ZE-Gen Market Deep Dive: The Philippines

Market report, 23 January 2025

intellecap
AAVISHKAAR GROUP

Executive Summary

Philippines' current energy profile: Philippines relies on RE for only 22% of electricity needs. Commercial & industrial (C&I) (74%) and household (22%) sectors are the main consumer of fossil fuels (excluding transportation)

- **Issues that have caused dependence on fossil fuel gensets (FFG):**
  - **7,000 island archipelago:** The geography is dispersed and sparse; it is not economically feasible to connect everyone via the grid; ~10% of Philippines is not electrified & even some electrified areas don't have access to 24/7 power
  - **Prone to natural disasters:** Philippines is prone to typhoons with some areas receiving 20 per year; these damage infra-assets making RE penetration challenging and leading to prominence of FFGs which provide an ancillary service
  - **Poor grid infrastructure:** Philippines has poor grid infrastructure with frequent voltage drops at the extremities of the grid; a typical concern for C&I and remote grid users
- **National developmental goals** – Government of Philippines (GoPh) wants to increase RE capacity to 35% by 2030 and to have a ~50% RE use for off-grid electricity in unserved areas; total electrification is a priority for GoPh with the goal to be electrified by 2032 (prev. goal was 2022)

Key segments for alternate solutions:

- **C&I:** High willingness to pay (WTP) for electricity due to the need for cost savings and reliable power. Data from 2016 highlights over 40% of businesses owning a genset. However, expert interviews suggest that this segment might not be the most impactful in the coming years
- **Off-grid users:** Unserved or underserved by the status quo -> agnostic to technology but want electricity; GoPh is actively working to electrify these areas using RE (cost of diesel is high and subsidised by the rest of the country)

	Type of use	Genset fleet size (# units)	Genset capacity (MW)	Daily use (hr)	GHG emissions abatement potential	Solution pathways
C&I	Back-up	450,000	~15,000 (estimated based on WB)	1 - 3 hours	5 MT CO_2e	Solar + BESS or BESS
Off-grid	Primary	300+ (diesel power plants) + small gensets for personal use	~600	8+	0.23 MT CO_2e	Solar + BESS + diesel

Note: The genset capacity data for C&I flows from a World Bank (WB) study from 2019.

Across APAC, certain common challenges like a poor grid and remote communities lead to dependence on gensets

What are the common challenges which sustain dependence on fossil fuel gensets (FFG)?

★☆☆ Poor quality of power

Our studies reveal that the quality of electricity, in terms of the frequency and duration of outages etc., is generally poor. In countries like Nepal, the commercial and industrial (C&I) segment is particularly impacted by this poor quality, while in India, the situation varies across regions and sectors

Outdated grid

The grid infrastructure across regions is outdated or non-existent, leading to a reliance on gensets due to inadequate grid systems and the absence of modern technologies like smart grids. Additionally, an outdated grid hinders the adoption of renewable energy solutions, which require complementary storage infrastructure

FFGs are the only game in town

FFGs are often considered the only viable option in these regions due to the lack of grid infrastructure or challenging geographical conditions. Furthermore, FFGs are established technologies perceived as reliable, supported by mature supply chains that ensure their continued use

BESS infrastructure is limited

Across regions, the BESS landscape is developing or non-existent. For example, BESS is very limited in Nepal due to high taxes whereas supply chain complications (limited capacity for maintenance) is limiting use in countries such as Maldives and Philippines; BESS is a key technology to replace gensets and improve reliability of RE technologies

What challenges are unique to the Philippines?

Prone to natural disasters: Philippines is prone to natural disasters, such as typhoons, which complicates the development of RE solutions; especially in off-grid regions

Limited public financing: Unlike other countries, GoPh provides limited financing or subsidies for RE solutions leaving only the private sector to invest and implement

Unserved remote population: In the Philippines, ~10% of the population does not have access to electricity largely due to the difficulty in supplying electricity (and their limited ability to pay)

There are four ecosystem solutions that can allow increased uptake of RE and reduced dependence on FFG

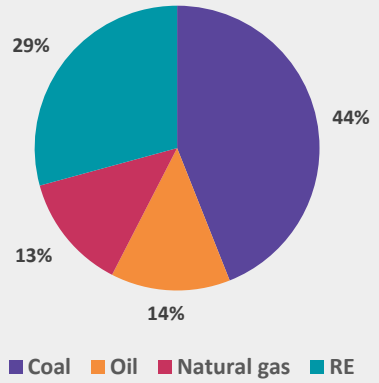
Modernizing the grid	In the Philippines, supporting the government's efforts to modernise & extend the grid and implement solutions such as smart grids would significantly enhance the penetration of RE solutions in these regions and serve as infrastructure that solves underlying issues with electricity supply and usage
Capacity building	Building the capacity of operators and technicians to maintain RE solutions is essential to ensure these systems deliver the promised results. Without proper maintenance, there is a risk of users either not paying for electricity or failing to utilise the solutions optimally. This challenge is further exacerbated with BESS, which represent newer and less familiar technology
Remote sensing & IoT based solutions	Incorporating IoT-based sensing and monitoring for RE solutions is crucial for the success of off-grid deployments. In these regions, geographic dispersion leads to extended service times for critical maintenance. Remote sensing offers a promising solution to bridge this gap in the market
Improving the landscape of parametric insurance	Increasing the adoption of insurance solutions, particularly those integrated with fintech, would be crucial in addressing the specific challenge of asset destruction in the Philippines

Sources: Berde Renewables

What is the as-is power situation in the Philippines?

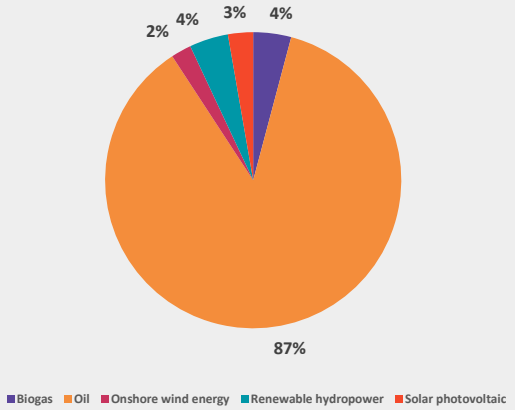
Philippines' electricity is largely driven by non-RE sources with diesel power being the prominent source of off-grid electricity

28 GW of installed capacity (~30% is renewable)



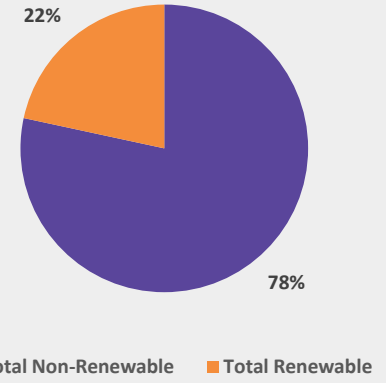
1. Total renewable capacity has grown at a rate of 2.8% in the past four years
2. Solar (on- and off-grid) accounts for only 6% of total capacity; hydropower is the leading RE source (12%)

720 MW off-grid capacity (~2.6% of total capacity)



1. Off-grid oil has 625 MW of capacity (and nearly 7x total off-grid RE)
2. Off-grid solar has grown at 9% over the past four years; standing at 20 MW in 2023

112,000 GWh of power generated in 2022 (~22% is from RE sources)



1. Solar accounted for 1.2% of all power generated while oil accounted for 2.3%
2. Less than 1% of power was generated off-grid; oil contributed to 60% off-grid generation

Sources: IRENASTAT; NEA.

The Philippines faces geographical challenges & reliance on fossil fuels, resulting in unreliable & costly electricity supply, leaving nearly 15% of the population underserved

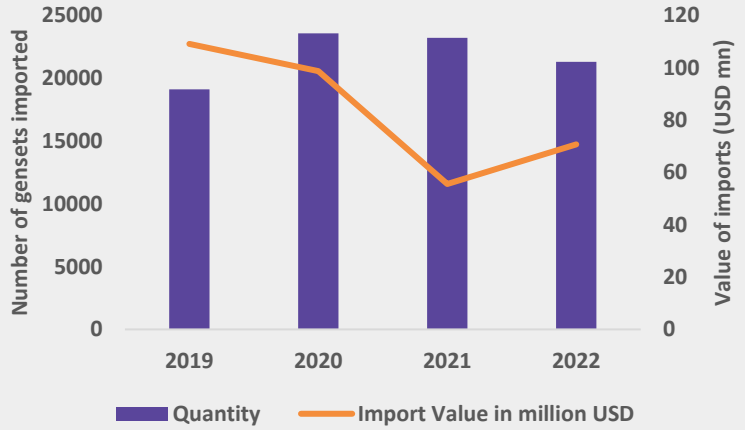
Challenges	Why is this a problem?	What can ZE-Gen do?
High electricity costs	• Philippines has the 2nd highest electricity costs (USD 180/MWh) in Southeast Asia after Singapore (USD 220/MWh); the average household spends 20% of their budget on electricity; costs can be even higher for rural customers • Likely causes are outdated grid infrastructure & reliance on inefficient coal plants	• RE costs are generally lower than traditional sources; ZE-Gen can build awareness of this as part of its outreach and marketing efforts
Reliability and frequent outages	• Power outages are common, particularly in rural and remote areas. The grid's vulnerability to natural disasters such as typhoons further exacerbates the issue • Insufficient supply of power to electric cooperatives is leading cause for outages. The Luzon grid's peak demand exceeds installed capacity leading to undersupply and brownouts (scheduled and unscheduled)	• Supported enterprises should prioritise the climate-proofing of solutions that target backup usage to serve as an immediate use case
Limited access in remote areas	• The Philippines is an archipelago of 7,000+ islands which represents a physical challenge to the viability of connecting all users to the grid • 4mn households are underserved by the national grid: 1.2mn have no access to electricity & 2.7mn live in underserved areas with some access to electricity (but not 24/7 access)	• Customised RE solutions that consider the operational and logistical challenges will be critical
Dependence on fossil fuel	• Philippines has heavy reliance on coal, oil, and LNG for its power supply; these combine for 75% of power generated in the country • Reliance on fossil fuels further leads to fluctuations in power costs as oil and LNG are imported; international disruptions like the Russia-Ukraine war can cause spikes in rates as LNG rates spiked by nearly 300% in Asia	• RE solutions, while initially reliant on imports, offer an import-free pathway for consumers (no oil), which could attract interest from captive consumption plants.

Sources: Filipinos burdened with power rate hike amid livelihood inflation, OECD, Microgrid Knowledge,

Philippines imported 21,000+ FFGs worth USD 70mn in 2022, signalling a market for back-up solutions that can be targeted

FFG have 0% tariffs under various Preferential Trade Agreements and Free Trade Agreements signed with Singapore, Vietnam, EU, ASEAN, China, etc. However, a 12% VAT is added to all imported gensets

~USD 73.8mn worth of FFGs imported in 2023



The increase in the quantity of genset imports since 2019, coupled with a reduction in import value, suggests that Philippines is likely importing more affordable or smaller-sized gensets than before

Source: WITS World Bank

1. **Dominant Player:** China is the leading supplier of gensets, accounting for 47% of the total market share in 2022 (by value)
2. **Other key players:** Other players include Vietnam (18% of the total value), followed by UK, Finland, USA and Singapore, each contributing less than 6% in the total import value
3. **Tariff free Imports:** No applicable tariffs on gensets under various trade agreements, with partner countries
4. **Top brands in market:** Caterpillar, Cummins, ISUZU, Deutz, FG Wilson, Kohler, Komatsu, Mitsubishi, MTU, and Perkins are leading brands in the market
5. **Price range:** Gensets cost approximately $4,800–$5,000 (30 kVA), $8,000–$10,000 (100 kVA silent), and $13,500–$25,000 (350-500 kVA)

Like in other APAC countries, genset suppliers focus on providing aftersales support & maintenance services which boosts their usage

How are gensets sold?

- New and used gensets are primarily sold through dealers. Most popular types of generators sold are Portable, Standby, Invertor and Industrial.
- Key features for consumers: Fuel type, power output, runtime, portability and noise levels
- Key services provided include: Fast delivery, free installation, genset rental and repair, load bank testing, periodic maintenance, after-sales support, etc.

Standards for Diesel Gensets

Standby gensets: Operate up to 200 hours annually, with a max of 3 hours/day or 3 days/week for light commercial/industrial use
Emission testing exemption: Standby gensets under 200 hours are exempt from source emission testing but must submit an updated EMOP
Peaking power & bunker fuel genssets: Required to undergo emission testing, regardless of operating hours

In 2021, diesel consumption for generator sets accounted for 41.8% of total diesel use

WESTPOINT ENERGY RESOURCES, INC.

- Sells and leases imported gensets ranging from 5 kVA to 2000 kVA
- Provides maintenance services, load bank testing, installation services, etc.
- Provides after sales support within 24 hrs in Metro manila and 2-3 days in provincial areas.

ZEUS

- Sells both brand new and used gensets with focus on agricultural, C&I and small business customers.
- Readily available services include relocation and hauling of gensets, installation, maintenance, repair of parts, etc.

FILPOWERGROUP & MARKETING CORPORATION

- Provides sales and services of used gensets (12 kVA to 2000 kVA) & their electrical parts
- Offices in Bacolod, Iloilo, Manila, Cebu, Dumaguete, Palawan, Zamboanga, Davao, & Leyte
- Clients include government units, education & health sector, construction , energy, banks, real estate, hospitality & resorts, etc.

multico

Asia's Equipment Specialist

- Supplies gensets and spare parts to Cebu, Manila, and other parts of the Philippines,
- Partnered with various brands as their authorised distributors
- Provides support in repair services, on-site technical assessment, load bank testing, extensive product training, etc.

FFG costs

- **30 kVA:** USD 4,800 – 5,000
- **100 kVA:** USD 8,000 – 10,000
- **350 kVA to 500 kVA:** USD 13,500 – 25,000

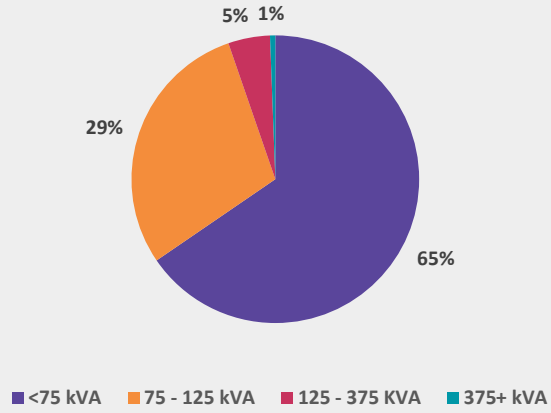
ZE-Gen relevance

ZE-Gen can support enterprises by building local capacity, streamlining logistics, and ensuring fast delivery, installation, and reliable after-sales support, helping customers transition smoothly from diesel gensets to green energy solutions.

The market for smaller gensets represents user WTP for power solutions; 24/7 power without OPEX of fuel can be a winning case

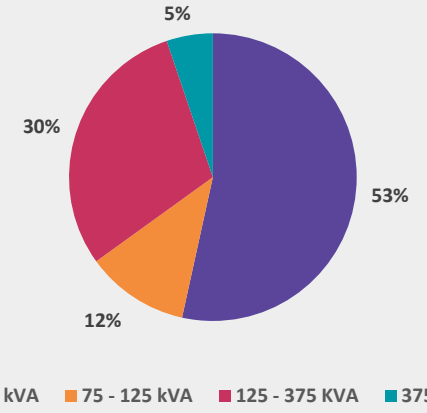
ZE-Gen relevance: Genset trends in Philippines indicate that a larger volume of <75 kVA gensets are imported; there is high demand for gensets for small businesses and individual off-grid use

Smaller gensets dominate by sales numbers (2022)



1. The average trade value of these gensets was ~USD 1,000; genset is likely to be less than 15 kW
2. Small businesses, fisheries, off-grid residences/grids, and emergency disaster response gensets

<75 kVA gensets also dominate by sales value



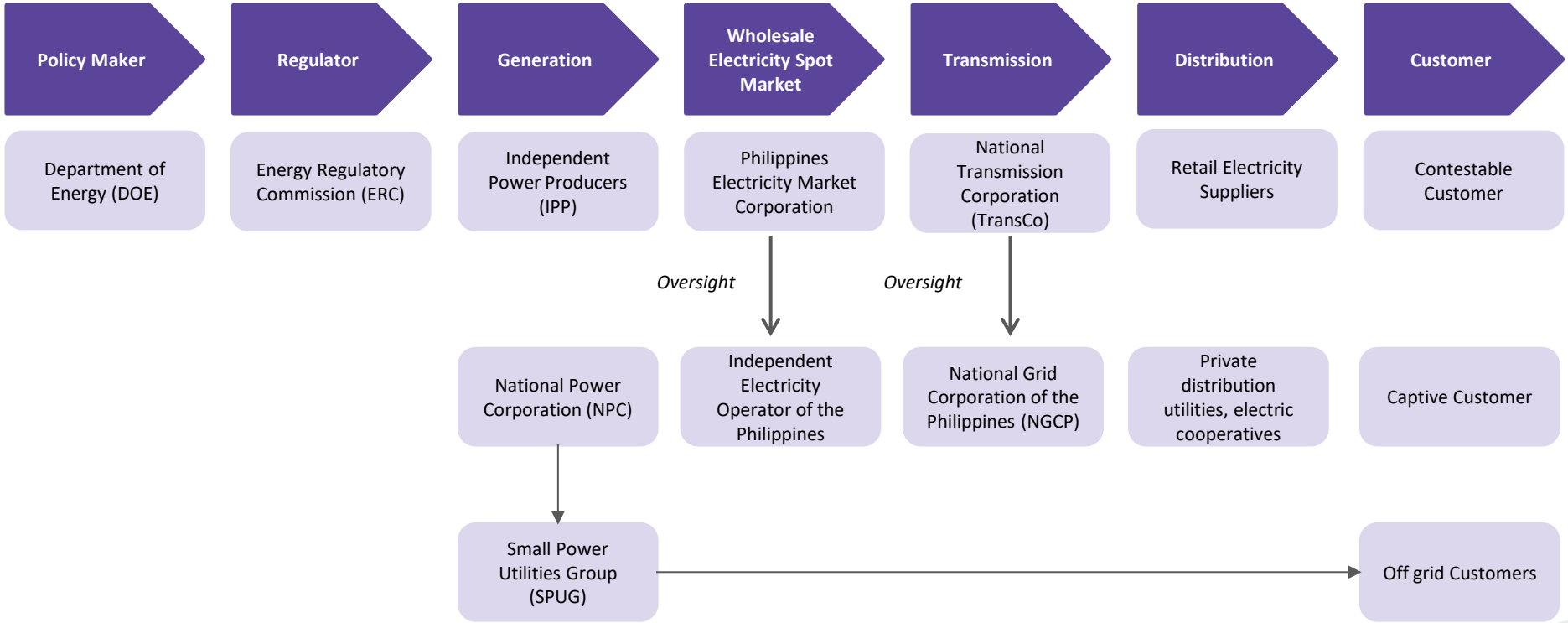
1. Total genset imports totalled USD 146mn in 2022 (there is a discrepancy between Philippines data & WB data)
2. The larger gensets gained some value share indicating that the buyers of these gensets are likely to pay higher for RE solutions

Sources: Philippines Statistics Authority

Note: The data from PSA seems to have discrepancies when compared to WB data used in Slide 8. It seems that HS codes might have been misattributed in PSA dataset

The Philippines power generation sector is deregulated; however, transmission & distribution are regulated requiring coordination with GoPh bodies

ZE-Gen relevance: Electricity sector map of relevant stakeholders; working with captive consumers (large C&I) or isolated off-grid users (small communities or PUE) could be an easier pathway



GoPh is actively seeking RE investments, with a target commercial operation capacity reaching 3,672 MW in 2025

Government body	Primary role in RE	Relevance for ZE-Gen
Department of Energy (DOE)	• Policy and strategy formulation, and oversight • Preparation of Missionary Electrification Development Plans • Reviewing and managing qualifications of RE developers and issuance of service/operating contracts	• Facilitates numerous private sector-initiated power projects across Luzon, Visayas, Mindanao, and other regions. • Good potential for ZE-Gen to partner with ECs and energy developers to meet solar targets.
National Electrification Administration (NEA)	• Supervision of Electric Cooperatives (ECs) • Technical, financial and institutional capacity developments of ECs	• NEA is collaborating with various stakeholders to achieve 100% electrification by 2028 • ZE-Gen can partner with ECs to build capacities
Energy Regulatory Commission (ERC)	• Approval of cash generation-based incentives for RE developers	• ERC will the critical body to set tariffs for off-grid electricity
National Grid Corporation	• Encouragement of Electric Cooperatives to go into embedded generation	• Limited relevance for ZE-Gen
National Power Corporation through its Small Power Utilities Group (NPC-SPUG)	• Generation in missionary areas if no Qualified Third Party (QTP) qualifies to provide electricity services • Consolidate Universal Charge for Missionary Electrification (UCME) cash incentives requirements of RE developers • Source a minimum percentage from RE resources	• Potential to utilize Universal Charge for Missionary* Electrification (UCME) incentives to develop RE solutions in off-grid areas
Power Sector Assets and Liabilities Management (PSALM)	• Distributing financial incentives to developers of renewable energy projects.	• ZE-Gen enterprises can make use of UCME-REDCI fund by partnering with RE developers

* GoPh designates off-grid, unviable, and unserved areas as ‘missionary areas’

GoPh's NDC emphasises private sector financing for the clean energy transition, with limited subsidies/schemes available

Programs	Program directives	ZE-Gen Relevance
Feed-in Tariff	• FiT scheme ensures that renewable energy producers receive a fixed rate for the power they generate and sell to the grid for a fixed period (usually 20 years) • Target for solar was increased from 50 MW to 450 MW due to high demand, but it was still oversubscribed by over 300 MW • Current ERC approved rates for solar energy are 0.174 USD (9.68 PHP) per kWh for the initial target and 0.156 USD (8.69 PHP) per kWh for the additional installation target	• Limited relevance for ZE-Gen enterprises as FiT is typically relevant for utility-scale RE adoption
Net Metering	• Net metering rates allow producers and consumers to generate electricity from RE systems up to 100 kW for their own use and sell excess power to the grid	• Opportunities to encourage SMEs to adopt small-scale RE systems
Renewable Portfolio Standards (RPS)	• Mandates utilities and generation companies to source a fraction (2.5% in on-grid areas and based on optimal mix in off-grid) of their electricity supply from eligible RE sources	• Enterprises can aid distribution utilities and energy providers to design and implement RE projects, meeting RPS requirements
Green Energy Option Program (GEOP)	• A voluntary policy allowing consumers with a demand of 100 kW or more to choose renewable energy as their electricity source	• Limited relevance for ZE-Gen beyond the general acceptance of RE which could lead to increased use of storage solutions
Green Energy Auction Program (GEAP)	• Promotes timely investments in new RE projects through a competitive bidding process. So far, two auction rounds were held in June 2022 and July 2023	• Limited relevance for ZE-Gen
Household Electrification Program	• DOE's Household Electrification Program, launched in 2010, provided solar PV lighting systems to 55,248 households by 2017, while also offering training on system maintenance and management	• Potential pathway for ZE-Gen enterprises to explore the use of solar home systems to electrify remote households

Foreign investors are now allowed to own 100% of RE projects in the Philippines, a significant change from the previous 40% ownership cap. This shift creates substantial opportunities for RE investors and developers while offering greater flexibility in financing

Hybrid technologies hold potential for NPC-SPUGs, who also have a 55% biofuel target set for diesel power generators

What are SPUGs?

- SPUGs are Small Power Utilities Groups responsible for providing electricity to remote and off-grid areas in the Philippines, typically using diesel generators
- The SPUGs are governed by the National Power Corporation (NPC), and at present the corporation operates 272 SPUGs Power Plants in 222 areas in 192 municipalities across 35 provinces all over the archipelago

Current DG use and RE goal

- Currently, SPUGs mainly rely on FFGs powered by imported diesel and bunker oil, but they are exploring hybrid systems combining DG with renewable energy to reduce costs and improve sustainability
- Most diesel gensets run for almost 16 hours a day
- Common gensets used are Cummins, Perkins, Weichai, etc., with capacities typically ranging from 38 kW to 800 kW

Common challenges

Expensive diesel dependence: Diesel power is costly, resulting in high electricity prices despite more affordable RE options

Financial strain: Due to climate related disasters, ECs face USD 54mn in damage and lack funds for repairs

Lack of modernization: The NPC-SPUG requires modernization to support RE adoption effectively; this includes updating the transmission infrastructure

ZE-Gen relevance

Showcase benefits of hybrid solutions: ZE-Gen can offer technical support, helping local ECs understand how RE systems can be integrated with gensets

UCME incentives: ZE-Gen can encourage enterprises to tap into UCME incentives, such as cash incentives, to support development of RE solutions

Modernization of equipment: ZE-Gen can target SPUG facilities with older, ageing gensets and replace them with RE technologies

GoPh offers a variety of tax benefits for RE developers and installers to subsidize the overall costs

Policy Incentives relevant to RE	Benefits	Stakeholders relevant for
Income Tax Holiday (ITH)	• A 7-year exemption from income tax for RE developers	C&I, SMEs, RE Developers, ESCOs
Duty-Free Importation	• RE equipment, machinery, and materials can be imported without paying custom duties	Large-scale and small, medium RE developers, RE equipment manufacturers and sellers, C&I
Special Realty Tax	• A reduced tax rate on RE equipment (< 1.5% of original cost minus depreciation)	Large-scale and small, medium RE developers, RE equipment manufacturers and sellers, C&I
Net Operating Loss Carry Over (NOLCO)	• It lets businesses use losses from the first 3 years to reduce taxable income for the next 7 years, ultimately helps saving on future taxes	SMEs, RE developers, C&I
Reduced Corporate Tax Rate	• After 7 years of ITH, reduced corporate tax rate of 10% on taxable income	RE developers, SMEs, C&I
Accelerated Depreciation	• Helps speeding up depreciation of assets if haven't received an ITH before full operation	RE developers, SMEs. C&I
Zero VAT rate	• No VAT on fuel or power generated from RE sources and on local goods/services purchased for RE projects	RE developers, local suppliers of RE goods and services

The Philippines does not offer capital subsidies for RE installations; however, it does offer a variety of benefits for RE developers and users

Source: DOE, Philippines

Investments in RE solutions can leverage GoPh incentives for off-grid & missionary electrification

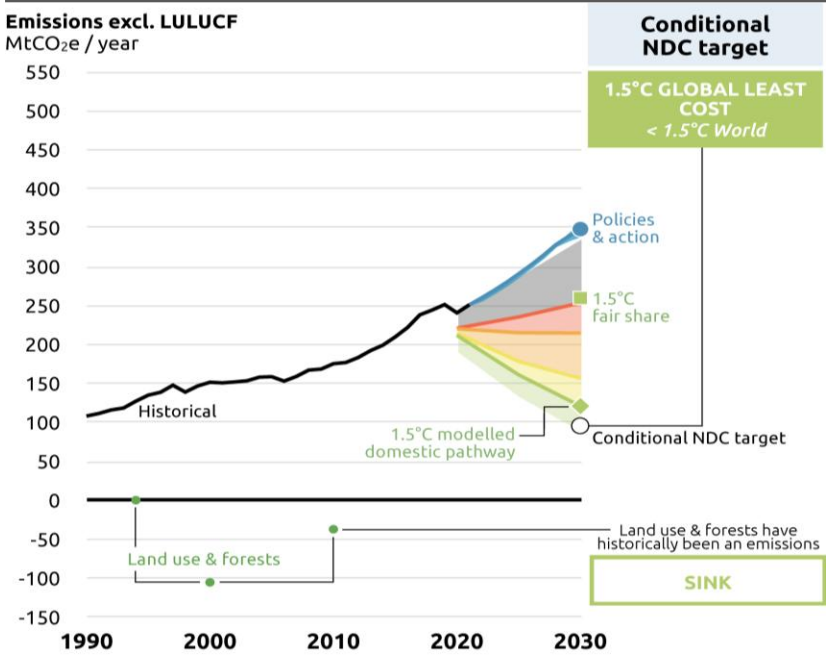
RE relevant policy incentives	Benefits	Stakeholders relevant for
Tax Exemption on Carbon Credits	• Earnings from selling carbon credits are tax-exempt	• RE developers, SMEs engaged in carbon credit projects
Cash Incentive for Missionary Electrification	• Developers supplying power to remote areas get a cash incentive of 50% of the universal charge per kWh generated, funded by the government	• Energy developers, local communities
Tax Credit on Domestic Capital Equipment and Services	• A tax credit for using locally sourced equipment and services	• RE developers, SMEs, C&I
Exemption from universal charge	• RE developers don't have to pay the universal charge—a fee that's usually added to electricity bills to fund various energy-related programs	• RE developers
Transmission and Wheeling Charges	• RE developers can pay for grid usage based on average per kWh rate, rather than higher rates	• RE developers
Full foreign ownership in the RE sector	• Foreign investors can now hold 100 percent equity in the exploration, development, and utilization of solar, wind, hydro, and ocean or tidal energy resources.	• Foreign Investors, RE developers

Source: DOE, Philippines

NDC is ambitious but largely dependent on international & private sector support; presenting significant opportunities for private players

ZE-Gen relevance: In the near term, the Philippines market presents substantial opportunities for solar and wind enterprises, driven by private sector-led energy transitions

The current NDCs are 1.5 C only with conditional support



2030 RE target conditional	35% (of total capacity)	Estimated costs	USD 36bn

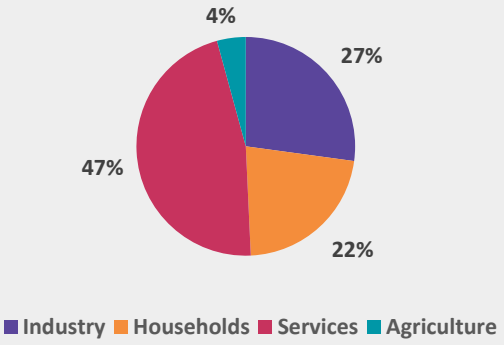
1	**Conflicting priorities:** NDC aligns with the 1.5°C climate goal with support; however, its PEP is carbon-intensive, commissioning 2.6 GW of coal power plants exempt from the coal moratorium. Climate Action Tracker rate the NDC as "Insufficient"
2	**Energy in focus:** Increasing RE capacity to 35% and improving the grid (introduction of smart grids for RE integration) are two key focuses of the NDC. It targets total emission reductions of 587 MtCO2e which 50% of costs being allocated
3	**Solar and wind lead the way:** NDC envisions deploying 10.7 GW of solar and 11.4 GW of wind by 2030; in additional it highlights deployment of 2.2 GW of BESS adoption. Solar generation is envisioned to increase by 240% between 2020 and 2030
4	**Call for private sector participation:** The NDC emphasises partnerships with development finance institutions (DFIs) to support the shift away from fossil fuels; it further counts on the private sector as solely responsible for delivery of the RE capacity and related investments

Sources: WWF, Climate Action Tracker, Implementation Plan for Republic of Philippines NDC

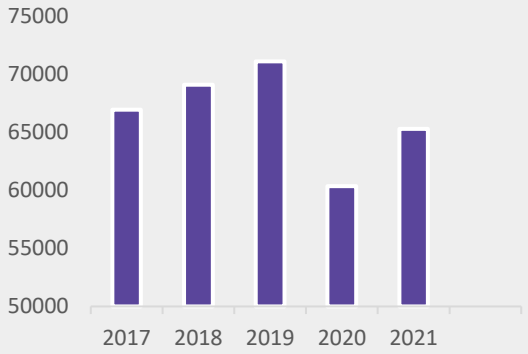
Who are the main market segments for fossil fuel genset use?

In 2021, diesel consumption for FFGs accounted for 41.8% of total diesel use in the Philippines

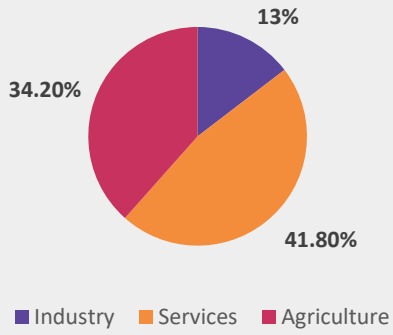
Oil & Oil products use for energy, 2021



Diesel consumption of Philippines over years (Metric Barrel)



Total energy consumption in different sectors, attributed to diesel, 2021



DOE requires a 3% blend of coconut methyl ester (CME), a type of biodiesel, in all diesel fuel sold nationwide, increasing to 5% by 2026

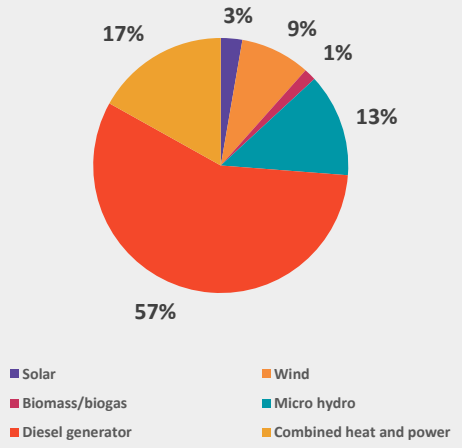
- Services sector is the largest consumer of oil for energy
- AAGR of diesel consumption from 2017 to 2021 is 4.1%, indicating a slightly upward trend and ongoing reliance on diesel
- Upcoming regulations to increase biodiesel % could be a potential opportunity to design hybrid solutions that incorporate biodiesel with RE

ZE-Gen relevance

- The C&I sector consumes the largest share of oil and demonstrates WTP, driven by non-economic reasons such as reducing its carbon footprint. ZE-Gen can assist RE enterprises in targeting large C&I businesses that heavily rely on power backup, helping them transition to renewable energy solutions
- Oil prices are expected to rise by 5% in the coming year. This, coupled with the higher cost of generation in off-grid areas (subsidized by UCME), strengthens the case for transitioning to renewable energy sources

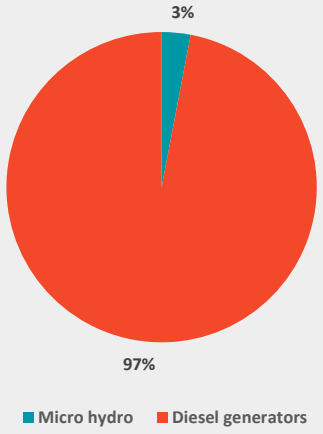
Fossil fuel gensets (FFG) are estimated at 1,400 MW installed capacity; this market can be targeted with RE solutions to replace FFGs

In 2015, on-grid DES capacity was 600 MW (3% of total installed capacity)



1. On-grid FFG generated **0.561mn MWh** (43% of on-grid DES generated)
2. On-grid sources primarily served **as back-up power sources**

In 2015, off-grid DES capacity was 400 MW (2% of total installed capacity)



1. Off-grid FFG generated **1mn MWh** (97% of off-grid DES generated)
2. Off-grid FFGs were critical sources of **primary power** in far-flung islands

2040 projections for FFG capacity

Total on-grid DES capacity
807 MW

On-grid FFG capacity
459 MW

Energy generated by on-grid FFG
2.8mn MWh (61% on-grid DES generation)

Total off-grid DES capacity
1,325 MW

Off-grid FFG capacity
1,276 MW

Energy generated by on-grid FFG
2.1mn MWh (87% off-grid DES generation)

Sources: ERIA

RE solutions need to emphasise reliability & ease-of-use to dislodge FFGs as the main source of back-up power for C&I users

Electricity is a barrier for C&I users in the Philippines

~18% (of firms)

Electricity is the main business constraint (vs. 7% avg. in East Asia & Pacific)

~40% (of firms)

Experience electricity outages

FFGs are reliable & easy-to-use mitigation tool for electricity issues

~43% (of firms)

Own a diesel generator

~39%

Electricity is generated from diesel generators

Trends in FFG use

Variability in regions: 67% of firms in Metro Cebu own a genset vs. 34% firms in Metro Manila

Variability in usage: 56% of electricity generated by genset in Colaborzon vs. 16% in Central Luzon

Not all firms face issues with electricity: Only 3% of firms in Metro Cebu identify electricity as a major constraint vs. 30% in Metro Manila

Electricity is not the main constraint for larger firms (100+ employees): Conversely, electricity is the primary constraint for firms with <100 employees

ZE-Gen relevance

Focus on reliability & ease of use: RE enterprises should design solutions that rival the reliability of FFGs, while incorporating training to help users optimise usage and minimise downtime.

Selecting ideal customers: Key industries in the Philippines over the next 20 years are manufacturing, BPOs, construction, and IT. Each has significant power and back-up needs but present differing load profiles and use cases

Size vs. needs: Larger firms require higher capacities of FFGs and have better access to finance; however, backup power needs are more pronounced for smaller firms. Targeting different sizes requires tailored approaches

Sources: ECONSTOR; WBG; Deloitte.

Note: The data in this slide is from 2018.

Everyday users with low storage needs are the ideal target; with the promise of cost savings & consistent electricity quality

Ideal and immediate C&I target segment

User archetype	Critical infrastructure	Everyday users	Harsh environs
Examples	Telecom towers, data centres, and hospitals	Public infra, commercial buildings, and factories	Mining, construction, and outdoor events
What needs to gensets meet?	Prime – back-up use gensets Reliability	Back-up gensets Reliability	Prime use gensets Durability Portability
Likeliness to switch to RE	• Certain use cases are easier to switch like telecom towers (established use case) and hospital (esp. off-grid) • Certain use-cases are unlikely to transition due to criticality of their function • Medium storage capacity needs; potentially high storage needs RE is the main source of power	• Likelier to experiment with alternative technologies • Higher ability to pay via either public funding or private funding • Low storage capacity needs as users are more likely to be connected to the grid & have higher day-time loads	• Current RE technologies cannot easily be deployed in these situation • Solar panels do not function very well in dusty/harsh environs • High storage capacity needs as users likely do not have a grid connection
Value proposition	• Batteries as temporary back-up until FFGs come online • BESS + storage as a replacement for FFGs entirely as BESS costs further reduce	• Peak shaving to evade demand-based charges • Back-up & quasi-primary consumption • Cost savings potential of up to 80%	• Cost savings from RE + storage solutions • Potential ease-of-use by not planning logistics & permits for fuel
Co-benefits	• Co-benefits depend on the use-case; high co-benefits for hospitals & off-grid critical infrastructure	• Additionality from benefits like promoting education etc.	• Limited-to-no co-benefits
ZE-Gen relevance	• Potential target segment if technology or business model innovation can make BESS affordable	• Easy segment to target if the unit economics make sense	• Potentially lucrative segment with an innovative technology that works in niche scenarios

Sources: McKinsey.

ZE-Gen can target 1.04mn households that are unelectrified through mini-grids and stand-alone home systems

GoPh targets

35,193 (1% of electrification)

Households to be electrified through micro-grid systems

1,009,549 (~28% of electrification)

Households to be electrified through stand-alone home systems

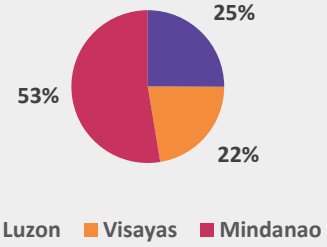
1,917,331

Households currently unserved (end of 2023)

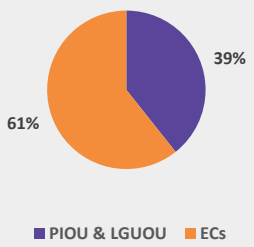
3,677,433

Total unserved electrified by 2028

Mindanao has the highest potential for impact with half the unelectrified households in this region



Enterprises will have to work with ECs to solve electrification challenges; as they have a larger % of unserved/underserved households



Two solution pathways to electrify the underserved or unserved

1	Stand-alone home system (SAHS): Typically used in hard-to-reach areas that are not viable for connection to the grid; executed via the SHS Mainstreaming Program where distribution utilities and electric cooperatives will procure, install, maintain, and replace SHS components under a fee-for-service model; tariffs determined by ERC
2	Microgrid systems: Under the National Total Electrification Roadmap, certain areas will be opened to the private sector to bid for hybrid microgrid systems; in other areas, SPUG will be responsible for generation and delivery of power (it can subcontract to private players); rates set by ERC

Sources: National Total Electrification Roadmap; Missionary Electrification Development Plan

Deploying micro-grids is the most impactful solution; however, PUE could be an entry point due to the ease of operationalizing

PUE is easier to deploy and a targeted solution; as it affects people's livelihoods, they are more invested in upkeep and payments

Operationalizing the solution	Mini-grids/Micro-grids	Productive-use of energy (PUE)/Stand-alone solar systems
What do we mean by this?	• ZE-Gen enterprise could work with ECs or LGUs to electrify off-grid communities	• Enterprises do not distribute electricity; instead, they deploy PUE systems such as cold-chains (fisheries are most common livelihood) or a SAHS
Who are the critical stakeholders?	• NPC/SPUGs, and ECs/LGUs are responsible for transmission and distribution, while the ERC determines the final rates and allocates the subsidy	• Directly work with the end-user groups; these solutions can circumvent challenges associated with gaining approvals and permissions (time consuming)
Which government programs support this?	• Missionary Electrification Plan supports mini-grid expansion to serve underserved/unserved communities; funded by electricity sales and the cross-subsidy offered by the Universal Charge for Missionary Electrification levied on all other consumers • NEA supports mini-grid developers through the Expanded Sitio Electrification Program with grant-assistance	• Productive Use of Renewable Energy (PURE) and RE Program for the Agriculture and Fisheries Sector are two prominent government & DFI programs that support productive use with financial assistance, capacity building, and R&D
How can this be financed?	• Public-Private Partnership (PPP) with ECs/LGUs which can access debt from the DoE or aggregating projects to attract private investors would be the two main modes of financing	• Enterprise would have to rely on DFI-programs, self-financing from the end-users, limited debt potential, and the possibility of philanthropic capital
What is the envisioned impact?	• The installation and maintenance of mini-grids is complicated, requiring coordination between multiple stakeholders. However, the impact potential is high as many end-users will move from 8 hours of diesel power to 24/7 power (with at least 50% RE)	• PUE is easier to implement than mini-grids and can increase incomes for some of the lowest strata of society in the Philippines. However, it does not directly replace diesel nor address the fundamental issue of lack of access to electricity.

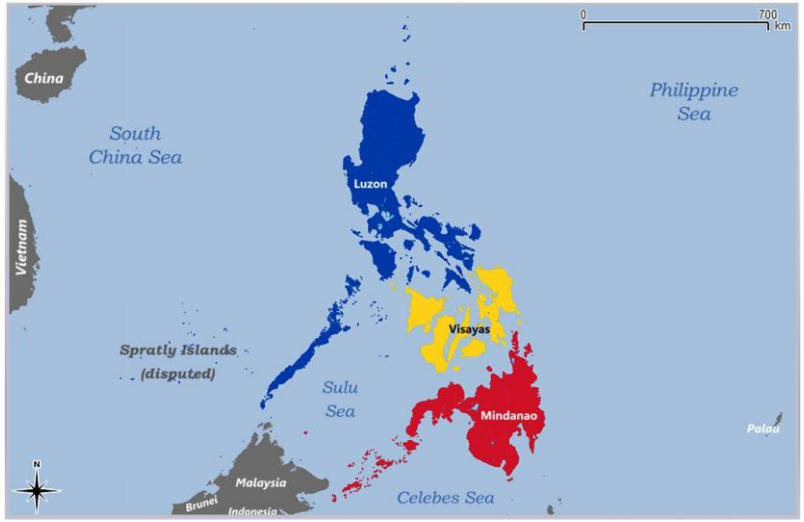
Sources: Expert interview, National Renewable Energy Program; Expanded Sitio Program

Replacing FFG in off-grid segments leads to large-scale adoption of clean solutions; while FFG replacement in C&I will lead to maximum emissions reduction

Impact metric	C&I consumers shifting to RE	Off-grid oil switch to 50% RE & electrification of unserved communities
GHG emissions reduction	5 MTCO2e	0.23 MTCO2e
Fossil fuel use avoided	1.9bn litres	86mn litters
Sulphur emissions reduction	~83,000 kg	~3600 kg
NOx emissions reduction	~877,000 kg	~38,000 kg
Total cost savings from fossil fuel avoided	USD 1.8bn	USD 130mn
Potential co-benefits	**Co-benefits:** minimised air pollution impacts on health and ecosystems, improved workplace health and safety and lower exposure to fuel price volatility	**Co-benefits:** enhanced energy access, strengthened energy security, better access to health and education services, increased household incomes, reduced harm to local flora and fauna, and minimized air pollution impacts on health and ecosystems

The three principal island groups offer different opportunities; there is a trade-off between ease of operations & impact

The Philippines can be divided into 3 island regions



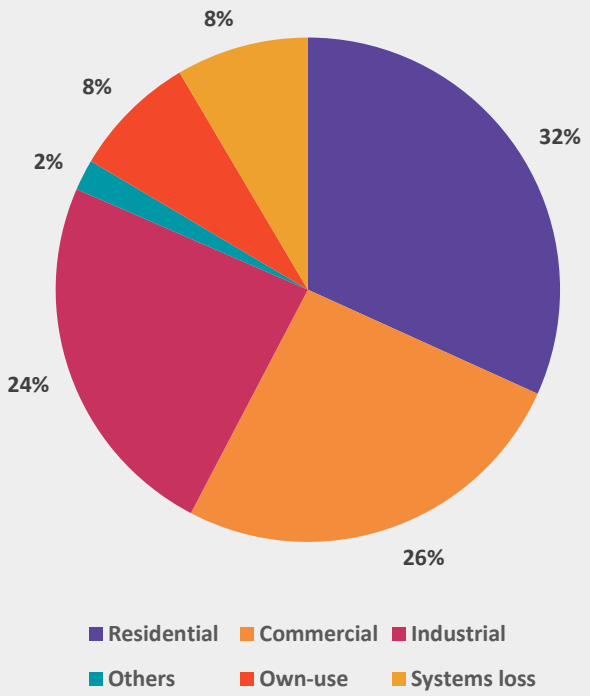
Each region offers different opportunities for RE expansion

Region	Luzon	Visayas	Mindanao
Grid-connectedness	High	High	Low
Cost of electricity	High	High	Low
% Population	57%	19%	24%
% GDP contribution	69%	14%	17%
Economic make-up	Hub of economic activity with a lot of startups	Upcoming economic region with a growing C&I base	Largely rural with high proportion of unelectrified and missionary regions

The trade-off between operational ease and achieving high impact is significant. The choice of region affects the type of stakeholders you can engage, the ease of establishing supply chains, and the potential for impact. An ideal target could be a missionary community in Luzon or Visayas due to the ease of operations, while the highest impact opportunities may be found in Mindanao. The more remote an enterprise goes, the less interaction it is likely to have with GoPh agencies.

Luzon region is the country's commercial hub and has the highest power consumption

Luzon consumes ~81,000 GWh of power in a year; C&I users dominate usage



Luzon's needs would be largely to provide RE-powered backup solutions

Electrification rate

96%

Installed capacity

20 GW

Power mix

15% RE

Wholesale prices

147 USD/MWh

Luzon is the **largest and most economically significant island** in the Philippines, home to the capital city, Manila, and key business districts. It plays a central role in the country's economy **(69% of GDP)** and has high energy demands due to its dense population **(57% of national population)** and industrial activity

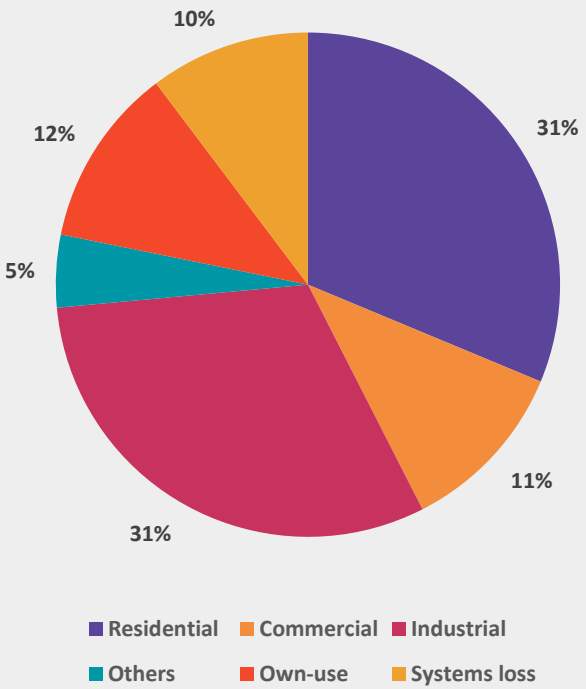
By 2040, Luzon's grid is projected to grow to 75 GW with over 40 GW of renewable capacity

Key investment priority areas: manufacturing, agriculture, food processing, and BPOs

Sources: OECD, Department of Trade and Industry

Visayas region has the highest WTP for power with the demand for backup solutions growing in the near future

Visayas consumes 13,600 GWh of electricity (5x less than Luzon); with residential and industrial consumers leading



Visayas' growing industrial sector could lead to demand for backup solutions like gensets

Electrification rate	Installed capacity
89%	5 GW
Power mix	**Wholesale prices**
79% RE	152 USD/MWh

Visayas region is an important economic zone characterised by tourism, agriculture, and emerging industrial sectors. With **19% of the country's population**, it contributes significantly to the national economy (**14% of GDP**) and has a rising energy demand due to increasing urbanization and industrialization, supported by a steadily growing population and infrastructure development

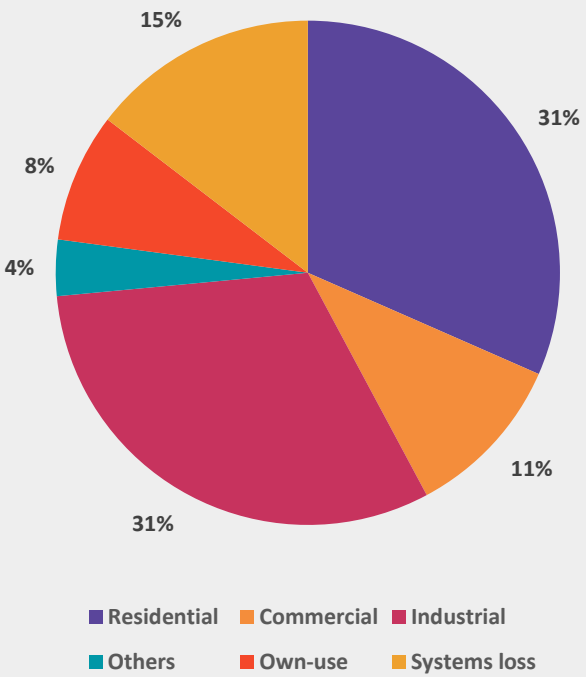
By 2040, Visayas' grid is projected to grow to 24 GW with over 20 GW of renewable capacity

Key investment priority areas: offshoring and outsourcing businesses

Sources: OECD, Department of Trade and Industry, Total Electrification Plan

Mindanao is potentially a promising region for off-grid solutions to serve agri-businesses and unserved consumers

Mindanao consumes 13,000 GWh of electricity (5x less than Luzon); with residential & industrial leading



Sources: OECD, Department of Trade and Industry

Mindanao offers the opportunity for innovative solutions to electrify the underserved

Electrification rate

87%

Installed capacity

5 GW

Power mix

37% RE

Wholesale prices

75 USD/MWh

Mindanao is known for its abundant agricultural resources and natural resources. Despite **contributing 17% to the national GDP**, its economy is primarily driven by agriculture, forestry, and fishing, while hosting **24% of the country's population**. The call centre industry is emerging as a new area of economic growth

By 2040, Mindanao' grid is projected to grow to 22 GW with over 19 GW of renewable capacity

Key investment priority areas: agri-businesses and call centres

What is the RE ecosystem in the Philippines?

Solar and BESS are key technologies for replacing FFGs, while wind and hydro attract investors due to their larger project sizes

Technology	Market maturity of technology	Challenges	ZE-Gen Relevance
Solar	• Maturity: Moderate – mature • Capacity: 1.7 GW • Potential: 58 GW	High upfront costs and reliance on imports for panels and batteries; additionally, typhoons severely hamper durability	Solar would be the most impactful technology, particularly, as it can be deployed at the unit household level
Hydro-power	• Maturity: Mature • Capacity: 3.1 GW • Potential: 655 GW	Large-scale hydro has limited societal acceptability; mini/micro hydro has high upfront costs for mini-grid applications	Hydro would be impactful as a mini-grid solution but permits and approvals process would be complicated due to impact on environment
BESS	• Maturity: Early • Capacity: 32 MW • Potential: N/A	Training and maintenance of BESS assets is a challenge (especially in off-grid areas) which can lead to quality of supply issues and ensuing payment/revenue problems.	BESS is a critical technology to bridge the reliability gap of RE; enterprises should focus on training
Wind	• Maturity: Moderate • Capacity: 442 MW • Potential: 94 GW	Offshore wind is an attractive solution for large investors who require scale; moreover, environmental concerns from offshore wind complicate use	Offshore wind can be a potentially impactful solution if it can be deployed at scale to make it attractive for large, European investors

Sources: DOE; IRENASTAT; NREP.

Training & capacity building across ecosystem should be prioritised

Philippines has an attractive BESS landscape; solar + storage is already a commercially viable solution for off-grid users

BESS key figures

Current installed capacity	32 MW	**Committed capacity (as of 2022)**	2,070 MW	**2030 projected capital cost**	USD 145 – 250 per kWh (4-hour battery)

What awaits in the Philippines?

Policy outlook	Challenges	Opportunities
Policy deadlock: Regulators believe existing ESS policies are sufficient; however, major developer feel ESS-specific incentives are needed	**Concentrated supply chain:** Logistical challenges and scarcity of key raw materials have delayed existing ESS plans; compete with EV market for raw materials	**Solar + BESS rising in acceptance:** Solar + BESS is a growing segment y-o-y; and a promising solution for on- and off-grid users
Strong push for ESS: Philippines is one of few countries in the region with ESS-related policies and a strong project pipeline	**Safety is a hurdle:** Accidents involving explosions and fires have cast some doubts on long-term operability of these solutions	**ESS demand to grow:** ESS demand will likely grow as it allows end-user opportunities to increase savings (peak shaving etc.) and improve efficiency
World's largest solar BESS project: GoPh is enabling Terra Solar, the world's largest solar + storage project, with 4,500 MWh of BESS	**Declining "High" cost:** While BESS costs are rapidly declining y-o-y; they are still expensive when compared to FFGs or mature RE techs	**Competitive in off-grid use cases:** Solar + BESS is cost competitive vs FFGs; on-grid viability depends on funding costs, business models & lower O&M costs

ZE-Gen relevance

Solar + storage + diesel is entry pathway: Incorporating existing FFG capacity into their deployed solutions; this could be helpful when working with users that have high back-up capacity needs (factories) and critical usage; these users can eventually be transitioned to solar + storage as capital costs reduce

Business model innovation to target customers with high storage needs: Enterprises would require business model innovation potentially lower costs for users with high storage needs. Off-grid customers (like small islands) can already incorporate solar + storage as a cost competitive option; adding another RE tech could increase system viability

Sources: Energy Storage News; Climate Smart Ventures.

The Philippines is prone to typhoons, leading to dependence on FFGs; there is an opportunity to design solutions that factor in this risk

Located along the Pacific Typhoon Belt, The Philippines experiences an **average of 20 typhoons per year**. In such an extreme event, heavy precipitation, intense wind, storm surge and landslides result in devastation and loss of life. The Philippines has over 7,000 islands with 36,000 km of coastline

What are the implications?

Severe damage to infra-assets: RE assets like panels get severely damaged and become unusable; once assets are damaged end-users stop paying for product

Complex Supply chains: The need to repair and replace increases supply chain complexity; limited trained technicians will further complicate matters

Genset usage increases: Gensets, typically smaller ones, see increased usage as a last line-of-defence in these scenarios**,** as their usage is less complex compared to RE

What can be done?

Enterprises should demonstrate solution value to customers: Locals are likely to reasonably safeguard the installation when they understand the value; demonstrating this value and good maintenance practice is key

Enterprises should work towards typhoon-proofing: Design of RE solutions must factor climatic conditions like strong winds. Currently the Philippines has limited typhoon insurance products; ZE-Gen can evaluate fintech-based parametric insurance products as part of financing solutions

Enterprises should look to incorporate hybrid solutions: Ideal RE solutions will likely be hybrid with 50% RE; there is potential to design solutions that minimize genset use & incorporate biofuels

Sources: Destination Earth

Customer education is the game changer for RE adoption in the Philippines

Understanding the consumer

Apparent high awareness

- **86.2% participants** support the **expansion of RE technologies** to provide electricity access
- **The government** was considered the **most important actor** in addressing RE-expansion

WTI with affordability being a selling point

- **80.8% of participants** displayed a **willingness-to-install (WTI) RE** on their property if affordable
- **Solar technologies** were the most recognised, with **86% of participants** being aware of them
- Participants were generally unaware that electricity costs were 2nd highest in similar Asian countries

Low but positive RE WTP

- Participants were willing to pay up to **10.6% (USD 5.7/month)** extra on their electricity bills to realize a 20% increase RE capacity
- **Education, electricity bill, awareness on RE and climate change** positively affect WTP
- The customers with the highest WTP might not be the ideal customer segment

ZE-Gen relevance

Strong information campaigns: Products and services that link RE-expansion with climate change effects are likely to bridge the perceived information gap in the Philippines; leading to WTI & higher WTP

Exploring PPP models: Services that incorporate government programs as part of their business model are likely to succeed given the public view on government's role in expanding RE

Focused-customer segmentation: Innovative business models are essential in addressing the affordability gap for renewable energy technologies and driving adoption among underserved rural and off-grid communities

Sources: Springer, Public Perceptions of Renewable Energy in the Philippines

Focusing on C&I users on remote islands and aggregating demand can help address the challenges of operating in these areas

Challenge	Why is this a problem?	What can be done?
Regulated distribution	Transmission and distribution of electricity is a challenge. Both these processes are regulated (unlike generation which is deregulated) and require interfacing with electric cooperatives and ERC (to approve tariffs); the latter process is time consuming and can take months	Target large consumers (C&I) with captive energy needs or businesses utilizing energy for productive purposes
Last mile electrification	Last mile electrification, also in the purview of electric cooperatives, is a challenge. Connecting the extremities around a micro-grid is not always commercially viable & the quality of electricity suffers (lower voltage or unreliable supply); these issues compound with poor operations & maintenance (O&M) and frequent natural disasters	SHS or nano-grids can be an effective way to target the most remote customers, whose electricity needs are lower
Poor maintenance	Cooperatives are community-run with limited margins & operate as not-for-profits; this leads to challenges in O&M (limits to training and resources deployed); issues compounded when islands are far apart	Train local staff on lighter maintenance tasks; explore remote monitoring for diagnosis. Training for BESS is a must
Infrequent collections	Collecting payments is a challenge in remote islands as the necessary infrastructure is not always present; poor O&M and lack of quality electricity leads to reduced willingness-to-pay dues. Mini-grid developers are recommended to have 6 months of receivables as working capital which is also a deterrent for investors	Explore PAYGO & utilise internet-based payment models; target users that rely on RE for their livelihood (more likely to pay & maintain)
Limited financing	Financing for micro-/mini-grids is not always available as traditional investors prefer larger installations (5+ MW); typical mini-grid size is 1.5 MW in the Philippines. In certain, communities the demand is less than 100 kW	Aggregate mini-grid projects in a group of proximate islands to make the project more attractive for investors

PAYGO can be an effective model to bridge collection issues & a potential financing mechanism for RE solution providers

With 94% of the population's online time spent on mobile devices and 50% of retail transactions now conducted through digital payments, the country's digital payments market is valued at USD 93bn and growing at an impressive 17%—second only to Vietnam in growth rate. Fintech consistently captures a significant share of Venture Capital (VC) funding and deal activity in the region. Against this backdrop, digital-PAYGO emerges as a highly attractive payment and financing model for RE enterprises, leveraging the country's increasing adoption of digital solutions.

Why digital PAYGO?	**87mn**	**74% (vs 66% global average)**	**34% (vs 29.9% global avg.)**	**89mn active users**
	Internet users	Internet penetration rate	Customers between 16-64 buy something online weekly	Number of eMoney users
What problems are solved?	**Streamline collections:** Upcoming model where electric cooperatives utilise online payments using GCash (a popular online wallet) to collect payments and solve for limited last mile banking	**Carrot-and-stick:** PAYGO pilots have improved collections in off-grid regions where last mile collections are an issue with the threat of cutting electricity (better monitoring)	**Potential model for financing:** PAYGO, if coupled with larger fintech players in the country, can be a potential financing mechanism as these players also provide loans	**Attracting VC funding**: ~70% of VC deals are for fintech enterprises, incorporating digital payments could make enterprises attractive for VC funding
What potential challenges remain?	**Collections problem not fully solved:** PAYGO does not bridge the gap of poor maintenance; the minute RE systems stop delivering electricity payments also stop; 5% of the population lacks access to 4G -> PAYGO solutions have a limit		**Uncertainty if the model works when scaled-up:** PAYGO has been tested in communities of 80 – 250 households; limited information exists on the success of this model in larger communities	

Which enterprises can support ZE-Gen's work in the Philippines? (1/6)

Enterprise	Technologies	Experience delivering solutions C&I segment	Experience delivering solutions for off-grid	Maturity
ACEN RES Renewable Energy Solutions	Solar, wind, geothermal	✓	✓	Mature
SOLAR PHILIPPINES	Solar, BESS	✓		Moderate
NATIV TECHNIKS	Solar, wind, BESS	✓	✓	Moderate
SOLARIC TURN ON THE SUN	Solar, BESS	✓	✓	Moderate

Which enterprises can support ZE-Gen's work in the Philippines? (2/6)

Enterprise	Technologies	Experience delivering solutions C&I segment	Experience delivering solutions for off-grid	Maturity
TRANSNATIONAL UYENO SOLAR CORPORATION	Solar, BESS	✓	✓	Moderate
SolarNRG	Solar, BESS	✓		Moderate
PHILERGY GERMAN SOLAR	Solar, BESS	✓	✓	Mature
First Gen	Solar, hydro, wind, BESS	✓	✓	Mature

Which enterprises can support ZE-Gen's work in the Philippines? (3/6)

Enterprise	Technologies	Experience delivering solutions C&I segment	Experience delivering solutions for off-grid	Maturity
HE	Solar, BESS		✓	Growth
BCS	Solar, BESS	✓	✓	Moderate
WEnergy Global Powering Change	Solar, BESS	✓	✓	Mature
autarsys	BESS	✓	✓	Mature

Which enterprises can support ZE-Gen's work in the Philippines? (4/6)

Enterprise	Technologies	Experience delivering solutions C&I segment	Experience delivering solutions for off-grid	Maturity
SOLAR PARA SA BAYAN	Solar, BESS		✓	Moderate
Infunde DEVELOPMENT	Solar, wind, hydro, BESS	✓	✓	Mature
	Solar, BESS	✓	✓	Moderate
OKRA	Solar, BESS		✓	Mature

Which enterprises can support ZE-Gen's work in the Philippines? (5/6)

Enterprise	Technologies	Experience delivering solutions C&I segment	Experience delivering solutions for off-grid	Maturity
BERDE RENEWABLES	Solar, BESS	✓		Moderate
SOLIDGREEN ENERGY INC.	Solar, BESS	✓		Moderate
ADVENTENERGY	Solar, BESS	✓		Mature
AP Renewables Inc.	Geothermal	✓	✓	Mature

Which enterprises can support ZE-Gen's work in the Philippines? (6/6)

Enterprise	Technologies	Experience delivering solutions C&I segment	Experience delivering solutions for off-grid	Maturity
AlphaSolar	Solar, BESS	✓	✓	Moderate
GO GRIDLESS	Solar, BESS	✓	✓	Moderate
MAXTEC SOLUTIONS	Solar, BESS	✓		Moderate
SUNSMART SOLAR POWER TECHNOLOGY INC.	Solar, BESS			Moderate

How can the switch to RE be financed?

FFGs are nearly 15 times less CAPEX intensive than an RE solution; however, LCOE is higher & diesel costs are unpredictable in remote areas

ZE-Gen relevance: The potential to eliminate diesel costs and logistics, ensure 24x7 power, and optimise overall LCOE will play a crucial role in driving the adoption of renewable energy alternatives in the Philippines

Technology	Initial cost (USD)	Operational cost (USD)	LCOE/LCOS (USD/kWh)
Diesel	9000	35,000 - 69,000	1.22
BESS	90,000	Minimal/incidental	0.14
Solar + BESS	150,000	Minimal/incidental	0.24

Assumptions for figures & calculations:
- FFG size 100 kW with 1,500 hours of annual use; diesel cost USD 0.91 – 1.82 per litre
- Solar capacity 100 kW
- BESS 400 kWh (100 kW for 4 hours)

1. **High initial outlay:** High import dependence on RE components like PV panels leads to escalated costs and installation timelines. Initial outlay is a significant barrier for adoption
2. **Gensets are expensive to use:** The actual cost for the end user on a missionary island is almost 2x cost on the mainland; mainly due to the logistics cost of transporting diesel to far flung islands
3. **BESS costs are declining:** BESS capital costs are expected to decline by 30-60% in the next 20 years, and 10-30% in the next 5 years. This will reduce initial outlay costs
4. **The true cost is higher:** The true cost of deploying solutions are higher especially in the off-grid and missionary areas of the Philippines; the cost is compounded when factoring in the cost of O&M
5. **Limited subsidy support:** While the government offers several incentives like tax holidays, there are limited subsidy programs aimed at the cost of installation

GoPh provides limited financing support for RE; however, there is opportunity for private sector in both financing & solutioning

	Domestic public finance	Domestic private finance	International public finance	International private finance
Financing landscape	• GoPh contribution to climate financing, tracked under "climate change expenditure tagging", has increased by 60% to USD 8bn in FY2023 compared to FY2022. • Most of this USD 8bn is allocated to climate adaptation measures. Approximately 10% of the funding supports NDC-related initiatives, with 94% of this targeting rail projects.	• GoPh is heavily reliant on the private sector to finance the NDC targets • GoPh actively promotes Public-Private Partnerships (PPPs) as a financing mechanism, with USD 100bn worth of active projects • Banks account for 80% of the financial system in the Philippines, with about 3% of loan portfolios allocated to renewable energy and energy efficiency projects	• The NDCs are conditional on international financing • The flow of international climate finance has fluctuated significantly, peaking at USD 1.7bn in 2021 through bilateral and multilateral funding sources • GoPh is collaborating with global climate finance mechanisms to enhance capacity building and improve access to these funds. For instance, the Green Climate Fund (GCF) has committed USD 130mn to date	• The Philippines received approximately USD 9.2bn in foreign direct investment (FDI) in 2022, a decrease from USD 12bn in 2021 • Recent regulatory changes now permit foreign investors to have full ownership in the exploration, development, and utilization of renewable energy resources in the country • VC landscape in the Philippines is also heavily influenced by international funds
Relevance	RE enterprises will have limited direct financing support from GoPh in the form of subsidies	RE enterprises can partner with banks and FIs that have dedicated consumer financing facilities	Leveraging programs and facilities developed by global international finance sources can prove an effective strategy for financing and mitigating risk	Recent regulatory changes provide enterprises with flexibility in financing. However, they may also limit access to certain government startup support mechanisms

Sources: Philippines NDC Implementation Plan; CCET 2022

The Startup Innovation Act establishes formal government support for startups in the Philippines, as part of broader efforts to simplify and encourage the growth of startups

Startup Innovation Act	• Established the **Philippine Startup Development Programme (PSDP)**, to support startups and startup enablers through various benefits, incentives, grants, and subsidies • Introduced startup visas for owners, investors, and employees and implemented Special Economic Zones for startups • Created a Startup Grant fund for the Department of Science and Technology (DOST), Department of Information and Communications Technology (DICT), and Department of Trade and Industry (DTI)
CREATE Act	• Introduced Corporate Tax Income Reduction aimed at attracting more local and foreign investors • Mandates fiscal incentives such as tax holidays, enhanced tax deductions, and VAT exemptions
Ease of Doing Business Act	• DICT will create an online business portal where all permits, licenses, and authorizations can be completed • Mandates the use of a single form for business registrations and renewals

Sources: Gobicore.VC

VC funding doesn't prioritise clean energy; ZE-Gen can collaborate with these firms to launch funds that target clean energy

Early-stage financing in numbers	Insights from the early-stage financing landscape	ZE-Gen relevance
40+ VCs covering ~950 K MSMEs in the Philippines (vs 3500+ in India; 55 per million MSMEs)	• A **good proportion of VCs are off-shoots or subsidiaries of traditional conglomerates** in the Philippines that have diverse business interests (Kickstart Ventures – Ayala Group or UBX – Aboitiz Group); these VCs tend to prefer investing in thematic areas that overlap with those of their parent group	**Partnering with VC-firms:** ZE-Gen can explore partnerships with these conglomerates to launch RE-focused funds; these would make the most of the conglomerates' network and business interests which can accelerate regulatory processes or ease logistical challenges
80-90% of VC funding is foreign (~12% of FDI went to startups in 2021)	• The **domestic appetite for funding is limited**; funds are raised from international investors who use funds domiciled in Singapore or the US to fund operations in the Philippines (to mitigate perceived risks of direct investment)	**Incorporating fintech in the RE solution:** The preference for fintech can be leveraged by incorporating fintech-elements in solutions such as a PAYGO-model; while cleantech has historically not been a prominent sector it is now an emerging one
In 2024, startups raised **USD 1bn in funding with fintech** attracting majority of funds	• Funding is **disproportionately skewed towards fintech**. In 2021, 66% of funding went to the fintech space in the Philippines. Agritech and cleantech received less than 0.01% of funding • The VC landscape in Philippines **favours mature, revenue-generating businesses** over early-stage ventures. Founders with business backgrounds are looked upon favourably	

Sources: Tech in Asia; ADB; BCG-Foxmont

Philippines has a thriving startup ecosystem; Manila is the ideal destination for early-stage enterprises

Manila — 20th ranked city in startup ecosystem (APAC)

35+ — # incubators and accelerators

Ideaspace x QBO — Most prominent incubator

Organization	Number of graduates (2015 – 2022)	Affiliation
Ideaspace x QBO	100+	DTI, DOST
Founder Institute Manila	50	Founder Institute Global
AIM-Dado Banatao Incubator	27	DOST-PCIEERD
Benilde HIFI	5	College of St. Benlide
UPSCALE	34	University of the Philippines, DOST-PCIEERD
Alibaba Netpreneurs	100+	Alibaba, Gobi Partners
Startup Village	50	Google Launchpad

ZE-Gen relevance

71% — **Cleantech focus:** Despite no mandates for RE, 71% of supported enterprises were in cleantech

52% — **Access to funding:** 52% of surveyed startups reported access to further funding

87 — **Target cities:** Manila ranks 87th globally for its startup ecosystem, while Cebu (268th) and Cagayan de Oro (493rd) are among the top 500 cities

Sources: ADB, BCG

The Philippines government runs several incubation and funding programs (typically grant) to which enterprises can apply

ZE-Gen relevance: Three government agencies, namely, DTI, DOST, and DICT lead many of the startup support programs in the Philippines

Relevant Programs	Agency	Type	Startup-stage	How can this help enterprises?
Incubation Development and Entrepreneurial Assistance (IDEA)	DTI	Incubation & acceleration	Early-stage with minimum viable product for commercialization	Support includes learning sessions and workshops, consultation services, and mentorship from industry experts
Global Acceleration Program (GAP)	DTI	Incubation & acceleration	Advance-stage that want to expand globally	Support includes international training workshops, venture capital funding, and delivering a regional business development program
Strategic MSMLE and Startup Link (SMART Link)	DTI	Internationalization and linkage creation	Stage agnostic	Business-to-business matching sessions to facilitate collaboration between traditional MSMEs and startups that can help them apply innovative activities, such as digital solutions, in their operations
Startup Venture Fund	DTI	Financing	Stage agnostic	USD 4.3mn venture fund to support the expansion, product development, sales, marketing, etc. of tech startups
Startup Grant Fund (Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development)	DOST	Financing	Early-stage	Provides funding to startups involved in agriculture, aquatic, and natural resources; qualified startups are entitled to receive as much as PHP 5mn to implement their proposal within 1 year.

ZE-Gen can potentially collaborate with GoPh to launch a fund that targets off-grid users or technologies that directly replace FFGs

Relevant Programs	Agency	Type	Startup-stage	How can this help enterprises?
Startup Grant Fund (Philippine Council for Industry, Energy and Emerging Technology Research and Development)	DOST	Financing	Early-stage	Funding for early-stage startups involved in sustainable industries among other sectors; funding provided under this grant could be up to USD 90,000
Women-Helping Women: Innovating Social Enterprise Program	DOST	Incubation & financing	No preference given	Provides incubation programs and funding support for women-led social enterprises; funding provided under this grant could be up to USD 90,000
Venture Financing Program	DOST-TAPI	Financing	Early-stage ready for commercialization	Funds the commercialization of innovative technologies or inventions by providing the necessary funding support to technology-based Micro, Small, and Medium Enterprises; funding support up to USD 35,000
Technology Innovation for Commercialization Program	DICT-TAPI	Financing	Early-stage ready for commercialization	Aims to accelerate the transfer, utilization, and commercialization of R&D outputs through financial and technical assistance; there is no funding cap

ZE-Gen relevance

GoPh attempts to fill the gap in the VC ecosystem by introducing programs that support RE and related-fields; they also regularly host grant funding competitions for startups; local governments have their own competitions

The types of assistance offered by these programs are typically incubation or grant funding, the relevance is higher for nascent technologies that align with national interests (e.g. hydrogen)

Sources: ADB, PhilDev, Startup.Gov

ZE-Gen can encourage enterprises to utilise TECHNiCOM; in parallel, ZE-Gen can explore partnerships with TECHNiCOM

Funding Opportunity	Relevant details	ZE-Gen relevance
Technology Innovation for Commercialization (TECHNiCOM)	TECHNiCOM aims to fast-track the transfer, utilization, and commercialization of R&D outputs to contribute to the Philippines' sustainable development through relevant technological platforms Provides technopreneurs with an easily accessible multimillion pre-commercialization grant and linkage to DOST-TAPI's technology and innovation support programs **Stage focus:** Pre-commercialization (with rough prototype or MVP) **Lead agency:** Technology Application and Promotion Institute (TAPI) **Priority sectors:** RE, energy storage systems etc. among other outlined Harmonised National R&D Agenda **Funding amount:** No funding cap	This funding program is highly relevant for pre-commercialization technologies or those with limited current commercial potential, such as hydrogen **Application link:** http://www.tapi.dost.gov.ph/call-for-proposals/technicom **Email:** info@tapi.dost.gov.ph

Sources: TECHNiCOM

PPP's can be a great mechanism to deliver solutions that target remote areas to replace prime use diesel gensets

The Public-Private Partnership (PPP) Program is a key government initiative aimed at accelerating infrastructure development and driving sustained economic growth. Under the PPP agenda, national and local implementing agencies (IAs) are consistently supported with technical assistance and capacity-building resources to successfully execute PPP projects across all stages of development and implementation.

Key support mechanisms

- **PPP Centre (PPPC) is a single-stop agency:** It facilitates, assists, and monitors PPP projects, provides technical support to implementation agencies, develops policies, manages the Project Development and Monitoring Facility (PDMF), ensures compliance, and reports progress.
- **Dedicated funding support:** PDMF is a USD 100mn revolving fund that provides support through a project's lifecycle; 3% of all projects are energy projects
- **Implementation agencies well-equipped:** PPPC builds capacity and supports local implementation agencies like universities or local government units

Key incentives

- **Investment priority areas:** RE is one of many priority areas outlined by the Investments Priorities Plan
- **Lucrative fiscal incentives to attract investors:** Incentives will have 4-7 years of income tax holiday before transitioning to 5-10 years of either enhanced deductions or preferential corporate income tax rate
- **Fiscal incentives vary by region and sector:** Higher incentives for PPPs in non-metro regions

Operationalization

- **Unsolicited projects:** Private proponents can submit unsolicited projects to the PPC for approval; projects aligned with priority investment areas have higher likelihood for success
- **Solicited projects:** Private players can also look out for projects that are designed by the PPPC and out for tender

Sample projects

- **High scope for RE projects:** Currently 3% of projects are RE projects among the ~440 active/pipeline projects; there is an opportunity to utilise PPP for RE development as this mechanism aligns with NDCs
- **MMSU 2MWp Solar PV System:** Solarscape Tech Co. is entering into a PPP with Mariano Marcos State University to install a 2 MWp solar system with 200 kWh of BESS at a cost of USD 1.2mn on build-operate-transfer model

ZE-Gen relevance

- **PPPs can subsidise costs:** PPPs can be an effective mechanism to finance and implement projects that target underserved populations in hard-to-reach areas
- **PPPs to get government buy-in:** Utilizing the PPP mechanism can potentially gain government buy-in to ease implementation challenges

Sources: PPPC

Quezon City's PV installation: A potential model for the use of PPP in operationalizing RE solutions

C40 CITIES FINANCE FACILITY

Target segments
50 Public schools in Quezon City, Metro Manila

Total financing
USD 2.7mn financed via a PPP through CFF

RE installed
Aggregate capacity of 2.9 MW

Key support mechanisms from CFF

- **Designing the PPP:** CFF supported the private investors and Quezon City Govt. (QCG) in the technical and financial structuring of the project
- **Capacity building and training:** QCG implemented the project; CFF built their capacity to implement the project and plan similar PV projects in the future

Financing model

- **PPP used to source project:** QCG funded PPP investors from its own budget. Private investor financed CAPEX through loans.
- **Utilizing net metering:** The program deployed 100 kW max per school utilizing net metering as a policy lever
- **OPEX funded by plastic tax:** QCG funded annual OPEX through plastic tax

Impact

- **Significant GHG emissions reduction:** 50,723 tCO2e during the project life of 2021-2050
- **Electricity savings:** Municipality saves USD 750 K annually in electricity costs
- **Scale-up potential:** The project aims to deploy similar PPP model to scale-up to 5,000+ rooftops in Quezon City

ZE-Gen relevance

Capacity building is required: Continuous capacity building and training for local partners is crucial for success of projects

Inter-department coordination: The project's key lever for success were measures to facilitate inter-departmental cooperation. Enterprises should factor this into their models

Ensuring political buy-in: The project faced delays due to elections which affected QCG. Working closely with the Mayor allowed continuity after elections

Schools as a target segment: Public schools have added benefit of being backed by the local government's credit rating, offering financial assurance. Schools' energy demands present opportunities for solutions that rely less on batteries

Sources: CFF Impact Brief, Project finance factsheet

ZE-Gen can explore partnerships with some of these DFI-funded programs (1/4)

DFI and program name	Amount of funding	How do they support RE enterprises or users? What is the source of funding?	Who can access?
Access to Sustainable Energy Project - The European Union (EU) and the World Bank	USD 69.9mn The source of funding for this project is a grant from the EU	They support RE enterprises and users by financing solar power plants and solar home systems, which help provide sustainable and clean energy solutions, especially to remote areas.	The electric cooperatives (ECs) in rural areas, specifically in Samar (Visayas), South Cotabato, and Sultan Kudarat (Mindanao), can benefit from the funding and support. This includes the target ECs like SOCOTECO II, SUKELCO, SAMELCO I, and SAMELCO II, as well as communities benefiting from solar home systems
Solarizing Public School Rooftops in Quezon City, C40 Cities Finance Facility (CFF), GIZ	USD 2.6mn	Offers dedicated technical advisors, funds technical feasibility studies, trains city staff in planning and designing solar PV systems and assists with legal and institutional studies	Quezon City is the primary beneficiary, with the project focusing on solarizing 50 public schools, public buildings, and social housing projects
Decarbonization of Electricity Generation on Philippine Islands – Using Tidal Stream and Solar PV, Mitigation Action Facility (MAF)	USD 21.2mn	By providing long-term concessional loans and CAPEX grants to make solar PV hybrid systems financially viable, particularly for off-grid islands. It also offers advisory support to local governments for integrating solar energy into their energy systems	Small island grid operators, energy providers, local governments, and private investors involved in renewable energy projects can access the support

Source: Delegation of the EU, C40 CFF, MAF-Philippine

ZE-Gen can explore partnerships with some of these DFI-funded programs (2/4)

DFI and program name	Amount of funding	How do they support RE enterprises or users? What is the source of funding?	Who can access?
Mainstreaming Green Growth in Development Planning project, Global Green Growth Institute (GGGI)	USD 0.84mn	By assisting with feasibility studies and financing or investments for the construction of renewable energy projects like the 50-MW solar farm in Bataan. They also work on mainstreaming green growth into local development plans, helping the province of Bataan achieve its long-term goal of becoming carbon neutral	The local government units (LGUs), specifically Bataan, and other selected pilot LGUs like Dinagat Islands, are the main beneficiaries. The support is aimed at helping these regions achieve climate resilience, inclusive growth, and green energy goals
Asian Development Bank (ADB) and Buskowitz Solar Inc.	USD 12mn	Aims to provide financing for the development, construction, and operation of rooftop solar systems, reducing perceived risks and offering longer-tenure loans	Commercial and industrial consumers, particularly small and medium-sized enterprises, across various provinces in the Philippines
Accelerating Coal Transition Investment plan, Climate Investment Funds (CIF)	USD 500mn (CIF funding: USD 475mn in loans and USD 25mn in grants)	Aims to support the transition from coal to RE by providing concessional financing for RE projects (e.g. offshore wind, floating solar, and battery systems)	Government sector and private sector energy companies involved in transitioning from coal to renewable energy
Partnership between the UAE's Masdar, renewable energy company based in Abu Dhabi, and the Philippines	USD 15bn	The project will develop 1 GW of RE (solar, wind, and battery storage systems) by 2030, with plans to scale up to 10 GW by 2035, while source of funding comes from the partnership between the UAE's Masdar and the Philippines government	RE enterprises and users in the Philippines will benefit from the projects, including those in economic hubs like Subic Bay, Clark, Manila, and Batangas

Source: GGGI, ADB, CIF, Primary consultation.

ZE-Gen can explore partnerships with some of these DFI-funded programs (3/4)

DFI and program name	Amount of funding	How do they support RE enterprises or users? What is the source of funding?	Who can access it?
Private Sector decarbonization and Repowering programme, ADB	The Asian Development Bank (ADB) is helping with a total of USD 600mn in financing. This includes: • USD 120mn from a fund called CIF-ACT (a concessional debt) • USD 2mn in grants from CIF-ACT • USD 240mn from ADB itself • USD 240mn from commercial co-financiers (private investors)	• ADB will offer financial support (sustainability-linked loans) to encourage companies that own coal-fired power plants (CFPPs) to either close down or repurpose them for cleaner energy sources. Companies can earn better loan terms if they meet environmental and social targets • ADB will fund renewable energy projects (like solar, wind, and energy storage) to replace the energy produced by coal. This includes newer technologies that are not yet as cheap as coal, like floating solar and battery storage. The funding will help ensure these projects are financially competitive	• Private sector companies • Energy service providers (ESPs) and energy service companies (ESCOs) • Renewable energy project developers
Accelerating Development of RE and transition from coal, IFC	The total funding is made up of: • USD 140mn from CIF-ACT (concessional debt) • USD 5mn in grants from CIF-ACT • USD 280mn from IFC itself • USD 280mn from commercial co-financiers	• IFC will offer sustainability-linked loans and bonds (loans that are tied to achieving environmental or social goals) to private companies to encourage them to transition from coal to renewable energy • The funding will help develop renewable energy projects, like offshore wind, floating solar, and battery storage, making these technologies more affordable and competitive with coal • The goal is to make these renewable projects cheaper, so companies will prefer them over coal and help the country meet its clean energy targets (i) Financing Instruments: IFC will provide financing using (ii) Senior debt: The main loan for the project • Mezzanine financing: Alternative types of financing like convertible debt or preference shares, which can later be converted into equity or provide higher returns	• Private sector companies • Energy service providers (ESPs) and energy service companies (ESCOs) • Renewable energy project developers

ZE-Gen can explore partnerships with some of these DFI-funded programs (4/4)

DFI and program name	Amount of funding	How do they support RE enterprises or users? What is the source of funding?	Who can access?
Clean Energy Finance and Investment Mobilization (CEFIM) program	Funding provided by Danish government; amount not specified	The goal of the program is to strengthen domestic conditions for energy efficiency and RE, draft policies to attract funding for clean energy projects, support the country's energy transition goals, develop a Clean Energy Finance Roadmap and provide trainings for local banks to enhance financing confidence in clean energy projects	• Government Sector (DOE, LGUs, etc) • Private sector entities, such as banks and businesses in the energy sector, particularly those looking to invest in or finance clean energy technologies and projects.

Declining trend in DFI financing: According to primary research, DFI funding for the Philippines is declining due to recent advances in national economic development and the prioritization of DFI funds towards LMICs. However, patient capital, such as credit guarantees, is essential in attracting private investment in renewable energy installations, particularly for off-grid applications

ZE-Gen can explore co-funding opportunities with several local banks and financial institutions (1/4)

Bank name	Amount of funding	Terms of funding	Who can access?
Land Bank of Philippines (ER 1-94 Program to support clean energy projects.)	Involves energy generation companies contributing one centavo (0.018 US cents) per kWh of generated power. While the exact loan or credit amount is not specified, it is focused on providing financial assistance to host communities	The MOU between the DOE and LBP includes a trust account for local communities, waiving service charges for accounts below the maintaining balance, and facilitating access to funds for local development projects like, livelihood, reforestation, health, and electrification projects	Distribution utilities (DUs), electric cooperatives (ECs), and host communities, particularly indigenous peoples (IPs) and indigenous cultural communities (ICCs), can access the funding
Development Bank of the Philippines (FUSED)	Up to USD 700 Mn	• Loan terms based on project cash flows • Repayment mode: Monthly or quarterly • Equity participation: 30% for private companies, 10% for electric cooperatives, no equity for LGUs	• Private companies (generation companies, qualified third parties) • Transmission/distribution utilities (electric cooperatives, private DUs) • Retail electricity suppliers • National government agencies, local government units (LGUs)
Development Bank of the Philippines, The Green Financing Programme (GFP)	• Private corporations/enterprises/cooperatives/associations: Up to 80% of the total project cost • LGUs/GOCCs/GA: Up to 90% of the total project cost	• Interest Rate: The prevailing market rate. • Repayment Terms: (i) Up to 15 years for repayment (ii) A maximum of 5 years grace period	• Private corporations/enterprises/cooperatives/associations • Local Government Units (LGUs) • Government Owned and Controlled Corporations (GOCCs) • Government Agencies (GA)

Source: Land Bank of Philippines, FUSED- brochure, Green Financing

ZE-Gen can explore co-funding opportunities with several local banks and financial institutions (2/4)

Bank name	Amount of funding	Terms of funding	Who can access?
Development Bank of the Philippines, Energy Efficiency Savings (E2SAVE) Financing Program	For public institutions (LGUs, National Government Agencies, State Universities, etc.), the maximum loan amount is up to 100% of the total project cost or the winning bid price, whichever is lower	• Repayment Terms: (i) Short Term: Up to 1 year (ii) Long Term: Up to 10 years, inclusive of a 1-year grace period on principal • Interest Rate: Based on DBP's prevailing rates, which may be fixed or variable depending on the source of funds • Other Fees: Standard fees and charges as per DBP's policy	• Public Sector: (i) National Government Agencies (NGAs) (ii) Government Owned and Controlled Corporations (GOCCs) (iii) State Universities and Colleges (SUCs) (iv) Local Government Units (LGUs) • Private Companies involved in energy efficiency and renewable energy projects • Energy Service Companies (ESCOs) accredited by the Department of Energy (DOE) or Energy Service Providers (ESPs)
Philippine National Bank	USD 24mn, as part of a USD 36mn financing deal with ADB	Loan package for the development, construction, and operation of 20 to 25 solar rooftop projects, generating 88 gigawatts of clean energy annually and reducing 54,000 tons of CO_2 emissions per year. Financing is provided with longer tenor loans that local banks typically can't offer for such rooftop solar projects	Commercial and industrial consumers in the Philippines, including businesses such as Coca-Cola, Lufthansa Technik, UniLab Group, and SM Prime, among others

Source: Land Bank of Philippines, FUSED- brochure, Philippine National Bank, E2SAVE

ZE-Gen can explore co-funding opportunities with several local banks and financial institutions (3/4)

Bank name	Amount of funding	Terms of funding	Who can access?
Bank of the Philippine Islands, Green Bonds (investment by IFC)	The amount of funding for the green bond issuance is USD 250mn	• The proceeds from the green bond will be used to finance eligible green assets in the Philippines, including projects related to renewable energy, energy efficiency, green buildings, electric vehicles, and climate-smart agriculture • While most funds will support local projects, part of the proceeds may also be used to invest in green assets through bonds overseas	• BPI is the issuer of the bond • The funds raised through the bond will be used to finance climate-related projects by private and public entities: (i) Renewable energy projects (ii) Energy efficiency initiatives (iii) Green buildings (iv) Electric vehicle projects (v) Climate-smart agriculture projects
Bank of the Philippine Islands, Household Solar Financing	• Top-Up Equity Loan: (i) Uses your existing housing loan as collateral. You can top-up the loan to finance solar panels for your home (ii) PHP 400,000 minimum loan amount • Multi-Purpose Loan: (i) Uses your car as collateral. You can leverage a fully paid car to finance solar panels (ii) PHP 200,000 minimum loan amount	• Top-Up Equity Loan: (i) Must have a minimum USD 0.007mn approx. (PHP 400,000) paid-up amount on your existing housing loan to be eligible (ii) Uses home equity for a longer-term loan (up to 20 years), consolidating existing housing loans if needed • Multi-Purpose Loan: (i) The car used as collateral must not be older than 5 years upon loan maturity, and the car must have a remaining loan term of at least 20% of the original term for existing loans. (ii) Uses car as collateral for a shorter loan term (up to 5 years) and is more flexible with a lower loan amount	• Households

Source: Bank of the Philippine-GreenBonds, Bank of Philippine-Solar Mortgage

ZE-Gen can explore co-funding opportunities with several local banks and financial institutions (4/4)

Bank name	Amount of funding	Terms of funding	Who can access?
China Banking Corporation (China Bank), Green Bonds	• The amount of funding raised through the green bond issuance in 2018 was USD 150mn • The proceeds are aimed at expanding its climate-smart portfolio, bringing it to over USD 200mn	• The proceeds from the green bond will be used to fund climate-smart projects, including: (i) Renewable energy, (ii) Green buildings, (iii) Energy efficiency, (iv) Water conservation	• The funding will be used to support climate-smart projects in the Philippines, including initiatives in the private and public sectors • China Bank will use the proceeds to finance projects related to sustainability and climate change mitigation

ZE-Gen relevance

Limited financing for smaller installations: Larger C&I customers prefer to self-finance installations; smaller C&I players require credit or some form of financing arrangement; targeting these smaller end users would require some financing innovation; as of now; there is limited financing for this segment and limited use of ESCO model

Financing for mini-grids in remote regions is conditional and not easily accessible: Mini-grids are financed by the EC or LGU primarily through debt facilities such as the Development Bank of the Philippines (DBP) or through GoPh loans at market rates; the ability to receive debt depends on the credit rating of the EC/LGU which can vary between regions

Limited financing for smaller projects and competition for financing from other "sustainable" activities: There is competition for RE financing from other "sustainable" activities. This competition is more intense within RE as debt providers generally prefer larger projects. They are reluctant to finance mini-grids for private investors due to the tendency of such projects to face cash flow issues

Source: China Bank Green Bond

What are the recommendations?

ZE-Gen can explore various funding modalities that target smaller RE installations and small-scale developers

	What can be done?	Why is it needed?	What is the envisioned impact?	Where does ZE-Gen come in?
Funding/co-funding interventions	Explore the viability of a new, RE fund for off-grid	• GoPh does not fund RE (generation, transmission, or distribution) and their limited, active DFI interest in funding RE programs • Funding is largely available at market rates; there are few instances of below market funding • Funding can target credit risk mitigation like guarantees as those are less prevalent	• Increased access to capital for RE enterprises at lower rates	• ZE-Gen can start a fund that targets off-grid enterprises that are deploying RE solutions • Potential partners could be other DFI's that are active in the country
	Co-launch RE-focused startup funds	• Across GoPh, there is a strong openness to feedback and collaboration. However, there are limited programs dedicated exclusively to energy-focused startups, and RE enterprises face competition from other climate-tech enterprises	• Increased access to early-stage funds for off-grid RE enterprises	• ZE-Gen can hold exploratory chats with bodies like DoE to create a grant fund that targets off-grid RE enterprises
	Provide concessional financing for local banks	• Philippines has limited RE financing (enterprise and consumer) at below market rates • Banks prefer to lend to larger (utility-scale) installations • Banks prefer to lend to commercial users over households	• Access to below market rate finance for MSMEs and lower capacity users	• ZE-Gen can work with a domestic bank to launch a specific RE fund that targets MSMEs and small-capacity users

ZE-Gen can engage with the startup ecosystem by initially creating awareness of successful business models

	What can be done?	Why is it needed?	What is the envisioned impact?	Where does ZE-Gen come in?
Startup ecosystem focused interventions	Awareness building for Private Equity (PE)/VC ecosystem	• Although the Philippines has an active VC ecosystem, these funds often lack understanding of renewable energy enterprises and successful RE business models • Climate-focused funds typically prioritise investments in agriculture	• Increased awareness of successful RE business models and enterprises	• ZE-Gen can engage with VC/PE firms to build awareness of successful RE business models and enterprises
	Partnering with a PE/VC fund to launch an RE fund	• PE/VC funds typically do not prioritise clean energy as part of their investment thesis • Large proportion of VC funds are run by large conglomerates who prefer to invest in areas they understand or have existing business interests in	• Increased availability of early-stage capital for RE enterprises	• ZE-Gen can engage with interested VC/PE firms to launch a dedicate RE fund that either prioritise a specific technology (BESS) or a use-case (off-grid)
	Collaborating with the active incubation/acceleration ecosystem	• Philippines has an active network of incubators and accelerators that support startups of all kinds • There are limited RE-specific accelerators and incubators; especially, outside the Manila NCR	• Increased startup support for RE-enterprises, particularly, those using novel technologies	• Collaborate with local players to provide acceleration and incubation support, leveraging CT's expertise in acceleration and the country-specific knowledge of local partners

ZE-Gen should look to fund PUE users that can serve as anchor loads to increase co-benefits of intervention and indirectly replace FFGs

	What can be done?	Why is it needed?	What is the envisioned impact?	Where does ZE-Gen come in?
Demonstration/customer focused interventions	Target PUE customers for off-grid applications	• In off-grid locations, deploying mini-grids involves complex operations and regulatory challenges, which are simplified when serving users with productive energy needs, such as cold chillers • PUE users typically maintain their systems better in the long-run	• Indirect replacement of FFGs and increased productivity	• Fund enterprises that have technologies targeting PUE use-cases
	Demonstrate large-scale use of PAYGO models for off-grid	• PAYGO and fintech-based models have shown success with up to 250 users, however, success with more users is limited • Online-based payments and fintech are very common in the Philippines and attract the bulk of VC-funding	• Increased penetration of PAYGO models in the Philippines	• Fund enterprises that can incorporate a PAYGO model • Collaborate with fintech players in the country to incorporate those models in RE-installations
	Target anchor load customer profiles	• Targeting anchor users such as hospitals and schools in off-grid scenarios provides multiple benefits. These users are more likely to maintain systems due to their business-critical nature, can navigate some mini-grid regulations, deliver co-benefits, and subsidise electricity for nearby communities	• Increased co-benefits from RE installation; indirect electrification of remote communities	• Fund enterprises that specifically target anchor profile customers

ZE-Gen fund the capacity of local banking institutions to successfully appraise loans for storage and other RE technologies (beyond solar)

	What can be done?	Why is it needed?	What is the envisioned impact?	Where does ZE-Gen come in?
Capacity building/training focused interventions	Capacity building for local banking institutions	• Local banks typically are well-suited to appraise solar projects but have limited understanding of other technologies like energy storage, wind, or hydrogen which are potentially impactful technologies for the Philippines • Banks typically lack capacity to appraise small-scale RE projects	• Increased capacity of local banks to finance solar + storage projects	• Utilise grant funding to train key staff at commercial banks to build capacity to finance solar + storage projects as well as other RE projects
	Capacity building for RE installers & O&M	• There is limited availability of trained installers and servicemen in the Philippines, especially, in the remote/missionary regions • Overall impact of the installed systems and payment cycles are disrupted when systems face disrepair	• Sustained impact of deployed RE solutions and better collections	• Utilise grant funding to train servicemen & installers that work in missionary and remote regions
	Capacity building for insurance-providers	• Philippines regularly suffers from natural disasters like typhoons which poses significant issues for RE assets • There are limited uses of tools like parametric insurance to protect RE assets, especially in the remote regions	• Increased risk mitigation for RE installations that leads to sustained impact	• Collaborate with insurance firms to develop insurance products that can be used by RE developers to mitigate against natural disaster risk

ZE-Gen can immediately target building awareness of successful RE-business models in PE/VC ecosystem and demonstrating viability in off-grid use cases

Funding/collaborative interventions
Capacity-building/training interventions
Demonstration/awareness-building interventions

Short-term	Medium-term	Long-term
Build capacity of local banks to appraise non-solar RE projects & small capacity RE projects	Build capacity of local engineers & servicemen to service RE installations	
Collaborate with local accelerators and incubators on potential programs targeting RE enterprises	Fund local banking institutions to further lend below market debt for RE installations	Co-fund an off-grid initiative with regional DFIs to provide concessionality or risk mitigation
Demonstrate viability of targeting PUE use-cases and anchor load customer profiles	Demonstrate viability of larger-scale PAYGO models for off-grid use cases	Collaborate with GoPh to launch RE-focused grant fund
Create awareness among PE/VC ecosystem about successful RE-enterprises and business models	Build capacity of insurance providers to develop RE-focused insurance products	Collaborate with local PE/VC firms to launch a RE-focused fund

Annexure

Annexure 1. List of primary consultations

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Annexure 2. Glossary

Abbr.	Description
ADB	Asian Development Bank
BESS	Battery Energy Storage System
C&I	Commercial & Industrial
DBP	Development Bank of the Philippines
DES	Distributed Energy Sources
DFI	Development Finance Institution
DG	Diesel Genset
DICT	Department of Information and Communications Technology
DOE	Department of Energy
DOST	Department of Science and Technology
DTI	Department of Trade and Industry
DU	Distribution utility
EC	Electric Cooperative
ERC	Energy Regulatory Commission
FDI	Foreign Direct Investment
FFG	Fossil Fuel Genset
GoPh	Government of Philippines
LCOE	Levelized Cost of Electricity
LCOS	Levelized Cost of Storage
LGU	Local Government Unit

Abbr.	Description
Missionary	GoPh designates off-grid, unviable, and unserved areas as 'missionary areas'
NEA	National Electrification Administration
NPC	National Power Corporation
O&M	Operations & Maintenance
PAYGO	Pay-as-you-go
PDMF	Project Development and Monitoring Facility
PPP	Public Private Partnership
PPPC	Public Private Partnership Centre
PSDP	Philippine Startup Development Programme
RE	Renewable Energy
SAHS	Stand-alone Home Systems
SHS	Solar Home Systems
SPUG	Small Power Utilities Groups
TAPI	Technology Application and Promotion Institute
VC	Venture Capital
WTI	Willingness-to-install
WTP	Willingness-to-pay

THANK YOU

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