Diagnostic for Competitive Arrangements for Energy Transition (DCAT) – Philippines

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About Kuungana Advisory

Kuungana Advisory Limited ("Kuungana") works on advisory projects that facilitate the transformational change required to increase access to environmentally sustainable and affordable energy supply.

Our name, Kuungana, is the verb 'to connect' in Swahili. This encapsulates our involvement in projects increasing energy access in some of the most energy hungry parts of the world and on projects in both developing and developed economies that innovate with new business models and commercial arrangements in our rapidly changing sector.

Disclaimer

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Across the Southeast Asia region, there is growing ambition to increase the role of renewable energy. While thermal power plants still dominate the electricity supply mix, the role of renewable energy is growing. Many countries have announced ambitious plans to increase this role over the coming years, contributing to global emissions reduction targets.

The Energy Transition Partnership (ETP) has appointed Kuungana Advisory to complete a Diagnostic for Competitive Arrangements for the Energy Transition (DCAT). ETP is a multi-donor partnership in southeast Asia, formed to accelerate the energy transition in the region, in line with the Paris Agreement and the Sustainable Development Goals. This assignment is focused on Indonesia, the Philippines, and Vietnam (ETP's focus countries), with the aim of empowering these countries to transition to procurement mechanisms for renewable energy that help to de-risk investment in the sector and increase the amount of renewable energy supply. This aligns with the second of four pillars of ETP's strategy: the "de-risking of energy efficiency and renewable energy investments."

DCAT has two main areas of focus. The work performed under this project will cover (a) the mechanisms (such as competitive procurement) that can be used to ramp up the procurement of renewable energy and (b) the commercial terms (such as those established through Power Purchase Agreements, PPAs) under which successful projects are subsequently contracted. The project will evaluate the status in each of these areas, in each of the three focus countries.

This report presents analysis of the key challenges for accelerating the procurement of renewable energy in the Philippines, together with recommendations to address those challenges. The report incorporates diagnostic work analysing the current state of renewable energy procurement in the Philippines, which was completed in 2023 and was subject to consultation through a series of workshops. Recommendations are presented for the country, which aim to address or mitigate the challenges and barriers identified by the diagnostic. The institutions that will need to be involved in implementing the recommendations are identified, and these actions are prioritised. Together, these recommendations form a roadmap for accelerating the procurement of renewable energy.

The evidence presented in this report is drawn from detailed research and extensive consultation with a wide range of stakeholders. Relevant laws and regulations (as of early March 2024), together with relevant strategies and energy sector plans, have been reviewed in detail. Discussions have been held with a wide range of stakeholders, including private sector developers and policymaking institutions. Bilateral meetings have been held both in person, during trips to the region, and online. In the Philippines, two consultation workshops were held in preparing this report, plus a final dissemination workshop in March 2024, at which the key findings from this report were shared.

The roadmap presented for each country highlights actions that energy sector policymaking institutions could take to accelerate the procurement of renewable energy. The government ministries responsible for the energy sector are Ministry of Energy and Mineral Resources (MEMR) in Indonesia, Department of Energy (DOE) in the Philippines, and Ministry of Industry and Trade (MOIT) in Vietnam. Both Indonesia and Vietnam have electricity sectors that remain centralised, with a dominant incumbent utility. Some of the actions identified in this report are therefore directed at those incumbent utilities, Perusahaan Listrik Negara (PLN) in Indonesia and Vietnam Electricity (EVN) in Vietnam. In the Philippines, which has a separate, independent regulator, some of the recommendations are for the Energy Regulatory Commission (ERC).

This report presents the roadmap for the Philippines. For the full report, which includes Indonesia and Vietnam, please refer to the full English version of this document.

A roadmap for accelerated procurement of renewables in the Philippines

While the electricity mix in the Philippines remains dominated by thermal power plants, an auction programme has awarded contracts to many renewable energy projects in recent years. However, this is in the context of a dramatic increase in generation for coal-fired power plants, with coal-based generation more than doubling from 2012 to 2022. The increase in coal capacity means that the share of variable renewable energy in the generation mix has only increased modestly: from 1.1% of generation in 2015 to 2.6% in 2022. Further renewable energy capacity is expected to be commissioned over the next few years following the first two rounds of the government's Green Energy Auction (GEA) programme.

The Philippines also has ambitious plans for growing the role of renewables, aiming to reach 35% of power generation by 2030 and 50% by 2040. These targets are set by the National Renewable Energy Program (NREP).[1] The NREP envisages 52.8 GW of new renewable energy generation capacity by 2040.

While the GEA programme has had some success, refinements are likely to be required to scale up procurement in future auction rounds. The second GEA auction, GEA-2, in July 2023, attracted 3.4 GW of bids. However, this fell well short of the 11.6 GW target. This target would have resulted in the NREP target for 2030 being met several years early. To build interest in future GEA rounds across a wider range of developers, DOE could publish a timetable for future auctions that clearly ties back to the volumes required to meet the NREP targets. It is also understood that some developers of solar PV projects may have withheld their projects from the auction because of concerns that the reserve price for such auctions was perceived to be too low.

To attract a wider range of international investors, it is likely that changes will be required to the commercial terms on which renewable energy projects are contracted. Some of the risk allocation included the Renewable Energy Payment Agreement (REPA), which is the equivalent of a PPA that all projects successful in GEA eventually receive, is not aligned with international norms. Most notably, projects are not protected against the risk of curtailment. Many operational projects have indeed suffered financial losses as a result. The REPA is also a short contract compared to many PPAs for similar projects. This is in part because the REPA extensively references rules that are defined in other regulatory instruments; for example, the regulation containing the FIT rules.[2] The analysis presented in this report highlights that this approach increases the risk of inconsistencies and unintended commercial outcomes. Finally, the REPA is only signed when construction is mostly complete, well after the point at which project developers would typically aim to achieve financial close. This is unusual and unlikely to be acceptable to most international providers of non-recourse project finance.

The Philippines has many different mechanisms for encouraging the development of renewable energy projects. GEA is the main mechanism now in place for procuring new renewable energy capacity. However, Distribution Utilities (DUs) are also required to increase the share of their supply from renewables to meet a Renewable Portfolio Standard (RPS). Many DUs have reported challenges in complying with the RPS. An 'opt-in' mechanism has been proposed, which would allow GEA capacity to be allocated to individual DUs for RPS compliance. However, there are many challenges in the detailed design of such a mechanism, and it has not yet been implemented.

To scale activity in the sector, processes to secure land rights and transmission connection capacity are likely to require further refinement. By delaying the development of renewable energy projects, this acts as a constraint on successfully procuring more renewable energy capacity in future. Developers have reported challenges and delays in securing land use conversion approval when converting land allocated for agricultural use for a renewable

[1] Department of Energy (2022): National Renewable Energy Plan 2020-2040. Link.

[2] Energy Regulatory Commission (2010): Resolution No. 16, series of 2010: Resolution adopting the feed-in tariff rules. Link.

energy project. Further delays are experienced because of a backlog in the completion of System Impact Studies (SIS), which are required to secure a transmission connection, by the National Grid Corporation of the Philippines (NGCP). In the short-term additional resource is being made available to speed up the process for securing a SIS, but in the long-term a more formalised connection queue might be required.

The roadmap proposed for the Philippines suggests that the top priority should be to ensure that projects already contracted under GEA can proceed. Failure to do so could undermine confidence in future renewable energy procurement attempts. This is likely to require coordination across several institutions to ensure that projects have the land and grid connection capacity that they require, and a bankable REPA to underpin their future revenues. Recommendations for the Philippines are summarised below in Table 1.

Table 1 Summary roadmap for the Philippines

Barrier or challenge identified	Recommendation	Responsible party	Timing
Projects already successful in the GEA process are due to be commissioned over the next 1-2 years. Failure to meet these milestones may undermine confidence in future auction rounds.	Ensure that GEA-1 and GEA-2 projects can proceed on a timely basis, potentially accelerating actions listed below where necessary.	DOE with support from other sector stakeholders	Immediate
DUs are struggling to comply with RPS requirements; DOE has not yet finalised an 'opt-in' mechanism that would provide a simpler way for DUs to comply.	Ensure that RPS compliance is feasible. This is likely to require either a rationalisation of the RPS (e.g., achieving compliance through centralised auctions such as GEA), or successful implementation of the Renewable Energy Market (REM).	DOE	Immediate
While clear renewable energy targets have been published, there is no clear communication to investors on how much capacity will be procured and when.	Publish a timetable and plans for future renewable energy auctions, articulating the technologies and quantities to be procured together with the auction timing where possible.	DOE	Medium-term
Many aspects of the REPA are not aligned with international norms; for example, projects receive no protection against curtailment risk.	Refine the risk allocation in the REPA template, especially for curtailment.	ERC	Medium-term
The REPA is also short by international terms, leaning heavily on rules that are covered in separate regulatory instruments.	Address potential gaps in the REPA; consider drafting a longer-form agreements.	ERC	Medium-term
Projects only receive their REPA once construction is nearly complete (i.e., well after the point at which developers would typically be required to reach financial close). This is late and likely to be a barrier to securing non-recourse project finance.	Refine the process for obtaining a REPA, potentially signing REPAs earlier in the development process, ahead of project financial close.	DOE/ERC	Medium-term
Many developers have suggested that the reserve prices set for previous auctions have been too low.	Ensure GEAR prices are set at an appropriate level for future GEA rounds.	ERC	Medium-term
Deeper network reinforcements have sometimes been delayed, resulting in curtailment of renewable energy projects that have been connected, especially during their early years of operation.	Normalise approval of NGCP allowed revenues so that this takes place on an ex ante 5-year cycle.	NGCP/ERC	Long-term
	Consider the use of flexible connection agreements to accelerate connections to the transmission system.	NGCP/ERC	Long-term

Barrier or challenge identified	Recommendation	Responsible party	Timing
Projects often experience delays in securing land use conversion for land currently used for agriculture.	Coordinate cross-agency to expedite land conversions where required.	DOE/DAR	Long-term
The FIT-All charge has been suspended for the last few years, largely because the formula used to calculate the charge is based on historical wholesale power prices, which have increased rapidly.	Consider amending FIT-All charge calculation to use forward looking expected wholesale power prices.	ERC	Long-term
Parties required to deliver the roadmap: DAR – Department of Agrarian Reform DOE – Department of Energy ERC – Energy Regulatory Commission NGCP – National Grid Corporation of the Philippines			

Ensuring that projects that have already been successful in the GEA process are commissioned on time should be DOE's top priority. If there are delays in the commissioning of new projects that have already been successful in the GEA, this could undermine confidence in future auction rounds. DOE should closely monitor the implementation of these projects, working to remove any bottlenecks that are identified by developers where possible. This might require the acceleration of other actions identified in Table 1. Implementing a mechanism that facilitates DU compliance with the RPS should also be a priority. Over the medium term, DOE should seek to establish a 'drumbeat' of regular auctions with well signalled quantities being procured in each round. This, together with refinements of the REPA and supportive industry processes, such as for connections and transmission investment, will help to build interest in future GEA rounds, helping the Philippines to scale its renewables sector and meet the ambitious targets of the NREP.

Conclusions and common themes

While many of the actions identified above are specific to the Philippines, the analysis presented in the full report identifies some common themes. These themes highlight lessons that can be applied more broadly in scaling the procurement of renewable energy capacity across the region:

- **Planning for renewable energy.** All three countries have power sector plans and/or renewable energy targets in place. However, none of the countries has clearly communicated to the market how it intends to procure the required renewable energy capacity over time. While these plans are always likely to evolve over time, a clear communication of the frequency of auctions, and the capacity and technologies to be procured in those auctions, would help project developers to plan with confidence.
- **Securing land use rights and electricity network capacity.** Land ownership is often fragmented in the region, and the process to secure land use rights can be time consuming and result in delays. Securing a grid connection can also be challenging, and in many areas the transmission network may be unable to support new projects. These are challenges that are complex and will take time to resolve, but developing comprehensive and scalable processes that developers can rely on will be critical to scaling up renewable energy capacity. In the short-term, in some settings tenders for developers to build projects on pre-defined sites where connection capacity is already secured might be an appropriate solution.
- **Refining the allocation of risks between projects and offtakers.** While the specifics vary between the three countries analysed in this report, in all three countries, PPAs for renewable energy have typically included terms that depart from international norms.

While an impressive amount of capacity has sometimes been procured under these terms, there is likely to be a limit to how far the sector can scale without changes to the commercial terms under which new capacity is contracted.

Together, addressing these factors is likely to help attract a much wider range of investors and a deeper pool of capital to the sector. The development of renewable energy projects in the region has been dominated by domestic and regional firms. The financing arrangements in place for projects has often differed to that seen for non-recourse project finance in many markets. To meet the ambitious targets for renewable energy that have been set across all three countries, a deeper pool of capital, likely involving more international investors, will be required. Mobilising that capital at scale will require many of the issues highlighted by this report to be addressed.

1. Introduction

1.1. Objectives

The objectives of the Energy Transition Partnership's (ETP's) Diagnostic for Competitive Arrangements for Energy Transition (DCAT) assignment are focused on diagnosing gaps that need to be addressed to catalyse the competitive procurement of renewables and advising on the interventions required to address those gaps. DCAT is performing this analysis in Indonesia, the Philippines, and Vietnam. The project has three main stated objectives:

- **Diagnose the legal, economic, financial, and political economic conditions** that relate to exploring a greater use of competitive and transparent market mechanisms in place of the conventional and more stagnant power purchasing systems;
- **Conduct consultations, policy dialogue to develop action agendas** for facilitating exposure, interest, and adoption of market mechanisms to integrate RE into the energy mix in the region; and
- **Develop country-specific pathways, capacity building measures and templates** for approval and implementation of optimal market-based competitive arrangements, improving flexibility in power procurement mechanisms for enabling smooth and expeditious access to variable renewable energy sources.

DCAT will contribute towards the second of ETP's four strategic pillars; namely, to de-risk energy efficiency and renewable energy investment.

Kuungana Advisory has been appointed by ETP to complete the DCAT assignment. This final report presents an overview of the status of renewable energy policy and procurement in each of ETP's countries, an analysis of the main issues and barriers to scaling up the role of renewable energy, and recommendations on how those issues and barriers could be tackled. The analysis focuses on two areas:

- The procurement mechanisms used to create demand for renewable energy projects.
- The commercial arrangements (e.g., PPAs) in place for renewable energy projects.

1.2. Target audience

This report can be used by the governments and energy sector regulatory authorities in Indonesia, the Philippines, and Vietnam. The recommendations can be used by policymakers in each country to identify which interventions are likely to be highest priority to attract a wide range of investors in renewable energy projects. The follow stakeholders are likely to be the primary users of this report:

- In the **Philippines**, the Department of Energy (DOE) is likely to be the primary user of the report. DOE has been leading design and implementation of the Green Energy Auction Program (GEAP) in the Philippines. Some of the issues and recommendations identified for the Philippines relate to more detailed regulations, so the Energy Regulatory Commission (ERC) is also likely to find this report helpful. The Philippines is the only ETP country to have an independent energy sector regulator.

The report will also be useful for development partners, including ETP, working with policymakers in each of the three countries to accelerate progress on renewable energy.

Developers and investors in renewable energy projects could also use the report. The report presents an analysis of the status of renewable energy procurement in each country, together with the key issues that need to be addressed so that competitive procurement can either commence or be scaled up in each country. In doing so, it covers many of the key risks that will be relevant for new investors considering investment in the Philippines.

1.3. Structure of the report

The remainder of this final report is structured as follows:

- Section 2 presents an overview of the methodology that has been used in completing the analysis presented in this report.
- Section 3 presents detailed analysis for the Philippines this includes:
    - Analysis of the status of renewable energy in the electricity mix.
    - An overview of renewable energy procurement activities that have taken place to date.
    - Analysis of the key stakeholders and the governance in place relating to renewable energy procurement.
    - Recommendations to accelerate the competitive procurement of renewable energy.
    - A summary roadmap, incorporating the recommendations identified above and proving an indication of the relative priority of those actions.
- Section 4 presents some overall conclusions from across the three countries that the report focuses on, identifying some common themes from across the analysis of Indonesia, the Philippines, and Vietnam.

2. Methodology for the analysis

2.1. Overall approach

The analysis presented in this report is focused on understanding the main barriers to the competitive procurement of renewable energy across the ETP countries and recommending actions to address those barriers. Analysis of the barriers considers the renewable energy landscape broadly, but is focused on two main areas:

- The **procurement mechanisms** in place for renewable energy. The focus is on competitive procurement and the extent to which auction / bidding mechanisms have or can be implemented. However, the analysis also assesses mechanisms such as feed-in tariffs that have been used previously to create demand for renewable energy in some countries.
- The **routes-to-market** for renewable energy; specifically, for utility-scale renewable energy projects procured using the mechanisms outlined above. The focus of the analysis is on the commercial terms for such projects contained in renewable energy power purchase agreements (PPAs).

The work performed as part of the DCAT project involved two phases: a diagnostic phase, followed by the preparation of recommendations to address the issues identified through the diagnostic. Table 2 summarises the key steps in the methodology that was used in completing the DCAT assignment. This report has been prepared following validation of the completed diagnostic with key stakeholders. Potential recommendations to address the issues identified by the diagnostic have also been discussed with stakeholders.

Table 2 Key steps in the approach for the DCAT assignment

Approach step	Overview
A: Inception and kick-off	Kick-off meeting and confirmation of our detailed approach for the assignment. Confirm key milestones and any timeline constraints. Prepare inception report, to include M&E framework for the assignment.
B: Diagnostic and gap analysis	Gather data on the renewable energy policy context in each country, diagnosing specific barriers to accelerated deployment of renewables. Initial consultations with stakeholders to feed into the diagnostic, and to validate our initial findings. Interim report to present diagnostic findings and forward consultation plan.
C: Consultations	Iterative consultations to present and refine emerging recommendations and possible pathways.
D: Roadmap and recommendations	Development of consolidated policy roadmaps for each country. Policy proposals and recommendations on PPA terms developed.
E: Dissemination and refinement	Refinement of final recommendations following final round of consultations. Dissemination of outputs from the assignment.

2.2. Data sources

The analysis presented in this report has been informed by research, the DCAT team's understanding of the markets, and stakeholder consultation. Building on the knowledge that the DCAT team has of the renewable energy landscape in each of the three markets, this study has been informed by:

- **Research**, including a review of the key laws and regulations in the renewable energy sector, as well as key sector strategies, plans, and statistics. This review covered laws and regulations in place prior to March 2024.

- **Consultation** with a wide range of sector stakeholders, including policymakers, sector institutions, development partners, and private sector investors. This has included in person bilateral meetings in each country as well as virtual meetings.

Stakeholder consultations have been particularly important in gaining a wide range of perspectives as to where the main barriers to renewable energy development are. In particular, the detailed analysis for the Philippines is presented in Sections 3 of this report, has been informed by information gathered through the consultations.

As part of the diagnostic work, three in-country workshops have been held in the Philippines. The first two workshops were designed as consultation workshops; the final workshop to disseminate the findings and recommendations presented in this report. In the Philippines, the workshop was open to all the key energy sector institutions. IPPs and other market participants were also invited to the second workshop in the Philippines.

2.3. Country-specific considerations

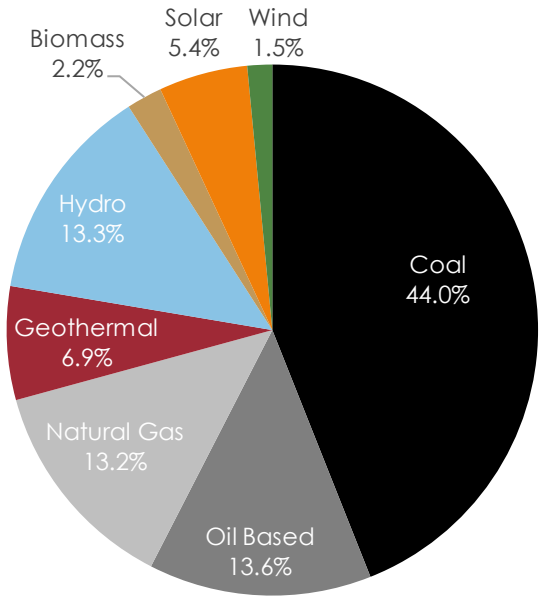
Because the current state of renewable energy procurement varies across the three countries, the approach taken, and the focus of the recommendations contained in this report has also been adapted to each. In the **Philippines,** a second renewable energy auction has recently taken place, so analysis has focused on issues that have been raised around the detailed design of the auction and factors that may have reduced participation in the auctions by IPPs. The nature of the recommendations presented for the Philippines in Section 3 are typically more detailed than for the other countries; many of the recommendations relate to implementing regulations.

3. Diagnostic and roadmap: Philippines

3.1. Renewable energy in the electricity mix

The Philippines' electricity generation mix remains dominated by thermal power plants. The Philippines has a diverse portfolio of installed capacity but is still dominated by power plants powered by fossil fuels. In 2022, almost three quarters of installed capacity comprised thermal plants the largest share of which ran (and still runs) on coal as shown in Figure 1.

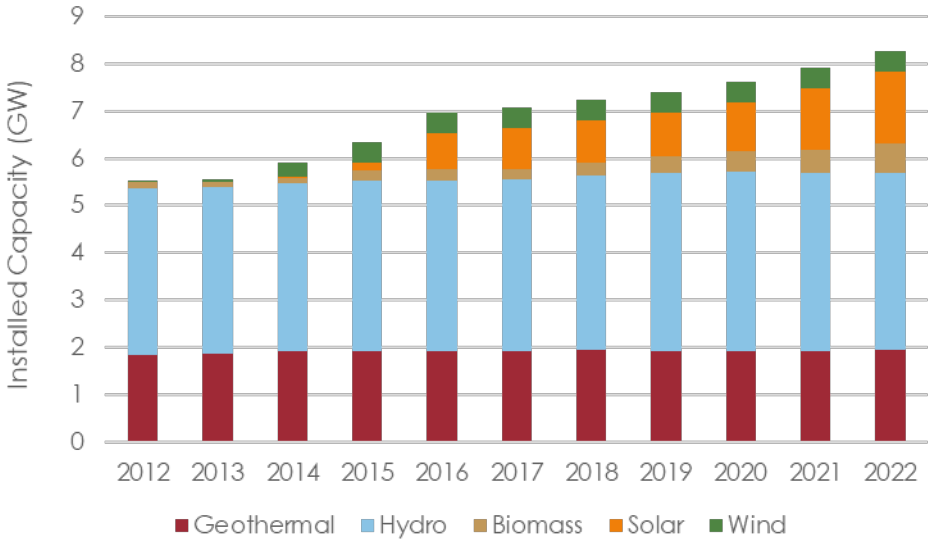
Figure 1 Installed capacity mix, Philippines, 2022



Source: Kuungana analysis of Department of Energy Annual Power Statistics

Installed renewable energy generation capacity mix has been steadily increasing. In recent years, there has been an increase in the deployment of renewable energy in the system especially for solar and wind. Figure 2 shows that most of the renewable energy capacity additions in the past decade is attributed to an increase in solar capacity. Most of this capacity is a result of the feed-in-tariff (FIT) mechanism implemented by the government. Section 3.2 presents analysis of the FIT and other procurement mechanisms used to encourage new renewable energy capacity.

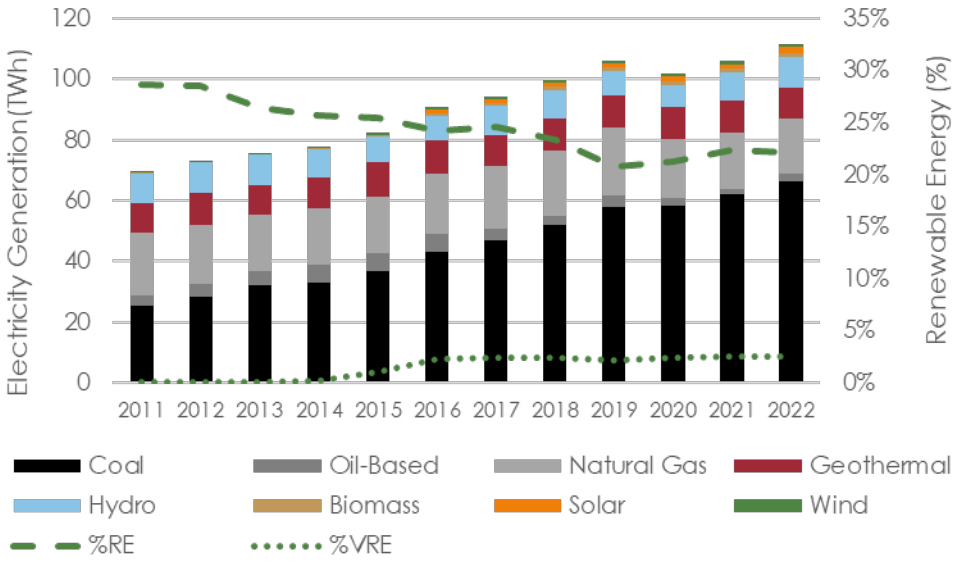
Figure 2 **Renewable energy installed generation capacity, Philippines, 2012-2022**



Source: Kuungana analysis of Department of Energy Annual Power Statistics

However, coal-fired generation capacity has increased even faster, resulting in renewable energy accounting for a declining share of electricity generation. Despite the steady increase of renewables, Figure 3 shows that over the last ten years coal generation has continued to increase as well. While the absolute quantity of variable renewable energy in the generation mix has been increasing because of the mechanisms in place, the commissioning of new coal-fired capacity means that the percentage share of renewable energy in the generation mix has been declining. This is likely to change as DOE implemented a coal moratorium in 2020 for greenfield coal-power plants[3] This moratorium is expected to continue, providing a signal to investors that the country is prioritising investments in renewable energy generation facilities.[4]

Figure 3 **Electricity generation mix, Philippines, 2011-2022**



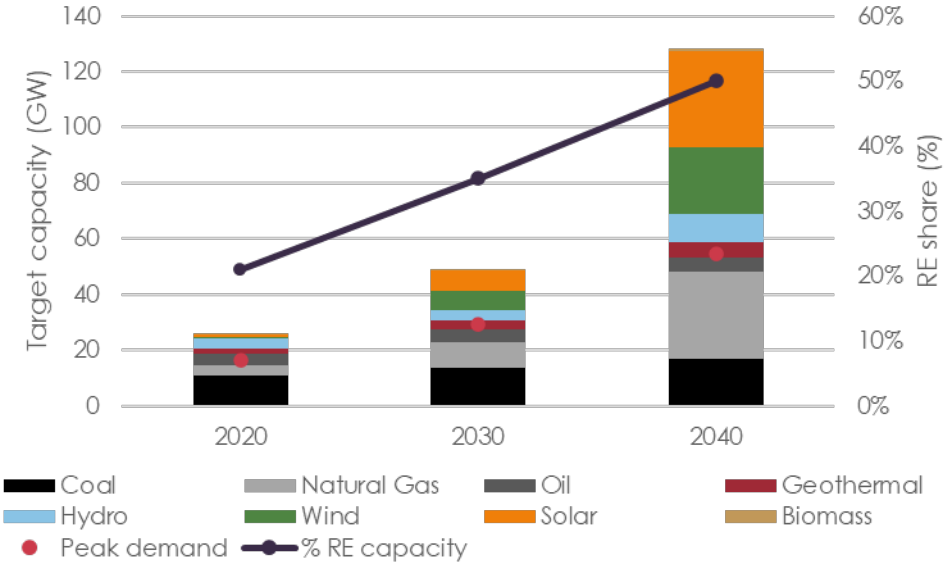
Source: Kuungana analysis of Department of Energy Annual Power Statistics

[3] Department of Energy (2020): Coal moratorium. Link.
[4] Manila Bulletin (2022): Coal moratorium to stay. Link.

The National Renewable Energy Program (NREP) provides a framework through which targets for future renewable energy procurement are set. The NREP is prepared by DOE with recommendations and contributions from the National Renewable Energy Board (NREB), a 15-person board established to make recommendations to DOE on renewable energy policy. The NREB monitors implementation of the NREP and works closely with the Renewable Energy Management Bureau (REMB) of DOE to ensure success of renewable energy in the country. REMB under the DOE is the main body tasked to ensure the development and utilisation of RE in the country through implementation of the RE Act.[5]

The NREP for 2020-2040 sets a target of renewable energy contributing 35% to the power generation mix by 2030, increasing to 50% by 2040. It sets out targets and prescribes the amount of power generation capacity required to reach the 2030 and 2040 targets as shown in Figure 4. In the most recent NREP, meeting the target would entail 52.8 GW of renewable energy from the 102.2 GW of new capacity needed by 2040 to meet demand.[6] The NREP contains an overview of existing mandatory and voluntary mechanisms and programs in place to increase the share of renewable energy in the country. It serves as a roadmap for both stakeholders and investors in the sector and it presents accomplishments and plans for renewable energy in the Philippines.

Figure 4 Installed capacity plans in NREP



Source: Kuungana analysis of National Renewable Energy Plan 2020-2040

3.2. Renewable energy procurement to date

The Philippines has introduced multiple mechanisms for procuring renewable energy. Most of these mechanisms were introduced through the Renewable Energy Act of 2008.[7] The two mechanisms introduced by the Act that are most relevant to the centralised procurement of renewable energy projects are (a) a Renewable Portfolio Standard (RPS), which sets a minimum renewable energy content for distribution utilities' (DUs) energy purchase portfolios, and (b) a feed-in tariff mechanism. The Act also introduced mechanisms to catalyse the decentralised development of renewable energy projects, including net metering and a Green Energy Option Program (GEOP), which empowers electricity users with an average

[5] Official Gazette (2008): Renewable Energy Act of 2008. Link.

[6] Department of Energy (2022): National Renewable Energy Plan 2020-2040. Link.

[7] Republic of the Philippines (2008): Republic Act No. 9513: An act promoting the development, utilization, and commercialization of renewable energy resources and for other purposes. Link.

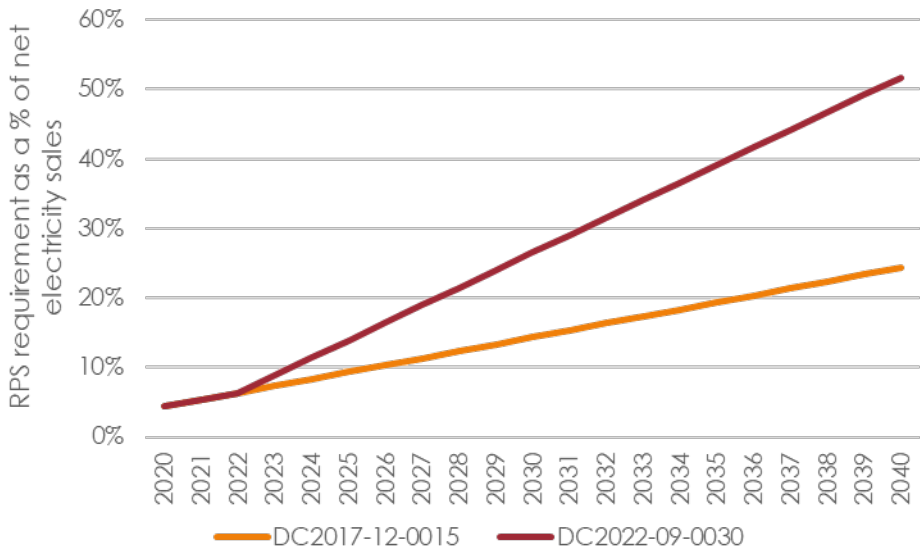
monthly peak demand of 100 kW and above to source their power from renewable energy sources.

The Renewable Portfolio Standard creates a 'pull' mechanism, requiring distributors to procure energy from renewable sources. Under the RPS mechanism, electric power industry participants are mandated to source a specified quantity of their energy requirement from eligible RE resources. Mandated participants include all DUs, all suppliers of contestable customers, and generating companies to the extent that they supply to directly connected customers.

Under Department of Energy (DOE) Department Circular No. DC2017-12-0015,[8] the RPS requirement was initially set to increase at a rate of 1% per year. The RPS requirement for a given market participant's portfolio is calculated by multiplying the RPS % requirement by the net electricity sales of the participant for the previous year. For off-grid areas, the DOE has issued separate policy instruments the latest of which is Department Circular No. DC2023-05-0014 or the "Revised RPS Off-Grid Rules."[9] In off-grid areas, an "optimal supply mix" of renewable energy will have to be determined per off-grid site. The optimal supply mix should result in a reduction in the Universal Charge for Missionary Electrification subsidy allocated for the off-grid area.

The annual increment in the RPS has subsequently been increased. Department Circular No. DC2022-09-0030[10] raised the annual increase in the RPS from 1% to 2.52%. The rationale for this increase was to ensure that the target of reaching 50% RE by 2040 is met, as described in Section 3.1 and as illustrated by Figure 5.

Figure 5 Increased RPS requirement as mandated by DC2022-09-0030



Source: Department Circular No. DC2022-09-0030

The original Department Circular (DC) also called on the establishment by DOE of a Renewable Energy Market (REM) and Renewable Energy Registrar (RER) to govern the trading and registration of RE Certificates (RECs) of electric power industry participants. The REM is intended

[8] Department of Energy (2017): Department Circular No. DC2017-12-0015 promulgating the rules and guidelines governing the establishment of the renewable portfolio standards for on-grid areas. Link.

[9] Department of Energy (2023): Department Circular No. DC2023-05-0014 promulgating the revised rules and guidelines governing the operationalization of the renewable portfolio standards for off-grid areas pursuant to Section 12 of the Renewable Energy Act of 2008. Link.

[10] Department of Energy (2022): Department Circular No. DC2022-09-0030 prescribing the adjusted annual percentage increment to be imposed on all mandated participants of the renewable portfolio standards for on-grid areas. Link.

to provide a mechanism through which mandated participants' compliance with the RPS can be monitored.

RECs are certificates to be issued to mandated participants showing the energy sourced, produced, and sold or used. RECs may be traded by mandated participants in the RE Market to comply with their RPS obligations. The RE Registrar is required to issue one REC for every one MWh of generated energy from registered RE facilities. RECs are issued based on the following:

- For non-FIT RE facilities, the RECs must be issued to the mandated participant that procures power from the RE facility.
- For FIT RE facilities, the RECs corresponding to the total output must be shared pro-rata among mandated participants according to their payment contribution to the FIT scheme.
- For energy generated by RE facilities operating under net metering, the RECs will belong to the distributor to which system the RE facility is connected.
- For energy generated by RE facilities installed in the end-user's premises for own-use and synchronised to the distributor's system, the RECs will likewise belong to the distributor.

The primary mechanism that the Renewable Energy Act introduced for procuring large scale renewable energy projects is a feed-in tariff. The feed-in tariff (FIT) aimed to accelerate the development of RE resources by giving RE generating facilities (i) priority connection to the grid, (ii) priority dispatch by grid system operators, and (iii) a fixed tariff for electricity produced from each type of RE resource over a period not less than twelve (12) years. The Energy Regulatory Commission (ERC) approved the installation targets and corresponding FIT rates shown in Table 3 in 2012.[11]

Table 3 FIT rates and installation targets

RE Resource	ERC approved FIT Rates (PhP/kWh)	Installation Targets (MW)
Run-of-river hydropower	5.9	250
Biomass	6.63	250
Wind	8.53	200
Solar	9.68	50
Ocean	Deferred	10

In April 2015, the installation targets for solar and wind were subsequently amended and increased to 500 MW and 400 MW, respectively. However, the additional installation targets had lower approved FIT Rates: 8.69 PhP/kWh for the additional 450 MW of solar[12] and 7.40 PhP/kWh for the additional 200 MW of wind[13]. As of June 2023, the installation targets for solar, wind and biomass have been fully subscribed. In the case of hydropower, there remains a balance of 117 MW of unsubscribed capacity from the installation target, which was increased from 250 MW to 350 MW.

Competitive procurement of renewable energy capacity was introduced through a new Green Energy Auction Program (GEAP), launched in 2021. The DOE defined the rules of the auction programme through the GEAP Guidelines, Department Circular No. DC2021-11-0036,

[11] Energy Regulatory Commission (2012): Resolution No. 10, series of 2012: Resolution approving the feed-in tariff rates. Link.
[12] Energy Regulatory Commission (2015): Resolution No. 6, series of 2015: Resolution adopting the new solar feed-in tariff (FIT) rate. Link.
[13] Energy Regulatory Commission (2015): Resolution No. 14, series of 2015: Resolution adopting the wind feed-tariff (wind-FIT2) rate. Link.

in November 2021.[14] The main objectives of the guidelines are to (a) "ensure transparent and competitive selection of RE facilities to achieve reasonable rates and encourage, as far as practicable, the best RE entrants in the system"; and (b) "address price volatility related to the procurement and pricing of RE Certificates (RECs) by increasing the availability of RECs in the RE Market".

The GEAP Guidelines cover the following areas:

- The setting of the auction procedures and timelines.
- The "opt-in mechanism," which gives distributors the option to procure power directly from projects that are successful in the GEAP. This mechanism is intended to provide a route by which distribution utilities (DUs) can meet their RPS requirement. However, detailed guidelines for implementing the mechanism have not yet been issued.
- The setting of the Green Energy Auction Reserve price (GEAR price) by the ERC.
- The setting of the Green Energy Tariff (GET), which is the (pay-as-bid) price paid to successful RE projects as a result of each auction. The marginal GET sets a price ceiling for distribution utilities procuring power directly from RE projects to meet their RPS obligations.
- Adoption of the FIT-All mechanism (which is used to recover the costs of the FIT scheme from end users of electricity) for recovering costs incurred through GEAP.

In effect, the GEAP is defined as an extension of the FIT mechanism. Auctions are simply used as a new mechanism for determining the tariff paid to renewable energy generators. This avoids the need for a new mechanism to be defined in primary legislation.

To date, there have been two auctions for renewables capacity held under GEAP. GEA-1, which was in conducted on 17 June 2022 was able to solicit 1,866 MW out of the target of 2,000 MW from 18 winning bidders. While there was an over-subscription for the solar installation target, the targets for the other RE resources were not met. For hydropower, there were only bids for 76% of the target and only 1.5% for biomass. The installation target for wind was nearly met with generated bids equal to 98% of the target.[15]

Table 4 GEA-1 installation targets and bids (MW)

	Targets			Bids Submitted		
RE Resource	Luzon	Visayas	Mindanao	Luzon	Visayas	Mindanao
Hydropower	80	-	50	80	-	19
Biomass	60	120	50	-	-	3
Solar	900	260	100	1,070	300	120
Wind	360	20	-	361	13	-
Sub-Total	1,400	400	200	1,511	313	143
Total		**2,000**			**1,967**	

Source: Kuungana analysis of Department of Energy: Notice of Award: List of winning bidders for the GEA-1

For the second round of the Green Energy Auction (GEA-2) held in July 2023, the DOE was able to solicit bids for 3,441 MW for the period 2024 to 2026. However, the submitted bids account for only about 30% of the targeted capacity of 11,600 MW. Bids for ground mounted solar received the highest number of offers in terms of capacity at 1,879 MW. This was only 28% of the targeted capacity. Similarly, 1,462 MW of bids were received for wind, which was 39.3% of the targeted capacity. Bids for floating solar and rooftop solar covered 30% and 1.6% of the

[14] Department of Energy (2021): Department Circular No. DC2021-11-0036 providing the revised guidelines for the Green Energy Auction Program in the Philippines. Link.

[15] Department of Energy (2022): Notice of Award: List of Winning Bidders for the GEA-1. Link.

installation targets, respectively. There were no bids received for biomass resources.[16] Some of the reasons for the shortfall in bids received for GEA-2 are analysed further in Section 3.4, together with discussion of the rationale used by DOE to determine the targets presented in Table 5.

Table 5 GEA-2 installation targets (MW)

RE Resource	2024			2025			2026		
	Luzon	Visayas	Mindanao	Luzon	Visayas	Mindanao	Luzon	Visayas	Mindanao
Ground Mounted Solar	1,420	325	280	1420	400	320	1900	350	300
Rooftop Solar	160	45	30	200	30	30	50	40	20
Floating Solar	0	0	0	0	0	0	300	0	0
Onshore Wind	800	400	0	700	470	0	700	500	150
Biomass	20	100	20	5	10	15	10	25	25
Sub-Total		3,600			3,600			4,370	
Total					**11,600**				

Source: Department of Energy

Table 6 GEA-2 bids received (MW)

RE Resource	2024			2025			2026		
	Luzon	Visayas	Mindanao	Luzon	Visayas	Mindanao	Luzon	Visayas	Mindanao
Ground Mounted Solar	508	-	-	507	-	8	643	173	40
Rooftop Solar	1	-	-	8	0	0	-	-	-
Floating Solar	-	-	-	-	-	-	90	-	-
Onshore Wind	-	-	-	230	-	-	730	502	-
Biomass	-	-	-	-	-	-	-	-	-
Sub-Total		509			754			2,178	
Total					**3,441**				

Source: Kuungana analysis of Department of Energy: Notice of Award: List of winning bidders for the GEA-2

DOE has plans for further renewable energy auctions over the coming months. An auction for non-FIT technologies (covering geothermal and large hydro) was originally expected to be launched in early 2024, but this has not yet been launched. DOE has also suggested that an auction for offshore wind could take place as early as 2024.

3.3. Governance of renewable energy procurement

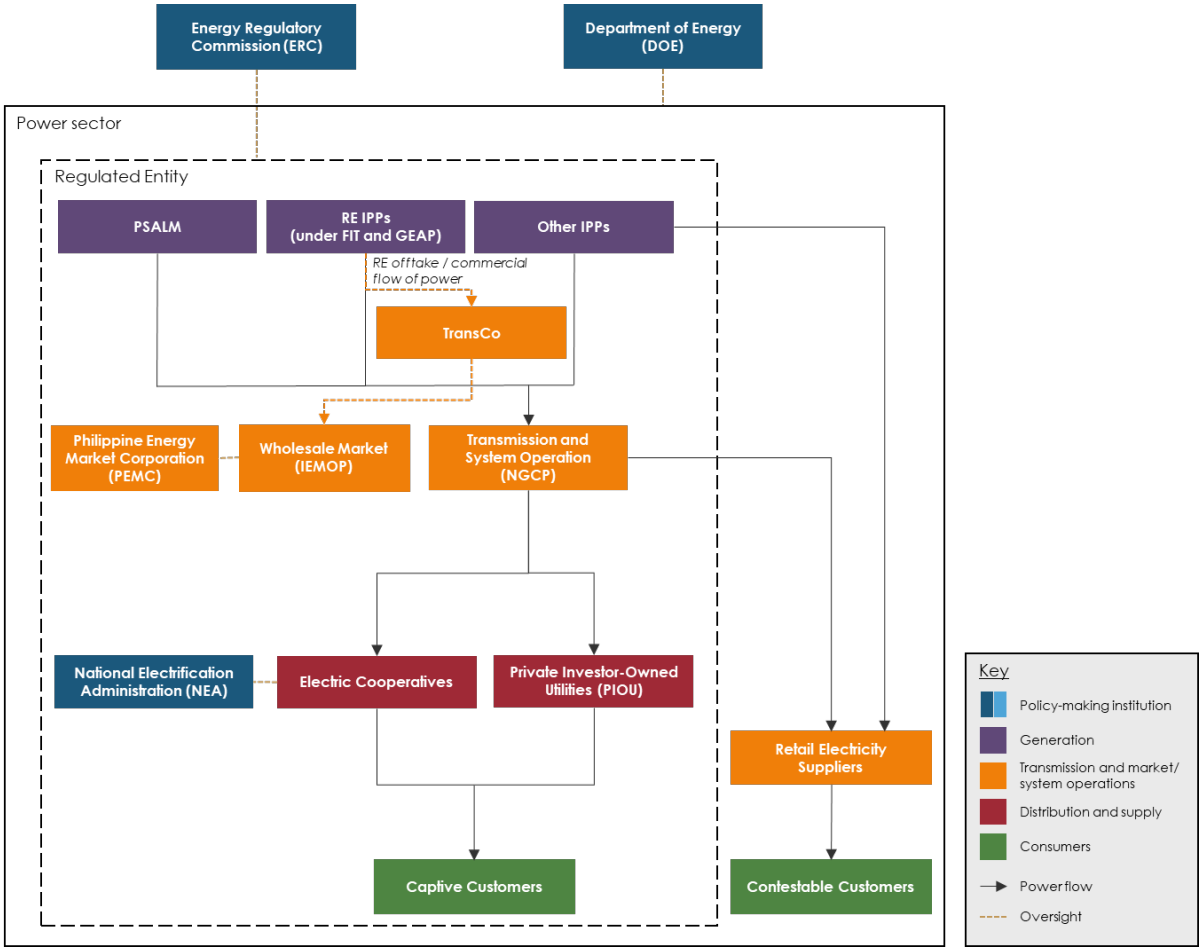
The electricity sector in the Philippines is unbundled; as a result, there are many more stakeholders involved in renewable energy procurement than in either Indonesia or Vietnam. The Electric Power Industry Reform Act (EPIRA) of 2001[17] resulted in fundamental changes to the structure of the electricity sector in the Philippines. The law resulted in the privatisation of

[16] Department of Energy (2023): Notice of Award: List of Winning Bidders for the GEA-2. Link.

[17] Republic of the Philippines (2001): Republic Act No. 9136: Electric Power Industry Reform Act of 2001. Link.

the generation assets previously owned by the National Power Corporation, or NPC. Ownership of NPC's transmission assets were transferred to a new government entity, the National Transmission Corporation (Transco). Subsequently, a concession was awarded through a congressional franchise to the National Grid Corporation of the Philippines, a private company, to operate the transmission network owned by Transco. The restructuring established the wholesale electricity spot market (WESM). WESM is a gross pool market, with centralised dispatch and net settlement. An overview of the structure of the electricity sector is presented in Figure 6.

Figure 6 Structure of the electricity sector in the Philippines



Source: Kuungana analysis of ADB Philippines Energy Sector Assessment, Strategy, and Road Map

The unbundled nature of the sector means that IPPs are key stakeholders in driving forward the development of renewable energy projects. Independent Power Producers (IPPs) own and develop most of the thermal and renewable generation capacity in the country. There are many IPPs in the country; generation has been a competitive market since the liberalisation of the power sector. There are several IPP associations in the country including the Philippine Independent Power Producers Association (PIPPA), Wind Developers Association of the Philippines (WEDAP), and the Philippine Solar and Energy Storage Association (PSESA).

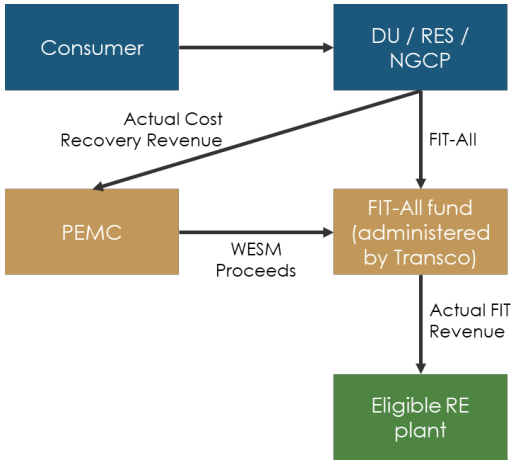
The Department of Energy (DOE) oversees policy making and is tasked with ensuring that renewable energy targets are met. DOE is responsible for the design and implementation of the market mechanisms provided for in the RE Act through the issuance of Department Circulars (policy). The DOE is also responsible for implementing the Green Energy Auction Program (GEAP), which is used to procure new renewable energy capacity, as already discussed in Section 3.2.

The Energy Regulatory Commission (ERC) oversees the regulation of the sector. This includes the regulation of electricity tariffs. It also approves transmission and distribution wheeling charges. For the GEAP, it sets the GEAR Prices or price ceiling for the auctions and approves the REPA (the equivalent of a PPA) for the winning bidders.

The Power Sector Assets and Liabilities Management (PSALM) Corporation was set up to manage the privatisation of generation assets following restructuring of the sector. PSALM acquired the generation assets from the former vertically integrated utility (National Power Corporation, NPC) and then sold these assets to the private sector. PSALM still owns a small number of generation assets, primarily hydroelectric plants.

The National Transmission Corporation (Transco) acts as the offtaker for RE projects contracted through the FIT mechanism. Transco administers the FIT-All fund which is used to pay generators remunerated through the FIT mechanism (Figure 7). This includes generators who have been successful in the GEAP.

Figure 7 Flow of funds as defined under the FIT-All Guidelines[18]



Source: Kuungana analysis of ERC Resolution No. 24, series of 2013

The Philippine Electricity Market Corporation (PEMC) governs and oversees the Independent Electricity Market Operator of the Philippines (IEMOP). IEMOP is the market operator and is responsible for operating the Wholesale Electricity Spot Market (WESM). A portion of the revenue earned by RE generators originates from WESM, although this revenue is remitted to the FIT-All fund and paid to RE generators by Transco. As well as operating the WESM, IEMOP will be responsible for operating the soon-to-launch RE Market.

The National Grid Corporation of the Philippines (NGCP) is responsible for the transmission system and acts as system operator. It is responsible for grid expansion and investment and maintaining and operating the transmission network. This will be especially important as more renewables are connected to the system. NGCP is responsible for completing a System Impact Study (SIS) for all projects that are to be connected to the network. Delays relating to the completion of SISs are discussed further in Section 3.4.4.

There are >140 distribution utilities (DUs) managing the distribution networks in the Philippines. These are composed of private investor-owned utilities (PIOU), electric cooperatives, and a small portion of government owned utilities, The National Electrification Administration (NEA) acts as a guarantor for electric cooperatives and local government owned utilities when buying electricity in the spot market. This is because, unlike the PIOUs, some of the utilities that NEA oversees need support to be credit-worthy. The main role that DUs have in the context of

[18] Energy Regulatory Commission (2013): Resolution No. 24, series of 2013: a resolution adopting the guidelines on the collection of the feed-in tariff allowance (FIT-All) and the disbursement of the FIT-All fund. Link.

renewable energy procurement is through the requirement that they meet the Renewable Portfolio Standard, as discussed previously in Section 3.2.

Local/Retail Electricity Suppliers (LRES/RES) supply energy through the Retail Electricity Market to contestable customers. Such suppliers are also mandated participants under the RPS.

3.4. Recommendations to accelerate competitive procurement of renewable energy

The electricity sector in the Philippines is sophisticated when compared to other countries in the region; this is reflected in the nature of the issues identified relating to renewable energy procurement. In the Philippines, the issues identified are mostly associated with detailed design of the auction and of regulatory instruments designed to support renewable energy projects, rather than fundamental gaps in the legal framework. The challenges and associated recommendations (shown in light blue boxes) have been grouped under four headings:

- **Auction design.** Several issues regarding design of the GEA mechanism have been identified, which have likely contributed to participation in the auctions being lower than targeted. These issues are analysed further in Section 3.4.1.
- **Risk allocation in the REPA.** The commercial arrangements for projects procured through the GEA have not been confirmed. Together with terms that sometimes depart from international norms, this acts as a further barrier for investors (and especially international investors) in renewable energy projects. This is analysed further in Section 3.4.2.
- **Renewable energy and its interaction with market design.** Broader market design challenges, such as the difficulty that DUs have in procuring renewable energy using bilateral contracts, have been identified that have the potential to adversely affect the procurement of renewable energy. These challenges are analysed further in Section 3.4.3.
- **Land and transmission connection barriers to renewable energy development.** Delays and complexity in securing land conversion and securing connection to the electricity network also risk undermining future investments in renewable energy. These are analysed further in Section 3.4.4.

3.4.1. Auction design

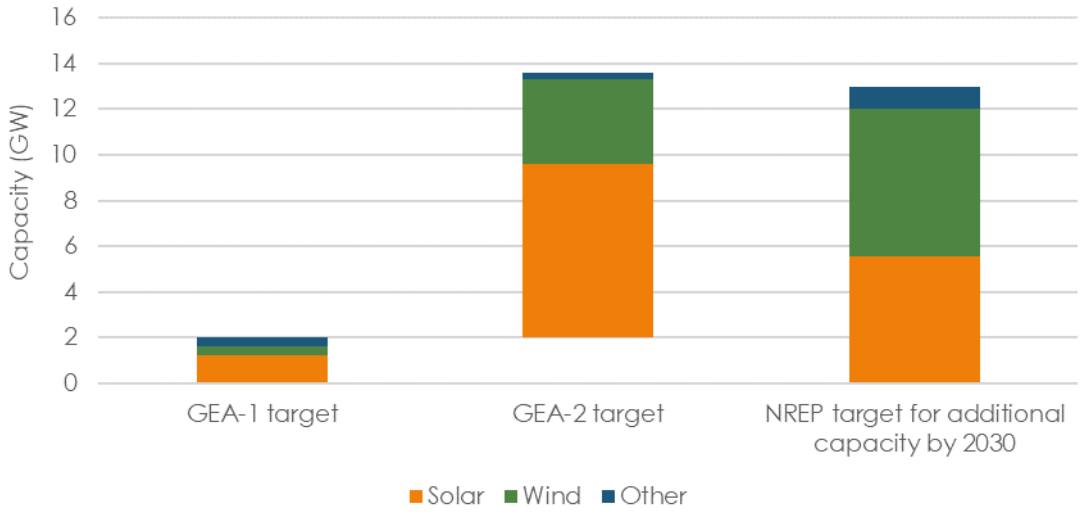
The Green Energy Auction Program (GEAP) has had mixed results in securing new renewable energy generation capacity. To reach the target of 35% of electricity generation being sourced from renewable energy by 2030 (as set out in the NREP), the Philippines has several mechanisms. The GEAP has been successful in attracting ~5.4 GW of new capacity over two auction rounds, as already presented in Section 3.2. The first auction round, GEA-1, secured interest from nearly 2 GW of capacity, amounting to 98.3% of the targeted capacity. However, GEA-2 fell short, only securing 29.7% of the intended capacity. While some of the capacity successful in GEA was existing and already earning revenues from alternative income streams such as WESM, new capacity (~40 MW from GEA-1 and ~500 MW from GEA-2) is due to be online from late 2024. Partly because of the challenges and delays presented in this chapter, it is unclear whether this capacity and other capacity to be contracted through GEAP will be commissioned on time.

Arguably, the capacity that GEA-2 sought to procure was too high. The capacity procured through GEA-1 and GEA-2 was informed by the 2030 NREP target, the aim being to reach to the 2030 target. In 2022, GEA-1 tried to procure 2,000 MW.[19] For GEA-2, the amount targeted increased significantly, to a total of 11,600 MW.[20] Figure 8 shows that had both auction rounds

[19] Department of Energy (2022): Terms of Reference, Green Energy Auction-1. Link.
[20] Department of Energy (2023): Terms of Reference, Green Energy Auction-2. Link.

been successful, the total capacity by 2026 would have met (indeed, would have slightly exceeded) the NREP 2030 target. This would have meant that no further auctions were required over the next few years for the Philippines to hit the 2030 target. The auctions were not only trying to procure volumes ahead of when they were required per the NREP; the amounts targeted also leant more towards solar PV versus wind compared to the published NREP.

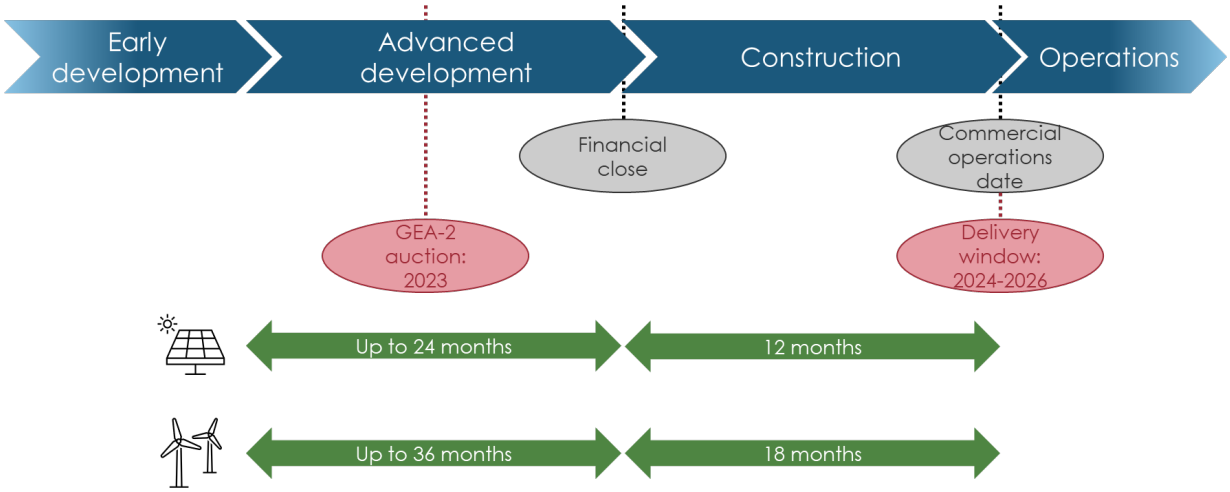
Figure 8 Alignment of GEA target with NREP target



Source: Kuungana analysis

The timescales were not realistic for delivery of some of the capacity. In the first auction, projects were permitted to specify any delivery commencement date between 26th December 2022 and 25th December 2025. Conversely, in the second round of procurement, which took place in 2023, separate lots were established for projects commissioning in different years: 2024, 2025, and 2026. As a result, the 2024 and 2025 slots attracted limited interest from investors. The limited lead time for delivering projects in these lots was in many cases not sufficient to cover the time required to secure permits, transmission connection agreements, and to construct a project as highlighted in Figure 9. Having realistic and sufficient lead times would help to encourage increased participation in future auction rounds.

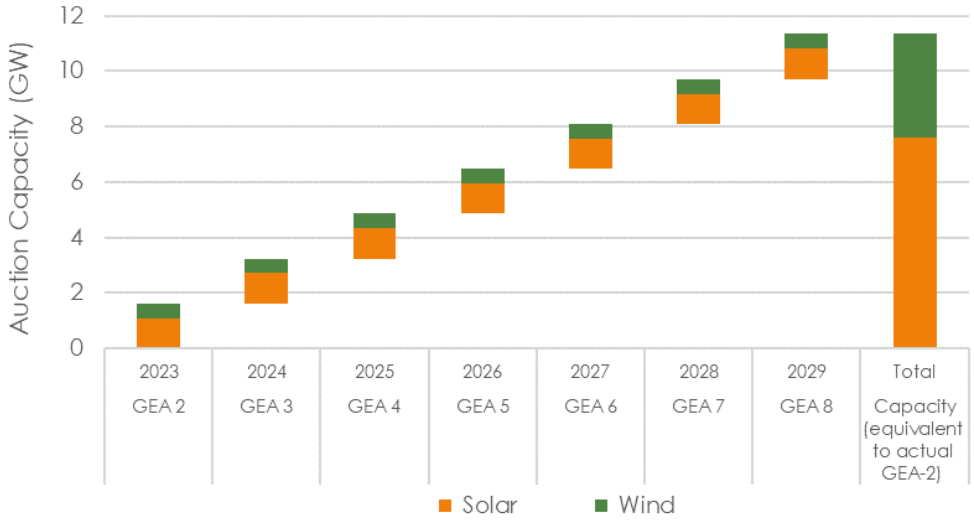
Figure 9 Lead times for development



Source: Kuungana analysis

The 2030 target could still have been met with a much lower target for GEA-2. Frequent, but smaller, auction rounds could help to build interest across a larger number of project developers. The NREP target could be broken down across several auction rounds as shown in Figure 10. For simplicity, in the figure a one-year construction period is assumed for both solar and wind projects. The annual auction volume in this scenario would have been well below the capacity attracted to GEA-2. Smaller auctions would therefore result in more competition in the market, driving down prices. With volumes set at the high levels seen in GEA-2, any participating project is likely to secure capacity if their bid is below the GEAR price.

Figure 10 GEA-2 targeted capacity spread over several years



Source: Kuungana analysis

It is unclear to what extent GEA target volumes consider the procurement plans of distribution utilities. Figure 8 shows if the GEA-1 and GEA-2 target capacities had been met, the NREP 2030 target would have been achieved 4 years early. The capacity procured by GEA would have met the NREP with no further intervention. However, the unbundled nature of the Philippines electricity market means that renewable energy capacity can also be procured elsewhere. The RPS (see Section 3.2) requires mandated participants to meet a certain portion of their demand using renewable energy. Distribution utilities (DUs) and electric cooperatives are mandated participants under the RPS. If these utilities were to successfully procure renewable energy capacity directly to meet their RPS obligation, there would be a risk of over-supply. Some utilities have attempted to procure renewable energy capacity directly in this way. For example, Meralco launched a tender for 850 MW from renewable energy sources in 2022, although it is understood that this tender was not successful.

The targets for future renewable energy procurement rounds should have a clear rationale that connects back to overarching long-term policy goals. The rationale for setting the amount of renewable energy generation capacity to be procured in future auction rounds should ideally be clearly set out. Ideally this rationale should be the same from one procurement round to the next, potentially even following a standard and pre-defined methodology. The quantities to be procured should reconcile to policy targets (e.g., in the NREP) and should consider the role of other procurement channels that might also contribute to those policy targets. Determining appropriate volumes to be procured might be simpler if the role of DUs in directly procuring renewable energy were to be reduced. This is discussed further in Section 3.4.3.

RECOMMENDATION: Determining volumes to be procured through GEA

For future GEA rounds, the rationale for the quantity of renewable energy generation capacity to be procured should ideally be clearly set out in the auction documentation published by

DOE and linked back to policy goals such as the NREP's renewable energy target. DOE could also publish a clear timetable for future auctions. Together, this would help developers to gauge future demand for new renewable energy capacity in the Philippines, which could increase the diversity of developers participating in future auctions.

Currently, the regulation states that capacity for each auction round should be set to ensure that grid demand can be met, there is sufficient RE in the generation mix, and volume of RE certificates in the market. The determination of the volumes to be procured through GEA should consider renewable energy quantities procured through other channels; for example, any volumes procured directly by DUs.

A more detailed definition of the approach for how auction volumes are determined could help to ensure that volumes procured through GEA do not overlap with volumes procured through other mechanisms.

Reserve prices for GEA (GEAR prices) have been set too low for some developers. Some developers of renewable energy projects in the Philippines have noted that the GEAR prices have been too low, especially for solar. This may help to explain why, in GEA-2, the volumes of solar procured fell short to a greater extent than was the case for onshore wind. For example, as shown previously in Table 6, the onshore wind volumes for 2026 delivery in Luzon and Visayas were fully subscribed, whereas the equivalent volumes for ground-mounted solar were only 34% and 49% subscribed respectively.

Some stakeholders have suggested that there is a mismatch between the capital cost and capacity factor assumptions used to calculate the GEAR price for ground-mounted solar. ERC's decision setting out the rationale for the GEAR prices uses a total capital cost assumption of 890 US$/kW and a net capacity factor (i.e., measured against AC, or alternating current, capacity) of 20.29%.[21] The ERC decision notes that the capital cost numbers are informed by cost benchmarks published regularly by the US's National Renewable Energy Laboratory (NREL).[22] NREL's capital cost numbers are quoted on a DC basis (i.e., per unit solar capacity installed). It is unclear whether the DC/AC difference has been incorporated in ERC's calculation of the GEAR price. This could have a significant impact on GEAR prices for this technology: NREL assumed a DC/AC ratio of 1.34 in its analysis.

ERC is reviewing GEAR prices ahead of future auction rounds. Responding to feedback from stakeholders on the GEAR price, it is understood that ERC has been reviewing the GEAR price for solar. The outcome from this review is not yet clear.

More generally, GEAR prices should not be required if the auction is competitive. As already noted above, setting lower volumes for future auction rounds could increase the competitive tension between competing projects. If success in the auction is not guaranteed (as it was, in effect, for GEA-2) developers are more likely to compete on price to secure a contract. For GEA-2, bidders could just bid slightly below the GEAR price to secure a contract. While in theory, a reserve price could become redundant in a well-designed renewable energy auction, in practice the concept is likely to be retained. Price caps are used even in countries with sophisticated energy markets. The UK sets "administrative strike prices", in effect a cap on auction prices, for its Contract for Difference auctions for renewable energy capacity. During Allocation Round 5, the results of which were announced in September 2023,[23] no contracts were awarded for offshore wind. This outcome was attributed to the administrative strike price for this technology being set too low.

RECOMMENDATION: Setting appropriate reserve prices for future GEA rounds

GEAR prices, especially for solar technologies, should be reviewed by ERC ahead of future GEA rounds. This is likely to require a review of the input assumptions to the GEAR price

[21] Energy Regulatory Commission (2023): Resolution No. 06, series of 2023. A resolution adopting the green energy auction reserve (GEAR) prices for the second round of auction. Link.

[22] National Renewable Energy Laboratory (2022): U.S. solar photovoltaic system and energy storage cost benchmarks, with minimum sustainable price analysis: Q1 2022. Link.

[23] Department for Energy Security and Net Zero (2023): Contracts for difference allocation round 5 results. Link.

calculations, as is typically completed by ERC ahead of each GEA round already. It is likely that solar prices will need to be revised to deliver renewable energy capacity at the scale required to meet the targets set out in the NREP.

3.4.2. Risk allocation in the REPA

The commercial terms for projects successful in the GEA rely on payment mechanisms set up for the FIT. ERC Resolution No. 18 of 2014[24] approved template contracts for projects operating under the FIT scheme that was implemented in the Philippines as described in Section 3.2. The resolution approved two contracts:

- The Renewable Energy Payment Agreement (REPA), which is the offtake agreement signed between the project and TransCo, which administers the FIT-all fund through which the costs of running the FIT are recovered. The REPA is the Philippines' equivalent of a PPA.
- The Renewable Energy Supply Agreement (RESA), which is signed between renewable energy projects and the host DU for projects operating in any locations not covered by WESM. The RESA provides a revenue stream equivalent to WESM prices for projects that cannot participate in the market. Many of the issues highlighted below for the REPA also apply to the RESA, but analysis has focused on the REPA.

These mechanisms were designed to support the FIT. For example, the template REPA refers to the administrator (TransCo) paying the "Actual FIT Revenue" to the project, as shown previously in Figure 7. The FIT-All Guidelines[25] in turn define the Actual FIT Revenue as being calculated with reference to the relevant FIT Rate. Subsequently, a new DOE Department Circular[26] has been issued to clarify that the Green Energy Tariff (which in turn is defined in the GEA Guidelines[27] as "the price…resulting from…the Green Energy Auction…on a pay-as-bid basis") shall be "considered, interpreted, and accepted as the FIT". One effect of this regulation is to clarify that projects successful in the GEA will be paid according to the bid they submitted through the REPA that they sign with TransCo.

Many aspects of the risk allocation in the template REPA are not aligned with international norms. Most notably, the REPA does not include any protections for developers against curtailment. This is not stated clearly in the REPA itself, but Clause 3.3.2.a. of the FIT-All Guidelines[28] defines "Actual FIT Revenue" as being defined by "Actual RE Generation". If plant output is reduced because of transmission constraints, or because of system operation decisions, the plant will not be compensated for the output that it would otherwise have generated.

Some projects have experienced a loss of revenue as a result of delays in transmission infrastructure. While these losses have been modest to date, curtailment may increase as renewable energy penetration increases. Figure 11 shows that the risk of curtailment increases as VRE penetration increases. Transmission upgrades will help to mitigate curtailment risk for some projects but will sometimes face delay. Transmission delays are discussed further in Section 3.4.4.These are risks that are not within the project developer's control and protection against these risks is typically provided. Many PPAs will pay deemed energy payments during a curtailment event. Sometimes deemed energy payments will cover all curtailment, sometimes only curtailment events beyond some pre-defined threshold will be covered.

[24] Energy Regulatory Commission (2014): Resolution No. 18, Series of 2014: A resolution approving the templates for the Renewable Energy Payment Agreement (REPA) and the Renewable Energy Supply Agreement (RESA). Link.

[25] Energy Regulatory Commission (2013): Resolution No. 24, series of 2013: a resolution adopting the guidelines on the collection of the feed-in tariff allowance (FIT-All) and the disbursement of the FIT-All fund. Link.

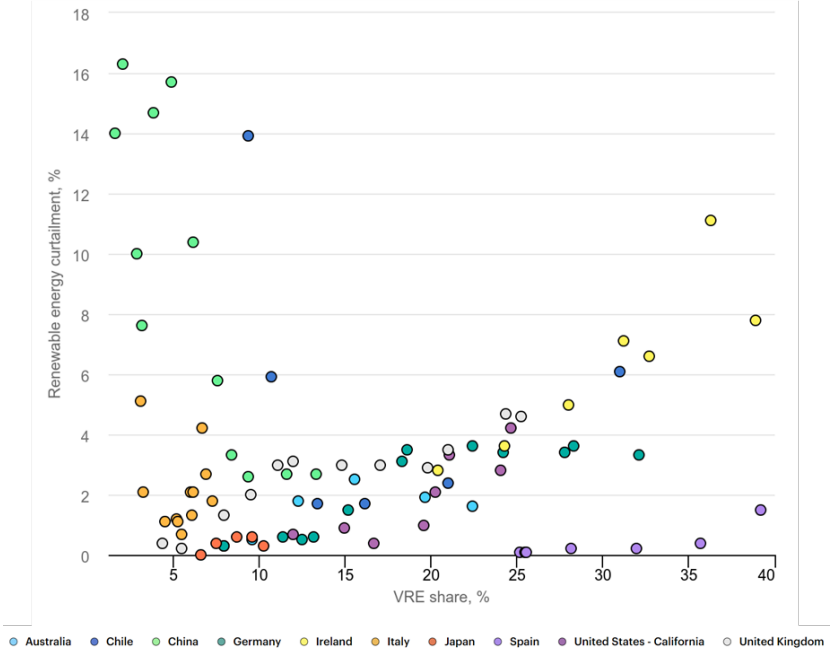
[26] Department of Energy (2023): Department Circular No. DC2023-09-0027: Amendment to Department Circular No. DC2021-11-0036 titled providing the revised guidelines for the green energy auction program in the Philippines. Link.

[27] Department of Energy (2021): Department Circular No. DC2021-11-0036 providing the revised guidelines for the Green Energy Auction Program in the Philippines. Link.

[28] Energy Regulatory Commission (2013): Resolution No. 24, series of 2013: a resolution adopting the guidelines on the collection of the feed-in tariff allowance (FIT-All) and the disbursement of the FIT-All fund. Link.

Deemed energy payments will normally be quantified using an estimate of the energy that would have been generated (e.g., with reference to site wind or solar resource measurements) without the curtailment event.

Figure 11 Renewable energy curtailment



Source: IEA graph from Renewable Energy Market Update - June 2023

RECOMMENDATION: Include protection against curtailment events

The pool of investors willing to participate in the GEAP is likely to be limited without protection against curtailment. International investors are likely to require protection during events that are outside of the project's control. To scale up the achievements in deploying RE to date, changes to the REPA are likely to be required to provide such protection. Implementing such changes would require intervention from ERC in the form of amendments to the REPA template.

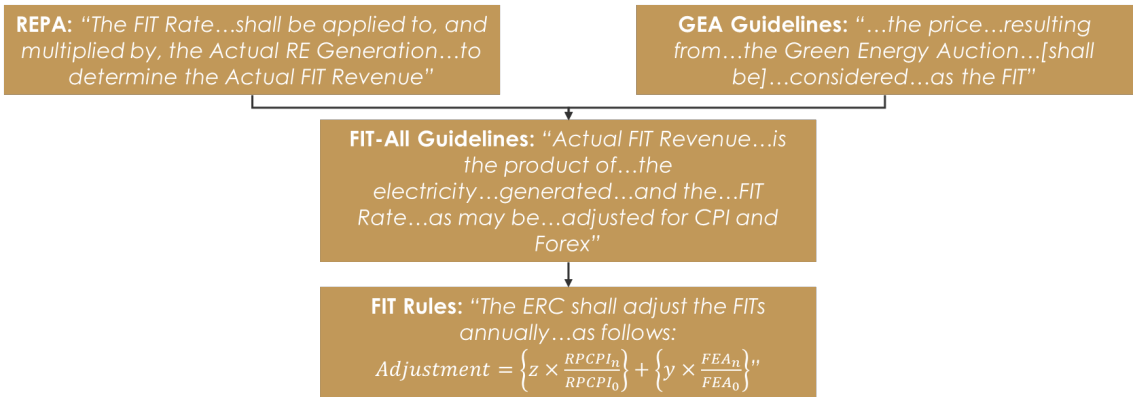
The REPA is a short document, with many provisions signposted to related regulations. The template REPA[29] is only 12 pages in length, which is much shorter than many PPAs. This is partly because some of the terms that would typically be drafted in full within the PPA are covered instead in related regulations. This means that the terms of the REPA could change part way through the contract term (if regulations or updated), or that REPA terms become out-of-date if relevant regulations are not updated, as illustrated by the example below.

This has the potential to be problematic, especially where GEA projects are in effect 'piggy-backing' on the legislative provisions in place for the FIT. For example, the REPA makes no reference to price adjustments for movements in exchange rates. Rather, this is again mentioned in Clause 3.3.2.a. of the FIT-All Guidelines.[30] Clause 1.4.1.1 notes that the foreign exchange adjustment is further defined in Clause 2.10 of the FIT Rules.[31] The FIT Rules do contain a formula setting out how this indexation works (both for local inflation and for exchange rate movements). However, the formula defines an annual adjustment of FIT rates. As indicated in Figure 12, the GEA Guidelines confirm that the submitted auction prices are equivalent to the

[29] Energy Regulatory Commission (2014): Resolution No. 18, Series of 2014: A resolution approving the templates for the Renewable Energy Payment Agreement (REPA) and the Renewable Energy Supply Agreement (RESA). Link.
[30] Ibid.
[31] Energy Regulatory Commission (2010): Resolution No. 16, series of 2010: Resolution adopting the feed-in tariff rules. Link.

FIT. However, it was understood by most developers that GEA prices would not be indexed. This is not reflected in current regulation. Further, it is unclear how the indexation should be applied in practice for GEA projects. For example, it is unclear whether the indexation (which is defined in the FIT Rules as being with reference to a 2009 baseline) is applied on the anniversary of the relevant GEA auction, the effective date of the relevant REPA, or some other date. It is possible that different developers have made different assumptions in preparing their bid prices, increasing the risk of dispute.

Figure 12 Example of GEA 'piggy-backing' on the FIT



Source: Kuungana analysis

Some risks that would typically be addressed in a PPA are not addressed in the template REPA. Risks that are not covered in the REPA, or are covered in less detail than would be the case in many PPAs, include:

- **Change in Law.** While the REPA does include a Change in Law clause (14.7) this is simply to state that "the parties shall continue to perform their respective obligations" in the event of a Change in Law. PPAs usually allow for the price to be adjusted in the event of a change in law or regulation that results in a material increase in project costs or reduction in project profitability, especially if that change in law is targeted or discriminates against a particular sector or project type.
- **Step-in rights.** There is no provision in the REPA for lenders to intervene in the case of the project defaulting.
- **Termination.** Default events, dispute resolution and termination clauses are less detailed than in many PPAs. In the event of a TransCo default, the protection offered to RE projects is limited. While the project is permitted to seek an alternative route-to-market (Clause 11.5 provides the "right to contract with other parties"), no compensation is provided if the new route-to-market provides a less favourable tariff than the REPA.

This is not an exhaustive list of items that are not covered by the REPA but illustrates the existence of gaps in the template contract, at least when compared against international norms.

RECOMMENDATION: Consider addressing potential gaps in the REPA

To attract a wider range of international investors in renewable energy projects, it is likely to be necessary to address many of the gaps identified in the REPA. It may be beneficial to develop a longer-form agreement that fully defines the commercial terms on which projects are to be contracted. This will mitigate the risk that different developers adopt alternative interpretations of the regulations, potentially distorting outcomes from auctions and increasing the risk of dispute. This would again require intervention from ERC to amend the REPA template. It is understood that a REPA template for GEA is being finalised by ERC. If this updated template

successfully addresses the gaps and inconsistencies identified above, this will help improve confidence in the REPA and reduce the risk of disputes.

The process by which a REPA is issued, and the interaction with the overall auction process is also unusual. The template REPA requires a set of criteria to be met prior to it becoming effective. This includes (in Clause 3.1.c.) the "FIT COC [FIT Certificate of Compliance] issued by ERC". Department Circular No. DC2013-05-0009[32] states that the FIT COC is issued after the DOE confirms Electromechanical Completion, which in turn is defined as having completed at least 80% of construction. Typically, a PPA will be a required document to reach financial close. While successful projects can rely on an existing template contract and will have received a Certificate of Award from DOE, the current phasing requires developers to carry out most construction activities without having their final contractual package in place. This is a material departure from international norms for power generation projects developed using project finance and is likely to be problematic for some international investors.

RECOMMENDATION: Bring forward the point at which a REPA is legally binding

It is recommended that the order in which milestones are achieved under the GEA is amended, to align with international norms and to attract a wider range of project developers in future auction rounds. Specifically, signing a new version of the REPA ahead of financial close is likely to mean that a larger number of market participants can use such a contract to access conventional project finance, helping to lower the cost of capital and thus ultimately bid prices. This would require close coordination between DOE (which is responsible for designing the auction process) and ERC (which is responsible for many of the regulatory rules governing these processes).

Many IPPs have been able to proceed with projects despite challenges regarding risk allocation, but this is unlikely to scale to a wider pool of international investors. Considering some of the risk allocation challenges noted above – some of which reflect a material departure from international norms – it is perhaps surprising that the GEA has been successful in securing interest from more than 5 GW of generation capacity to date. However, this is at least in part a reflection of local factors and the existence of deep local pools of capital. There are several large conglomerates operating in the Philippines that may benefit from the strength of their group balance sheet when securing finance for new power generation capacities. This is a benefit that new developers relying on 'pure' non-recourse project finance will not have access to. Such developers are likely to find the issues noted in this section to be a barrier to obtaining non-recourse financing and therefore to development. While the existence of sophisticated local pools of capital is a positive, material changes to the existing risk allocation are likely to be required to attract a diverse mix of international project developers in future.

3.4.3. Renewable energy and its interaction with market design

The policy environment for the procurement of renewable energy in the Philippines is complex. As already noted in Section 3.2, there are many mechanisms in place for the procurement of renewable energy. Most of these originate from the Renewable Energy Act.[33] In some cases this arguably adds unnecessary complexity to the regulatory environment for renewable energy projects, and for all market participants. In some cases, multiple mechanisms exist where one may be sufficient. An example of this is the co-existence of the GEA (or FIT) and the RPS. Typically, one or the other might exist:

- The RPS is in effect an obligation mechanism that creates demand for renewable energy by requiring DUs to procure a certain quantity of it; this quantity increases gradually over time. In theory, this can create a market for renewable energy, with no further intervention required.

[32] Department of Energy (2013): Department Circular No. DC2013-05-0009. Guidelines for the selection process of renewable energy projects under feed-in tariff system and the award of certificate for feed-in tariff eligibility. Link.

[33] Republic of the Philippines (2008): Republic Act No. 9513: An act promoting the development, utilization, and commercialization of renewable energy resources and for other purposes. Link.

- The FIT mechanism, and subsequently the GEA, results in a more centralised demand signal, with DOE determining the amount of renewable energy capacity that is procured.

The GEA was partly intended as a means by which renewable energy could be procured so that DUs were then able to meet their RPS obligations. However, the existing of two different demand signals increases the risk of confusion. As already noted in Section 3.4.1, it is not clear that the potential for DUs procuring renewable energy capacity was fully considered in setting the volume to be procured in GEA-2.

The RPS is mandated by primary legislation but is arguably unnecessary. If the volumes procured through the GEA (discussed further in Section 3.4.1) are set such that the renewable energy targets set in the NREP are met, the RPS is not strictly required. However, the existence of RPS is currently mandated in primary legislation, through the Renewable Energy Act;[34] this cannot easily be changed. As noted above, the GEA is viewed by DOE and ERC as a mechanism by which RPS obligations can be met.

Implementing the RPS is challenging for distribution utilities (DUs). DUs are required[35] to submit to DoE annual Power Supply Procurement Plans (PSPPs), which should demonstrate how they intend to meet projected demand. A consolidated summary of the latest PSPPs, based on the Distribution Development Plan (DDP)[36] is presented in Figure 13. This shows how the DUs typically have committed supply-side resources for the next few years. The committed capacity shown in Figure 13 includes both capacity that is already contracted and capacity that has been procured where the Power Supply Agreement (PSA) is awaiting ERC approval. The capacity shown as planned indicates where the DU is planning to meet demand through a future Competitive Selection Process (CSP).

The supply-demand balance outlook illustrated by the DDP highlights challenges for the procurement of renewable energy by DUs:

- Many DUs have already committed to supply contracts. Signing new supply contracts could result in them being over-committed. This could lead to inefficient market outcomes and higher costs for consumers.
- Managing intermittent generation is challenging, especially in the context of the very small portfolio that many DUs have. For example, to meet a 10% RPS requirement by contracting with solar PV generators with an average capacity factor of 20%, a DU with 50 MW of load would require an average of 5 MW (50 MW x 10%) renewable energy. The DU might contract with 25 MW of solar to meet this requirement (5 MW / 20%). However, the DU would sometimes receive 25 MW of solar output. If they had also secured power from other generators, they might be over-supplied during these periods. During periods of high solar output DUs are likely to be exposed to lower WESM prices and may suffer losses through net settlement. DUs paying availability or capacity payments to thermal generators contracted through previous CSPs will be required to continue paying these charges even though they will be using the thermal plants less.

There is no requirement for DUs to contract 'firm' power, but it is also unclear how DUs should incorporate renewable energy in their portfolio. Section 23 of the Electricity Power Industry Reform Act[37] requires DUs to "supply electricity in the least cost manner to its captive market". A department circular from 2021[38] issues guidelines on the development of the DDP and reiterates this requirement while also noting the obligation that DUs have under the RPS.

[34] Ibid.

[35] Department of Energy (2018): Department Circular No. DC2018-02-0003: Adopting and prescribing the policy for the competitive selection process in the Philippines in the procurement by the distribution utilities of the power supply agreement for the captive market. Link.

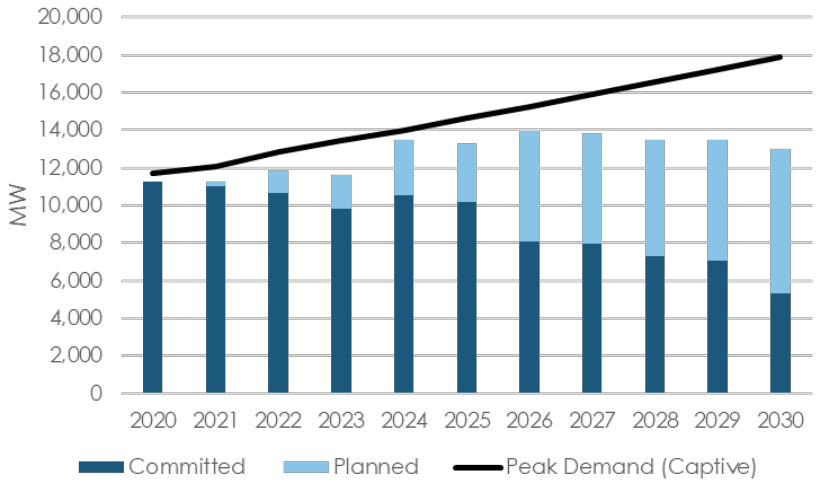
[36] Department of Energy (2023): Distribution Development Plan, 2021-2030. Link.

[37] Republic of the Philippines (2001): Republic Act No. 9136: Electric Power Industry Reform Act of 2001. Link.

[38] Department of Energy (2021): Department Circular No. DC2021-03-0003: Prescribing the policy and guidelines for the formulation of the distribution utilities distribution development plan integrating the relevant laws, policy issuances, rules and regulations. Link.

However, this circular does not offer any guidance on how DUs should balance these requirements when they are in conflict, which is likely to often be the case for market participants with a small portfolio.

Figure 13 Summary of Power Supply Procurement Plans (PSPPs) submitted by DUs



Source: Department of Energy: Distribution Development Plan, 2021-2030

These challenges are unavoidable at a system level with the integration of more intermittent generation. However, pushing these risks down to individual DUs (and especially to very small DUs) may likely create inefficiencies that result in higher prices for end consumers.

Even in more advanced power markets, it is unusual for smaller market participants – such as the smaller DUs and cooperatives in the Philippines – to be exposed to these risks. For example:

- In Singapore's electricity market, which is also a mandatory gross pool, most bilateral contracts are financial, rather than physical, with most physical volumes being traded directly through the pool. Small retailers do not therefore contract directly with generators to procure their power.
- Even in bilateral contracts markets, such as the UK, very small retailers will typically not sign long-term PPAs with generation companies. In many cases, small retailers will work with a wholesale energy trader, who will provide market access for the retailer, and will manage market risk across a much larger portfolio.

Regardless of the above challenges, it would be difficult for most DUs to procure renewable energy capacity directly while complying with price ceiling regulations enacted through the GEA Guidelines. Section 14 of the GEA Guidelines[39] notes that the marginal price secured through GEA "per technology shall serve as the price ceiling for the power supply agreement of a DU undertaking a CSP for its compliance under the RPS."

It seems likely that prices would be higher for projects contracting directly with small DUs, partly because the project size would likely be much smaller in many cases, but also because of perceived counterparty risk. It is understood from discussions with DUs that even larger DUs have struggled to generate interest in renewable energy CSPs. Project developers have suggested to the DUs that they would prefer to simply compete in the GEA.

The GEA's opt-in mechanism can be viewed as an attempt to address these challenges. Rule 4 in the GEA Guidelines defines an opt-in mechanism to meet DU supply and RPS compliance

[39] Department of Energy (2021): Department Circular No. DC2021-11-0036 providing the revised guidelines for the Green Energy Auction Program in the Philippines. Link.

requirements.[40] The Guidelines require DOE to develop the detailed design of the mechanism, but set out the general principles:

- Opted-in DUs would sign a contract to procure power at the "offer price or blended offer price of the winning bidders".
- The costs associated with this power would then no longer need to be recovered through FIT-all charges to all end consumers.

DOE has been working to develop the detailed design of the opt-in mechanism, but many design questions remain. Most recently, in August 2023, DOE consulted on a draft circular relating to the opt-in mechanism.[41] While this draft circular provides further detail on the process for opting in, it leaves many questions regarding the commercial arrangements for the mechanism unanswered. For example:

- It is noted that the Opt-In Participation Agreement (OPA) between an opted-in DU and TransCo will contain a start and end date, but no guidance is provided on the term of these agreements. It is unclear whether this will be required to mirror the term of underlying REPAs or whether DUs will be able to specify a term to meet their specific compliance requirements.
- Because the OPA is a transaction of physical power, the challenges associated with WESM exposure highlighted above remain an issue.
- If the output from GEA plants is curtailed, it is unclear whether this results in RPS compliance risk for opted-in DUs. This is a risk that is outside the control of DUs; arguably they should receive 'deemed' Renewable Energy Certificates (RECs) for RPS compliance in this instance.

Consolidating smaller DUs' RPS compliance requirements could help to overcome these challenges. Several options exist for implementation of this recommendation:

- **Supplier obligation.** RPS could be implemented in a centralised or decentralised manner.

    1. A centralised approach would allow the RPS to be achieved at a system level, with payment of the FIT-All charge being deemed to demonstrate compliance with the RPS. The opt-in mechanism could be removed, with the FIT-All charge becoming the default cost recovery mechanism to fund renewable energy procurement. The result would be aligned with many other markets where the costs of renewable energy procurement need to be recovered across multiple energy retailers. For example, in the UK the cost of remunerating renewable energy plants through Contracts for Difference is funded through a CfD Supplier Obligation Levy,[42] which all electricity suppliers pay. This approach is also arguably most consistent with the original design of the FIT-All charge as a uniform charge to all grid-connected consumers. In this scenario, the RPS would be the main driver for GEA target volumes, ensuring that mandated participants collectively comply with the RPS. This would need regulatory amendments to the GEA Guidelines, FIT-All Guidelines, and the Rules and Guidelines for RPS.

        A variation to this approach would be to allow mandated participants to reduce their exposure to the FIT-All charge if they procure renewable energy directly. This may however result in FIT-All rates increasing for small DUs and ECs in rural areas who are unable to procure renewable energy directly.

    2. An alternative, decentralised approach would be to reform RPS. Under this approach mandated participants would still be required to individually comply

[40] Ibid.

[41] Department of Energy (2023): Draft department circular. Prescribing the guidelines for the opt-in mechanism under green energy auction program in the Philippines. Link.

[42] Low Carbon Contracts Company (accessed 22nd December 2023): About the CfD scheme. Link.

with the RPS. However, to ease compliance, certificates would be traded separately over the RE market. Implementation of the REM is proceeding slowly, largely because it is unclear how REC prices will be determined. However, operating in parallel with GEA, even a reformed RPS would be problematic. The existence of multiple revenue streams targeting the same (renewable energy) attributes would arguably be unnecessarily complex and would likely interact with the prices in GEA.

- **Aggregation.** A commercial aggregator could be created to manage RPS compliance across multiple DUs. The volume risks associated with managing a portfolio of intermittent energy supply remain, but scale and diversity mean that these risks can be managed more efficiently. This could cover all DUs, or all DUs below some size threshold (although an arbitrary size threshold risks gaming and the potential for unintended consequences). The aggregation could be voluntary or mandatory. It is understood that in principle a Retail Electricity Supplier could be created to take on this aggregation role. The aggregator would then charge the equivalent of a supplier obligation fee to DUs participating in the aggregation arrangement. A similar arrangement could in theory be applied to participation in the wholesale market. This could be beneficial to the customers of smaller DUs but is outside the scope of this report.
- **Consolidation.** Taking this one step further, in the medium term there might be a case for consolidation of DUs as there are many very small DUs in the Philippines. This could yield some of the same benefits as using a commercial aggregator but might take longer to implement.

RECOMMENDATION: Facilitating RPS compliance

A solution is urgently required from DOE to ensure that DUs can comply with their RPS obligations. As noted above, the RPS is in many ways redundant if auctions are to be run regularly, with auction volumes determined such that the Philippines meets its renewable energy targets. The simplest way to reconcile these mechanisms would be for payment of the FIT-All charge to more closely mirror a supplier obligation, with payment of the charge being declared (e.g., via a DOE circular) to result in RPS compliance. The following regulatory amendments would be required to implement this change:

1. In the GEA Guidelines,[43] Section 10, which refers to the opt-in mechanism, would be removed.
2. Also in the GEA Guidelines,[44] Section 15, which refers to the distribution of RECs to Mandated Participants paying the FIT-All levy, would need to be amended to state:

"The volume of RE procured through GEA pursuant to Section 6.2 shall be guided by the amount of RE required to achieve compliance with the RPS requirements set out in DC2022-09-0030. Therefore, payment of the FIT-All charge by Mandated Participants shall be deemed to result in compliance with RPS. For avoidance of doubt, no further evidence shall be required from Mandated Participants to certify such compliance."

3. The FIT-All Guidelines, ERC Resolution No. 24 of 2013,[45] which define the methodology used to set the amount of the FIT-All levy, could also be amended to include a statement to clarify that payment of FIT-All results in RPS compliance.
4. The Rules and Guidelines for RPS[46] could be greatly simplified. This is likely to be the most substantial change, but a simplification. This regulation would need to confirm that RPS

[43] Department of Energy (2021): Department Circular No. DC2021-11-0036 providing the revised guidelines for the Green Energy Auction Program in the Philippines. Link.

[44] Ibid.

[45] Energy Regulatory Commission (2013): Resolution No. 24, series of 2013: a resolution adopting the guidelines on the collection of the feed-in tariff allowance (FIT-All) and the disbursement of the FIT-All fund. Link.

[46] Department of Energy (2017): Department Circular No. DC2017-12-0015 promulgating the rules and guidelines governing the establishment of the renewable portfolio standards for on-grid areas. Link.

volumes will be procured through the GEA and that GEA volumes will therefore be determined with reference to RPS. The regulation would also note that Mandated Participants are required to pay the FIT-All levy, *pro rata* according to their share of end user demand, and that payment of the levy shall be deemed to amount to compliance with the RPS.

A FIT-All charge has been designed to recover the cost of FIT and GEA projects. The FIT-All Guidelines of 2013[47] define the FIT-All charge, which was originally intended as a uniform charge to recover FIT-related costs and, going forward, will also act as a vehicle for recovery of GEA-related costs. As was previous summarised in Figure 7, the FIT-All charge is designed to ensure that any shortfall between total FIT revenues to be paid to renewable energy generators and cost recovery achieved through selling electricity from eligible generators at the market price in the WESM.

The calculation methodology for the FIT-All charge resulted in it being suspended. Application of the FIT-All charge was suspended multiple times through 2022 and 2023. The suspension was extended by ERC in August 2023[48] "until…the FIT-All fund available shall be deemed insufficient to cover the monthly fund requirements. The primary reason given by ERC for the continued suspension is the healthy level of the FIT-All fund, meaning that no additional funds would be required from consumers over the following months.

This extended period during which the FIT-All charge was suspended has now ended. In January 2024, ERC issued a resolution[49] declaring that the FIT-All charge should be applied again from February 2024 as ERC expected the fund to be deleted during this time.

The surplus in the FIT-All fund had built up because of climbing WESM prices. The FIT-All charge is calculated annually with reference to a forecast cost recovery rate. This is defined as "the average…WESM [price] for the Luzon and Visayas grid for the 36 months immediately preceding the filing of the [FIT-All] application." The charge is therefore set based on historical power prices, rather than based on expected prices. The impact of this formulation on the calculation of the FIT-All charge is illustrated in Figure 14. The FIT-All charge calculation for 2023[50] was based on WESM prices over the 36 month period from April 2019 to April 2022. As shown in Figure 14, WESM prices during this period were much lower that prices today. The FIT-All charge calculation therefore underestimated the cost recovery that would be achieved through WESM, resulting in over-recovery in the FIT-All fund.

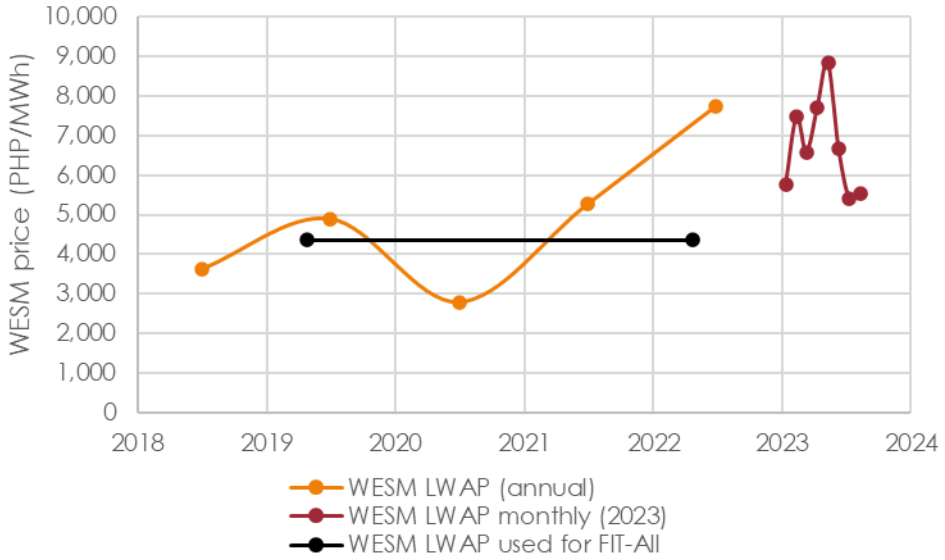
[47] Energy Regulatory Commission (2013): Resolution No. 24, series of 2013: a resolution adopting the guidelines on the collection of the feed-in tariff allowance (FIT-All) and the disbursement of the FIT-All fund. Link.

[48] Energy Regulatory Commission (2023): Resolution No. 11, series of 2023: a resolution adopting the extension of suspension of the collection of feed-in tariff allowance (FIT-All). Link.

[49] Energy Regulatory Commission (2024): Resolution No. 1, series of 2024: a resolution adopting the lifting of suspension of the collection of feed-in tariff allowance (FIT-All). Link.

[50] Energy Regulatory Commission (2022): ERC Case No. 2022-051 RC: In the matter of the application for approval of the feed-in tariff allowance for calendar year 2023 pursuant to the guidelines for the collection of the feed-in tariff allowance and disbursement of the feed-in tariff allowance fund. Link.

Figure 14 Impact of WESM price increase on the FIT-All charge calculation for 2023



Source: Kuungana analysis of IEMOP data

There is a risk that in future, if wholesale prices decrease, that the FIT-All charge results in under-recovery of costs. For example, if the FIT-All charge were to be calculated based on a WESM price of 6,000 PHP/MWh and outturn prices were in fact 4,000 PHP/MWh, there could be a cost recovery deficit of 2,000 PHP/MWh. If 5 GW of solar PV with an average capacity factor of 20% (generating 8.8 TWh per year) were being remunerated through the FIT-All fund, this would result in an annual deficit of PHP 17.5 bn.

Because the FIT-All charge is a function of the WESM price, this risk cannot be avoided. However, in a situation like now, where there is a clear disconnect between historical prices and the current price environment, the methodology defined in the FIT-All guidelines results in a systematic, long-lasting, and predictable error. Calculating the FIT-All charge using a forward-looking WESM price would at least mean that any over or under recovery is the result of movements in the WESM price following the setting of the FIT-All charge. Similar mechanisms are already used in other jurisdictions. For example, the Supplier Obligation Levy for the UK's Contracts for Difference mechanism is calculated using a forecast of wholesale prices over the period to which the levy relates.[51]

Safety mechanisms exist in the FIT-All mechanism that should ensure cost-recovery in most cases. A working capital allowance (WCA) is established by the FIT-All guidelines. In the most recent FIT-All charge decisions, the funding of the WCA has been set to target a fund balance of ~10% of total annual FIT revenues. Further, the FIT-All guidelines state that if the WCA falls outside of 50-150% of its value at the start of the year, an application can be submitted to adjust the FIT-All charge. However, this can take a further 90 days to be approved. While these mechanisms provide some safeguards, they may be insufficient for some investors. Specifically:

- Using a backward-looking methodology to calculate future FIT-All charges will mean that such mechanisms are relied on and tested more frequently than would ideally be the case. Ideally, safeguard mechanisms should only be tested in exceptional market conditions.
- Arguably, if the mechanisms are well defined and do not require the application of judgement, they should apply automatically and should not require an additional round of regulatory approval. ERC should be reassured that a situation where a sudden

[51] Low Carbon Contracts Company (accessed 22nd December 2023): Interim Levy Rate and Total Reserve Amount dashboard. Link.

upward adjustment in the FIT-All charge is required is likely to be accompanied by rapid falls in WESM prices, meaning that total consumer bills are likely to be falling, rather than rising. Indeed, this illustrates the stabilising impact that renewable energy capacity could have on consumer bills in the long-term.

RECOMMENDATION: Recovering costs through the FIT-All charge

It is recommended that ERC amends the approved calculation methodology for the forecast cost recovery from WESM for input to the FIT-All charges, so that it uses a forecast / forward-looking WESM price, rather than historical prices. It is acknowledged that such an approach was considered when the FIT-All Guidelines were developed, and that this was rejected in favour of the backward-looking methodology, partly to avoid the risk of lengthy debates over forecasting methodologies. While these concerns are understood, it is noted that such challenges have been overcome in other markets. It is also noted that the development of markets for forward contracts and/or futures could improve forward-looking price discovery in WESM, making such a transition less contentious.

3.4.4. Land and transmission barriers to renewable energy development

Projects face significant challenges in securing land and the necessary permits for developing a project. Acquiring land and securing the associated permits for RE projects, particularly for solar and wind projects, is a difficult and costly process. Aside from the high cost of purchasing land for the RE facility, developers must secure rights-of-way for associated transmission connection infrastructure, and in most cases, there is a need to convert agricultural land to industrial land. Land conversion requires developers to file applications with the Department of Agrarian Reform (DAR).

In a survey conducted for ETP in January 2023 (by RELP, formerly Greenmap),[52] land access and conversion permit issues were identified by stakeholders as the top risks for firms participating in the GEA. The Energy Virtual One Stop Shop (EVOSS), established by law in 2018,[53] was intended to address this issue, but in practice it is understood that this has not expedited land acquisition or conversion. The EVOSS Act requires DAR to respond to applications on land use conversion within a maximum of 75 days. However, while the Act does impose penalties in the case of non-compliance with some provisions of the Act, these do not appear to cover compliance by DAR. Continued delays experienced by developers suggest that it might be necessary for DOE and/or EVOSS to take a more hands-on role in supporting GEA winners regarding land acquisition. This could include liaising with DAR and other government agencies on behalf of the GEA winner to follow-up applications and facilitate the release of permits.

RECOMMENDATION: Cross-agency coordination to accelerate land conversion and permitting

Further action is required to accelerate processes that project developers must navigate for their projects to be ready to implement. This is especially true for land conversion. EVOSS and/or DOE should coordinate with DAR to tackle bottlenecks and to accelerate the land conversion process overseen by DAR.

There are also challenges and significant delays in securing the required grid capacity. Achieving the government's RE targets will require the construction of new transmission lines to connect RE facilities to the grid. However, several issues have been identified which are causing difficulties for RE plants to secure connection to the transmission grid. Often cited by private developers is the backlog at the National Grid Company of the Philippines (NGCP) for system impact studies (SIS) on planned/committed RE facilities. At the time of writing, in December 2023, NGCP's website suggests that there are no available slots for the completion

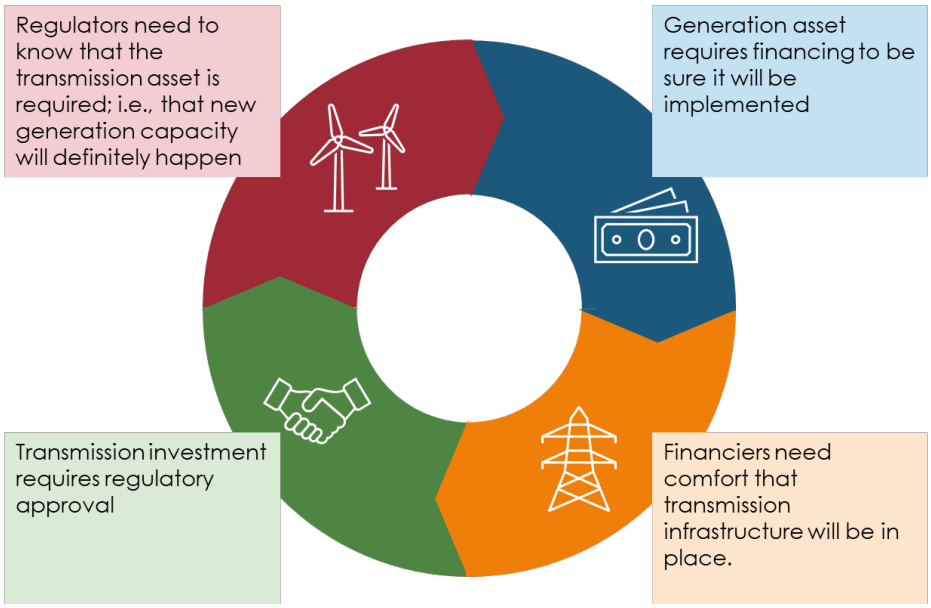
[52] Greenmap (2022): The Philippines Green Energy Auction Program Survey 2022: Report of results and conclusions.

[53] Republic of the Philippines (2018): Republic Act No. 11234: an Act establishing the energy virtual one-stop shop for the purpose of streamlining the permitting process of power generation, transmission, and distribution projects. Link.

of a SIS until at least June to August of 2024.[54] It is understood that NGCP is increasing its resourcing of the department that completes SISs, and that ERC is also working on guidelines for the accreditation of suppliers that NGCP could outsource some of this work to.

'Deeper' reinforcements of the transmission network are also required. This sometimes acts as a constraint on RE development: NGCP's capex for such reinforcements requires regulatory approval through the annual Transmission Development Plan (TDP). This leads to a vicious cycle which hampers RE development: RE developers require financing, but financing would not be available until transmission access is assured; but transmission lines could not be approved until the need for a new line is clear. This cycle is illustrated in Figure 15, which is adapted from the NGCP's Transmission Development Plan.[55]

Figure 15 Schematic illustrating the 'circular dilemma' in advancing transmission investment to support the integration of renewable energy



Source: Adapted from schematic by National Grid Corporation of the Philippines (NGCP)

Part of the challenge in transmission planning results from deviations from established industry processes. NGCP's Maximum Allowable Revenues were last set for the period 2011-2015. The allowable revenue for the subsequent 5 year regulatory period (referred to as the 4th regulatory period), 2016-2020, was never agreed. Because of the time that has lapsed, ERC issued revised rules for NGCP's cost recovery,[56] whereby the 4th regulatory period was extended to the end of 2022 and ERC resolved that a new application would be submitted by NGCP to allow a reset. It is understood that NGCP has recently filed a submission to ERC covering the 5th regulatory period of 2023-2028. While hearings remain ongoing, a successful conclusion of this process would represent an important step back towards ex ante regulation of transmission. This alone may help to normalise the process for approving transmission investments.

RECOMMENDATION: Normalise approval of NGCP allowed revenues

Efforts to revert to a 5 year ex ante approval of NGCP's maximum allowed revenues, which are already underway, should be expedited. This will require close coordination between ERC and NGCP. Further measures are likely to be necessary to unlock the investment in the

[54] National Grid Company of the Philippines (accessed 22nd December 2023): System Impact Studies (SIS) Queuing Information. Link.

[55] National Grid Company of the Philippines (2023): Transmission Development Plan 2022-2040. Link.

[56] Energy Regulatory Commission (2022): Resolution No. 08, Series of 2022. A resolution adopting the amended rules for setting transmission wheeling rates (Amended RTWR). Link.

transmission infrastructure that will be required to accommodate large volumes of renewable energy. However, re-establishing this regulatory process would be an important first step.

DOE has sought technical assistance on grid planning for competitive renewable energy zones (CREZ). CREZ areas have been identified where there is a high concentration of RE resource and where there are many RE developers active (as can be gauged by the number of RE service/operating contracts issued by the DOE). The aim is for the CREZ process to be used to justify investments in transmission upgrades that would spur large-scale RE development. However, this remains at an early stage. To accelerate the regulatory process, the CREZ zones will need to be integrated into the transmission development plan (TDP) and clear criteria set that ERC would use for approving additional transmission investments.

Ahead of reinforcements being completed, flexible connection agreements could be introduced by NGCP. In many cases, network constraints may only be an issue during a small number of hours. Grid access problems could be alleviated if connection agreements were to allow a small amount of curtailment during these hours (i.e., not offering a fully 'firm' connection). There are many different forms that such agreements can take,[57] for example:

- The availability of capacity can be limited temporarily.
- Capacity is made available on a fully flexible basis, i.e., system users only have access to the grid to the extent that capacity can be made available by the network operator.
- Firm capacity is made available but only during certain time windows (e.g., months, days, hours).
- Connection capacity can be shared between groups of system users.
- Import and export limits can vary dynamically over time, depending on system conditions.
- Use-it-or-lose-it (UIOLI) provisions can be included in firm connection agreements whereby firm capacity is revised downwards under certain circumstances to maximise efficiency across the system.

The above tools can also be combined.

SUMMARY RECOMMENDATION: Consider using alternative connection agreements

Alternative connection agreements could be worth further investigation in areas where renewable energy capacity could be connected but may face temporary operating constraints while transmission infrastructure is being reinforced. Such agreements would need to be implemented by NGCP but would also likely require regulatory approval from ERC.

3.5. Prioritisation and summary roadmap

Ensuring that GEA-1 and GEA-2 projects can progress according to the original tender timelines should be a priority. If projects that were successful in the GEA-1 and GEA-2 auctions are not implemented or if they are delayed, this could undermine confidence in the GEA mechanism, both from investors already engaged in the market and from potential new investors. Ensuring that these projects can be successfully implemented should therefore be DOE's top priority. DOE should communicate frequently with developers so that any bottlenecks identified can be addressed in a timely manner. Ensuring that a REPA that is acceptable to developers is approved and ready to be implemented is likely to be a top priority, along with expediting the completion of System Impact Studies (SIS) in cases where these have not been completed. Further detail regarding both recommendations is presented below.

[57] Council of European Energy Regulators (2023): CEER paper on alternative connection agreements. Link.

Implementing mechanisms to facilitate DU compliance with the RPS should also be a priority. As described in Section 3.4.3, the ability to comply with the requirements of the RPS is a major concern. The opt-in mechanism is intended to provide a solution, allowing DUs to leverage renewable energy capacity procured through the GEA to meet their RPS requirement. As noted in Section 3.4.3, it is recommended that this mechanism becomes the default option, with payment of the FIT-all mechanism (a) spreading the cost associated with paying renewable energy projects across all DUs, and (b) being treated as a means by which DUs can comply with the RPS.

Additional resource should be made available to expedite SISs for connections to the transmission system. As noted in Section 3.4.4, delays in securing a SIS have been frequently raised as a concern by developers. It is understood that NGCP is already allocating additional resource to try to clear the backlog and that ERC is developing guidelines to allow NGCP to outsource some of this work, making more resource available. NGCP and ERC should work together to ensure that the existing backlog of SISs can be cleared and to ensure that this activity is properly funded and resourced so that backlogs do not develop in the future.

In parallel, a clear plan for future GEA rounds should be developed and communicated to the market. As noted in Section 3.4.1, the volumes procured through the GEA should be more clearly connected to the government's renewable energy policy, and especially to the targets defined in the NREP. The volumes set for GEA-2 were far higher than was necessary to meet the NREP targets, as illustrated by Figure 10, which may have resulted in reduced competition in the auction than would otherwise have been the case. With clear renewable energy targets defined, DOE should be able to set out a clear timetable for future GEA rounds, at least for the next few years, which would allow investors to deploy capital into the development of projects that might compete in future auctions.

A full review of the REPA should also be carried out for future GEA rounds, with the aim of increasing participation from a wider range of investors. As discussed in Section 3.4.2, risk allocation in the existing REPA template is unlikely to be considered bankable by most international developers of renewable energy projects. Most notably, the lack of protection against any curtailment risk is likely to be problematic. Further detail on the issues that might need to be addressed by an updated REPA is contained in Section 3.4.2, but the recommended changes can be summarised as follows:

- The risk allocation defined by the REPA should wherever possible be aligned with international norms. This would include providing at least some protection against curtailment risks outside of the project's control.
- The REPA currently contains many less terms than most PPAs for comparable renewable energy projects, with many cross-references to department circulars and other regulatory instruments. While these references may be valid, a longer form agreement with clear and full definition of the intended risk allocation might reduce the potential for ambiguity.
- The timing for signing of the REPA should also ideally be brought forward. Most international banks would likely require the REPA to be signed and in place for debt to be made available on a project finance basis.

Subsequently, longer-term challenges can be tackled. Other recommendations that have been presented in this section include changes to the calculation of the FIT-All charge (Section 3.4.3), acceleration of land conversion processes, and ensuring that reinforcements to the wider transmission system (beyond the immediate connection infrastructure covered by the SIS) can be funded and implemented (both covered in Section 3.4.4). While these recommendations are likely to be important in reaching the ambitious goals set out in the NREP, they are lower priority than the actions set out above.

Table 7 Summary of recommendations and their prioritisation, Philippines

Recommendation	Responsible party	Timing
Ensure that GEA-1 and GEA-2 projects can proceed on a timely basis, potentially accelerating actions listed below where necessary.	DOE with support from other sector stakeholders	Immediate
Ensure that RPS compliance is feasible. This is likely to require either a rationalisation of the RPS (e.g., achieving compliance through centralised auctions such as GEA), or successful implementation of the Renewable Energy Market (REM).	DOE	Immediate
Additional resource should be recruited to ensure that SISs for new transmission connections can be completed on a timely basis.	NGCP/ERC	Immediate
Publish a timetable and plans for future renewable energy auctions, articulating the technologies and quantities to be procured together with the auction timing where possible.	DOE	Medium-term
Refine the risk allocation in the REPA template, especially for curtailment.	ERC	Medium-term
Address potential gaps in the REPA; consider drafting a longer-form agreements.	ERC	Medium-term
Refine the process for obtaining a REPA, potentially signing REPAs earlier in the development process, ahead of project financial close.	DOE/ERC	Medium-term
Ensure GEAR prices are set at an appropriate level for future GEA rounds.	ERC	Medium-term
Normalise approval of NGCP allowed revenues so that this takes place on an ex ante 5-year cycle.	NGCP/ERC	Long-term
Consider the use of flexible connection agreements to accelerate connections to the transmission system.	NGCP/ERC	Long-term
Coordinate cross-agency to expedite land conversions where required.	DOE/DAR	Long-term
Consider amending FIT-All charge calculation to use forward looking expected wholesale power prices.	ERC	Long-term

4. Conclusions and common themes

There are several common themes – and common recommendations – in the analysis of renewable energy procurement in Indonesia, the Philippines, and Vietnam presented in the full report. While the roadmap recommendations presented in Sections 3 of the report are tailored to the circumstances in the Philippines, and there are challenges that are unique to each country, there are also common themes evident in the analysis, which are summarised below.

4.1. Planning for renewable energy

While the status of renewable energy procurement varies between Indonesia, the Philippines, and Vietnam, all three countries lack a clearly defined procurement pipeline. All three countries do have sector plans and/or renewable energy targets that provide an indication of how much capacity will be procured over the medium to long-term, but in each case, there are factors that mean it is difficult for developers to clearly understand the procurement pipeline:

- In Indonesia, there has been a persistent disconnect between published power sector plans (such as the RUPTL) and implementation. Many projects that are shown as being 'committed' in the RUPTL and other plans have not been implemented. This means that the plans do not provide a useful signal to investors on what procurements are likely to take place over a given planning period.
- In the Philippines, as explained in Section 3.4.1, renewable energy auctions have set very ambitious procurement targets. In the second auction round, GEA-2, the amount of capacity secured was far less than the target set for that auction. As shown in Section 3.4.2, GEA-2 attempted to procure far more capacity than was required to meet the renewable energy target set by the Philippines in its NREP (National Renewable Energy Plan). The amount targeted by GEA-2 could have been procured over several smaller auctions through the 2020s, increasing competition between developers. DOE has been clear that it intends to run further auctions but has not published any guidance that would help developers to understand when additional capacity might be procured.
- In Vietnam, the challenge for developers trying to understand when future procurement might take place is more fundamental. Although the government has announced its intention that future procurement of renewable energy uses competitive processes, there are many areas where laws and regulations will need to be updated for this to be possible. This means that while investors can see ambitious renewable energy targets in Vietnam's latest power sector plan, PDP8, it is unclear how or when the capacity required to meet these targets will be procured.

Where possible, procuring agencies should issue clear messaging regarding the timing and size of future procurement rounds for different technologies. Each country has some of the required ingredients in place; specifically, each has a published power sector plan, or a separate renewable energy plan that provides an indication of how much renewable energy generation capacity is required. However, in none of the three countries is there a clear connection between these plans or targets and the timings of the competitive procurement events and the volumes procured through those events. The following are required for investors in the sector to have clear visibility of future procurement events that they might participate in:

- **Credible power sector plans and/or renewable energy targets.** In countries where current plans appear to lack credibility, these should be updated so that investors can have the confidence to rely on published plans.
- **Clear communication on procurement timelines to implement power sector plans.** The exact timelines for auctions and the exact quantities to be procured are likely to evolve

over time, but clear communication on the frequency of auctions would help investors to understand the timing and quantity of the market opportunity. For example, if an investor knows that a given quantity, x, of wind or solar capacity is to be procured over a series of y auctions, it can in very simple terms estimate the like opportunity at each procurement event as $^{x}/_{y}$, unless the procuring entity provides alternative guidance. None of the three countries analysed in this report currently provide guidance to the market that would help investors to better understand the market opportunity in this way.

4.2. Securing land and electricity network connections

Ministries responsible for energy should coordinate closely with other ministries to tackle barriers relating to other aspects of the planning process. In addition to ensuring the power sector plans are credible and that the link between such plans and the procurement of renewable energy is clear, government ministries responsible for the energy sector should consider the role that they and other energy sector institutions play in tackling other planning considerations. In all three countries, developers have experienced challenges in securing land rights and in securing the transmission capacity that they need for their projects. Improving planning processes to tackle these issues is likely to take time but will be important to be able to scale the renewable energy sector to deliver the quantities of new capacity required for the energy transition.

Securing land rights can be complex in all three countries. The best sites for wind and solar projects are frequently far from large population centres and located in rural areas. In many rural areas, land ownership can be unclear and fragmented, and it can be difficult to convert the land use for sites currently used for agriculture. In Indonesia, the lack of a single land registry database can mean that it is complex to secure the land rights required to implement a given project. In the Philippines, conversion of agricultural land to industrial land requires the permission of the Department of Agrarian Reform (DAR), which has resulted in delays for some projects. In Vietnam, all land is owned by the state, and the pricing of land use rights is heavily regulated. In practice, this can act as a barrier to being able to acquire the land use rights required to implement a land intensive renewable energy project. Streamlining processes to secure land use rights is likely to be a medium to long term challenge. Ministries responsible for energy policy should work closely with other ministries and government agencies to address the bottlenecks identified in this report.

Securing access to the transmission system can also be a challenge for renewable energy projects. In the Philippines, project developers have experienced delays in securing a System Impact Study (SIS) (see Section 3.4.4), which is a pre-requisite for connecting to the transmission system. Delays in transmission network reinforcement have also resulted in curtailment of renewable energy projects that have been built. This has affected developers in both the Philippines and in Vietnam, where PPAs do not provide any protection against curtailment. Delays in transmission infrastructure, which are outside of the project's control, can therefore result in financial loss. These issues are less apparent in Indonesia; not because there is less need for investment in transmission infrastructure, but because projects are procured for specific locations, meaning that PLN can pre-select a substation that has sufficient capacity available to accommodate new generation capacity. This is a useful mechanism for navigating constraints in the short-term, but it may be difficult to scale to meet ambitious renewable energy targets.

Transmission constraints are not unique to the region; the challenge of providing a firm connection to all new renewable energy projects is a major issue even in liberalised energy markets, where the queue to secure a connection can be measured in years. In the UK, the connection queue has grown to 400 GW, with some projects now being offered connection

dates as late as 2037.[58] There are several mechanisms that have been used internationally to manage the challenges in upgrading transmission systems, which may be relevant in future as regional power systems evolve:

- **Connection queuing.** Connection queues can help provide information to system operators regarding the demand for new transmission capacity, while aiming to allocate capacity between system users. However, such a system needs to be designed and managed carefully; for example, trying to avoid the risk of available transmission capacity being 'blocked' by projects that are unlikely to proceed soon. Formalised queuing systems may be required in all three countries to scale up the role of renewables but are unlikely to be an immediate priority in the countries covered by the report.
- **Flexible connections.** In areas of the grid where connection capacity is available, but cannot be guaranteed 100% of the time, flexible or non-firm connection agreements can be developed. This may be appropriate in areas where grid constraints are expected during a small number of hours, e.g., in very high wind or solar hours. There are many different forms that flexible connection agreements can take,[59] but typically these agreements will allow for some curtailment of energy output from a plant (e.g., up to some pre-defined cap). Because the PPAs currently in use in the Philippines and Vietnam allow for curtailment without compensation already, such connection arrangements are unlikely to be immediately applicable in these markets, but they may be a useful tool if PPA templates are amended in future.
- **Accelerating approval of strategic projects.** Energy sector regulators in all markets must strike a difficult balance between enabling (i.e., approving) the investment in electricity networks that is required to connect new generation capacity and enable the energy transition, while also protecting consumers by only approving projects that benefit consumers over the long-term. This is particularly difficult during a rapid transformation of the energy system. Some regulators have lowered the requirements for the approval of strategically important transmission investments with the aim of trying to accelerate those projects. In the UK, Ofgem's Accelerated Strategic Transmission Investment (ASTI) mechanism is an example of this.[60]
- **Tendering for transmission development in selected areas.** Competition can be used, with tendering of certain pre-defined transmission projects. For example, New South Wales in Australia is introducing a mechanism where transmission projects in identified renewable energy zones will be awarded through a competitive tender process.
- **Locational price signals.** In liberalised power sectors, locational pricing can be used to calibrate the relative attractiveness of different locations for project developers. This already exists to some extent in the Philippines, which has a nodal wholesale electricity market. In some countries, locational use of system charges are incurred by generators.

4.3. Risk allocation

PPAs used for renewable energy projects across all three countries contain clauses that are not aligned with international norms. Issues relating to the PPAs used for renewable energy projects in Indonesia, the Philippines (Section 3.4.2), and in Vietnam have been identified and analysed.

Projects in the Philippines and in Vietnam do not benefit from any protection against curtailment risk. Banks typically require at least some protection to curtailment that is outside the control of a project, because without this the theoretical downside that a project is

[58] Ofgem (2023): Connection and Use of System Code (CUSC) CMP376: Inclusion of Queue Management process within the CUSC, Final Decision. Link.

[59] Council of European Energy Regulators (2023): CEER paper on alternative connection agreements. Link.

[60] Ofgem (2022): Decision on accelerating onshore electricity transmission investment. Link.

exposed to is unlimited. As mentioned above in Section 4.1, renewable energy projects in both the Philippines and in Vietnam have experienced revenue losses because of curtailment. It is possible that this experience impacts the bankability of future projects.

In Indonesia, although PPAs provide some protection against curtailment risk, projects are exposed to volume risk in other ways. The PPAs for projects in Indonesia have often restricted the revenues that a project can earn in a year with above average wind or solar resource. Similar terms are prescribed by a draft PPA regulation being developed by MEMR. This introduces asymmetry to the volume risk for renewable energy projects, as the projects remain exposed to lower revenues in years with below average wind or solar resource. This in turn increases the price that developers will need to charge to achieve a given return requirement.

PPAs in the region are also non-standard in other ways. For example, in Indonesia PPA terms relating to dispute resolution and arbitration have often been problematic for investors, with PLN requiring Jakarta to be the seat of arbitration, rather than an arbitration venue that is more likely to be widely accepted, such as Singapore. In the Philippines and Vietnam, published PPA templates do not include the level of detail seen in many other PPAs. This sometimes indicates gaps that would typically be covered by a PPA and that international investors would typically require to be covered; for example, the consequences (i.e., compensation) of termination. In other cases (especially in the Philippines) the PPA template signposts to supporting regulations for detail. This potentially increases the risk that PPA terms can change and increases the risk that the internal consistency of the contract is compromised.

4.4. Attracting a deep pool of capital

Non-standard commercial terms may increase the cost of capital both directly and indirectly, by restricting availability. Terms that are not aligned with international norms, as highlighted above in Section 4.3, are likely to (a) increase project risk and the returns required by both equity and debt investors, and (b) reduce the number of investors and lenders willing to deploy capital in a country's renewable energy sector. A reduction in the number of investors participating in a market is likely to result in less competition and higher prices. Many international investors can choose to deploy capital in wide range of markets and may be less likely to deploy capital in a market where the commercial terms depart materially from international norms.

An impressive amount of capital has been deployed to fund renewable energy projects in the region, mostly from local and regional sources. As noted in the previous country-specific chapters, investors have already funded many renewable energy projects in the region. For example, in Vietnam 18.5 GW of solar capacity was commissioned over a five-year period from 2017 to 2022. However, much of the capital mobilised, especially in Vietnam and in the Philippines, is from local and regional companies, conglomerates, and banks. This mobilisation of local capital is a good thing and should be celebrated. However, the absence or minor role of international investors and especially international banks providing project finance does suggest that such investors have been unwilling to deploy capital under the terms currently on offer. The risk appetite of these investors is generally informed by accumulated experience; it is possible that as local investors suffer losses because of risk allocation that is not aligned with international norms (for example, when their projects' output is curtailed), their risk appetite will also diminish.

Given the large volumes of capital required to finance the energy transition, other sources of capital are likely to be required. Indonesia, the Philippines, and Vietnam all have electricity sector plans that include ambitious plans for rapidly scaling up the role of renewable energy on their electricity system over the next few years. This will require the rapid mobilisation of capital. While domestic sources of finance have been successful in delivering much of the growth in renewables to date, the scale of the transformation required is likely to require capital from a wider range of sources, including international investors. Over time, attracting a wider range of investors is also likely to deliver price benefits by increasing competition.

Appendix A. Stakeholders engaged in completing this report

Organisation	Type of stakeholder	Type of engagement
Philippines		
DOE	Policymaker	Bilateral meetings and workshop
ERC	Regulator	Bilateral meetings and workshop
NGCP	Transmission utility	Bilateral meeting and workshop
BATELEC I	Distribution utility	Workshop
Clark Energy Distribution Corporation	Distribution utility	Workshop
Meralco	Distribution utility	Bilateral meeting and workshop
PENELCO	Distribution utility	Workshop
QUEZELCO I	Distribution utility	Workshop
TransCo	Sector agency	Bilateral meeting and workshop
PEMC	Sector agency	Bilateral meeting and workshop
IEMOP	Market operator	Workshop
FDC Utilities	IPP	Bilateral meeting
ACEN	IPP	Bilateral meeting and workshop
PIPPA	Industry association	Bilateral meeting and workshop
DREAMS	Industry association	Workshop
Greenmap/RELP	Development partner	Bilateral meeting and workshop
GIZ	Development partner	Bilateral meeting and workshop
Development Bank of the Philippines	Bank	Workshop

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