

ENERGY
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New Energy Ecosystem Maps for Vietnam, Indonesia and the Philippines



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Authors:

Stanley Ng, Jan Ralph Eborá, Sheryl Estella, Thao Tran, Hung Bui, Katt Nguyen, Shafira Putri, Mohammed Naufal

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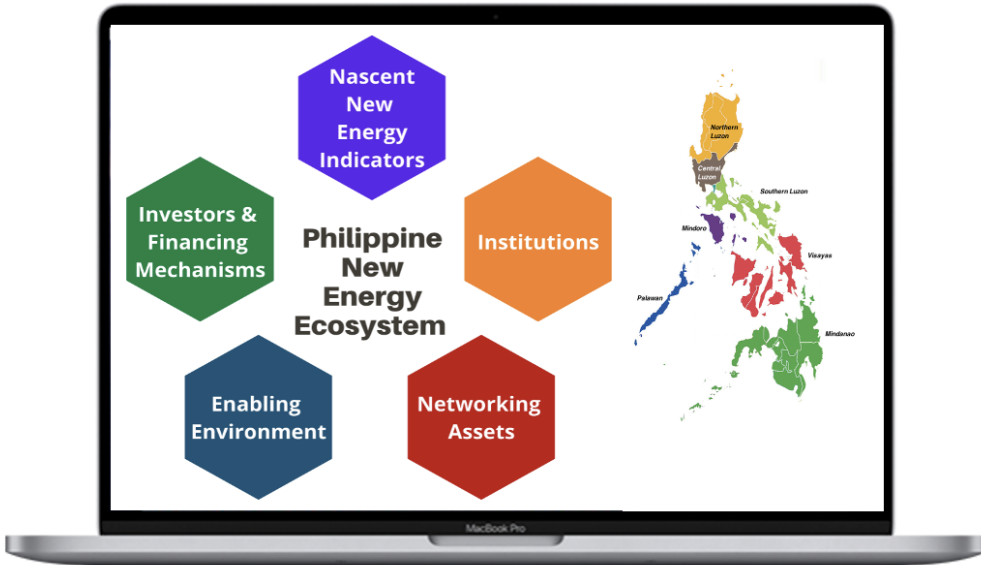
Background

2020 the Philippines New Energy Ecosystem Map

An interactive map, document and database of the different ecosystem players and stakeholders in the Philippines new energy landscape.

The map is useful for:

- > Startups and entrepreneurs: to identify market opportunities, existing energy innovations and business models, identify support mechanisms available to them
- > NGOs, incubators and entrepreneur/SME support organizations: to understand the parts of the ecosystem that need further support and strengthening
- > Funders and investors: to recognize market opportunities and the different innovation indicators
- > Government, private companies, LGUs: to be conscious of other ecosystem players and explore areas for collaboration
- > Energy researchers: to serve as a baseline study for R&D projects in the new energy space



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New Energy Ecosystem Map Framework

Conceptual Frameworks

The **Clean Energy Innovation Ecosystem** refers to the intersection of nascent clean energy assets with financing mechanisms and related companies located in a geographically concentrated area that has an enabling environment, or supportive clean energy policies, which encourages commercialization and networking assets to increase communication and collaboration opportunities (Lin & Chinthavali, 2016). This working definition of an innovation ecosystem is derived from the cluster theory of competitive advantage, a highly regional strategy of economic development introduced by Michael Porter in 1990.

A **Startup Ecosystem** is formed by people, startups in their various stages, and various types of organizations in a location (physical and/or virtual), interacting as a system to create new startup companies (Startup Commons, n.d.). Organisations can be categorized as universities, funding agencies, support organizations (such as incubators, accelerators, co-working spaces, etc.), research laboratories, service providers (like legal, financial services, etc.), and large corporations that provide specific support to startups at their specific stages of development.

Conceptual Frameworks

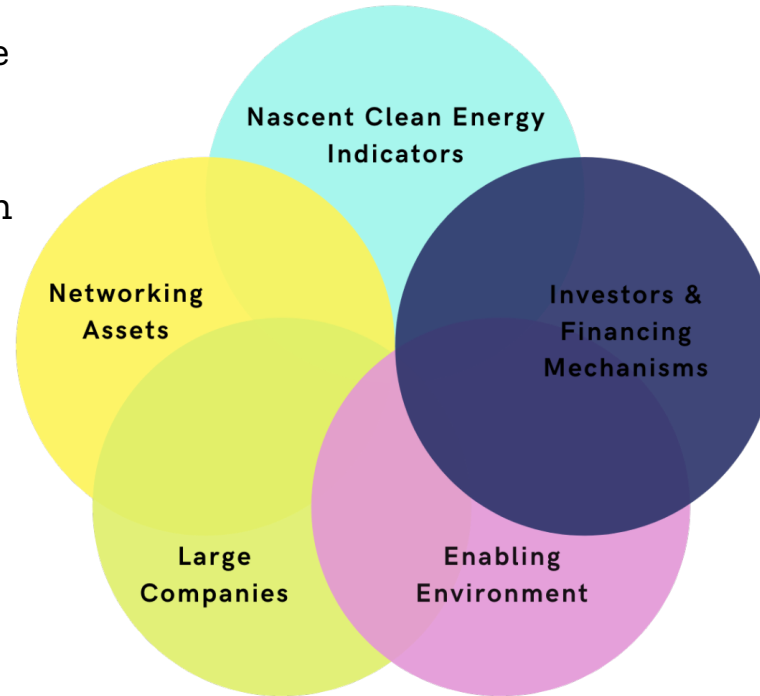
Two conceptual frameworks were used in the New Energy Ecosystem Map framework development:

- The Clean Energy Innovation System Model
- The Startup Ecosystem Model

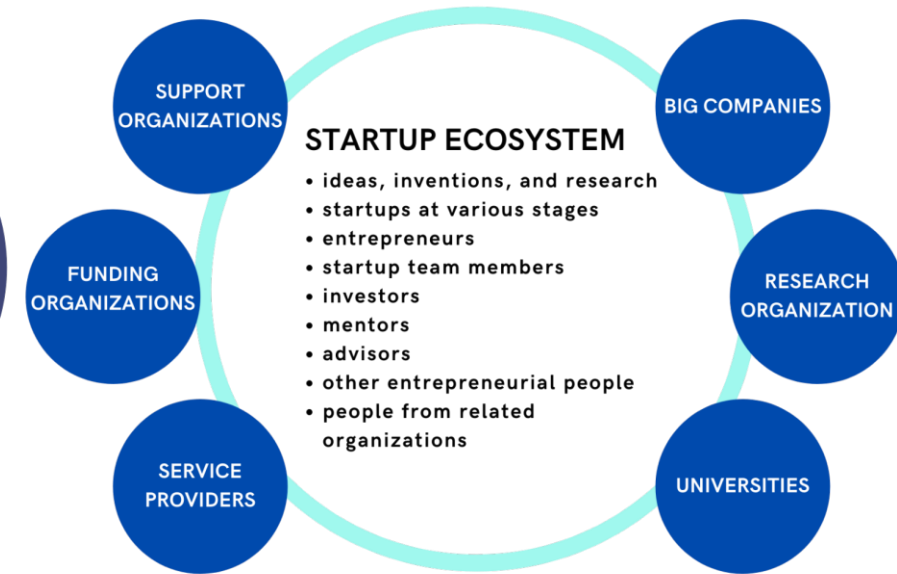
Combined, the two models provide fundamental structures and indicators in creating a framework for the New Energy Ecosystem Mapping.

The five dimensions of the Clean Energy Innovation Ecosystem served as the main structures of the new energy ecosystem map.

Additionally, the components of a startup ecosystem are the indicators in the networking assets of the ecosystem map.

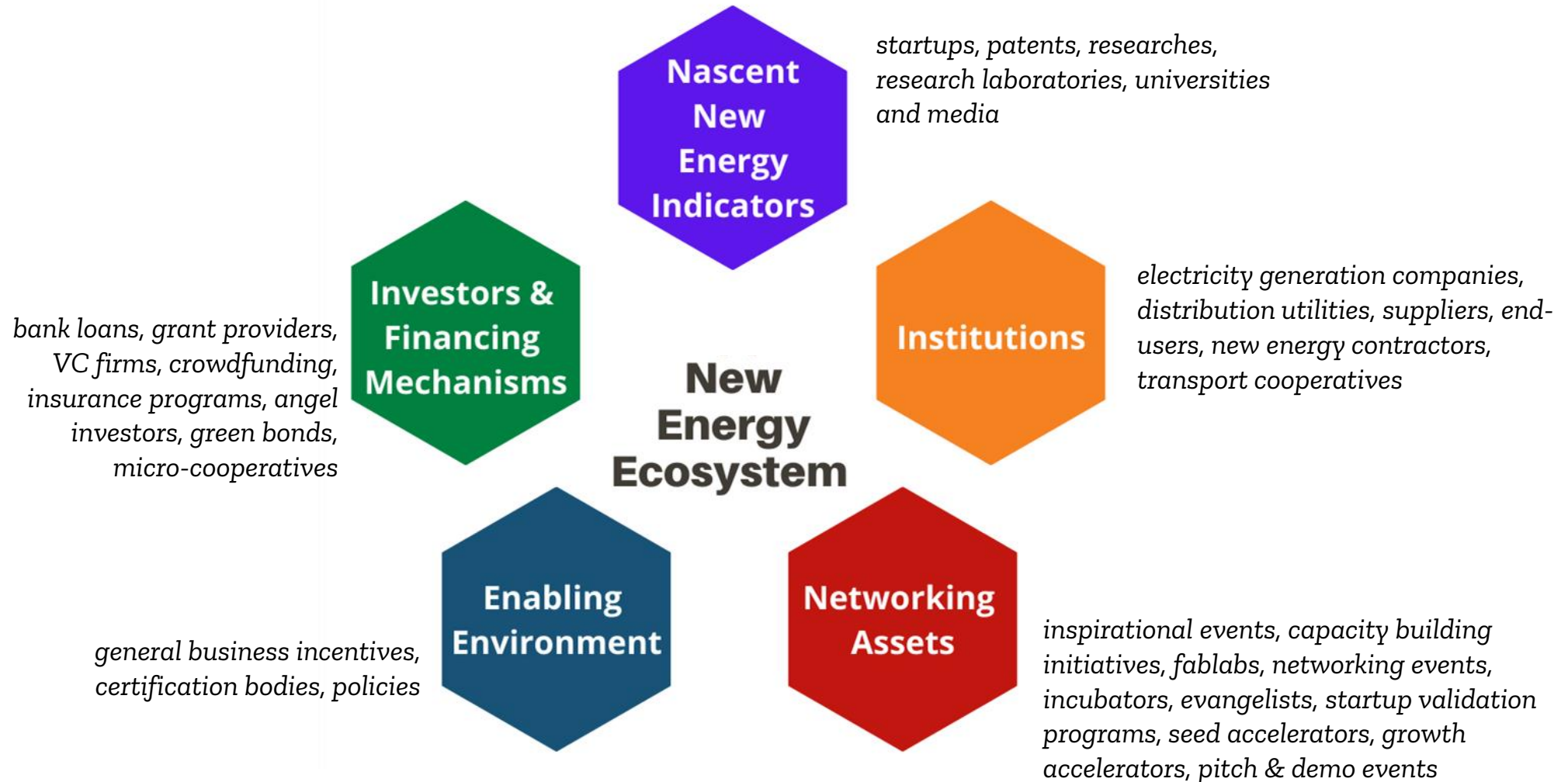


Clean Energy Innovation System Model
(Lin, J., & Chinthavali, S., e. 2016)



Startup Ecosystem Model
(Startup Commons)

Ecosystem Map Model



Definition of each component

- > **Nascent New Energy Indicators:** The nascent new energy indicators are the drivers of innovation. These indicators are characterized by the presence of clean energy startups, patents coming out of research laboratories, media outlets that promote energy-related news, clean energy contractors, and research focused on energy, renewable energy, energy efficiency, energy access and other related topics.
- > **Investors and Financing Mechanisms:** Investors and financing mechanisms are key to the growth and commercialization of nascent clean energy assets. The funding types and levels could vary based on the size of the nascent clean energy indicators and could range from insurance programs, bank loans, grants, angel investors, venture capital firms, private equity firms to crowdsourced funds.
- > **Enabling Environment:** The enabling environment encompasses the regulatory regime, supporting policies for renewable energy or new industry innovations, and/or the physical electricity generating characteristics of a region that would favor the growth of one sector of clean energy over another. Most of the enabling environment characteristics will be at the local or state level, rather than national, and include things such as certification bodies, general business incentives, state and local clean energy subsidies, and other clean energy incentives.

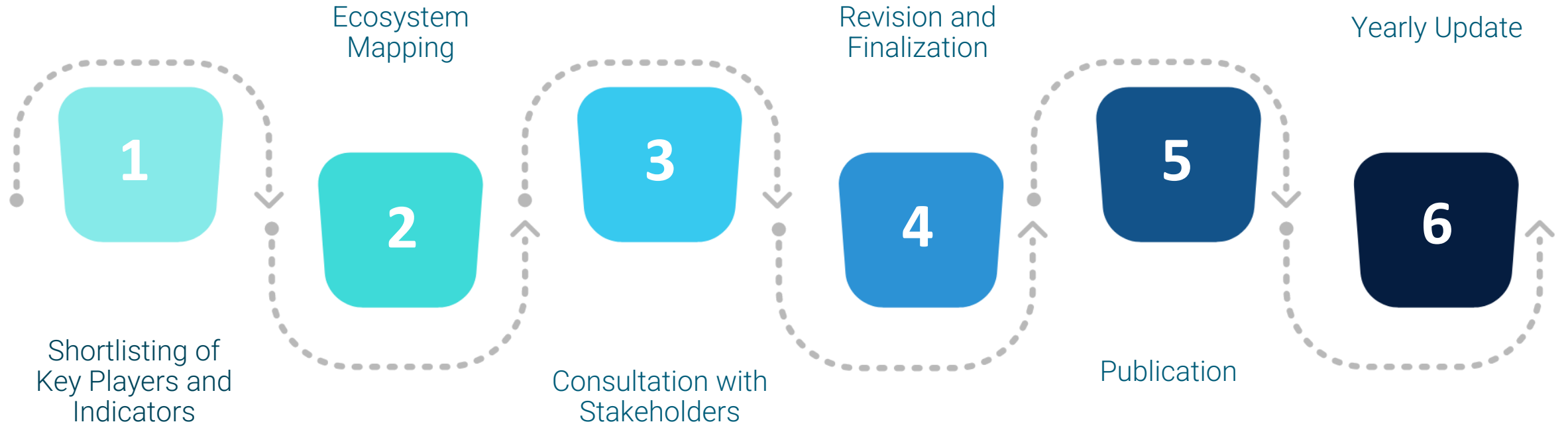
Definition of each component

- **Institutions / Large Companies:** These are energy service companies (ESCOs), electricity generation, fuel extraction & refining companies, distribution companies, retail electricity suppliers and end-users, or other companies that collaborate with energy startups, or compete with them, or may buy startup companies as one of the exit strategies.
- **Networking Assets:** Networking assets are events or entities that facilitate communication and collaboration among the various actors of the ecosystem. These are inspirational events, capacity building initiatives, startup validation programs, fab labs, networking events, incubators, seed & growth accelerators, pitch & demo events, and individuals or organizations called evangelists that promote/advocate renewable energy.

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Methodology

Methodology



Validation Criteria

- > Each data per indicator sub-category was subjected to validation criteria
- > The validation criteria may or may not be different per country. Example: Data in Category II – Investors and Financing Mechanisms are mostly from legitimate online sources. In Category I – Nascent New Indicators, the criteria are different per sub-category per country.
- > Complete validation criteria via this link: [Consolidated Validation Criteria](#)

Subcategory	Validation Criteria
Startups	> Has to be recommended by New Energy Nexus or other incubators, active for the past 6 months, with online presence
Patents	> Source must be from government IP office, status must be "published"
Researches	> From legitimate online sources (government sites, Academia.edu, Google Scholar, etc.)
Research labs	> From government database, from legitimate online sources
Professional services	> From legitimate online sources
Media	> From legitimate online sources, must have recurring publication

Validation Criteria for Category I – Nascent New Energy Indicators

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New Energy Ecosystem Map – the Philippines

The Philippines New Energy Ecosystem 2020

Nascent New Energy Indicators



Institutions



Investors and Financing Mechanisms



Networking Assets



Enabling Environment

Renewable Energy Law of 2008

EPIRA - Electric Power Industry Reform Act of 2001 (RA 9136)



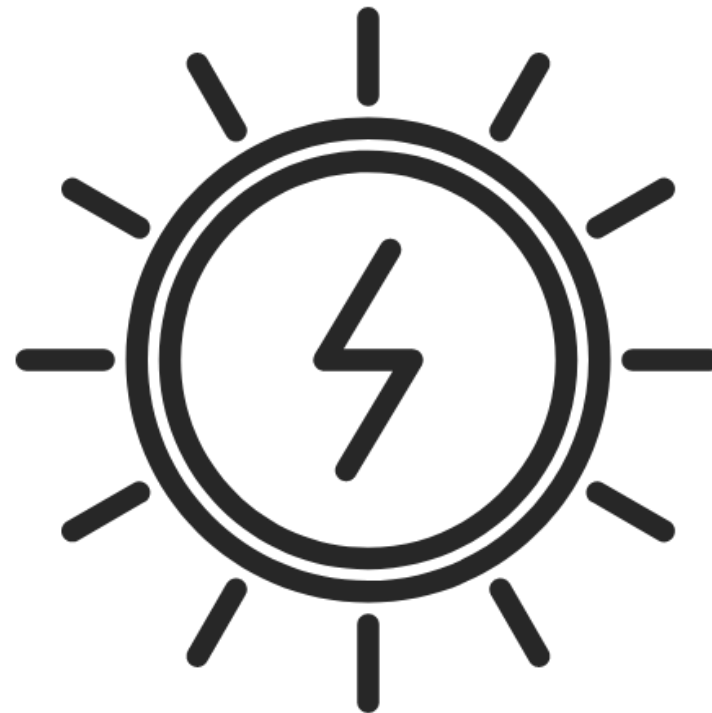
The Philippines New Energy Ecosystem 2020

16
New Energy Startups

240
Active Patents

141
Researches

59
Professional Service Providers



11
Research Laboratories

8
Universities

16
Media

Nascent New Energy Indicators

The Philippines New Energy Ecosystem 2020

27
Bank Loans

7
Grant Providers

12
Venture Capital Firms



2
Insurance Programs

5
Crowdfunding Platforms

6
Angel Networks

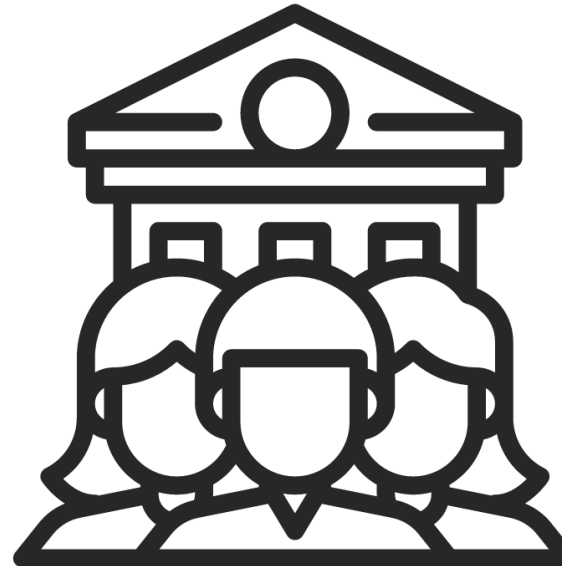
5
Green Bonds

Investors and Financing Mechanisms

The Philippines New Energy Ecosystem 2020

4
General Business Incentives

5
Certification Bodies



88
Policies

Enabling Environment

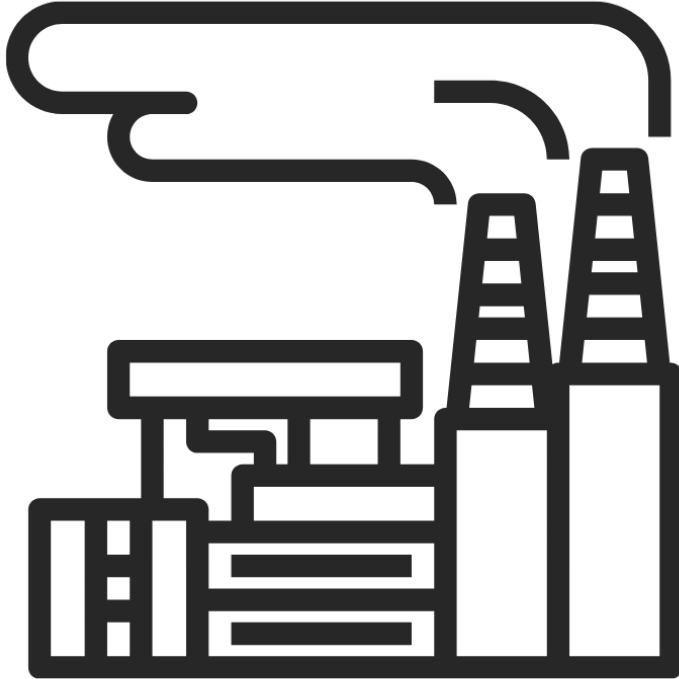
The Philippines New Energy Ecosystem 2020

198
Electric Generation Companies

22
Private Distribution Utilities

6
LGU-owned Utilities

120
Electric Cooperatives



Institutions

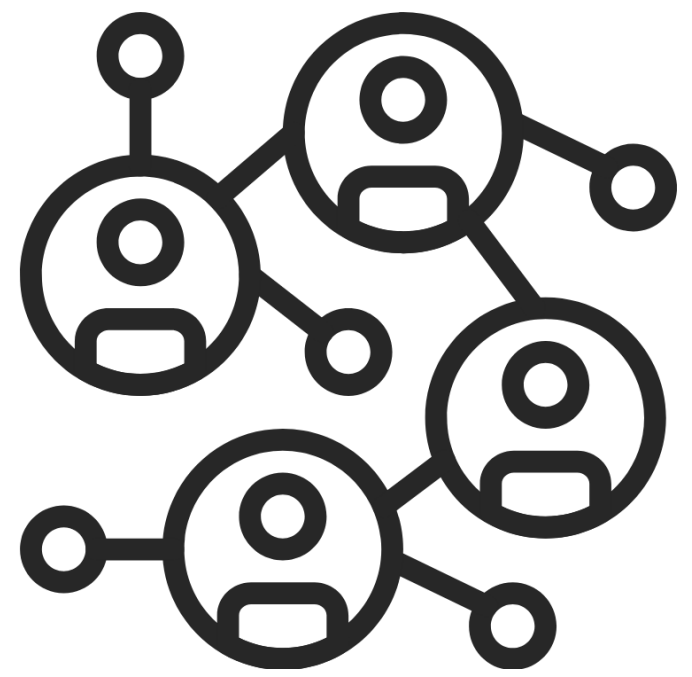
67
Retail Electricity Suppliers

2,089
End Users

396
Transport Cooperatives

The Philippines New Energy Ecosystem 2020

- 18**
Inspirational Events
- 22**
Fabrication Laboratories
- 15**
Capacity Building Initiatives
- 15**
Networking Events
- 43**
Incubators



Networking Assets

- 27**
Evangelists
- 2**
Startup Validation Programs
- 5**
Seed Accelerators
- 1**
Growth Accelerators
- 2**
Pitch and Demo Events

“This is a very good initiative. I hope we can transform it into a digital portal/website where the directories of all clean energy players are already there.”

- Reido Panaligan, President of Center for Renewable Energy and Sustainable Technology

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New Energy Ecosystem Map – Vietnam

Vietnam New Energy Ecosystem 2021

Nascent New Energy Indicators



Institutions



Networking Assets



Investors and Financing Mechanisms



Enabling Environment

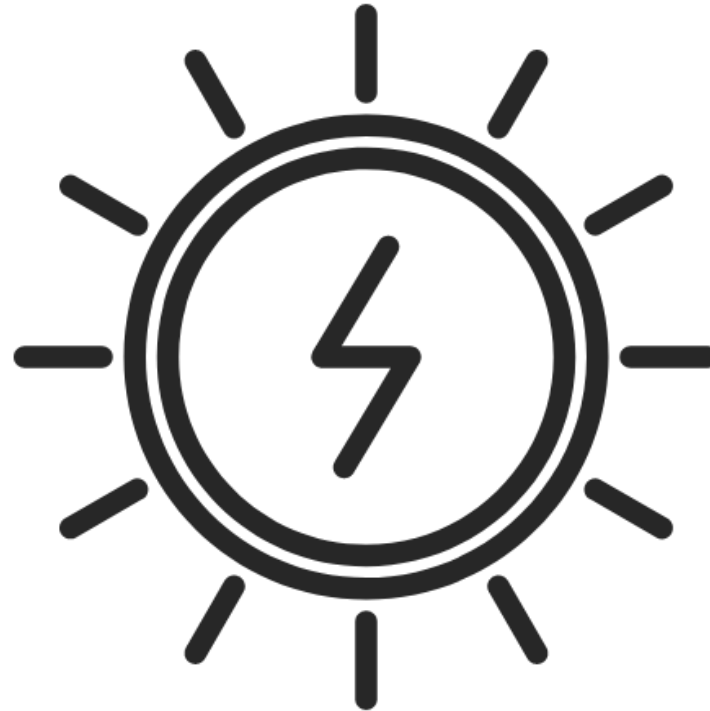


Vietnam New Energy Ecosystem 2021

9
New Energy Startups

115
Active Patents

35
Professional Service Providers



8
Research Laboratories

16
Universities

7
Media

Nascent New Energy Indicators

Vietnam New Energy Ecosystem 2021

21
Bank Loans

10
Grant Providers

35
Venture Capital Firms



5
Crowdfunding Platforms

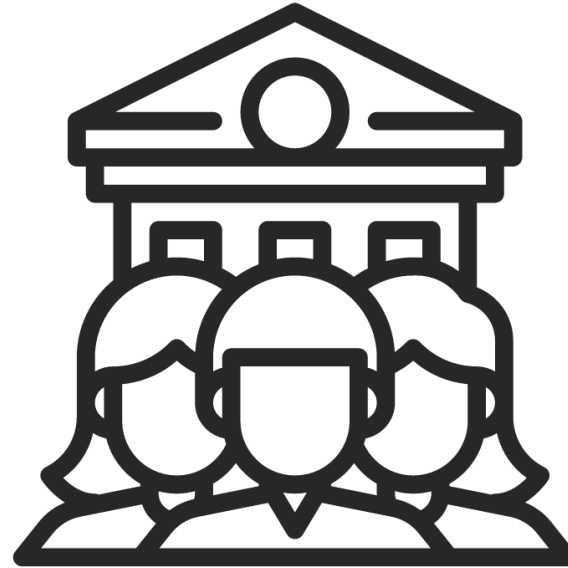
4
Angel Networks

Investors and Financing Mechanisms

Vietnam New Energy Ecosystem 2021

13

Certification Bodies



48

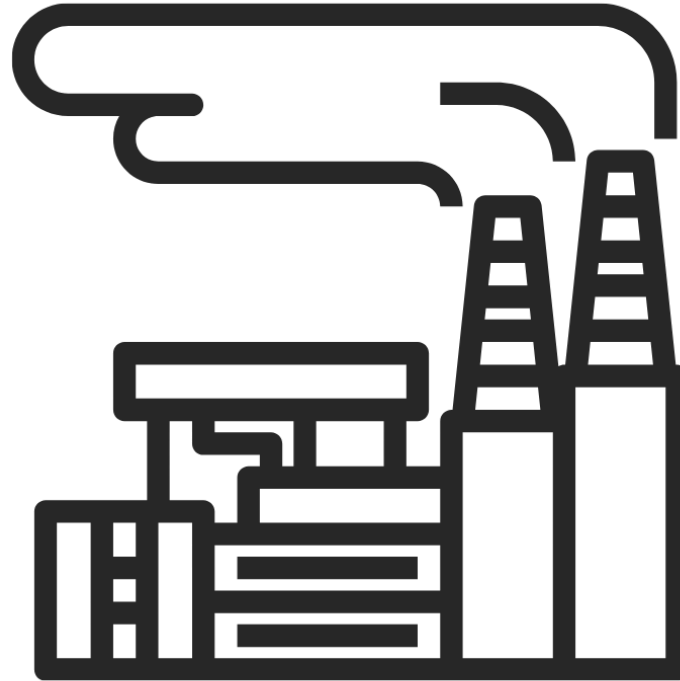
Policies

Enabling Environment

Vietnam New Energy Ecosystem 2021

115
Electric Generation
Companies

1
Transmission Companies



5
Distribution
Companies

1
Retail Electricity
Suppliers

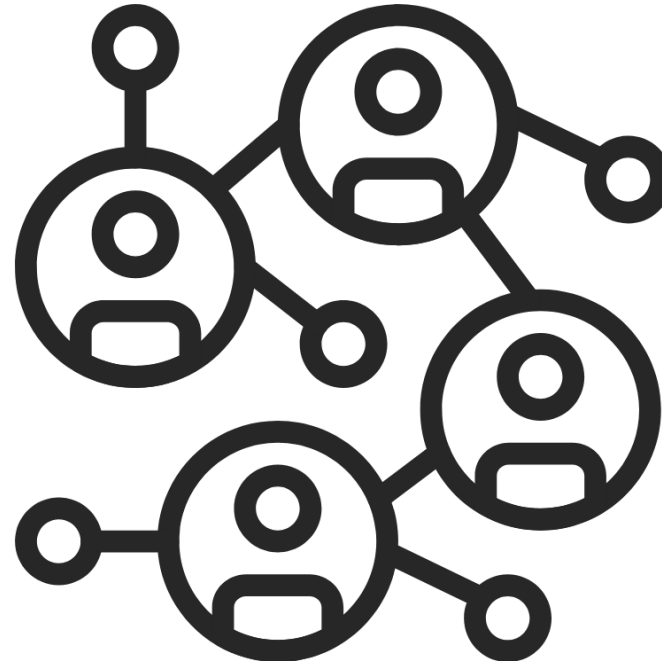
Institutions

Vietnam New Energy Ecosystem 2021

13
Capacity Building Initiatives

20
Networking Events

6
Incubators



9
Accelerators

2
Pitch and Demo Events

Networking Assets

"The map is useful for ecosystem stakeholders to gain a general picture of clean energy entrepreneurship in Vietnam, especially potential investors who are looking for initiatives."

- Ms. Hang Dao and Mr. Tung Ho, Clean Energy Investment Accelerator (CEIA) Vietnam

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New Energy Ecosystem Map – Indonesia

Indonesia New Energy Ecosystem 2021

Nascent New Energy Indicators



Enabling Environment



Institutions



Investors and Financing Mechanisms



Networking Assets

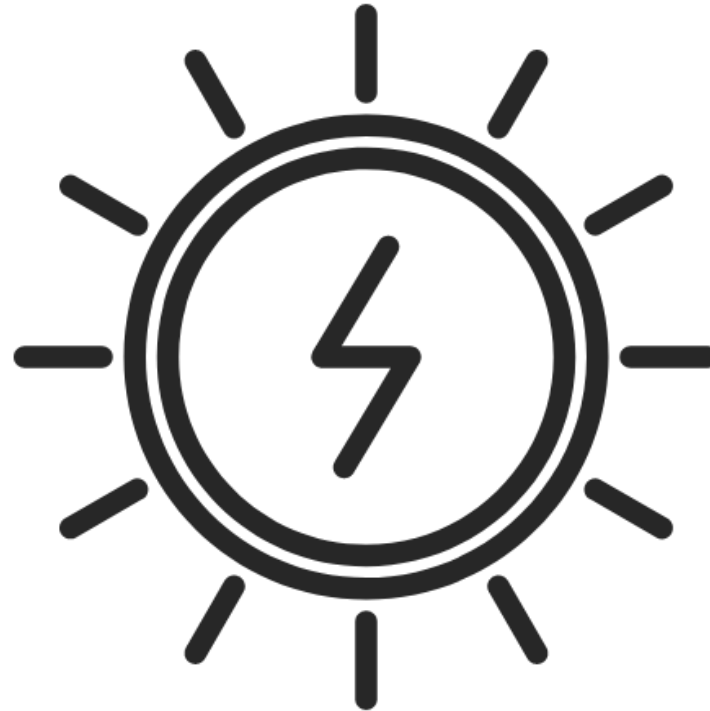


Indonesia New Energy Ecosystem 2021

79
New Energy
Startups

161
Researches

115
Professional Service
Providers



27
Research Laboratories

9
Universities

18
Media

Nascent New Energy Indicators

Indonesia New Energy Ecosystem 2021

24
Bank Loans

1
Grant Providers

71
Venture Capital Firms



17
Crowdfunding Platforms

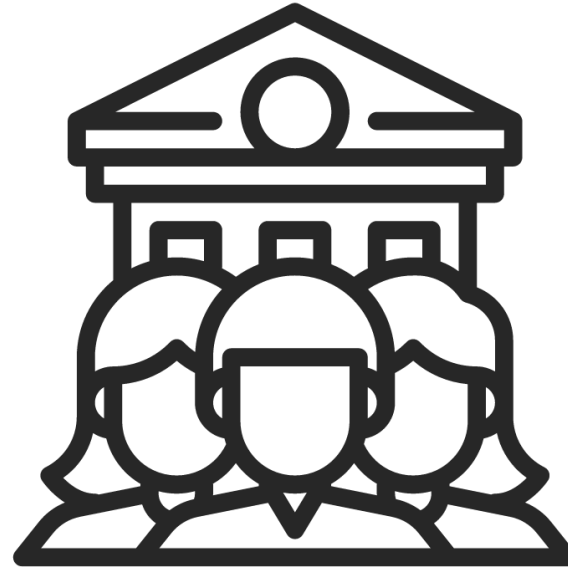
16
Angel Networks

Investors and Financing Mechanisms

Indonesia New Energy Ecosystem 2021

4

Certification Bodies



8

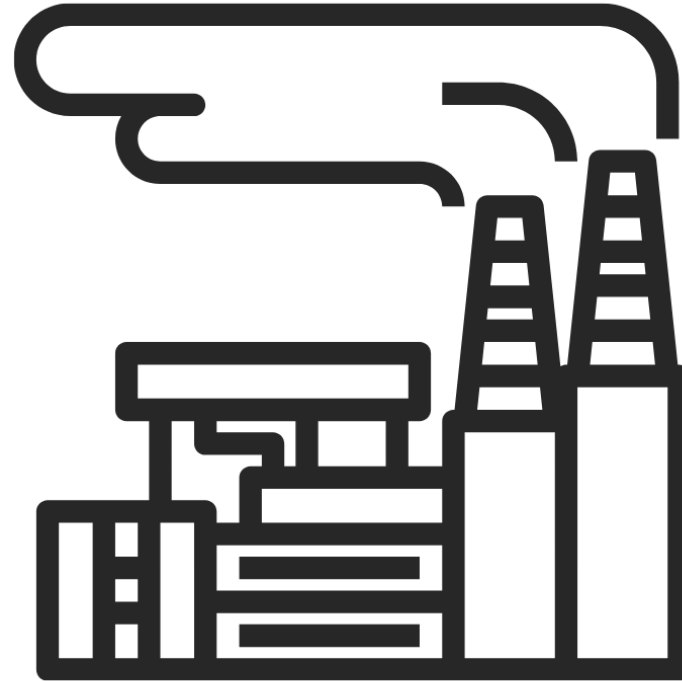
Policies

Enabling Environment

Indonesia New Energy Ecosystem 2021

59

Electric Generation
Companies



1

Electricity Distribution
Companies

Institutions

Indonesia New Energy Ecosystem 2021

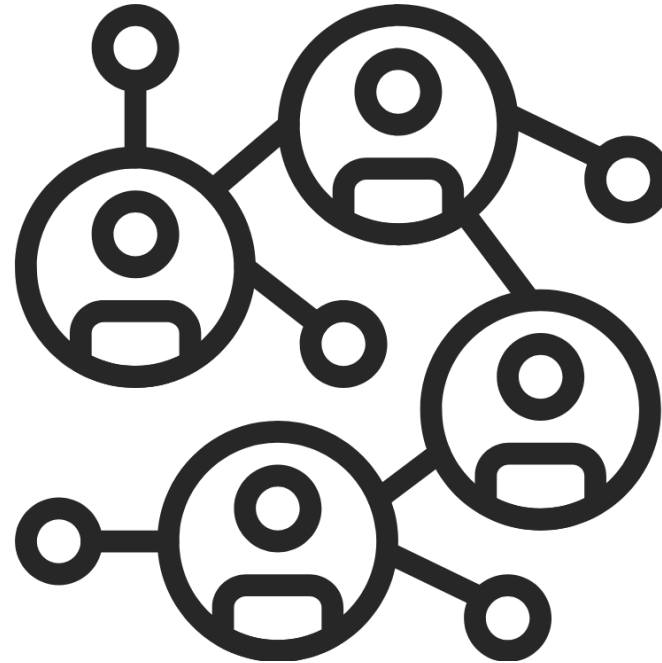
8
Inspirational Events

18
Fabrication Laboratories

13
Capacity Building Initiatives

9
Networking Events

20
Incubators



Networking Assets

24
Evangelists

7
Startup Validation Programs

16
Seed Accelerators

6
Growth Accelerators

14
Pitch and Demo Events

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Key Findings and Insights

New Energy Startups

- > According to [Technode global](#), Indonesia's tech startup ecosystem started booming in the early 2010s and has matured even further since then. Currently, it is home to unicorn startups such as Gojek and OVO.

Startups solving country's energy problems

- > The clean energy generation category has the most startups in Indonesia (at 17.7%) - a country that is still reliant on fossil fuels for its power generation (more than 80% in 2020).

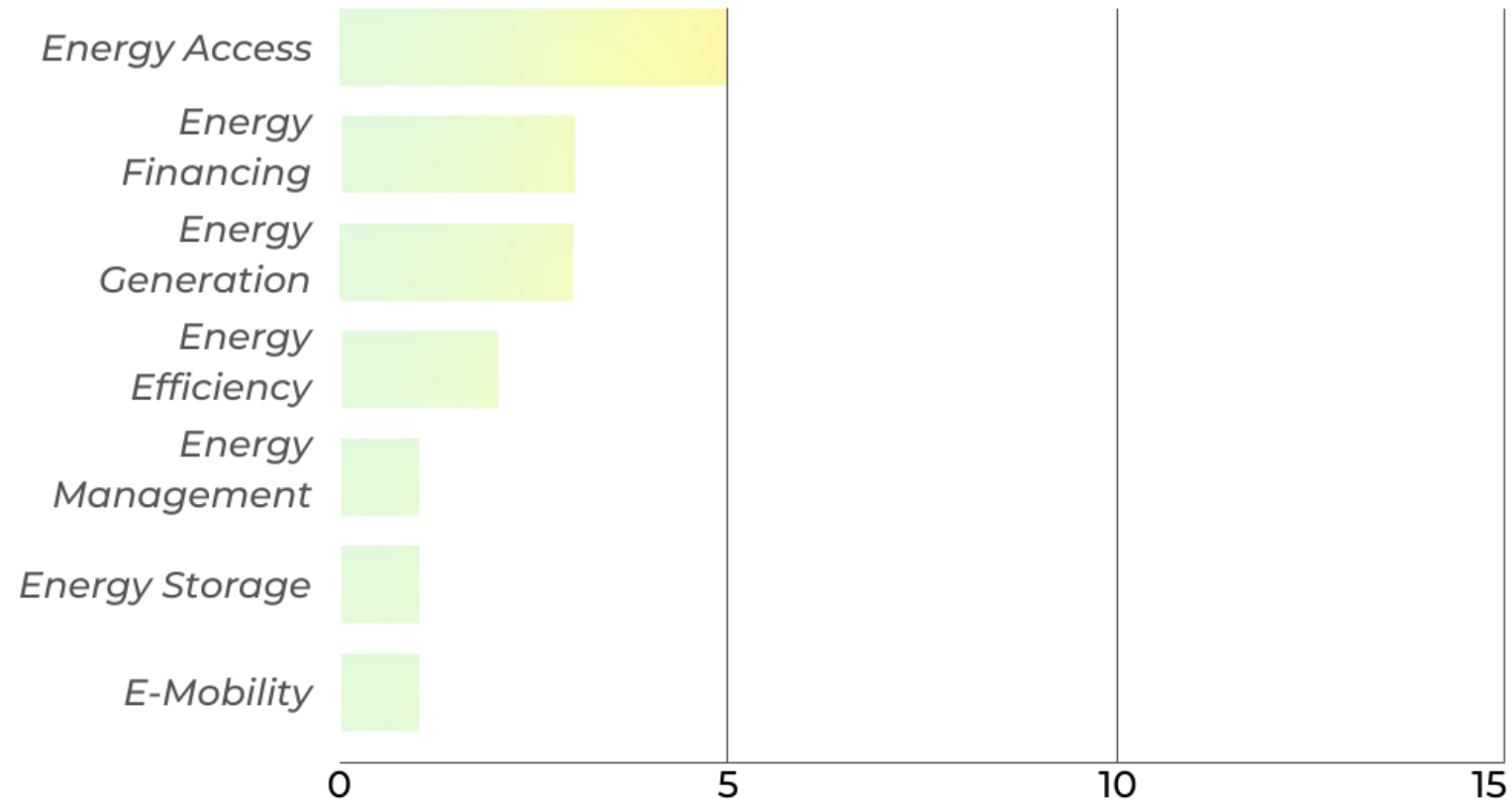
- > Not surprisingly, the energy startup ecosystem in Indonesia is also more mature compared to Vietnam and the Philippines. One of the data that stands out is the number of startups in Indonesia (79), which is much higher than in the Philippines (16) and Vietnam (9).

Startups solving country's energy problems

- > On the other hand, in the Philippines, the category with the most startups is energy access (at 31.2%). The Philippines has one of the lowest electrification rates in Southeast Asia at around 93%.

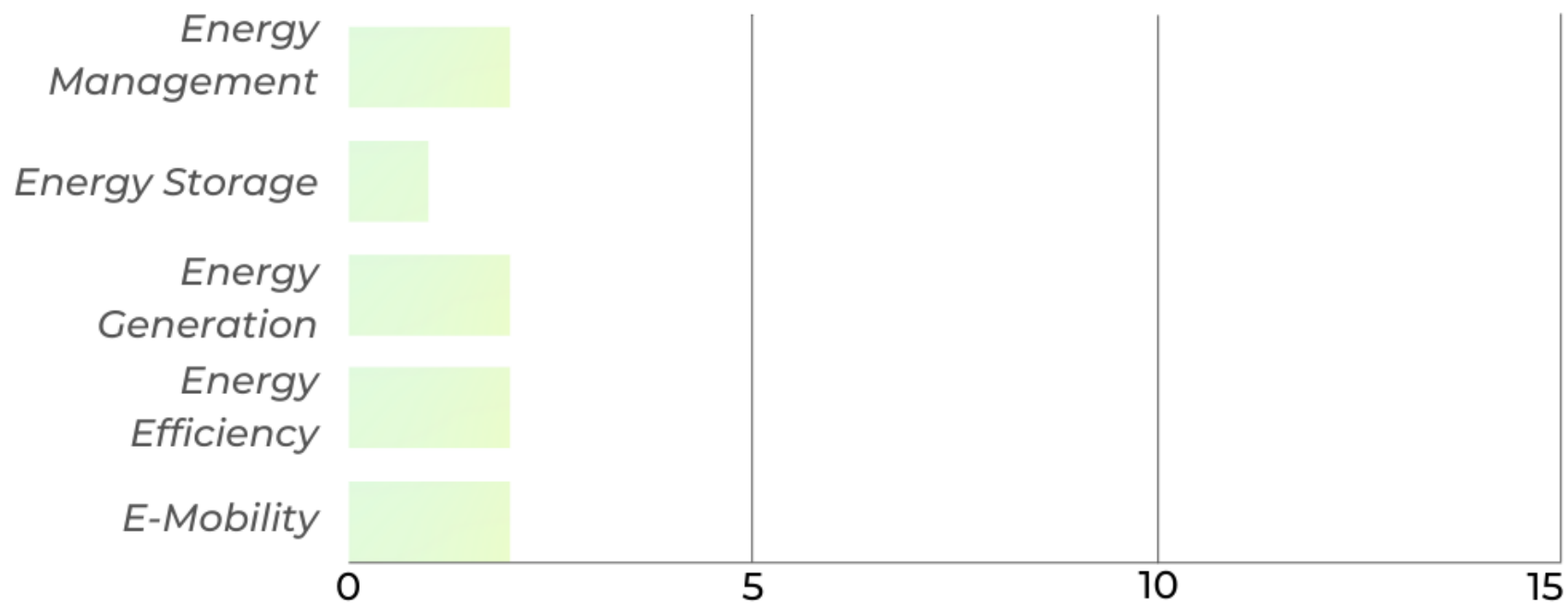
New Energy Startups

Philippine Startups by Category



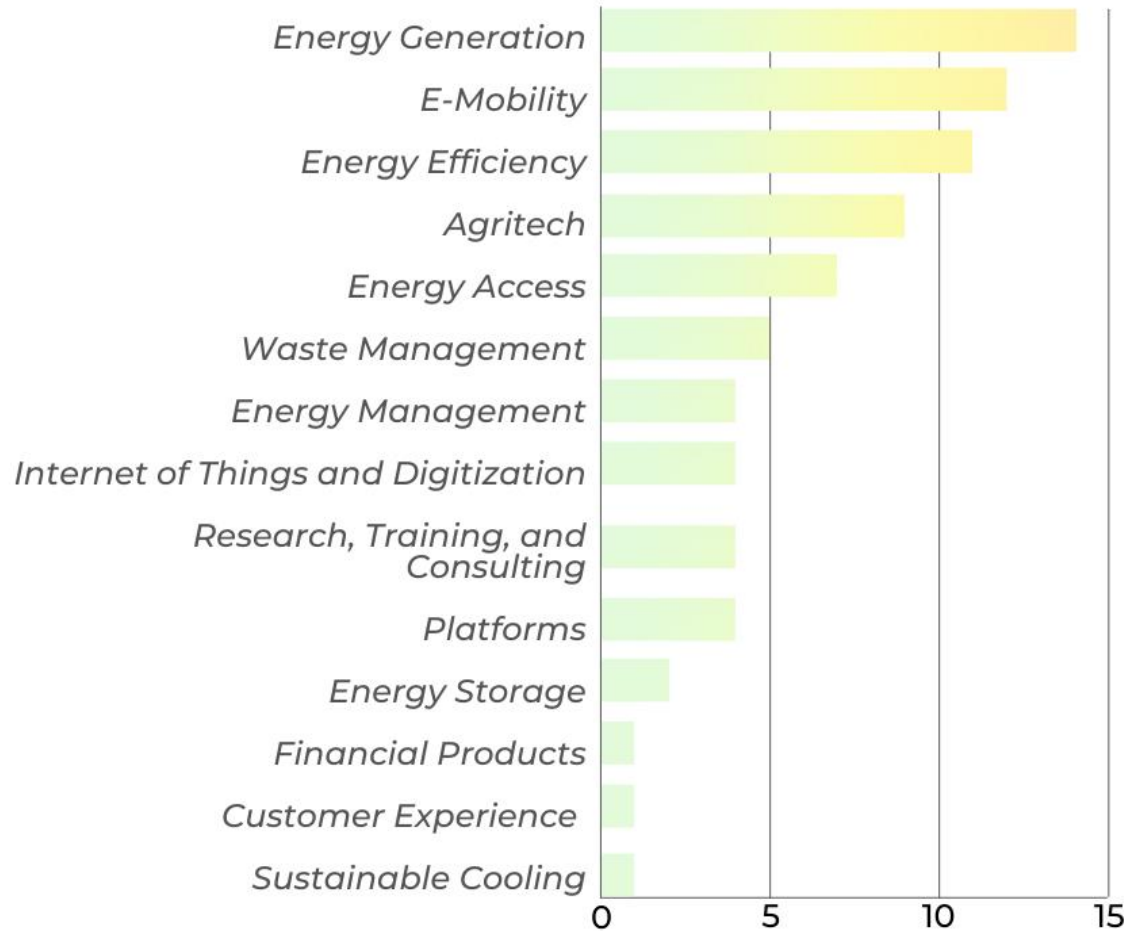
New Energy Startups

Vietnam Startups by Category



New Energy Startups

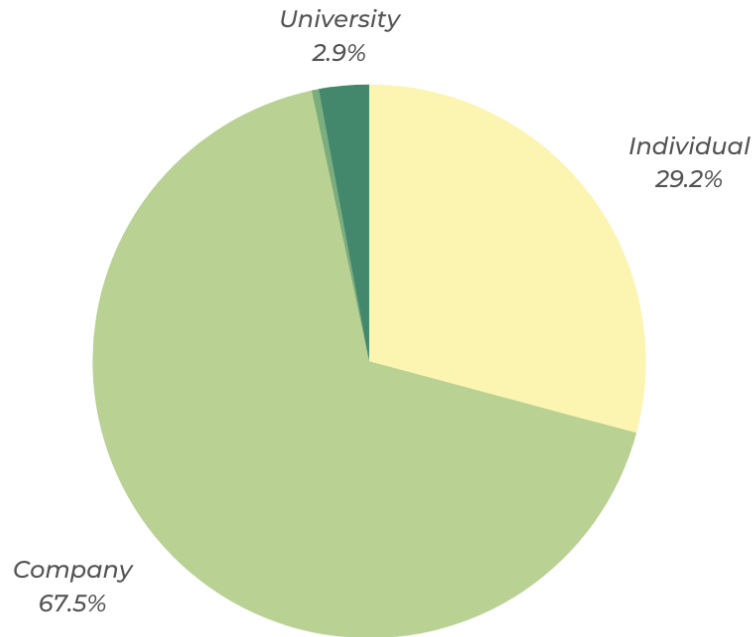
Indonesian Startups by Category



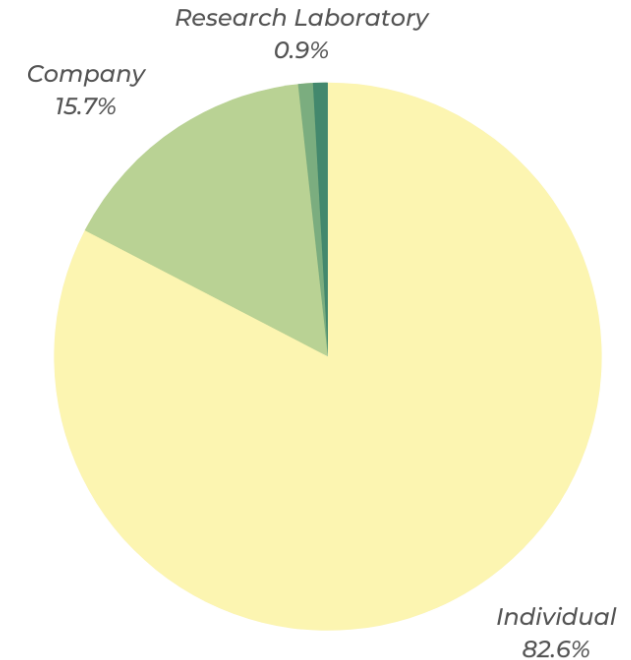
Patents

- > There is an interesting contrast between energy-related patent applications in the Philippines and Vietnam: most of the patent applicants in the Philippines are companies (68%). On the other hand, most of the patent applicants in Vietnam are individuals (82%). It is yet unclear as to what is causing this disparity.

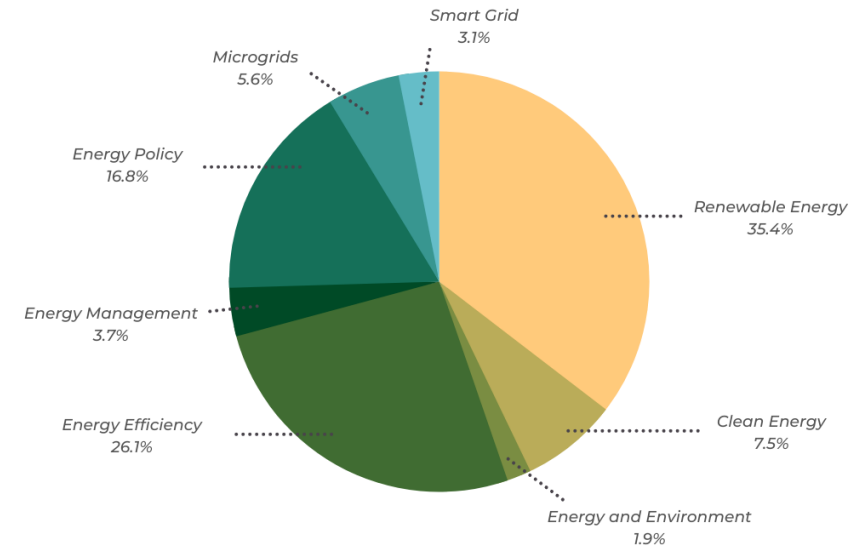
Energy-related patent applications: The Philippines



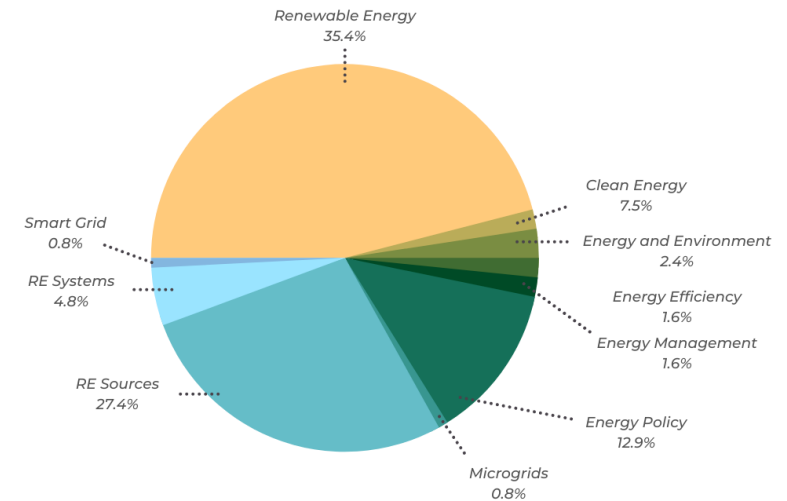
Energy-related patent applications: Vietnam



Energy Researches in Indonesia (2011-2021)



Energy Researches in the Philippines (2011-2021)



Researches

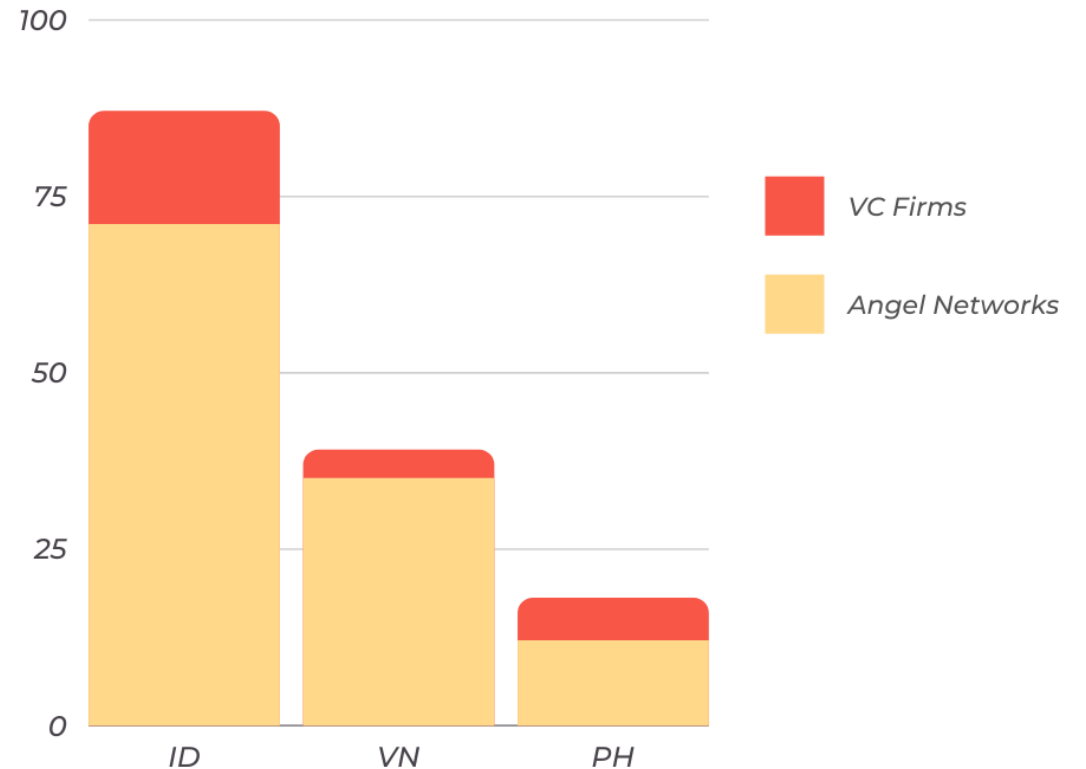
Energy researches in Indonesia and the Philippines for the past ten years:

- > Almost 80% of the energy researches in the Philippines are under the Renewable or Clean Energy category.
- > There is more diversity in energy researches in Indonesia: around 43% are under RE/Clean energy, 30% on energy efficiency and management, and 17% on energy policy.
- > Interestingly, the Philippines, with one of the lowest electrification rates in SEA, has only 1 (out of 124) energy researches in the past ten years focused on microgrids.

Financing Mechanisms

- > As previously stated, Indonesia's energy startup ecosystem is more mature than that of Vietnam or the Philippines.
- > This is apparent in the number of financial support mechanisms in the three countries. For example, the number of VC firms and Angel Networks in Indonesia is more than double that of Vietnam and almost five times greater than in the Philippines.
- > However, the number of bank loans available for RE project financing is almost the same.

Financing Mechanisms: VCs and Angel Networks



Institutions

Electricity generation companies

- > In Vietnam, power structure is mixed between private-owned and government-owned (Vietnam Electricity, EVN).
- > In the Philippines, the power sector is privatized, and it is the private sector that owns and controls the majority of the power sector assets.
- > In Indonesia, about 75% of the electricity generation companies are government-owned (Perusahaan Listrik Negara, PLN).

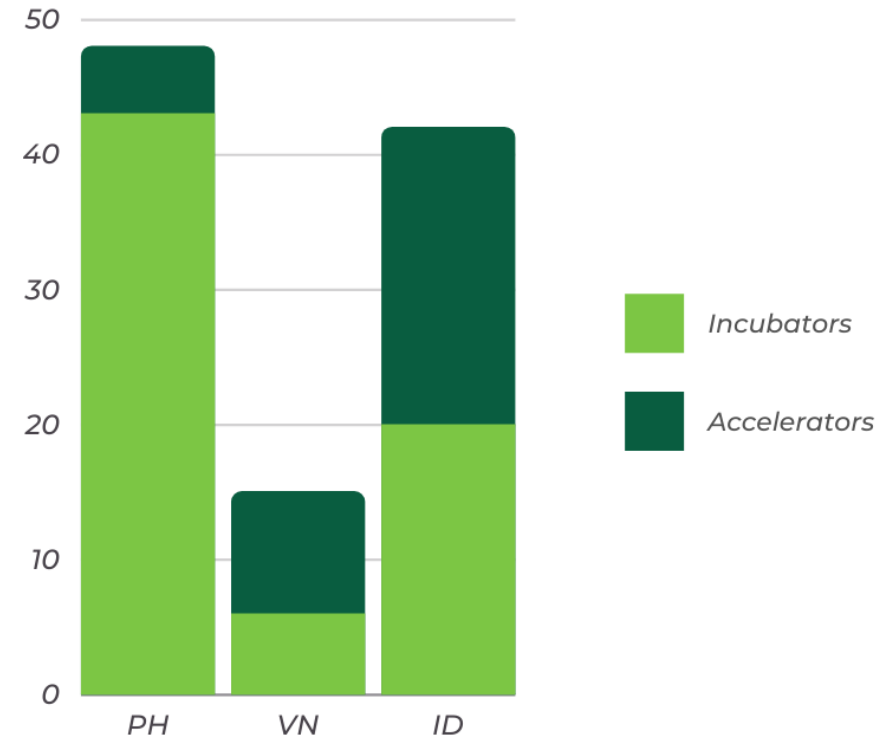
Electricity distribution companies

- > The electricity distribution market is a monopoly in Vietnam (EVN) and Indonesia (PLN).
- > In the Philippines, the electricity distribution market is decentralized: about 150 entities are engaged in power distribution – both private-owned and cooperative-based models.

Networking Assets

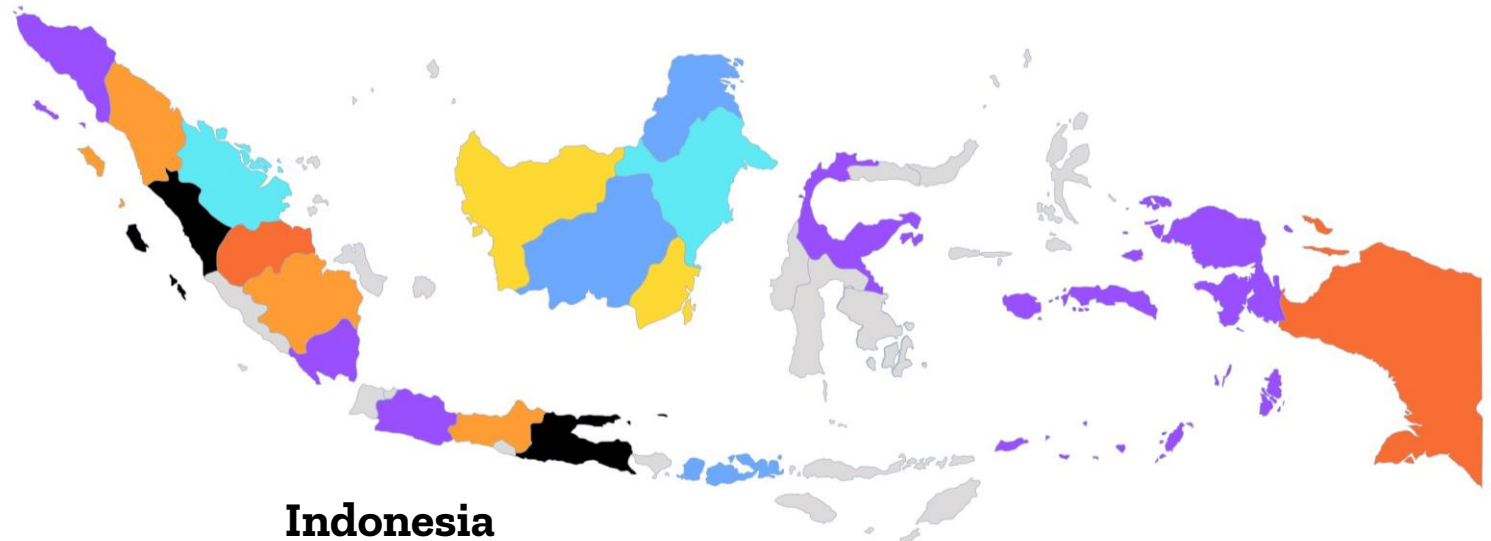
- > A rising number of organizations are assisting sustainability-oriented ventures in all geographies, including climate, clean energy, agritech, etc. However, these organizations are likely to focus on several sustainable development goals simultaneously rather than just clean energy.
- > The Philippines seems to have a lot of incubators (43). However, upon further review, two-thirds of these are general Technology Business Incubators (TBIs) – a [program by the PH Department of Science and Technology](#) to promote innovation and technopreneurship in the country.

Networking Assets: Incubators and Accelerators



Conclusions

Indonesia has a more mature startup ecosystem than the other two countries. The country is home to several unicorn startups and the energy startup ecosystem is also more mature in Indonesia. As reflected in the mapping activity, there are more energy entrepreneur support organizations and financial support mechanisms in Indonesia than in the Philippines and Vietnam. **As a result, clean energy startups entering the Indonesian market will likely get more fundraising opportunities and acceleration and incubation support. However, local renewable energy policies can be more challenging to navigate than in other countries.**



Conclusions

The Philippines has a more “open” energy ecosystem (i.e. more private sector entities) than the other two countries. As reflected in the mapping activity, in Vietnam and Indonesia, the power sector is dominated by a large government entity (EVN and PLN, respectively). Thus, a new market entrant will probably find the Philippine market more accessible to navigate than the other two. Furthermore, numerous private sector organizations support each other and lobby issues to the Philippine government, which is additionally helpful for new energy startups entering the country.



Recommendations – the Philippines

Recommendations for clean energy startups looking to enter the Philippine energy market

1. As discussed previously, several active organizations in the Philippines support new market entrants (e.g. Renewable Energy Association of the Philippines for RE, Philippine Energy Alliance for EE, etc.). It is recommended that new energy startups entering the Philippine market reach out to relevant organizations to identify potential partnerships and get their buy-in.
2. For startups in the energy access sector, it is recommended to partner with in country startups, non-government organizations, or civil society organizations working on an unelectrified area / island to get buy-in and avoid replication of work.



Recommendations – the Philippines

Recommendations for clean energy startups looking to enter the Philippine energy market

3. For startups raising funds in a Philippine energy project: several commercial banks offer project financing, but these are limited to projects where the bank has previous experience. Typical routes for new projects would be angel investment (not as common), venture capital (typically cross-border), or government and development grants for new projects.
4. For startups in the energy access sector, the authors would recommend reaching out to the Technology Business Incubator (TBI, see slide 51) based in the unelectrified area/island.



Recommendations – the Philippines

Recommendations for clean energy startups looking to enter the Philippine energy market

5. Both off-grid and on-grid RE projects are subject to the approval of the electric cooperative (see 4 – *Institutions* for the whole list) in that area. Getting their support and buy-in early on would be crucial to the project's success.



Recommendations - Vietnam

Recommendations for clean energy startups looking to enter the Vietnam energy market

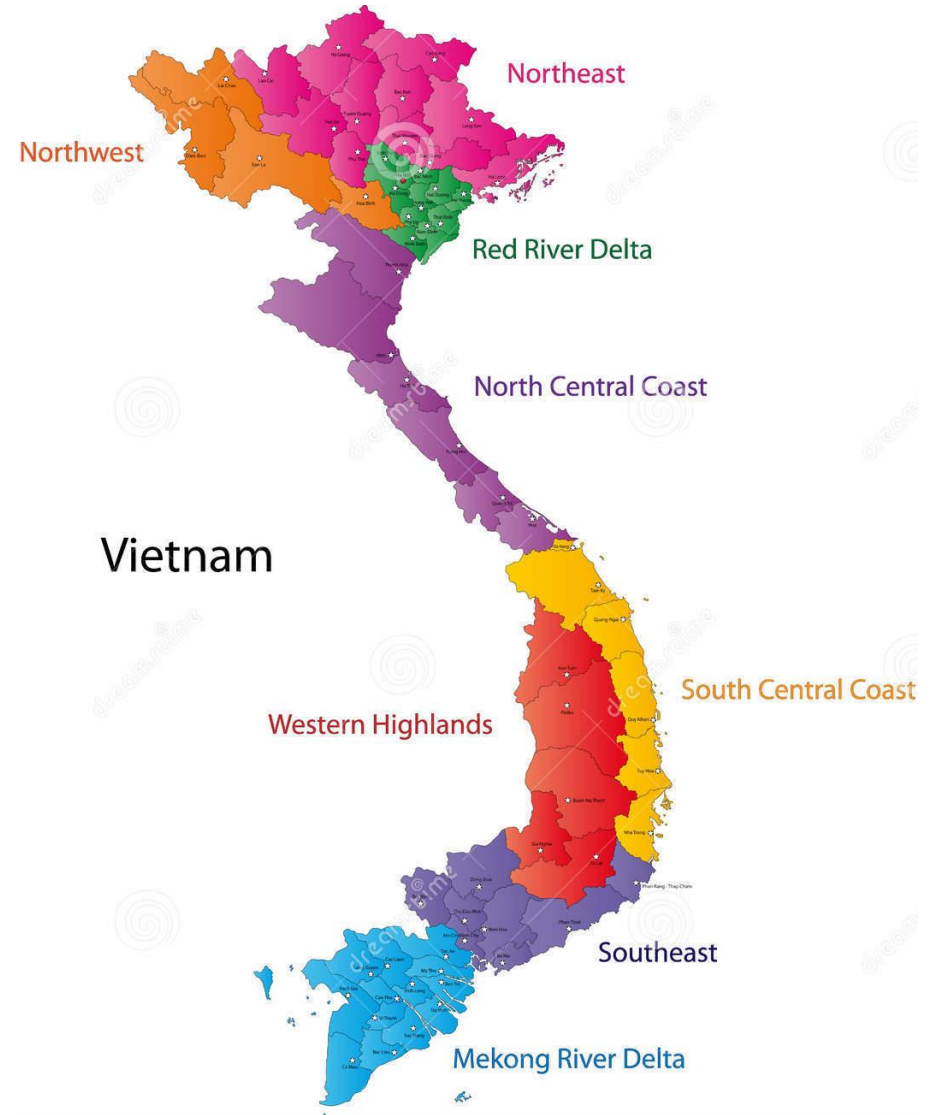
1. The number of entrepreneur support organizations (ESOs) in Vietnam is few but growing, and it is expected that some of these ESOs will be expanding in the clean energy sector. It is recommended that new energy startups entering the Vietnam market get connected with a local ESO. An ESO helps facilitate an introduction to mentors and local experts. Further, they can also help overcome the language barrier (some locals are not comfortable using English).



Recommendations - Vietnam

Recommendations for clean energy startups looking to enter the Vietnam energy market

2. Understanding the local energy policies and restrictions would be a good starting point for new market entrants. It is recommended that startups find local mentors and energy experts to help them understand and navigate the nuances of the policies.
3. It is recommended for startups dealing with Vietnam Electricity (EVN, the state-owned sole buyer of power in the country) to understand that negotiating power purchase agreements (PPAs) with EVN is time-consuming, which leads to an increase in the total project costs.



Recommendations - Vietnam

Recommendations for clean energy startups looking to enter the Vietnam energy market

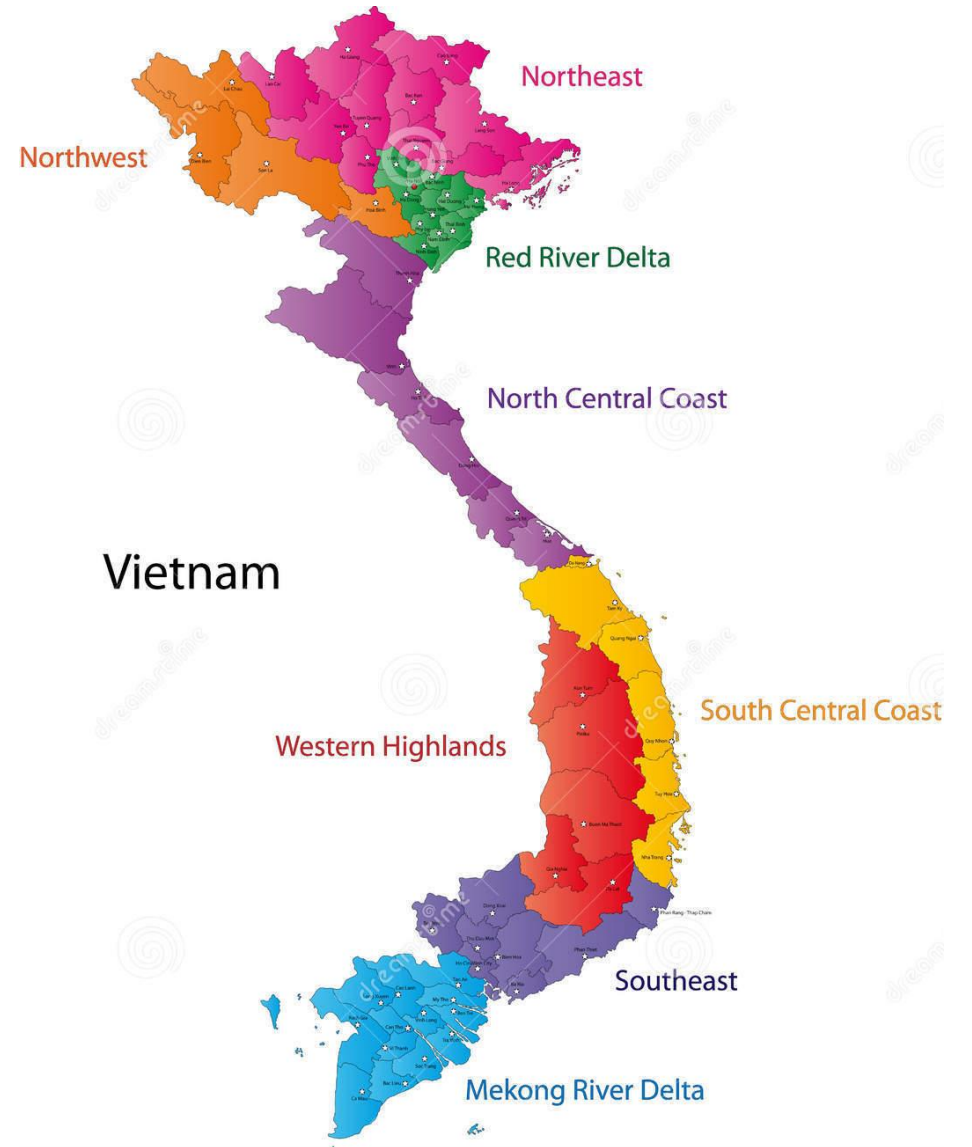
4. Solar has grown exponentially in Vietnam in the last two years (~15 GW total from 2019-2020). While this is excellent news, the transmission infrastructure was not ready for the drastic change. This transmission issue has caused EVN to restrict how much power operators can feed into the grid. Therefore, this must be considered by energy startups interested in entering Vietnam with a business model of providing renewable energy to the grid.



Recommendations - Vietnam

Recommendations for clean energy startups looking to enter the Vietnam energy market

5. Previous solar feed-in tariffs (FITs) are favorable to the project developers, while other technologies are less so. These generous solar FITs have been determined as the primary driver of solar PV adoption (see the previous item). Therefore, historically, the government has favored solar energy. Potential new market entrants, especially non-solar technology, should consider this.



Recommendations - Indonesia

Recommendations for clean energy startups looking to enter the Indonesian energy market

1. Similar to the Vietnam recommendation: understanding the local energy policies and restrictions would be a good starting point for new market entrants. It is recommended that startups find local mentors and energy experts to help them understand and navigate the nuances of the policies.
2. Similar to the Philippine recommendation: For startups in the energy access sector, it is recommended to partner with startups, non-government organizations, or civil society organizations working on an unelectrified area/island to get buy-in and avoid replication of work.



Recommendations - Indonesia

Recommendations for clean energy startups looking to enter the Indonesian energy market

3. As mentioned previously (Slide 52), Indonesia has a robust startup ecosystem. Among the three countries in the scope of this report, it is likely easiest to get local funding for energy projects from the Indonesian market. This should be a consideration, especially for new market entrants who need startup or project financing.
4. Indonesia has a considerable untapped solar energy potential. There are regions (East Java, Sulawesi, etc.) with high solar irradiation. The solar capacity is negligible at the moment (~150 MW), while the potential is estimated to be up to 200+ GW, and the government is targeting ~4.7 GW by 2030. This is a vast market opportunity that is open even for new market entrants.

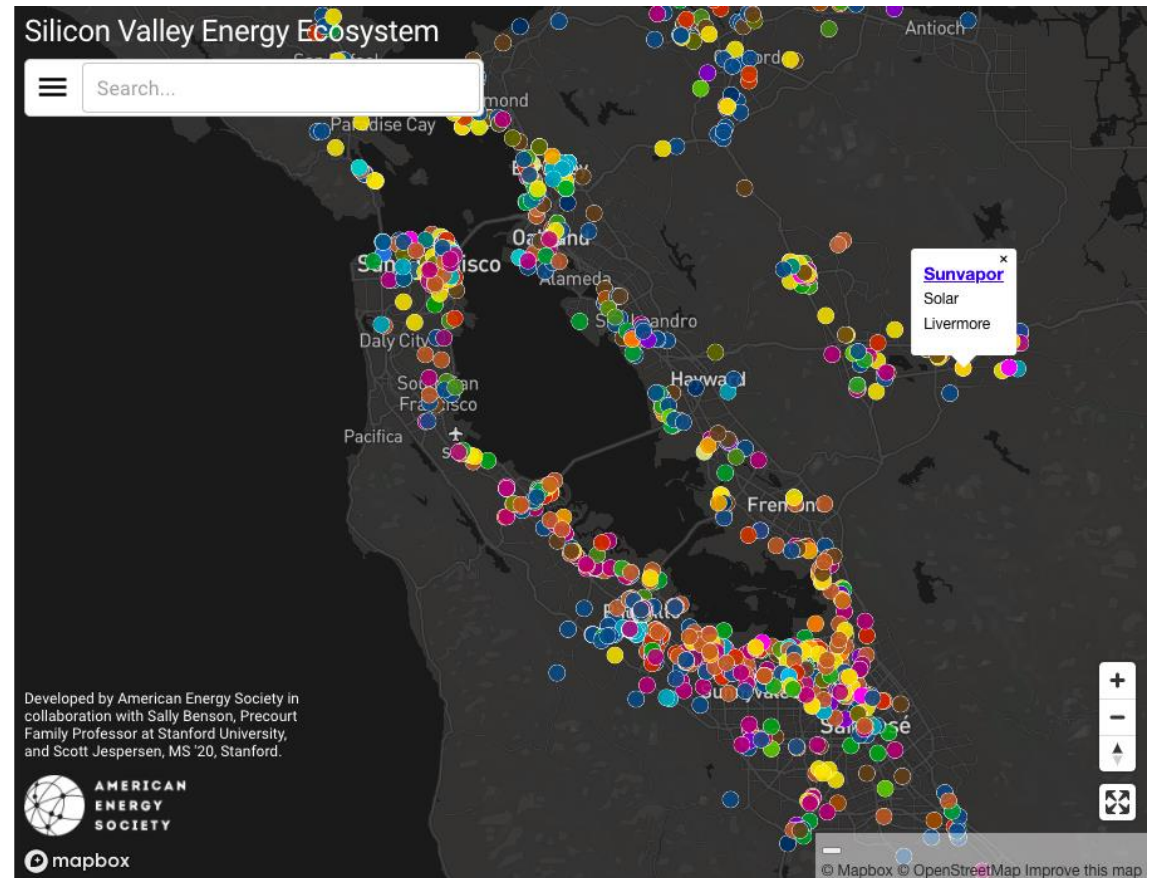


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Next steps

Next steps/Future plans: Interactive New Energy Ecosystem Maps

- > Making the New Energy Ecosystem Maps interactive will draw users and bring public attention
- > New Energy Nexus Philippines (NEN PH) has ongoing discussions with the American Energy Society (AES) to develop an interactive ecosystem map. In 2020, AES developed the Silicon Valley Energy Ecosystem Map.
- > In the interim, NEN PH uses this [map](#) (a work-in-progress).
- > Eventually, the map is envisioned to **become a tool to identify or initiate cross-stakeholder collaborations and facilitate inter-connections** (e.g. how to use networking assets to improve nascent indicators; how to improve institutions and financing mechanisms collaborations, etc.)



Source: [American Energy Society](#)

Next steps/Future plans: Updating and Revisions

- > The current New Energy Ecosystem Maps focuses on information related to the power sector and clean energy generation. Thus, New Energy Nexus is looking to expand the scope of the map to other sectors of energy as well, such as clean mobility, energy efficiency, alternative fuels, etc.
- > The energy ecosystem is rapidly changing and growing. Thus, all New Energy Ecosystem Databases are live documents (online Google Sheets) to enable constant updating.
- > New Energy Nexus will be revising the PH and VN New Energy Ecosystem Maps based on comments and suggestions received in stakeholder consultations. However, the ID New Energy Ecosystem Map is yet to be subjected to a series of consultations.
- > Some information is still missing in the databases (e.g. patents in ID Ecosystem Map, researches in VN Ecosystem Map, etc.) and will be updated in due course.

Resources and Further Reading

The Philippines

- > Philippine patents - <http://onlineservices.ipophil.gov.ph/wopublish-search/public/home?1>
- > Philippine energy policies – <https://www.doe.gov.ph/laws-and-issuances/compendium-energy-regulation-laws-circulars-and-other-issuances>
- > Electricity distribution companies - <https://www.doe.gov.ph/duprofile>
- > <https://www.erc.gov.ph/>
- > <https://cda.gov.ph/>

Vietnam

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- > Vietnam VCs - <https://www.nexea.co/venture-capital-vietnam/>, <https://tracxn.com/d/investor-lists/Venture-Capital-Funds-in-Vietnam>
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