opportunities.

By fostering interconnected networks, both physical and virtual, and implementing localized strategies with dedicated champions, the energy startup ecosystem can be strengthened. This approach, combined with tailored support for startups at different stages, will create an environment where innovation flourishes and the Philippines can become a global leader in new energy solutions. Participation of startups in these events not only builds individual startup visibility but also strengthens the overall community. Sharing stories, successes, and challenges fosters a supportive ecosystem where startups can thrive and innovate. Ultimately, a thriving ecosystem necessitates a balance of individual startup growth and collective community development, with events serving as catalysts for both.



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