Diagnostic for Competitive Arrangements for Energy Transition (DCAT)

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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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Acronyms

AC	Alternating Current
ADB	Asian Development Bank
AF	Annual Forecast
ASTI	Accelerated Strategic Transmission Investment
BESS	Battery Energy Storage Systems
BOT	Build-Operate-Transfer
BPP	*Biaya Pokok Pembangkitan*, or Costs of Generation
BUMN	*Badan Usaha Milik Negara*, or Ministry of State-Owned Enterprises
CE	Committed Energy
CfD	Contract for Difference
CIPP	Comprehensive Investment and Policy Plan
CMMIA	Coordinating Ministry for Maritime and Investment Affairs
CREZ	Competitive Renewable Energy Zones
CSP	Competitive Selection Process
DAR	Department of Agrarian Reform
DC	Department Circular
DC	Direct Current
DCAT	Diagnostic for Competitive Arrangements for the Energy Transition
DDP	Development Plan
DMO	Domestic Market Obligation
DOE	Department of Energy
DPT	*Daftar Penyedia Terseleks*, or selected providers
DU	Distribution Utility
EBTKE	*Energi Baru, Terbarukan Dan Konservasi Energi*, or Directorate General of New, Renewable Energy, and Energy Conservation
ECs	Electric Cooperatives
EPIRA	Electric Power Industry Reform Act
EPTC	Electricity Purchase and Trading Corporation
ERAV	Electricity Regulatory Authority of Vietnam
ERC	Energy Regulatory Commission
EREA	Electricity and Renewable Energy Authority
ETM	Energy Transition Mechanism
ETP	Energy Transition Partnership
EVN	Electricity Vietnam
EVOSS	Energy Virtual One Stop Shop
FIT	Feed-in-Tariff
FIT COC	Feed-in-Tariff Certificate of Compliance
FIT-All	Feed-in-Tariff Allowance
GEA	Green Energy Auction
GEAP	Green Energy Auction Program
GEAR	Green Energy Auction Reserve

GEOP	Green Energy Option Program
GET	Green Energy Tariff
HBA	*Harga Batubara Acuan*, or reference export price
IEMOP	Independent Electricity Market Operator of the Philippines
IFI	International Financial Institutions
IPP	Independent Power Producers
JETP	Just Energy Transition Partnership
LRES/RES	Local/Retail Electricity Suppliers
MEMR	Ministry of Energy and Mineral Resources, or *Energi dan Sumber Daya Mineral* (EDSM)
MOF	Ministry of Finance
MOI	Ministry of Industry
MOIT	Ministry of Industry and Trade
MONRE	Minister of Natural Resources and Environment
MPI	Ministry of Planning and Investment
NEA	National Electrification Administration
NGCP	National Grid Corporation of the Philippines
NLDC	National Load Dispatch Centre
NPC	National Power Corporation
NPTC	National Power Transmission Corporation
NREB	National Renewable Energy Board
NREL	National Renewable Energy Laboratory
NREP	National Renewable Energy Program
OPA	Opt-In Participation Agreement
PDP	Power Development Plan
PEMC	Philippine Electricity Market Corporation
PIOU	Private Investor-Owned Utilities
PIPPA	Independent Power Producers Association
PLN	*Perusahaan Listrik Negara*
PPA	Power Purchase Agreement
PPCs	Provincial People's Committees
PSALM	Power Sector Assets and Liabilities Management
PSESA	Philippine Solar and Energy Storage Association
PSPPs	Power Supply Procurement Plans
PV	Photovoltaic
RE	Renewable Energy
RECs	RE Certificates
REM	Renewable Energy Market
REMB	Renewable Energy Management Bureau
REPA	Renewable Energy Payment Agreement
RER	Renewable Energy Registrar
RESA	Renewable Energy Supply Agreement
RFP	Request for Proposal

RPS	Renewable Portfolio Standard
RUKD	Regional Electricity Plan
RUKN	National Electricity Plan
RUPTL	Electricity Supply Business Plan
SDG	Sustainable Development Goals
SIS	System Impact Studies
TDP	Transmission Development Plan
TransCo	National Transmission Corporation
UIOLI	Use-it-or-lose-it
UK	United Kingdom
UNCITRAL	United Nations Commission on International Trade Law
VRE	Variable Renewable Energy
WCA	Working Capital Allowance
WEDAP	Wind Developers Association of the Philippines
WESM	Wholesale Electricity Spot Market

Executive summary

Context and approach

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 each country, together with recommendations to address those challenges. The report incorporates diagnostic work analysing the current state of renewable energy procurement in each country, which was completed in 2023 and was subject to consultation through a series of four workshops. Recommendations are presented for each 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 Indonesia and 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).

A roadmap for accelerated procurement of renewables in Indonesia

Indonesia has made limited progress in accelerating the procurement of renewable energy capacity. While total renewable energy (including hydro and geothermal) in the electricity generation mix was 13% in 2022, the contribution made by variable renewable energy (specifically, wind and solar) was small, well below 1%. Total power generation capacity has grown rapidly in recent years, reaching 84 GW in 2022,[1] but the largest contribution to this increase in capacity has been from coal-fired power generation capacity.

However, Indonesia's plans for the sector, combined with the requirements of the Just Energy Transition Partnership (JETP), will require a rapid scale up of renewables. The RUPTL for 2021-2030, which is the detailed power sector plan prepared by the utility, PLN, includes 40.6 GW of new generation capacity, with half of this being from renewable sources. Separately, a Comprehensive Investment and Policy Plan (CIPP)[2] has recently been developed through the JETP process. The scenario presented in the CIPP includes 97% of generation from renewable energy sources by 2050, with the role of coal completely phased out.

Indonesia's electricity sector plan does not provide a credible indication to investors of how much renewable energy capacity will be procured and when. Indonesia's electricity sector plans are updated regularly. Indeed, the RUKN (which is a sector plan prepared by MEMR, which guides preparation of the RUPTL) and the RUPTL are currently being updated.[3] However, these plans include several projects that have been rolled forward from previous iterations of the RUPTL but have not been implemented. Some of these projects may not be feasible. The RUPTL has included, for example, wind projects sited in locations where there is understood to be insufficient wind resource. Retention of these projects in the RUPTL means that the plan is never fully implemented, undermining the extent to which investors can rely on the planning process to provide a dependable indication of how much capacity of which technologies will be procured and when.

So far, Indonesia's renewable energy tenders have been for specific projects or locations. As the volumes procured increase (which will need to be the case for the targets outlined above to be met), it is likely to be difficult to scale this type of tender process. The current process often requires developers to secure their own land, but to connect to a specific substation. This results in a scramble for land in the chosen locations, which is unlikely to result in efficient market outcomes. It also restricts participation in tenders to companies able to secure land in appropriate locations. In the long-term, participation in tenders will likely be increased if open tenders are conducted, allowing developers to propose their own sites and connection points. However, in the short-term challenges in securing both land rights and connection capacity mean that it may be more appropriate to run tenders where specific sites are selected by PLN. This could be achieved, for example, through a solar park initiative where PLN secures the land and grid connection and then auctions the right for developers to build on that land. Where project locations are selected by PLN, pre-feasibility assessments should ensure that the site selection is appropriate for the chosen technology.

Developers have raised concerns that the PPAs issued for recent renewable energy tenders have contained clauses that depart from international norms. MEMR is currently finalising a PPA regulation for renewable energy, which will set the boundaries for drafting of future renewable energy PPAs. This regulation should help to increase certainty for investors. The DCAT team has prepared a separate and detailed guidance document covering implementation of the draft regulation. This guidance has suggested areas where the terms of renewable energy PPAs could be both simplified and better aligned with international best practice. For example, many PPAs used in the market to date restrict the additional revenues that projects receive during a year with better than expected wind or solar resource, while not providing

[1] Ministry of Energy and Mineral Resources, Indonesia (2023): Handbook of Energy and Economic Statistics of Indonesia, 2022. Link.

[2] JETP Secretariat (2023): Draft Comprehensive Investment and Policy Plan. Link.

[3] Ministry of Energy and Mineral Resources, Indonesia (2023): Draft Rencana Umum Ketenagalistrikan Nasional (RUKN), 2023-2060. Link.

corresponding protection during years with lower than expected resource. This introduces asymmetry to the volume risk for the project, which will result in higher prices for PLN.

There are several issues unique to Indonesia that act to distort the market in a way that is unfavourable to project development, especially for renewable energy. These factors include:

- Requirements that developers partner with PLN, sometimes resulting in PLN having a controlling stake in a project.
- High local content requirements, especially for solar modules, that many developers have cited as being unrealistic. The requirements for solar modules were reduced to 40% in 2023 but are scheduled to increase to 60% at the start of 2025.
- Domestic coal producers are required to supply the local market at below market prices. This means that coal-fired power generation appears to be far cheaper than it would be without this implicit subsidy.
- Take-or pay commitments in the PPAs for coal-fired power generators means that it is difficult and costly to reduce the output from coal plants to accommodate renewables. This acts to increase the cost of renewables integration.

The recommended roadmap for Indonesia prioritises improvements to the processes for procuring renewable energy, building confidence in the market while deeper-seated issues are addressed. In the short-term it is recommended that some renewable energy tenders are run where developers are not exposed to the complex risks of securing land rights and transmission capacity. This could, for example, be achieved through a solar park initiative. Finalising the PPA regulation is also a priority. Together, this could help to build confidence in the sector, increasing participation in tenders, while more complex challenges are tackled, as summarised in Table 1.

Table 1 Summary roadmap for Indonesia

Barrier or challenge identified	Recommendation	Responsible party	Timing
Participation has been very limited in some of the renewable energy tenders held to date. Some projects have not been tendered.	Commit to making renewable energy tenders open to more participants. This might start with tenders where land acquisition risk is mitigated for developers.	PLN	Immediate
There is no standardised PPA template for renewables, and terms often depart from international norms.	Finalise the renewable energy PPA regulation that is currently under development.	MEMR	Immediate
Local content requirements are frequently cited as a barrier to the development of solar projects in particular.	Recalibrate local content requirements for solar, at least delaying the increased requirement due to be implemented from 2025.	MOI (and CMMIA), with MEMR	Medium-term
Investors in IPPs are required to partner with PLN in many cases, even where PLN makes no substantial financial or non-financial contribution to the project.	Phase out mandatory participation requirements.	Ministry of SOEs	Medium-term
The RUPTL lists individual projects that are planned to be implemented, although some of these projects have been proposed for many years without moving forward, undermining the credibility of the plan.	Adjust approach to defining renewable energy projects in the RUPTL, potentially moving away from listing individual projects.	PLN	Long-term
Many coal plants are contracted with high take-or-pay commitments. Combined with over-supply, this increases the risk that renewable energy will be curtailed.	Try to renegotiate take-or-pay commitments and/or curtail the lifetime of coal-fired power plants through innovative use of concessional finance.	IFIs, working closely with PLN and IPPs	Long-term

Barrier or challenge identified	Recommendation	Responsible party	Timing
Coal is priced well below international price levels, artificially lowering the cost of coal-fired power generation.	Start to phase out DMO requirement on domestic coal producers.	MEMR	Long-term

Parties required to deliver the roadmap:

IFIs – International Finance Institutions

IPPs – Independent Power Producers

MEMR – Ministry of Energy and Mineral Resources

MOI – Ministry of Investment

PLN - Perusahaan Listrik Negara, the state-owned utility

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).[4] 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.[5] 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.

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

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

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 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 2.

Table 2 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

Barrier or challenge identified	Recommendation	Responsible party	Timing
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
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 2. 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.

A roadmap for accelerated procurement of renewables in Vietnam

Since 2017, the role of renewable energy, and especially solar, has increased dramatically in Vietnam. Solar capacity has increased from near-zero in 2017 to reach 18.5 GW in 2022.[6] The increase in renewable energy capacity was driven by a feed-in tariff (FIT) mechanism that has since expired. The exceptional growth in installed capacity means that variable renewable

[6] International Renewable Energy Agency (2023): Renewable Capacity Statistics 2023. Link.

energy accounted for 13% of electricity generation by 2022. Coal-fired power generation has declined in both absolute and relative terms. No permanent replacement to the FIT has yet been established.

The rapid increase in renewables has not been without challenges. Investment in electricity networks has not kept pace with the growth in renewable energy capacity and some projects have experienced curtailment because of the resulting grid congestion, especially in the central region of Vietnam. Payment of the FIT is one of many factors, alongside rising commodity costs, which has contributed to losses at EVN (Electricity Vietnam). Accumulating losses have been partly offset by tariff increases for end users. Many wind projects missed the deadline for commissioning of projects under the FIT, which resulted in a prolonged period during which those projects were stranded from the grid. The framework for bilateral negotiations with these projects was set by MOIT Circular 15/2022/TT-BCT,[7] and ceiling tariffs based on this framework were subsequently published in MOIT Decision 21/QD-BCT.[8] Where new terms have been agreed, these have typically been agreed only for one year and will require further negotiation for a long-term solution. The pricing agreed has typically only been sufficient to cover debt repayments and has been in Vietnamese Dong, rather than in US Dollar terms, which had been the case in the original PPAs.

The recently finalised Power Development Plan 8 (PDP8)[9] confirms an ongoing commitment to increasing the role of renewables. PDP8, which was approved in 2023, includes an additional 22 GW onshore wind, 6 GW offshore wind, and 2.6 GW of solar PV by 2030. The plan also states that government will explore options for procuring this capacity through competitive mechanisms.

The existing PPA templates,[10] which have been used for projects contracted through the FIT mechanism, contain clauses that depart from international norms. The templates do not provide any protection against curtailment for renewable energy projects – similar to the REPA in the Philippines. The templates also include terms that are non-standard relating to dispute resolution and termination.

However, the legal framework in Vietnam means that it will be complicated to introduce new procurement mechanisms for renewable energy, especially those involving competitive bidding. Since the expiry of the FIT mechanism, there has been no mechanism for the procurement of renewable energy projects located in Vietnam. Despite the stated intention to move towards competitive procurement, no mechanism has yet been established. The complexity of Vietnamese law (and the law concerning land use rights – all land is owned by the State – in particular) means that amendments are likely to be required to several laws. Consultation with stakeholders in Vietnam has suggested that at least the following legal changes would be required:

- The Law on Procurement[11] would require guidance (in a separate document to the Law itself) on how bidding mechanisms should be applied to power generation projects.
- Changes may also be required to the Electricity Law to allow for competitive procurement.
- Some stakeholders have suggested the addition of a separate Law on Renewable Energy, although it is noted that there is no consensus on this point.

[7] Ministry of Industry and Trade (2022): Circular Number 15/2022/TT-BCT prescribing methods for formulating price brackets for solar power plants, transitional wind power plants. Link.

[8] Ministry of Industry and Trade (2023): Decision Number 21/QD-BCT promulgating the price brackets for electricity generation from solar power plants, transitional wind power plants. Link.

[9] Prime Minister of the Socialist Republic of Vietnam (2023): Decision Number 500/QD-TTg approving the national power development plan for the period 2021-2030, with a vision to 2050. Link.

[10] Ministry of Industry and Trade, Socialist Republic of Vietnam (2017): Circular Number 16/2017/TT-BCT on project development and model power purchase agreements applied to solar power projects. Link.

[11] Socialist Republic of Vietnam (2023): Law Number 22/2023/QH15, Law on Procurement. Link.

- Legislation specifically to cover the procurement of renewable energy would likely also be required.

This is a process that could take many years.

The complex legal reforms required to enable the competitive procurement of renewables should be completed, but interim solutions should also be implemented so that Vietnam does not suffer a prolonged pause in the development of new renewable energy capacity. The time likely to be required to design and implement the complete set of reforms required to support a move to competitive procurement means that a short-term alternative solution is required. This could involve re-opening the previously closed FIT mechanisms, or implementing solar park projects or similar, focused on a pre-defined site. Such projects might be tendered competitively, which could help to ease the financial pressure on EVN. Such a tender would still require some legal changes but might be simpler to implement than a totally open competition where developers secure their own sites.

Table 3 Summary roadmap for Vietnam

Barrier or challenge identified	Recommendation	Responsible party	Timing
The complexity of the legal changes required to facilitate the introduction of competitive procurement may mean that these reforms take many years to implement.	Implement interim solutions to procure renewable energy capacity ahead of competitive procurement being introduced, e.g., through reintroduction of the FIT and/or solar park projects or similar.	MOIT/EVN	Immediate
The terms included in the template PPAs for wind and solar projects contain non-standard terms. Projects are not protected against the risk of curtailment.	Refine the risk allocation in the template PPAs for renewable energy projects, market testing the proposed terms with potential investors, including international lenders.	MOIT/EVN	Medium-term
Government has stated its intent to procure future renewable energy projects competitively,[12] but the existing legal framework does not accommodate competitive procurement.	Expedite amendments to laws and regulations to facilitate the transmission to competitive procurement of renewable energy projects.	MOIT, plus MONRE, MPI, PPCs, and other ministries	Long-term

Parties required to deliver the roadmap:

EVN – Vietnam Electricity, the state-owned utility

MOIT – Ministry of Industry and Trade

MONRE – Ministry of Natural Resources and the Environment

MPI – Ministry of Planning and Investment

PPCs – Provincial People's Committees

Conclusions and common themes

While many of the actions identified above are specific to each country, the analysis presented in this 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.

[12] Prime Minister of the Socialist Republic of Vietnam (2023): Decision Number 500/QD-TTg approving the national power development plan for the period 2021-2030, with a vision to 2050. Link.

- **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 **Indonesia**, the Ministry of Energy and Mineral Resources (MEMR) is likely to be the primary user of this report. Parts of the report may also be relevant to PLN, the state-owned and vertically integrated utility, because as the offtaker for on-grid IPPs, PLN normally runs IPP procurement processes.
- 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.
- In **Vietnam**, the Ministry of Industry and Trade (MOIT) is likely to be the primary user of the report, although as is discussed further in Section 5 some of the policy amendments likely to be required in Vietnam are complex and will also require engagement from other government ministries. As in Indonesia, the state-owned, vertically integrated

utility, EVN, will also be an interest party because of its role as offtaker for IPPs, including renewable energy projects.

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 ETP's markets.

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.
- Sections 3 to 5 presents detailed analysis for Indonesia, then the Philippines, then Vietnam. In each of the country chapters, the following is presented:
    - 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 6 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 4 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. This report will be subject to a final round of workshops for dissemination during the first few months of 2024, after which any final amendments will be made, reflecting feedback received during the workshops.

Table 4 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 of barriers presented in the detailed country-specific sections of this report (Sections 3 to 5), has been informed by information gathered through the consultations.

As part of the diagnostic work, three in-country workshops have been held in both Indonesia and 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 Indonesia the workshops included individuals from government ministries (mostly from MEMR) and PLN; 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. In Vietnam, bilateral stakeholder discussions were held. This in-person engagement with stakeholders has been used to complete the analysis presented in this report.

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. Specifically:

- In **Indonesia**, MEMR is developing a regulation covering PPAs for renewable energy, so this regulation and the terms agreed in previous renewable energy PPAs have been a focus of discussions with stakeholders. However, the recommendations presented in Section 3 are broader; a separate deliverable has been prepared (and provided directly to MEMR) containing more detailed guidelines regarding implementation of the PPA regulation.
- 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 4 are typically more detailed than for the other countries; many of the recommendations relate to implementing regulations.
- In **Vietnam**, rapid progress was made under an earlier FIT programme, but this progress has since stalled for a variety of reasons. The analysis in Section 5 therefore focuses on some the issues that have resulted in this pause, with the aim of understanding the interventions that might help to re-start the market.

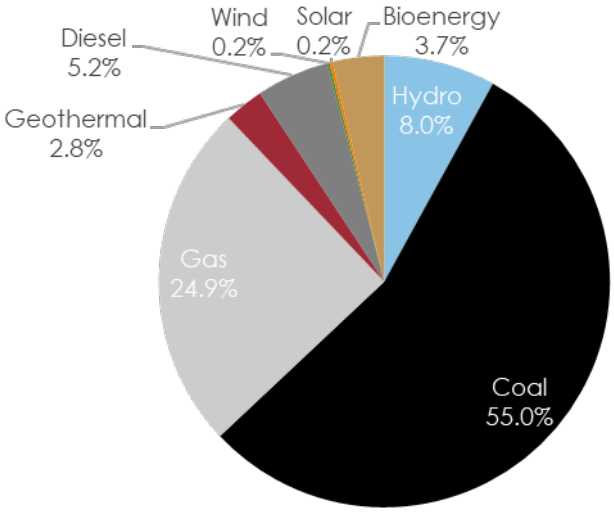
3. Diagnostic and roadmap: Indonesia

3.1. Renewable energy in the electricity mix

Indonesia's electricity generation mix is dominated by thermal power plants, with coal-fired plants accounting for more than half of total installed capacity. The abundance of coal reserves in Indonesia makes it not only one of the biggest coal exporters globally[13] but for coal to be an obvious (in the sense of being convenient and the least expensive) choice of fuel for its power needs as shown in Figure 1. Policies in place, such as the Domestic Market Obligation (DMO, discussed further in Section 3.4.4), result in coal being significantly cheaper compared to other fuels and technologies. To date, renewables account for a small share of the capacity mix. Existing renewable generation capacity is mostly hydroelectric and geothermal power plants but installed capacity remains small when compared to fossil fuels.

Total installed capacity is nearly 84 GW. Of this capacity, about 82% is for public use and is overseen by PLN, 11% for private power utilities (captive power) and most of the remaining capacity is for own use. Of the installed capacity being used on PLN's network, about 39% is owned by IPPs.[14]

Figure 1 Installed capacity mix, Indonesia, 2022



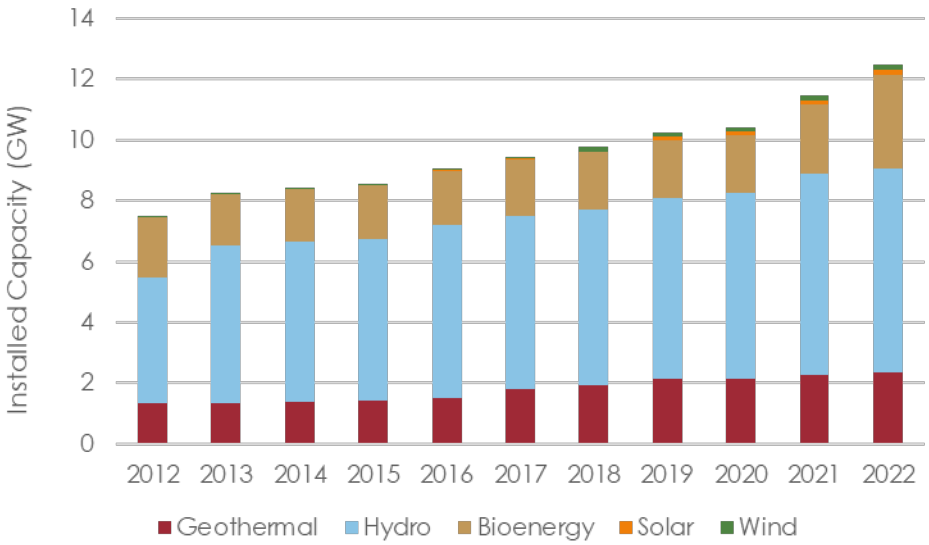
Source: Kuungana analysis of MEMR Handbook of Energy and Economic Statistics of Indonesia 2022 and IRENA Data

While some renewable energy projects have progressed, both the number and size of renewable generation projects remain very small compared to the total size of the system. Geothermal (2.4 GW), hydropower (6.7 GW), and bioenergy (3.1 GW) together represent a large portion of the installed capacity of renewables (total = 12.5 GW). While the share of solar and wind in the system has increased over the last decade, the uptake of these technologies has been stagnant in recent years, as fossil fuels (specifically, coal) continues to play a dominant role in the sector. Section 3.2 provides a discussion on procurement mechanisms that have been used to procure renewable generation to date.

[13] International Energy Agency (2020): Coal Information: Overview – Exports. Link.

[14] Ministry of Energy and Mineral Resources, Indonesia (2023): Draft Rencana Umum Ketenagalistrikan Nasional (RUKN), 2023-2060. Link.

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



Source: Kuungana analysis of MEMR Handbook of Energy and Economic Statistics of Indonesia 2022 and IRENA Data

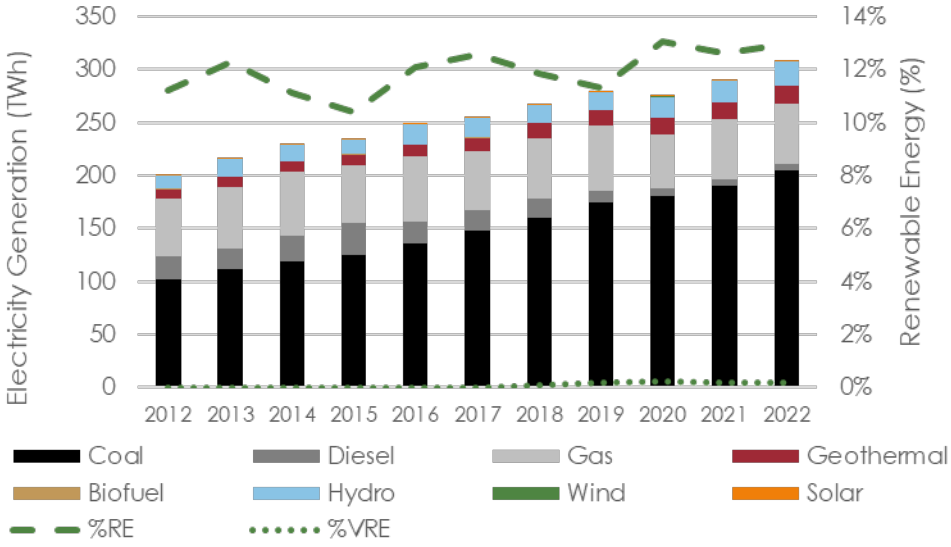
A large amount of new coal-fired power generation capacity has been commissioned. The total coal capacity installed has increase rapidly as a result of the ambitious plan to build 35 GW of new capacity by 2019. This was initiated shortly after the President of Indonesia, Joko Widodo, came to power in 2014.[15] On-grid generation of coal is continuously increasing as shown in Figure 3. Indonesia also has increasing capacity of off-grid coal generation to support the country's industrial sector. Many of these captive coal plants are used for nickel smelting, and this is expected to continue to increase without any significant shift in policies and planning.[16]

Coal's share of the electricity generation mix has increased. Year on year, the output from coal-fired power generation capacity has increased, and coal is expected to continue to dominate the generation mix, as seen in Figure 3. Coal-fired generation reached ~67% in 2022 while total RE generation (including hydro and geothermal) contributed just ~13%.

[15] PwC (2016): Supplying and Financing Coal-Fired Power Plants in the 35 GW Programme. Link.

[16] JETP Secretariat (2023): Draft Comprehensive Investment and Policy Plan. Link.

Figure 3 **Electricity generation mix, Indonesia, 2021-2022**



Source: Kuungana analysis of MEMR Handbook of Energy and Economic Statistics of Indonesia 2022 and IRENA Data

Government Regulation 79/2014[17] sets Indonesia's current renewable energy targets for primary energy supply. This regulation targets 23% of renewable energy by 2025 and 31% by 2050. However, these targets are defined in terms of primary energy. Subsequent regulations have set additional conditions that will impact the future generation mix. Presidential Regulation 112/2022[18] requires the prioritisation of renewable energy development and formalises a ban on new coal-fired power plants that are not under construction and have not reached financial close. The regulation also requires that MEMR prepares a roadmap for the early termination of coal PPAs.

There are three main electricity sector planning documents in Indonesia:

- The RUKN (or National Electricity Plan) is developed by government through MEMR and forms the basis for development of new projects in the power sector.
- The RUKD (Regional Electricity Plan) takes this planning to a more regional level and is developed by provincial governments.
- The RUPTL (Electricity Supply Business Plan) is a more detailed plan for the next 10 years, , using the RUKN for guidance.

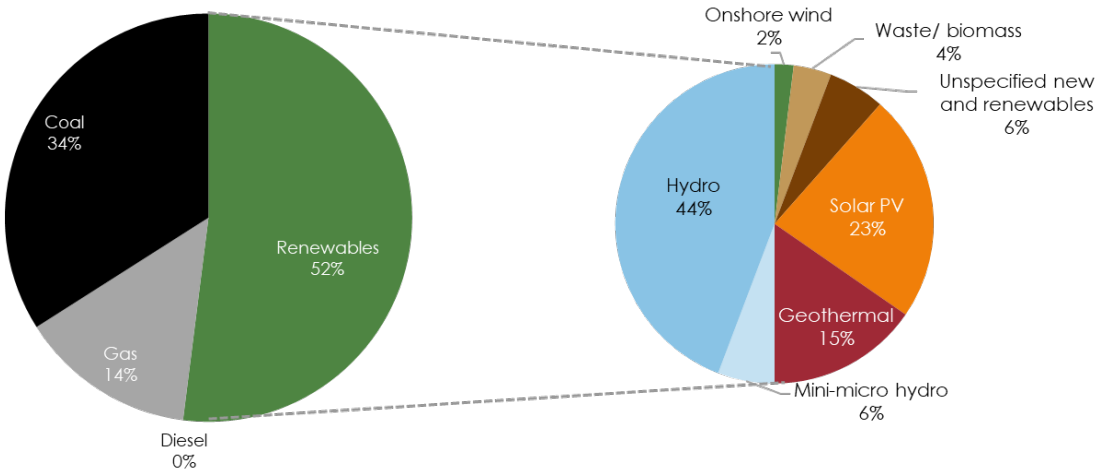
It is the RUKN and RUPTL that are most relevant to this report as they cover the whole country.

The latest published RUPTL, for 2021-2030, includes more ambitious plans for renewable energy than previous power sector plans. The RUPTL 2021-2030 plan includes 40.6 GW of new generation capacity, half of which is to be renewable generation, signalling a significant shift towards use of renewable energy. The plan also includes demand growth of 4.9% p.a., which is much lower than in previous plans, but closer to actual growth rates. Figure 4 shows the breakdown of the proposed new capacity. 52%, or 20.9 GW, is to come from renewable energy while the other 48% or 19.7GW will be from fossil fuels.

[17] State Gazette of the Republic of Indonesia (2014): Government Regulation No. 79 of 2014 concerning National Energy Policy. Link.

[18] President of the Republic of Indonesia (2022): Presidential Regulation Number 112 of 2022 concerning the Acceleration of Renewable Energy Development for Electricity Supply. Link.

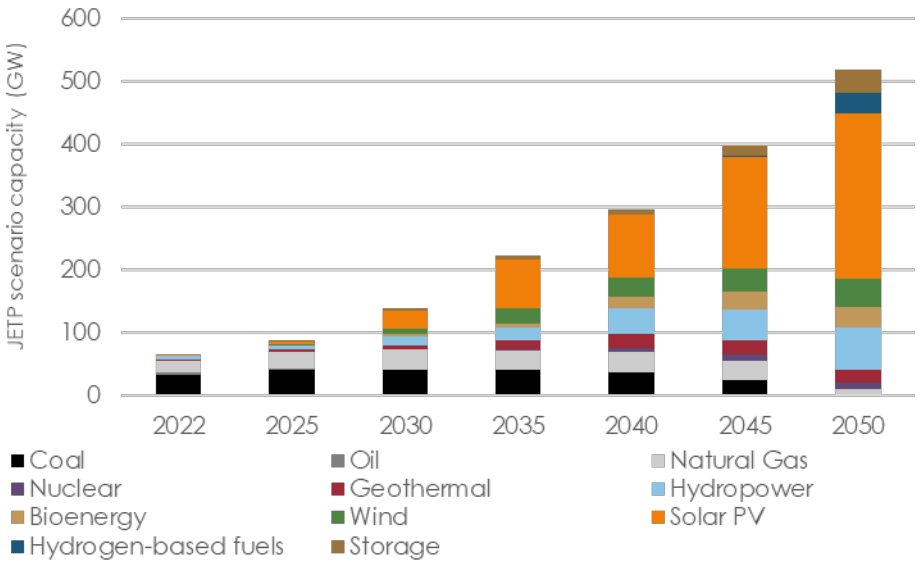
Figure 4 **RUPTL target capacity additions, 2021-2030**



Source: Kuungana analysis of RUPTL

A separate Comprehensive Investment and Policy Plan (CIPP) was recently prepared through the JETP process. The CIPP also includes capacity additions both from fossil fuel and renewables. The scenario includes 44% renewables (14% variable renewable energy) in the generation mix by 2030 and this would increase rapidly to 97% by 2050 (36% variable renewable energy) under this scenario. This far exceeds the existing renewable energy target for 2050 included in Government Regulation 79/2014. Figure 5 below shows that by 2050 coal-fired power generation has been removed from the capacity mix, with a much more diverse range of supply options taking the place of coal.

Figure 5 **JETP on-grid scenario capacity by technology**



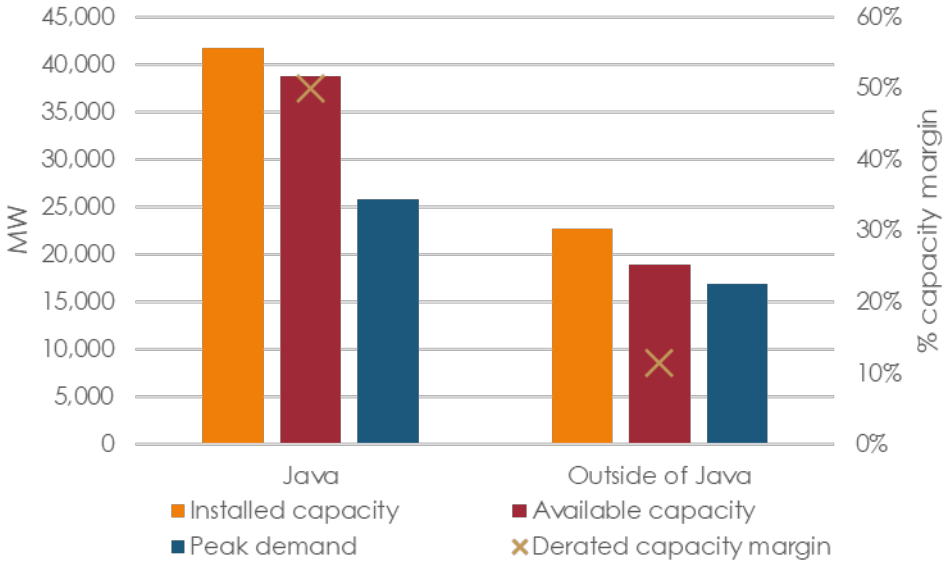
Source: Kuungana analysis of CIPP. Link.

It is understood that Indonesia will publish updated versions of its electricity sector plans in 2024. While it is understood that the CIPP developed through the JETP process has limited legal

standing, an updated RUKN (2024 to 2060)[19] and RUPTL (2024 to 2033) are now being developed. It is expected that these plans will be published in 2024.

Ambitious renewable energy capacity expansion plans are complicated by oversupply in the main Java-Bali system. Over-supply (supply greater than demand) is a particular issue on the Java-Bali power system which disincentivises the procurement of new capacity from renewable energy. A large power generation supply surplus acts as a brake on procurement of any new generation capacity as is illustrated by Figure 6. Early coal retirement could therefore be of particular importance in Indonesia to create space in the supply mix for renewable energy. An early example of how this could be achieved is provided by Cirebon 1: in late 2022, the Asian Development Bank (ADB) led a refinancing of the 660 MW Cirebon 1 coal-fired power plant.[20] Under this deal, the plant secured access to lower cost finance in exchange for agreeing to take the plant out of service 10-15 years before the end of its useful life. The exact terms of this agreement and the extent to which it is binding are unclear. Nonetheless, the deal could provide a template for Indonesia to take more coal-fired power generation capacity out of service early.

Figure 6 Regional electricity supply/demand balance, Indonesia, 2021



Source: Kuungana analysis of PLN Statistics 2021

3.2. Renewable energy procurement to date

As noted above, Indonesia is at a very early stage in its procurement of renewable energy capacity, especially variable renewable energy. In 2022, variable renewable energy only accounted for 572 GWh (0.2%) of total electricity generation. At the end of 2022, the total installed capacity of solar PV was 190 MW, and the total installed capacity of onshore wind was 154 MW.[21]

There have been various attempts to establish a framework for procuring renewable energy generation capacity. Initiatives to procure renewable energy have included:

[19] Ministry of Energy and Mineral Resources, Indonesia (2023): Draft Rencana Umum Ketenagalistrikan Nasional (RUKN), 2023-2060. Link.

[20] Asian Development Bank (2022): MOU on Early Retirement Plan Under Energy Transition Mechanism. Link.

[21] Ministry of Energy and Mineral Resources, Indonesia (2023): Handbook of Energy and Economic Statistics of Indonesia, 2022. Link.

- **Solar feed-in tariff.** Government Regulation No. 19/2016[22] briefly introduced a fixed feed-in tariff for solar PV. Prices were set at the equivalent of 14.5 to 25.0 US$c/kWh, depending on location, with the highest tariffs awarded in Papua and the lowest tariffs awarded in Java. This mechanism was not successful in attracting investment and little capacity was developed under this short-lived regulation. Reasons for this included the lack of a template PPA and strict local content requirements, which are discussed in more detail in Section 3.4.4.
- **Avoided cost price cap.** MEMR Regulation No. 12/2017[23] superseded the 2016 regulation, establishing new mechanisms for the purchase of renewable energy. The regulation required the procurement of both solar and wind plants to move to an open tender process, with prices capped through benchmarking against BPP price. The BPP price (*Biaya Pokok Pembangkitan*, or Costs of Generation) is, in effect, the avoided cost of displacing existing generation with new, lower cost generation capacity.
- **Technology-specific price cap.** Presidential Regulation No. 112/2022[24] replaces the BPP prices with technology-specific price caps. These price caps not only vary by technology; they also vary by location and project size and include a step-down in the price paid after 10 years. The price caps for solar PV projects are shown in Table 5; those for onshore wind projects are shown in Table 6. These caps are for greenfield projects with no battery storage facility; different caps are set by the regulation for expansion projects and/or for projects incorporating storage. The price caps vary by project size, reflecting the economies of scale for larger projects. The price cap for the first 10 years of a project also varies by location. The locational factors used are shown in Table 7. The factors (denoted as "F" in the tables below) vary from 1.0 for Java, Madura, and Bali, to 1.5 for Papua Barat and Papua.

Table 5 Price caps for solar PV under Presidential Regulation No. 112/2022

	Ceiling price (US$c/kWh)	
Capacity	Years 1 to 10	Years 11 to 30
<1 MW	11.47 x F	6.88
1-3 MW	9.94 x F	5.97
3-5 MW	8.77 x F	5.26
5-10 MW	8.26 x F	4.96
10-20 MW	7.94 x F	4.76
>20 MW	6.95 x F	4.17

Table 6 Price caps for onshore wind under Presidential Regulation No. 112/2022

	Ceiling price (US$c/kWh)	
Capacity	Years 1 to 10	Years 11 to 30
<5 MW	11.22 x F	6.73
5-20 MW	10.26 x F	6.15
>20 MW	9.54 x F	5.73

[22] Ministry of Energy and Mineral Resources, Indonesia (2016): Regulation Number 19 of 2016 on Power Purchase from Photovoltaic Solar Power Plant by PT Perusahaan Listrik Negara (Persero). Link.

[23] Ministry of Energy and Mineral Resources, Indonesia (2017): Regulation Number 12 of 2017 on the Utilization of Renewable Energy Sources for the Supply of Electricity. Link.

[24] President of the Republic of Indonesia (2022): Presidential Regulation Number 112 of 2022 concerning the Acceleration of Renewable Energy Development for Electricity Supply. Link.

Table 7 Location factors applied to price caps

	Territory	Location factor (F)
1	Java, Madura, and Bali	1.00
	- Small islands	*1.10*
2	Sumatera	1.10
	- Riau Islands	*1.20*
	- Mentawai	*1.20*
	- Bangka Belitung	*1.10*
	- Small islands	*1.15*
3	Kalimantan	1.10
	- Small islands	*1.15*
4	Sulawesi	1.10
	- Small islands	*1.15*
5	Nusa Tenggara	1.20
	- Big islands	*1.20*
	- Small islands	*1.25*
6	North Maluku	1.25
	- Small islands	*1.30*
7	Maluku	1.25
	- Small islands	*1.30*
8	Papua Barat	1.50
9	Papua	1.50

Procurement of variable renewable energy (i.e., wind, solar) to date has focused on specific project opportunities in a limited number of locations. Procurements have taken place for individual projects or locations, rather than open tenders allowing developers to bring forward projects from across the country (as demonstrated by the list of projects below). In some cases, tenders have taken place;[25] in other cases, projects have been secured through bilateral agreements with project developers.[26]

For wind generation, three projects have been procured to date, with procurement underway for a fourth. The projects that have progressed to date are:

- **Sidrap, 75 MW** – this project was commissioned in March 2018 and was Indonesia's first utility-scale wind farm. The project is in South Sulawesi and is owned by UPC Renewables, in partnership with ACEN, which in turn is owned by Ayala Corporation, a Filipino conglomerate.
- **Tolo, 72 MW** – this project achieved commercial operations in May 2019. The project is owned by Vena Energy.
- **Tanah Laut, 70 MW with 10 MW / 10 MWh BESS** – the RFP for this project was issued in May 2022. The project was awarded to Total Eren, and it is understood that the PPA was signed in May 2023. The project is targeting full commissioning in 2025.

[25] Adaro Power (2023): PLN and Total Eren – Adaro Power – PJBI sign the power purchase agreement for the 70 MW Tanah Laut wind project in Indonesia. Link.

[26] Masdar (accessed January 2024): Our projects: Cirata floating solar photovoltaic plant. Link.

- **Timor, 22 MW** – it is understood that the procurement of this project is currently underway, but that only two qualifying bidders have submitted proposals.

Until recently, the solar projects developed have been smaller in scale. While ~79 MW_p of capacity had been installed as at the start of 2023, this was made up of many small projects. This includes, for example, 3x 7 MW_p solar PV installations on Lombok, operated by Vena Energy.

A "de-dieselisation" tender intends to deploy solar to many small, distributed diesel generators. An RFP was issued in March 2022 for the first two clusters (17 MW_p in Kalimantan and 19 MW_p in Java Madura) of a larger number of small-scale solar PV installations (350 MW_p across 183 locations), the intention being to displace the use of diesel on isolated (non grid-connected) systems. However, this tender was unsuccessful – some developers have suggested that this was at least partly a result of complexity in securing land rights across so many different locations. It is understood that there are plans for this tender to be relaunched. Originally this was expected in late 2023, but the process has suffered further delays.

Two floating solar projects have made progress, having been procured bilaterally, on a non-competitive basis. The Cirata floating solar project (145 MW_{ac} / 192 MW_p) has been developed by Masdar and was commissioned in November 2023. The project is Indonesia's first floating solar project. The project was not tendered competitively; it is understood that the PPA was signed in 2021 with an agreed price of 5.8 US$c/kWh.[27] Masdar plans to expand the Cirata project to 500 MW_p. ACWA has also agreed to develop two floating solar projects for PLN: the Singkarak (50 MW_{ac}) and Saguling (60 MW_{ac}) projects. The Singkarak project is on Sumatra; Saguling is on Java. ACWA announced a co-ownership deal with PLN in 2022, but the projects are understood to still be at the permitting stage.

These projects reflect some success in attracting international investors, but to date this has been on a small scale, project-by-project. Regional IPPs (such as UPC and Vena) together with international investors such as ACWA and Masdar have been able to navigate the complexity and the challenges of Indonesia's market. However, it is understood that competition has been limited for some of the tenders held by PLN; in some cases (such as for the floating solar projects) agreements have simply been negotiated bilaterally. Discussions with MEMR and PLN have also noted an extended time taken to proceed with some of the procurements, partly because of delays caused by bilateral PPA negotiations. The challenges experience by developers in agreeing appropriate risk allocation in PPAs in Indonesia are discussed further in Section 3.4.3.

3.3. Governance of renewable energy procurement

Ministry of Energy and Mineral Resources (MEMR, or EDSM in Indonesian) is the governmental ministry responsible for development of policy and regulations and decision making relating to energy and mineral resources in Indonesia. There is no independent regulatory authority, so MEMR's role in the sector is particularly important. Its tasks include the implementation of regulations and policies related to oil and gas, coal, new and renewable energy.

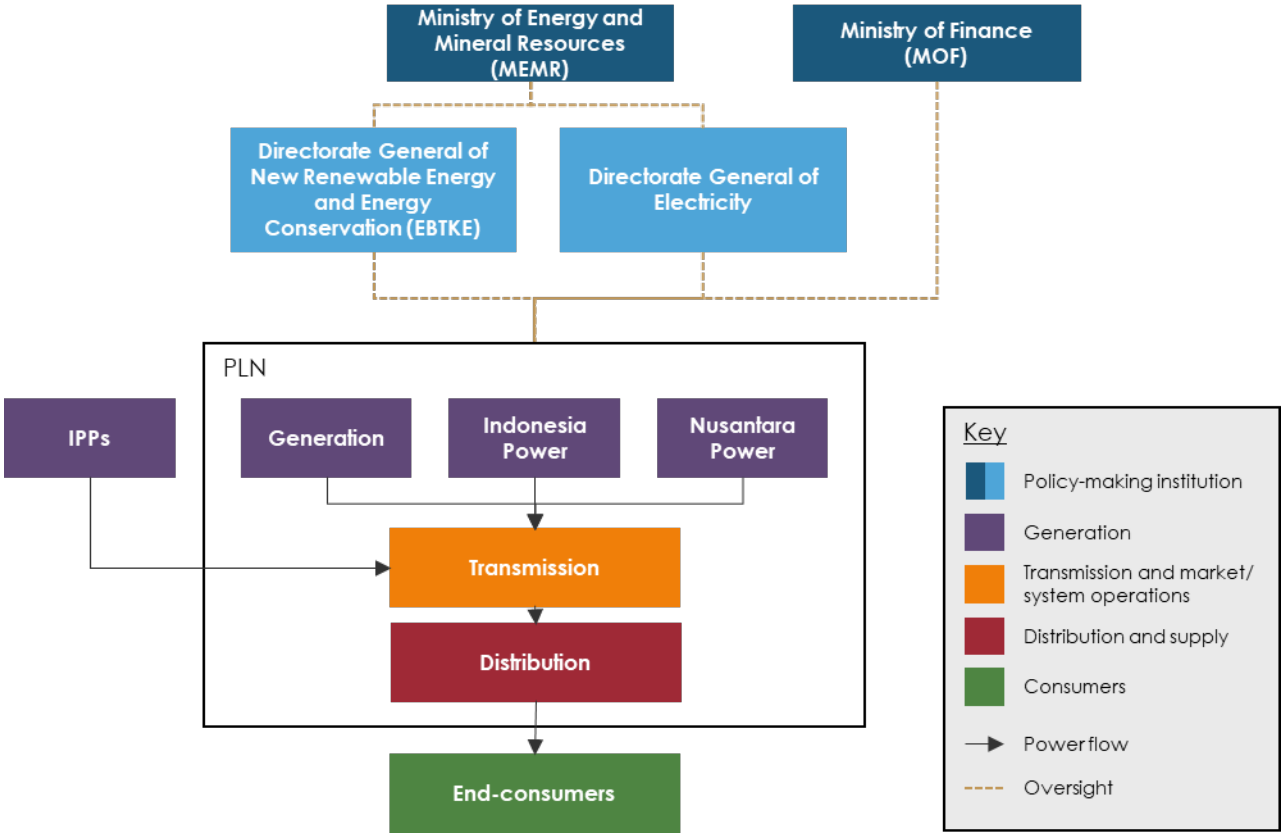
Directorate General of New, Renewable Energy, and Energy Conservation, or *Energi Baru, Terbarukan Dan Konservasi Energi* (EBTKE), is one of four directorates within MEMR. The other three directorates cover, respectively, oil and gas, minerals and coal, and electricity. EBTKE is tasked with formulating and implementing policy relating to renewable energy and energy conservation in Indonesia, while the Directorate General of Electricity is responsible for formulating and implementing policy and supervising activities in the broader electricity sector.

[27] Power Technology (2021): Cirata Floating Photovoltaic Power Plant. Link.

MEMR, through EBTKE, is responsible for developing most laws and regulations relevant to renewable energy procurement. EBTKE is, for example, currently developing a new regulation, which will establish a framework governing the PPA terms on which new renewable energy projects can be contracted. This is discussed in Section 3.4.3. Relevant regulations can also be issued directly by the President, as demonstrated by the Presidential Regulation 112/2022,[28] which defines the technology specific price caps for renewable energy. Presidential Regulations are legal instruments that were introduced by Law 10/2004,[29] which governs the establishment of laws and regulations in Indonesia.

Ministry of Finance (MOF) oversees finance, state assets, and overall budget for the country. For the energy sector it ensures that there is state budget for subsidies, fiscal incentives, and energy-related government guarantees.

Figure 7 Policy making stakeholders in Indonesia's electricity sector



Source: Kuungana analysis

Other government ministries also have a supporting role in the electricity sector, including:

- The **Ministry of Investment (MOI)** has issued regulations that impact the procurement of renewable energy. Specifically, as discussed further in Section 3.4.4, MOI has issued local content requirements, which impact the viability of many solar PV projects in Indonesia.
- The **Ministry of SOEs** (BUMN) manages the government's shareholdings in SOEs of which PLN is one of the largest.

[28] President of the Republic of Indonesia (2022): Presidential Regulation Number 112 of 2022 concerning the Acceleration of Renewable Energy Development for Electricity Supply. Link.

[29] President of the Republic of Indonesia (2004): Law Number 10 of 2004 concerning the Establishment of Laws and Regulations. Link.

- The **Ministry of Public Works and Housing** also has an important role managing dams for hydro and floating solar PV.
- The **Ministry of Environment and Forestry** is important in permitting development in forestry areas for RE power.

Perusahaan Listrik Negara (PLN) is the vertically integrated state-owned utility responsible for supply of electricity throughout the country. It owns most generation assets in the country and is the main purchaser of power from IPPs, including for renewable energy. PLN is therefore the counterpart to PPAs signed by IPPs. Further, PLN has many subsidiaries, many of which are partners in IPP projects. Two 'sub-holding' generation companies have been set up by PLN: Indonesia Power and Nusantara Power. PLN also owns and operates the transmission and distribution networks and it responsible for delivering power to end consumers.

The dominance of PLN is at the heart of many of the challenges relating to the procurement of renewable energy, as discussed in Section 3.4. Much of the IPP capacity in the country is not truly independent. PLN is a "mandatory partner" in most power generation projects (not just renewable energy projects), meaning that it often holds a controlling stake IPP projects. This is discussed in Section 3.4.4. There is also currently no framework for wheeling power across PLN's electricity network, which means in effect means that it is not possible to sell power to an offtakers other than PLN (unless the project is entirely separate from PLN's network).

3.4. Recommendations to accelerate competitive procurement of renewable energy

Several barriers to accelerating the competitive procurement of renewable energy in Indonesia have been identified. These are analysed through this section, together with recommendations (shown in light blue boxes) for how the barriers could be tackled, under the following headers:

- **Electricity sector planning.** Sector plans have not typically provided a good indication of how much renewable energy capacity is to be procured, and existing plans are not viewed as being credible by many potential investors. This is analysed further in Section 3.4.1.
- **Procurement processes.** For the small number of competitive procurement exercises that have so far taken place, a low level of interest and participation has meant that competition in those tenders has been limited. This is analysed further in Section 3.4.2.
- **Risk allocation in PPAs.** Investors have noted that PPAs for renewable energy projects in Indonesia have included many non-standard terms that make it more difficult for international developers to participate in tenders for renewables. This is analysed further in Section 3.4.3.
- **Market distortion.** There are several factors that are quite specific to Indonesia that act to distort the economic and commercial incentives for renewable energy in the country, including factors that act to entrench PLN's role in the sector, and that result in below-market coal prices. This is analysed further in Section 3.4.4.

3.4.1. Electricity sector planning

Energy sector planning is governed by the National Energy Policy, Government Regulation 79/2014.[30] This regulation is the main driver of energy sector planning in Indonesia, and it provides a high level steer for more detailed planning. For example, Article 9 of the policy sets targets for getting close to 100% electrification by 2020, and meeting 23% of primary energy demand for new and renewable energy sources by 2025, with this increasing to 31% by 2050.

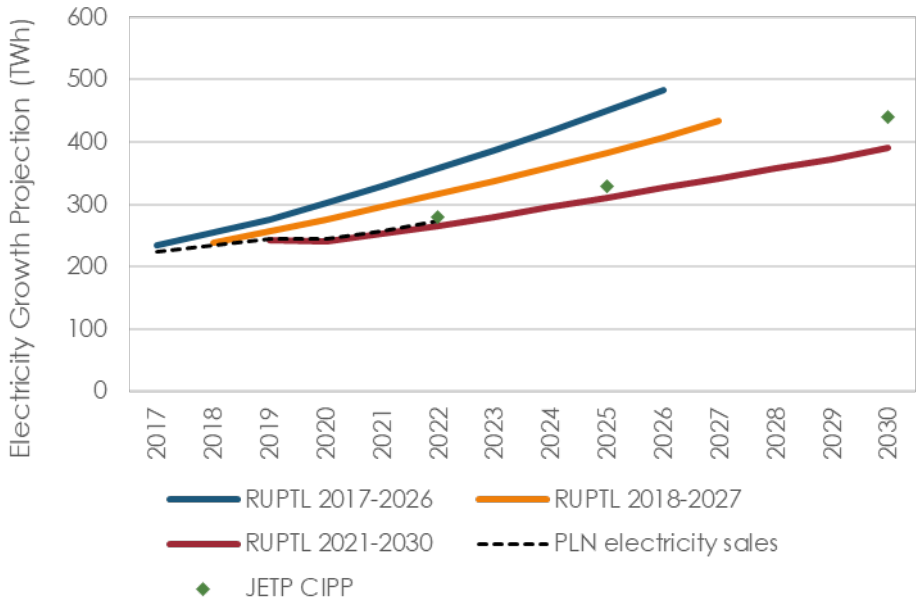
[30] President of the Republic of Indonesia (2014): Government Regulation Number 79 of 2014 on National Energy Policy. Link.

More detailed energy sector plans are guided by the National Energy Plan (RUEN). The National Electricity Plan, or RUKN (*Rencana Umum Ketenagalistrikan Nasional*), is prepared by the Electricity Directorate within MEMR. The last RUKN was developed for the period 2019-2038. Provincial Electricity Plans are prepared alongside the RUKN by provincial governments. The RUKN provides the foundation for the Electricity Supply Business Plan, or RUPTL (*Rencana Umum Penyediaan Tenaga Listrik*), which is a more detailed 10-year plan, prepared by PLN. The latest RUPTL published by PLN was for the period 2021-2030.[31] Updated versions of both the RUKN and RUPTL are expected to be finalised in 2024.

PLN is required to evaluate the validity of the RUPTL on an annual basis. Government Regulation 14/2012[32] requires that the RUPTL is reviewed every year. If changes are required to the plan, PLN is then required to update the RUPTL, submitting the updated version to the minister responsible for energy for approval.

Many of the 'committed' projects included in previous RUPTLs have not been implemented. Many of these projects have been included in subsequent RUPTLs, but with later commissioning dates. It is understood that some projects have been rolled forward many times. This is partly a result of projects being deferred because demand has grown less quickly than projected in previous RUPTLs. Figure 8 shows how demand projections have evolved over subsequent RUPTLs and shows the demand projections for the first decade of the scenario used for the CIPP. As noted in Section 3.1, the CIPP does assume faster demand growth than the 2021 RUPTL, but actual demand growth in recent years has been closer to that assumed in the RUPTL.

Figure 8 RUPTL and JETP CIPP demand projections



Source: Kuungana analysis of RUPTL, JETP CIPP, and MEMR Handbook of Energy and Economic Statistics of Indonesia 2022

It is understood that some projects shown as committed in the RUPTL may not be technically feasible. For example, stakeholder discussions have suggested that some planned renewable energy projects may not be in locations with sufficient wind or solar resource, or within reach of the electricity network. The CIPP also includes projects included as committed in the 2021 RUPTL. It would be difficult to remove the deferred projects that have been rolled over in new

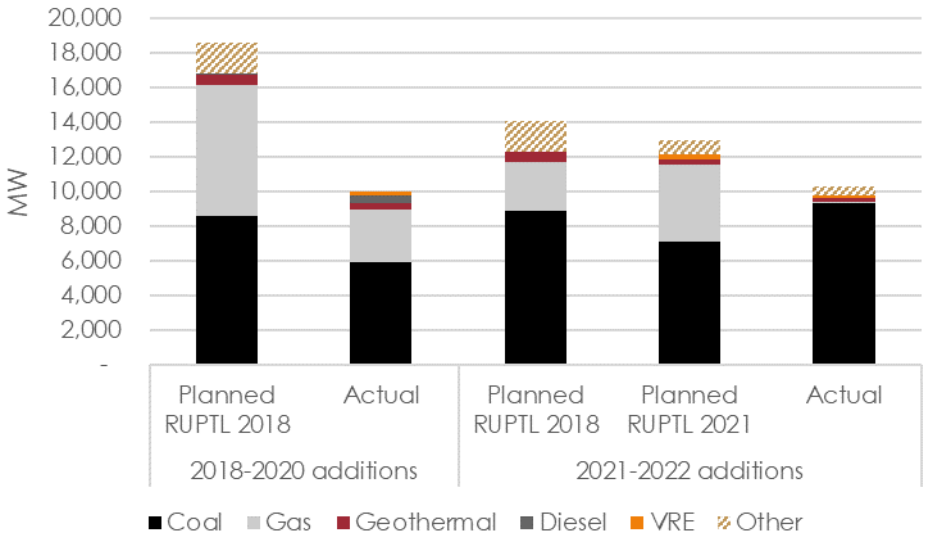
[31] PT Perusahaan Listrik Negara. (2021). Rencana Usaha Penyediaan Tenaga Listrik (RUPTL) 2021-2030. Link.

[32] President of the Republic of Indonesia (2012): Government Regulation Number 14 of 2012 concerning Electricity Supply Business Activities. Link.

updates of the RUPTL: as a result of high projected demand and the previously mentioned goal to build 35 GW of coal capacity, PPAs have already been signed with developers for many of these projects. Cancelling or removing these projects from the RUPTL would in some cases result in a default on existing contracts. This leads to a situation where planning is in part driven by procurement, rather than planning being used to drive procurement decisions.

Frequent deferral of projects included in energy sector plans may undermine confidence in planning. Figure 9 compared actual new additions of power generation capacity in recent years against the new capacity planned in the last two RUPTLs. The energy sector plans, and the RUPTL in particular, can play an important role in signalling future demand for renewable energy. However, for this signal to translate into broad-based interest from investors, those investors will need to be confident that the plan will be implemented.

Figure 9 Planned versus actual new power generation capacity



Source: Kuungana analysis of RUPTL and MEMR Handbook of Energy and Economic Statistics of Indonesia 2022

The objective of any changes to the process for power sector planning should be to signal a clear and credible pipeline of future opportunities. If investors have a clear indication of the amount of capacity that can realistically be expected to be procured, the technologies required, and the timing of procurement processes (and, critically, have confidence that the plan with be implemented as proposed), they will have a basis on which to make investment decisions. Developers will, in turn, have the confidence to start mobilising the capital and to build the supply chains that they need to implement their projects.

As Variable Renewable Energy (VRE) accounts for a growing share of new capacity, it may not always be credible to identify every single project that should be implemented over the planning time horizon. The average project size for wind and solar installations will be much smaller than has previously been the case for thermal power plants, such as coal. It is also likely to be necessary for more of these plants to be developed by the private sector. It is therefore likely be more appropriate to allow the private sector to determine the best sites on which projects can be developed through an open tender process, rather than specific projects being identified and selected in advance. Alternative approaches for future RUPTLs could include:

- Setting a **total capacity target** for renewable energy technologies. Vietnam has adopted such an approach in its most recent power development plan (PDP8).[33] Such

[33] Prime Minister of the Socialist Republic of Vietnam (2023): Decision Number 500/QD-TTg approving the national power development plan for the period 2021-2030, with a vision to 2050. Link.

an approach has the potential to send a clear signal to investors on the ambition to procure a certain quantity of capacity, while also encouraging developers to compete and to find new project development opportunities. However, the complexity involved in securing land rights in Indonesia may limit the potential of such an approach, as discussed in Section 3.4.2.

- If the RUPTL retains the approach of identifying **specific projects**, these should be subject to prior analysis and due diligence to ensure that they can be effectively implemented. It is likely to be difficult to remove coal plants that secured PPAs in the past, because as mentioned previously this would in some cases result in cancelling existing contracts. Still for early VRE pipeline development, well-chosen projects could help to build investor confidence, but this approach is likely to encounter limits as the need to ramp up VRE development increases rapidly. It is unlikely to be possible for PLN to identify/originate and analyse the large number of projects required to meet ambitious renewable energy targets. However, it might still be desirable for PLN to take an active role in specifying the technical requirements, specifications, and location of some projects; for example, projects incorporate storage that might also be used for grid support.
- An alternative, compromise option would be to set targets at a **regional level**, so that PLN leverages the skills in the private sector to identify and develop specific project opportunities, while also ensuring that projects are located in areas where power supply is required and in locations that are compatible with PLN's own plans for development of the electricity network. This approach could be appropriate given the archipelagic nature of Indonesia's geography. In theory, a similar outcome could be achieved through auction design. For example, non-price criteria could be used to place additional value on projects in certain locations. Such criteria could be considered through include scoring for projects in desirable locations, or an adjustment to bid prices for evaluation purposes.

Any changes to the RUPTL would need to be agreed between PLN and MEMR, to ensure that the RUKN and RUPTL remain internally consistent and to ensure that there is a clear connection between MEMR's policy objectives and PLN's operationalisation of those objectives.

RECOMMENDATION: Defining a pipeline of renewable energy project opportunities

In future, EBTKE (the New and Renewable Energy Directorate within MEMR) should be more involved in the preparation of energy sector plans. Currently these are prepared by the Directorate of Electricity. EBTKE's role is critical to make sure that renewable energy policy goals are fully incorporated in energy sector plans.

PLN should consider changing the way in which renewable energy projects are included in future RUPTLs. As described above, there are multiple options for how renewable energy projects are included. National or regional capacity targets for renewable energy technologies could be included in the RUPTL, instead of identifying specific projects.

In the short-term, where specific opportunities are identified, it is important that, to the extent possible, only projects that have been subject to proper due diligence and have realistic development potential are included in the RUPTL, so that developers have confidence that the published plan will be implemented. It is noted that it might be difficult to remove projects that already have a PPA. This might accelerate the move to adopting national or regional capacity targets by technology, as described above.

In the medium to longer-term it is unlikely to be appropriate to identify every project in a centralised plan. However, Indonesia's geographical characteristics mean that it may still be important for PLN to steer the broad locations in which new capacity is required.

In future, procurement should be driven by energy sector plans, rather than plans being dictated by projects that have been procured (i.e., projects that have already been awarded a PPA).

3.4.2. Procurement processes

There have been limited opportunities for new investors in renewable energy projects to participate in Indonesia's electricity sector. Previous procurement exercises for renewable energy projects were discussed in Section 3.2. As noted in that section, there have only been a small number of competitive tenders to date. The experience of private sector developers in the sector has been mixed: while developers have been able to successfully implement a small number of projects, there have been delays to some tenders. The tenders that have taken place have been for specific connection points, limiting participation to developers able to secure land in a suitable location.

Some projects have been procured with no public tender process. While some projects have been procured through a competitive process, others have been procured through bilateral negotiations with developers. For example, our understanding is that the floating solar projects awarded to Masdar and ACWA were not procured competitively. Over the long-term, competitive tender processes are likely to secure the lowest prices for end consumers of electricity.

There has been limited interest in some of the tenders that have taken place. Solar and wind projects are procured through a process referred to as "direct selection", which is defined in Presidential Regulation 112/2022.[34] This mechanism also applies to biomass and run-of-river hydro generation projects. For projects tendered through direct selection, a list of "selected providers" (DPT, or *Daftar Penyedia Terseleksi*) is maintained by PLN, which developers can apply to join once every 3 months. PLN will then submit any tender documents to the DPT list, who compete to win the right to implement the project(s), subject to the price caps presented above. Any tenders must be aligned with capacity quotas defined by MEMR. The regulation suggests that the process from submission of tender responses to the signing of a PPA should take no longer than 180 days, although no consequences of missing this deadline are defined. There has been limited participation in some recent tenders using the "direct selection" procedure:

- It is understood that a recent wind project tender only attracted the participation of two qualifying bidders. This was despite there being 40-50 developers on the DPT list. Discussions with stakeholders suggest that the low participation was at least in part because of concerns relating to the risk allocation in the PPAs for the tender. PPA risk allocation is discussed further in Section 3.4.3.
- The de-dieselisation tender mentioned in Section 3.2 was delayed. It is understood that one of the key reasons for this delay was concerns raised by bidders about the complexity involved in securing land for many individually small projects.

The difficulty with implementing competitive tenders in Indonesia is partly a result of the challenges associated with securing land. There is no single land registry database and some renewable energy developers have reported challenges in managing overlapping land rights claims when securing rights to a site and to the land for connecting a project to the closest substation. Individual land parcels can also be very small, meaning that project developers need to negotiate with many landowners and stakeholders to secure sufficient land rights to develop and wind or solar project.

The lack of transmission capacity can also be a barrier to renewable energy projects. In many parts of the country, the transmission grid remains underdeveloped. The grid has a radial structure and while major population centres are often well served, the network infrastructure between them can be less well developed.[35] The archipelagic nature of Indonesia makes the development of the transmission network particularly challenging. Many separate island systems exist, and even large-scale systems are not always connected. This can sometimes

[34] President of the Republic of Indonesia (2022): Presidential Regulation Number 112 of 2022 concerning the Acceleration of Renewable Energy Development for Electricity Supply. Link.

[35] International Energy Agency (2022): Enhancing Indonesia's Power System. Link.

limit the size of projects that can be implemented, reducing the opportunity for economies of scale.

In the medium to long-term a strong, credible pipeline of project opportunities will encourage investors to make the investments required to overcome these challenges. Successfully addressing challenges around land registration and securing land rights would reduce costs for developers and therefore the prices that they can offer to PLN. However, these issues are complex and have wider implications for developing land – they do not only impact the energy sector. It is likely to take time to arrive at a comprehensive solution and a single, unified land registry database. The projects that have been developed by the private sector demonstrate that it is possible to make progress in the meantime. Developers can assemble the local expertise to navigate complex land rights claims. However, building this local knowledge and navigating the complexity requires investment in a strong local team (and/or advisors). Committing to such an investment in turn requires confidence in a future pipeline of project development opportunities, emphasising again the importance of the recommendations presented in Section 3.4.1.

In the short-term, tenders could be designed to maximise competition, while mitigating land and transmission risk for developers. The tenders that have taken place to date make some attempt to mitigate this risk, by being specific to locations where transmission capacity is available. However, by restricting the location, but still requiring bidders to secure their own site (with all the complexity that this can involve, as noted above), this tends to restrict participation, reducing competition. One alternative, which could increase participation, would be for high quality sites to be secured ahead of a tender, removing the land rights risk for developers, with bidders then competing to build a project on a pre-determined site.

Solar park projects could allow capacity to be scaled rapidly by multiple developers, building confidence in the market. Solar parks allow the procuring entity to secure land rights to a site that already has access to the transmission system. While this reduces the number of parameters that bidders are competing on, it helps to de-risk the project, potentially increasing participation in a tender. This can be useful in a nascent renewable energy sector, such as in Indonesia. In the region, Cambodia has recently successfully procured solar capacity through a solar park project, with the first 60 MW_{ac} of capacity being commissioned at the National Solar Park.[36]

Over time, IPPs could take on more development risk. To deliver new renewable energy capacity at scale it is likely to be necessary to conduct more open tenders where most project development activities are allocated to the private sector. However, this could be done gradually, moving from solar park-like or location specific tenders to more open forms of tendering, encouraging competition between different operators, locations and eventually technologies.

RECOMMENDATION: Designing tenders to scale renewable energy development

PLN should consider running tenders for solar park projects and/or location specific wind and solar projects. These tenders should reduce the level of complexity for bidders and act as a confidence-building measure, resulting in greater participation. PLN would need to identify suitable sites for such tenders.

PLN could then move towards a variant of its current approach: procuring projects that can connect to specific transmission connection points (again, PLN would need to identify suitable connection points), but listing multiple connection points that bidders could use. This approach would allow for greater participation because it would open up a larger number of locations for development than is the case with the current approach.

Some stakeholders have suggested that such an approach might be preferred to a site-specific tender; this is likely to be because the approach is closer to the status quo and is therefore familiar. PLN could adopt such an approach, but substations would need to be

[36] Asian Development Bank (2022): News article: ADB-supported National Solar Park in Cambodia Connects to Grid. Link.

selected carefully to ensure that there was sufficient viable land that can be secured by developers to maximise competition and to mitigate the risk of speculation on land values.

In the longer-term, tenders could be much more open on where projects are located. However, (a) this is likely to require a more comprehensive land registry database, and (b) Indonesia's archipelagic geography means that tenders are likely to need to retain some degree of locational specificity.

3.4.3. Risk allocation in PPAs

MEMR is currently finalising a new regulation governing the contents of renewable energy PPAs. The intention is that the regulation sets the boundaries within which the terms of new renewable energy PPAs can be negotiated. The regulation would build on MEMR Regulations 10/2017[37] and 49/2017,[38] which define the regulatory framework for PPAs for other power generation technologies. However, MEMR Regulation 10/2017 is mostly focused on the PPA terms for thermal power plants and Article 2(3) states explicitly that the PPA terms for some technologies, including intermittent renewable energy technologies, shall be covered by a separate regulation. Further, Article 21(4) of Presidential Regulation 112/2022[39] (which is focused on accelerating the deployment of renewable energy) states that PPA guidelines specifically for renewable energy projects should be developed.

PPA Guidelines have been developed by the DCAT project team,[40] in consultation with MEMR. These guidelines, together with the new regulation, aim to standardise the PPAs for new renewable energy projects where appropriate. This is partly in response to feedback from stakeholders, including project developers, suggesting that delays suffered by previous projects have been the result of negotiations regarding PPA terms, without there being any clear guidance setting out the boundary conditions for these negotiations.

Several areas have been identified where the risk allocation in PPAs for renewable energy projects in Indonesia does not reflect international best practice. The guidelines developed as a separate output from this project[41] present analysis of these areas. However, in general it is worth noting that the PPAs that have been deployed in Indonesia to date do in fact address some key risk allocation issues that have not yet been addressed in the PPAs used for renewable energy projects in other countries reviewed as part of this assignment. For example, projects do benefit from some protection against the risk of output being curtailed in Indonesia, which is not the case in either the Philippines or in Vietnam.

The PPAs used in Indonesia to date are complex by international standards. This is largely because they often try to incorporate and then adapt provisions typically associated with PPAs for thermal power plants, rather than starting from a template that is more suitable for renewable energy projects. The draft regulation currently being developed appears to incorporate some of these same issues.

Projects are required to meet strict local content requirements. The draft regulation requires that projects must meet legislated local content requirements. While this requirement is clearly reasonable, the requirements themselves are onerous, especially for solar projects. This is discussed further in Section 3.4.4.

Intermittent renewable energy projects are subject to asymmetric volume risk, which is likely to result in higher prices for PLN. While projects do receive deemed energy payments during

[37] Ministry of Energy and Mineral Resources, Republic of Indonesia (2017): Regulation of the Ministry of Energy and Mineral Resources Number 10 of 2017 concerning the Principles of the Power Purchase Agreement. Link.

[38] Ministry of Energy and Mineral Resources, Republic of Indonesia (2017): Regulation of the Ministry of Energy and Mineral Resources Number 49 of 2017 concerning Amendments to the Regulation of the Ministry of Energy and Mineral Resources Number 10 of 2017 concerning the Principles of the Power Purchase Agreement. Link.

[39] President of the Republic of Indonesia (2022): Presidential Regulation Number 112 of 2022 concerning the Acceleration of Renewable Energy Development for Electricity Supply. Link.

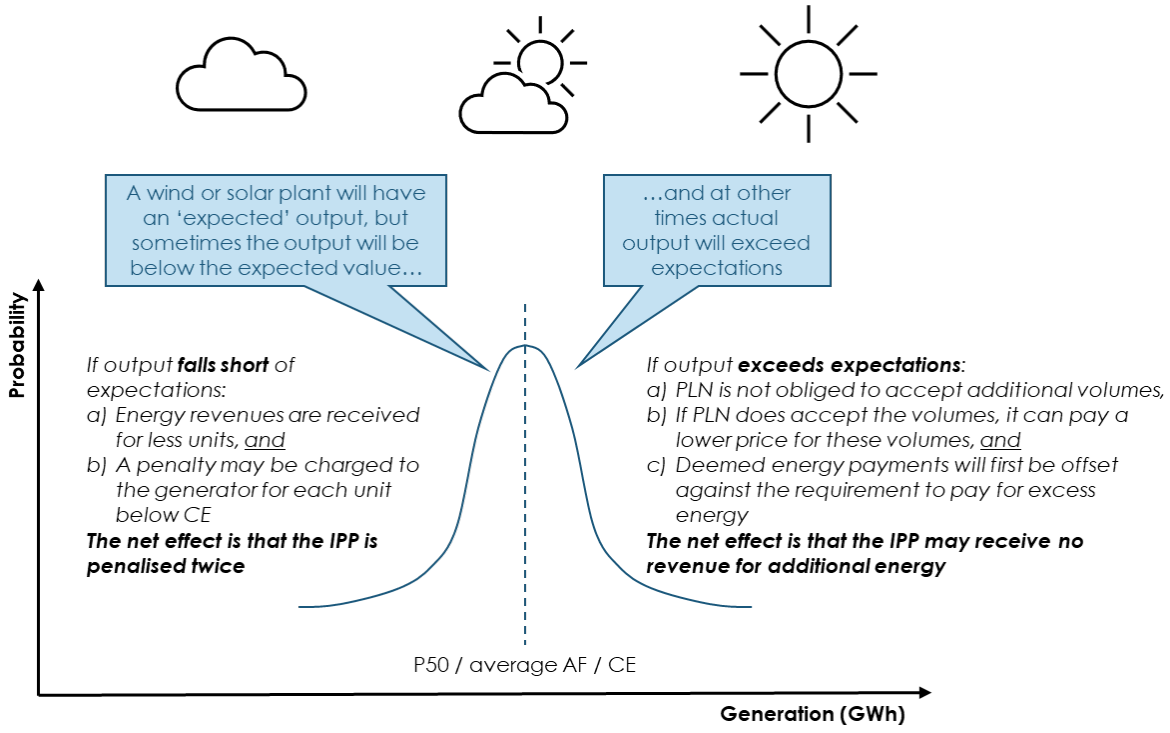
[40] Kuungana Advisory (2023): Diagnostic for Competitive Arrangements for Energy Transition (DCAT): PPA Guidelines for Indonesia.

[41] Ibid.

periods of grid unavailability, these deemed energy payments can be forfeited if the project's output then exceeds expectations. Deemed energy payments are treated as a prepayment, which is then released if output exceeds a "Contracted Energy" amount defined in the PPA. PLN is also not obliged to accept these additional volumes and, if it does, it can often pay a lower price for them. Further, under some circumstances, a penalty can be charged to the project if output falls below "Projected Available Energy". While this is defined such that the project is not exposed to the risk of low wind or solar resource availability, these clauses together are problematic for the following reasons:

- **Complexity** – drafting these clauses so that they are acceptable to at least some project developers has resulted in complex drafting in sections of the PPA defining the amounts to be paid to a project. Especially combined with the limited pipeline of clearly defined opportunities discussed earlier in Section 3.4.1, the commercial complexity is likely to result in reduced interest from international developers (and banks) who have the option of choosing to deploy capital in markets with simpler commercial arrangements.
- **Asymmetry** – Figure 10 summarises the risk allocation that is typical in renewable energy PPAs signed to date in Indonesia, and that is reflected in the draft PPA regulation being developed by MEMR. This risk allocation can act to increase the exposure of a project to reduced revenues in cases of poor performance, while reducing the upside received by the project in cases where performance exceeds expectations. While taken individually these risk allocation decisions may seem reasonable, taken together they will act to increase the price that a project needs to secure to earn its target return. These additional costs will ultimately be paid by Indonesian consumers.

Figure 10 Asymmetry in volume risk for renewable energy projects in Indonesia



Source: Kuungana analysis

In some cases, the PPA regulation does not provide flexibility and this could deter investments. For example, in the context of hybrid projects that include battery storage installations:

- **Payment structure** – The wording of the draft regulation is focused on the payment of energy payments. This is how payments to intermittent renewable energy generators

are typically structured, but for some types of hybrid project a capacity payment might sometimes be paid (for example, if the battery installation is required to be available to deliver ancillary services). While the draft regulation does not explicitly exclude capacity payments, the drafting could more clearly allow for flexibility in the payment structures used in renewable energy PPAs.

- **Metering** – Similarly, the requirement for all exported volumes for hybrid projects to be metered at a single transaction point could be problematic under some circumstances. If dispatch of the storage unit is not controlled by the project owner and the round-trip losses suffered are highly uncertain, an alternative metering approach might be required.

Terms relating to dispute resolution and arbitration have also been problematic for some developers. Specifically, it is understood that the seat of arbitration has sometimes been contentious in agreeing terms to PPAs in Indonesia. Although Indonesia has ratified the New York Arbitration Convention on the Recognition and Enforcement of Foreign Arbitral Awards, it has not yet adopted the UNCITRAL (United Nations Commission on International Trade Law) Model Law on International Commercial Arbitration. This means that adopting Jakarta as the seat of arbitration is often problematic for international investors. Adopting a seat of arbitration such as Singapore, which is viewed as being more objective by investors, is likely to be preferable.

The separate PPA guidelines document[42] prepared for MEMR provides recommendations on how the new PPA regulation should be implemented. This includes further analysis of the issues discussed above, together with guidance on how recommendations should be implemented in the drafting of future PPAs for renewable energy projects.

RECOMMENDATION: Defining a framework for renewable energy PPAs

The draft PPA regulation should be finalised by Ministry of Energy and Mineral Resources, reflecting the recommendations contained in the PPA guidelines.[43] This will provide a clear framework for future renewable energy PPAs.

Wherever possible, renewable energy PPAs should align with international best practice (i.e., should align with the recommendations made in the PPA guidelines) so that Indonesia can draw on as deep a pool of capital as possible. It is noted that improved risk allocation will help to reduce the cost of renewable energy in future tenders, partly because of greater interest, partly because of lower cost of capital. The regulation, and draft PPAs for future tenders run by PLN, should ideally be subject to market sounding with international developers and lenders to validate that the documents are bankable for a wide range of potential bidders.

3.4.4. Market distortion

This section outlines a number of issues that are specific to the Indonesian market, which relate to specific regulatory or commercial factors that impact the attractiveness of investing in renewable energy projects in the country.

PLN frequently requires power generation project developers to accommodate PLN taking an equity stake in the project. This is sometimes referred to as "mandatory participation". Sometimes, this stake is a majority or controlling stake, and PLN does not make a commensurate financial contribution in exchange for the stake. This is non-standard both internationally and commercially and can cause several issues for potential investors in renewable energy projects:

- **Control** – If the investor (or investor group) does not have control over the project, this greatly increases the risk to investor, to the extent that it is unlikely to be bankable in many cases.

[42] Ibid.

[43] Kuungana Advisory (2023): Diagnostic for Competitive Arrangements for Energy Transition (DCAT): PPA Guidelines for Indonesia.

- **Contribution** – Equity stakes are typically received in exchange for a contribution that is equivalent to the value of the equity stake received, whether that contribution is made in financial (e.g., cash) terms or whether it is made 'in kind' (e.g., through securing land for the project).
- **Project finance** – Partly because of the above factors, it can be at best difficult to secure project finance for projects with mandatory participation stakes. If the participation level is sufficiently high such that the project assets are in effect state owned or state controlled, this can act as a barrier to raising finance.

Rules to determine the size of the stake secured by PLN are outlined in Presidential Regulation 14/ 2017[44]. The regulation outlines the role of PLN and its subsidiaries for electricity infrastructure development and requires that for joint venture projects, the PLN subsidiary involved holds at least 51%. For some projects, PLN has secured a 51% controlling stake, but smaller stakes have been required for other projects (e.g., 30% for the Tanah Laut wind farm; 15% for the de-dieselisation projects). The regulation does not appear to result in restrictions on a developer being able to complete a pure IPP (non-joint venture) project.

Mandatory participation requirements should be limited to cases where PLN is making a meaningful contribution to the project and there is a strategic reason for PLN's involvement. In cases where the contribution provided is aligned with the equity stake and level of control sought by PLN, this does not need to be a barrier to project development. Mandatory participation requirements that do not follow this principle are likely to increase the perceived risk of a project, which will in turn increase the cost of finance and thus the energy price that bidders can offer in a tender.

It is noted that PLN's involvement in the sector will remain critical, even if the share of generation capacity that it owns declines. PLN's role in planning and managing the network infrastructure that connects generators to end users will become more complex as generation is sited further from demand. Its role in system operations will also become more involved as the share of generation from intermittent renewable energy increases.

RECOMMENDATION: Phasing out the requirement for mandatory participation

Allowing developers to have 100% ownership on projects they develop would encourage more investors to deploy capital in the country. The current Presidential Regulation 14/ 2017 requires a substantial ownership stake for PLN for many projects. Equity participation for PLN in IPP projects (regardless of whether they are renewable energy installations or not) should be limited to cases where PLN is making a meaningful contribution to the project, such as securing and paying for land rights. In such cases, any equity stake received by PLN should reflect a fair valuation of the contribution made. Where PLN does not provide substantial financial or any other assistance to a project, developers should be allowed to take full ownership of their project.

It is expected that this would result in PLN not being a participant, or being a small minority shareholder, in most projects.

Local content requirements act as a barrier to many renewable energy projects, especially solar projects. Local content requirements for solar were first introduced by Ministry of Industry (MOI) Regulation 54/2012.[45] This regulation initially introduced minimum local content requirements for centralised solar projects of 25.63% for goods, 100% for services, and 43.85% combined. The requirements for solar were then tightened up in 2017 through MOI Regulation 5/2017.[46] In addition to increasing the total local requirement for goods used in a solar system

[44] Republic of Indonesia (2017): Presidential Regulation 14/2017 - Amendments to Presidential Regulation Number 4 of 2016 Concerning the Acceleration of Electricity Infrastructure Development. Link.

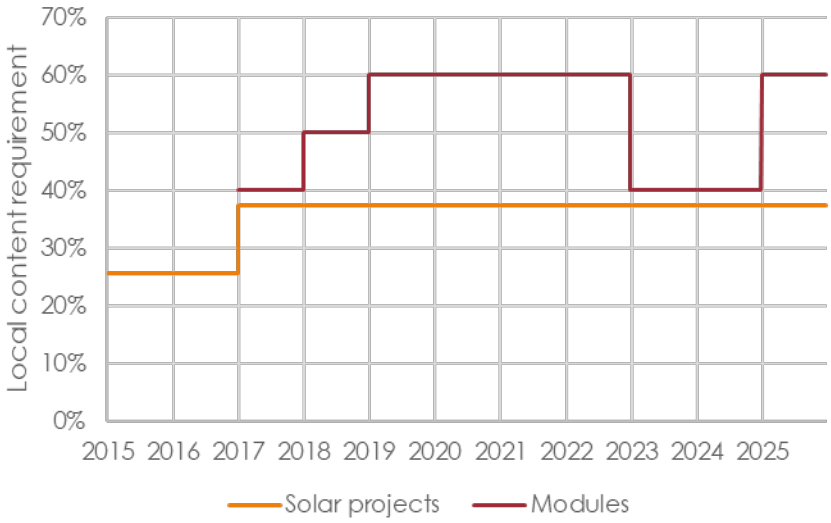
[45] Ministry of Industry, Republic of Indonesia (2012): Regulation Number 54 of 2012: Guidelines for the use of domestic products for electricity infrastructure development. Link.

[46] Ministry of Industry, Republic of Indonesia (2017): Regulation Number 5 of 2017: Amendments to the Regulation of the Minister of Industry Number 54/M-IND/PER/3/2012 concerning Guidelines for the Use of Domestic Products for Electricity Infrastructure Development. Link.

to 37.47%, minimum requirements are set for individual component inputs. This sets a minimum requirement for solar modules at 40%, which subsequently increases to 50% on January 1st, 2018, and 60% on January 1st, 2019. It is understood that PLN has been able to demonstrate local content of >40% in a solar PV project.

The implementation of these increases in local content requirements for solar modules has recently been delayed to 2025. In MOI Regulation 23/2023,[47] the 60% local content requirement is delayed until January 1st, 2025, and the 50% interim requirement is removed as shown in Figure 11. In practical terms, these amendments are unlikely to have a material impact on the development of solar power projects. The more onerous local content requirements for solar have likely been a significant factor behind wind projects making more progress than solar projects in Indonesia until recently, despite variable wind resource.

Figure 11 Local content requirements



Source: Kuungana analysis

A predictable pipeline of project opportunities is likely to achieve more in building a local supply chain than regulation. As already noted in Section 3.4.3, using system planning to define a predictable pipeline of project opportunities is critical for generating interest in the sector from a wide range of investors. This is true for the supply chain as much as it is for project developers. Without such a pipeline of opportunities, it is unlikely that a substantial domestic supply chain would develop.

RECOMMENDATION: Re-calibration of local content requirements

Local content requirements might help to 'nudge' project developers to use local supply chains but will not create a robust local supply chain by themselves. A predictable pipeline of project opportunities is likely to achieve more in this respect.

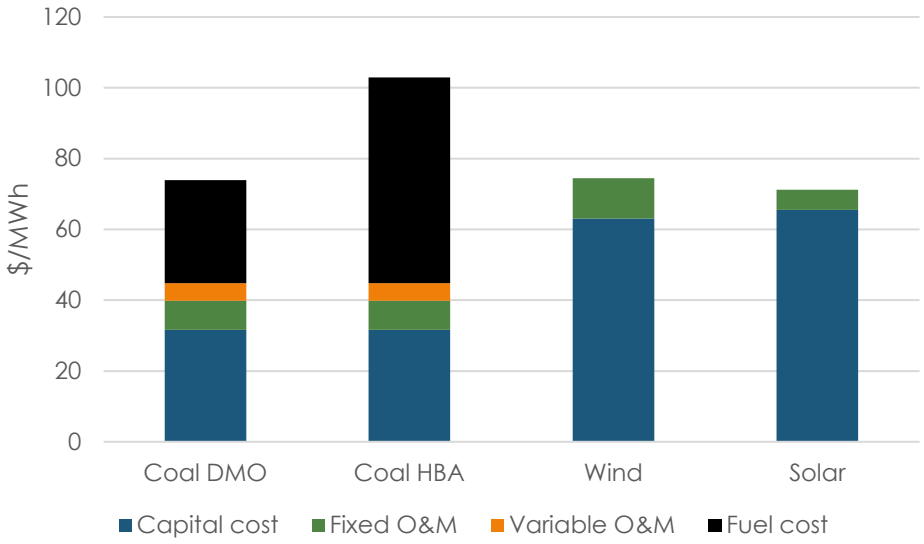
Local content requirement should be set at a level that does not discourage project development. For example, it is understood that some operational solar projects include local content of ~40%. In the short-term, it seems likely that at the very least a further delay in the implementation timescales for the 60% local content requirement for solar modules will be required. This would require a new regulation from Ministry of Industry (MOI), extending the provisions of MOI Regulation 23/2023. MEMR should work with MOI to secure the required regulatory changes.

[47] Ministry of Industry, Republic of Indonesia (2023): Regulation Number 23 of 2023: Second Amendment to the Regulation of the Minister of Industry Number 54/M-IND/PER/3/2012 concerning Guidelines for the Use of Domestic Products for Electricity Infrastructure Development. Link.

Local coal companies are required to sell 25% of their production domestically at below-market prices. This domestic market obligation (DMO) was established through MEMR Regulation 34/2009,[48] responding to the requirement to guarantee coal supply for domestic use in Indonesia's mining law.[49] The regulation does not set the quantity of the obligation; rather, this is set through a ministerial decree that is issued annually. The latest version of this decree was issued in November 2023,[50] maintaining the obligation at 25%. MEMR Decree 1395/2018[51] provides the best overview of the regulation for pricing this coal. A ceiling price of 70 US$/tonne is set for coal sold through the DMO, based on certain reference properties, including a reference calorific value of 6,322 kcal/kg. It is understood that the quality of coal used in domestic coal plant is substantially lower than this benchmark, with an average calorific value of 4,550 kcal/kg.[52] This results in an actual coal price of 43 US$/tonne. If reference export prices are below the 70 US$/tonne price level (which was last the case in 2020), the DMO price also declines.

The implicit subsidy on coal prices distorts investment decision-making as it results in renewable energy projects looking less competitive. Figure 8 shows the impact of the reduced coal price on the levelised cost of new coal-fired power capacity, compared to wind and solar. Two results are shown for coal: one with the reduced DMO price, a second with the HBA (*harga batubara acuan*) reference export price, which was 140 US$/tonne in November 2023. While individual assumptions to these levelised calculations are clearly uncertain, the figure illustrates the distortive impact of the implicit subsidy on investment decisions. While coal remains competitive with renewable energy technologies at the DMO price, this is not the case when international market prices are used for the calculation.

Figure 12 Impact of coal prices on levelised cost of electricity



Source: Kuungana analysis

It would be difficult to withdraw the DMO entirely. The immediate impact of increasing the price for domestic coal would be to dramatically increase power generation costs incurred

[48] Ministry of Energy and Mineral Resource, Republic of Indonesia (2009): Regulation Number 34 of 2009 concerning prioritisation of mineral and coal suppliers for the public interest. Link.

[49] Republic of Indonesia (2009): Law Number 4 of 2009 on Mineral and Coal Mining. Link.

[50] Ministry of Energy and Mineral Resources, Republic of Indonesia (2023): Decree Number 399.K/MB.01/MEM.B/2023 concerning meeting coal demand requirements in the country. Link.

[51] Ministry of Energy and Mineral Resources, Republic of Indonesia (2018): Decree Number 1395.K/30/MEM/2018 concerning the Selling Price of Coal for the Provision of Electricity for Public Interest. Link.

[52] JETP Secretariat (2023): Draft Comprehensive Investment and Policy Plan. Link.

by PLN. These costs would either require a substantial increase in electricity bills for end consumers of an increase in the already-large direct operating subsidy paid to maintain PLN's financial viability.

The DMO could be reduced over time, limiting the immediate impact on affordability for end consumers. While a complete and immediate withdrawal would be politically difficult, alternative policy options could help to mitigate the distortive impact of the DMO on forward-looking investment decisions:

- Commercial arrangements could be established to preserve the DMO pricing for legacy plants, but with the reduced price being removed for new coal-fired power plants. If new coal-fired power plants were fully exposed to market prices, they would likely be uncompetitive against renewable energy competitors.
- The implicit support from the price reduction could be redistributed to mitigate the impact on end consumers most impacted by the shift to fully cost-reflective electricity tariffs. The additional revenues collected by coal suppliers could be redirected to subsidies for the poorest households and/or the industries most impacted by higher electricity prices.
- The DMO could be gradually phased out over time, with amount of coal available at a reduced price declining over time.

It is likely that either the first or third option would be simplest to implement.

RECOMMENDATION: Phase out of the domestic market obligation for coal

The DMO and associated below-market price for domestic coal is distortive and disincentivises investment in renewable energy generation capacity. A full withdrawal of the mechanism is unlikely to be possible, but it is recommended that either (a) a clear glide-path is established for the gradual withdrawal of cheaper coal from the market, or (b) arrangements are set up to withdraw the DMO benefit for all new coal-fired generation capacity. These policy decisions and the drafting of any new regulatory instruments will need to be led by MEMR.

Take-or-pay commitments in PPAs for existing coal-fired power plants further impair the business case for new renewable energy generation capacity. While the DCAT team has not performed a comprehensive review of existing PPAs, it is understood that most existing coal plants are subject to take-or-pay requirements. If PLN's utilisation of a plant falls below some threshold level (sometimes as high as 80%) it would be required to cover costs up to the take-or-pay threshold. The displacement of coal-fired generation by renewables can therefore have the impact of increasing PLN's costs.

Restructuring of these contractual commitments might be possible but is likely to require innovative financing mechanisms. The take-or-pay clauses are included in long-term contracts; failing to honour these clauses would be counterproductive in a market trying to raise capital for new power generation capacity as it would undermine confidence in long-term PPAs in Indonesia. However, innovative financing mechanisms such as the Energy Transition Mechanism (ETM) mentioned in Section 3.1 could release funds to 'buy out' such clauses. The use of concessional funds to bring down the cost of finance for existing coal plants, thereby releasing cashflow, could provide compensation to allow for take-or-pay clauses to be renegotiated.

RECOMMENDATION: Recalibrate take-or-pay requirements where possible

Ultimately, the only way to remove this constraint from the market will be to cease all new coal-fired power plants. New plants will likely be required to make take-or-pay commitments to a fuel supplier to secure a reliable supply of fuel; the power generator will in turn then pass this contractual commitment through to PLN.

Mechanisms such as ETM may provide an opportunity to restructure some legacy take-or-pay commitment. The use of concessional funds from International Financial Institutions (IFIs) may help to release cashflow that can be used to compensate parties adversely impacted by the restructuring of legally binding agreements. IFIs will need to work closely with both PLN (as

offtaker) and thermal power plant IPPs to design commercial arrangements that work for all parties.

3.5. Prioritisation and summary roadmap

Building confidence in the procurement processes used for renewable energy projects in Indonesia is a top priority. As far as possible, the tender process run by PLN should be standardised, so that bidders can build familiarity with the procurement process and the criteria used to assess projects. Because of the complexities involved in securing land rights for solar and wind projects, it was suggested in Section 3.4.2 that tenders could be run where developers are protected from this risk. This could help to attract a larger number of bidders, helping to increase the competitiveness of pricing in the medium term. In the medium-term, PLN could shift towards tenders that allow bidders to develop projects connecting to a pre-defined subset of potential connection points. For a fully open auction (i.e., where it is entirely the bidders' responsibility to identify suitable locations for a new project) it is likely that reforms will be required to alleviate the issues associated with securing land rights.

In parallel, a standardised approach should also be taken to the drafting of PPAs for renewable energy projects. This is already being addressed by MEMR through the development of a regulation covering PPAs for renewable energy projects. This regulation is at an advanced stage of drafting, and finalising the regulation should be a priority for MEMR, as discussed in Section 3.4.3.

While these short-term confidence building measures are implemented, some of the factors that distort the market for renewable energy projects in Indonesia should be tackled. As discussed in Section 3.4.4, the following issues are likely to need attention to increase the number of developers active in the Indonesian market for renewable energy projects over the medium-term:

- While the delay in implementation of the 60% local content requirement for solar modules is helpful, it is likely to be necessary for the Ministry of Industry to further delay implementation of this requirement, or to reduce or remove it, for the market for solar PV projects to gain sustainable momentum.
- PLN should phase out the mandatory partnership model that has been used for most IPP projects. Any participation by PLN in renewable energy IPP projects should be directly linked to PLN's actual contribution to the project's development.

While some projects have been able to proceed through carve outs or exceptions being granted to these requirements, permanent changes are likely to be required to encourage long-term investment in the market. This in turn is likely to have more success in stimulating the development of a sustainable local supply chain than sudden increases in prescribed, minimum local content requirements.

Improving the signalling of a long-term pipeline of opportunities to invest in renewable energy is a less immediate barrier to project development. A clearer connection between power sector plans, procurement, and implementation of power generation projects will help developers gain confidence in the pipeline for renewable energy projects. This will require coordination between MEMR and PLN, both of which are involved in power sector planning. In the longer-term, a change in the approach to planning is likely to be required, moving away from individual candidate renewable energy projects being identified. This is a shift that has already been implemented in Vietnam.

Tackling market distortions that favour incumbent coal will be complex and carries the risk of unintended consequences. Phase-out of the domestic market obligation for coal production and recalibration of take-or-pay obligations could increase the space for renewable energy generation. However, this will take time and, in some cases, may need to be negotiated on a plant-by-plant basis. Designing solutions that tackle these distortions while mitigating or avoiding the risk of increasing electricity costs for end consumers and the risk of undermining confidence in long-term agreements for future IPP projects is likely to be complex.

Table 8 Summary of recommendations and their prioritisation, Indonesia

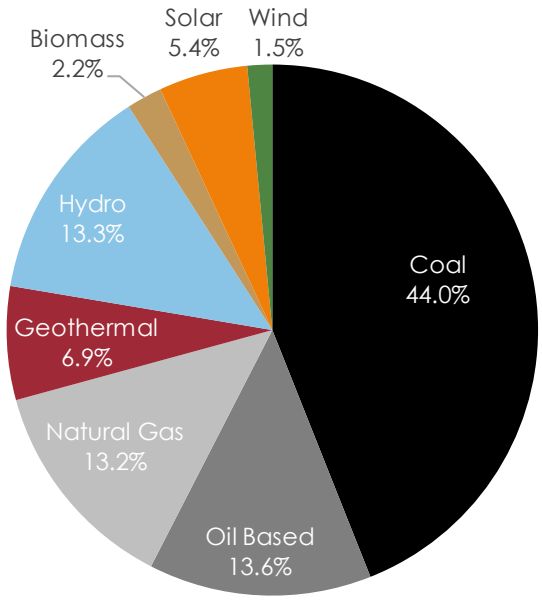
Recommendation	Responsible party	Timing
Commit to making renewable energy tenders open to more participants. This might start with tenders where land acquisition risk is mitigated for developers.	PLN	Immediate
Finalise the renewable energy PPA regulation that is currently under development.	MEMR	Immediate
Recalibrate local content requirements for solar, at least delaying the increased requirement due to be implemented from 2025.	MOI (and CMMIA), with MEMR	Medium-term
Phase out mandatory participation requirements.	Ministry of SOEs	Medium-term
Adjust approach to defining renewable energy projects in the RUPTL, potentially moving away from listing individual projects.	PLN	Long-term
Try to amend take-or-pay commitments and/or curtail the lifetime of coal-fired power plants through innovative use of concessional finance.	IFIs, working closely with PLN and IPPs	Long-term
Start to phase out DMO requirement on domestic coal producers.	MEMR	Long-term

4. Diagnostic and roadmap: Philippines

4.1. 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 13.

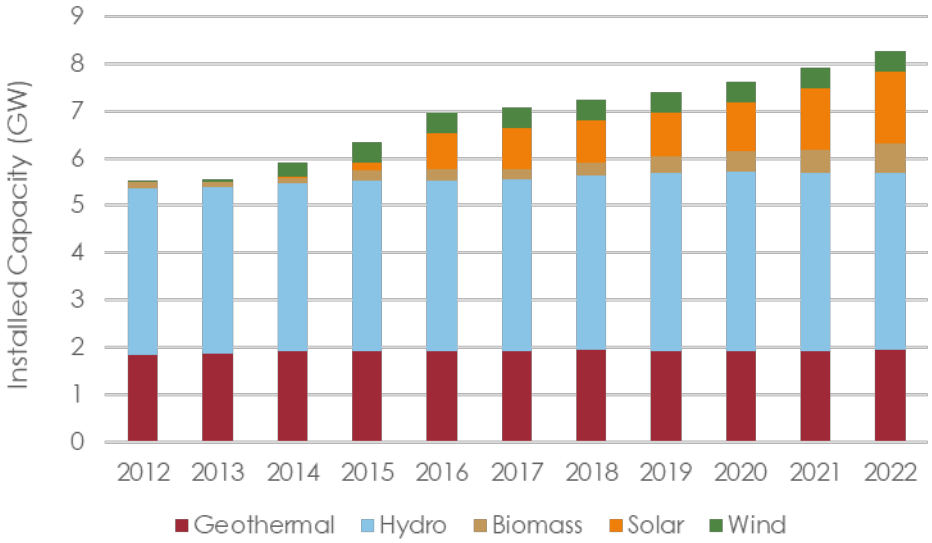
Figure 13 Installed capacity mix, Philippines, 2022



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 14 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 4.2 presents analysis of the FIT and other procurement mechanisms used to encourage new renewable energy capacity.

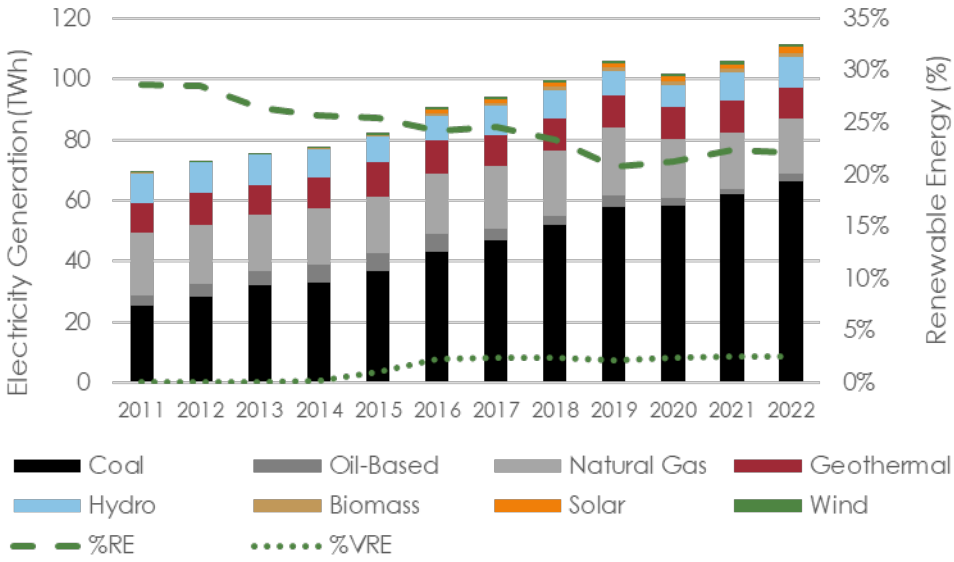
Figure 14 **Renewable energy installed generation capacity, Philippines, 2012-2022**



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 15 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[53] This moratorium is expected to continue, providing a signal to investors that the country is prioritising investments in renewable energy generation facilities.[54]

Figure 15 **Electricity generation mix, Philippines, 2011-2022**



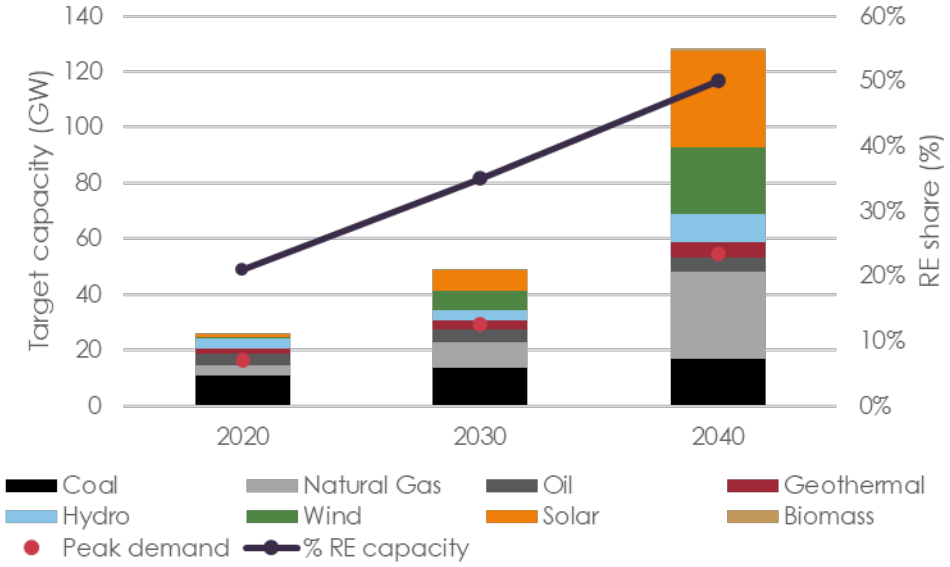
Source: Kuungana analysis of Department of Energy Annual Power Statistics

[53] Department of Energy (2020): Coal moratorium. Link.
[54] 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.[55]

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 16. 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.[56] 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 16 Installed capacity plans in NREP



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

4.2. 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.[57] 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

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

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

[57] 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.

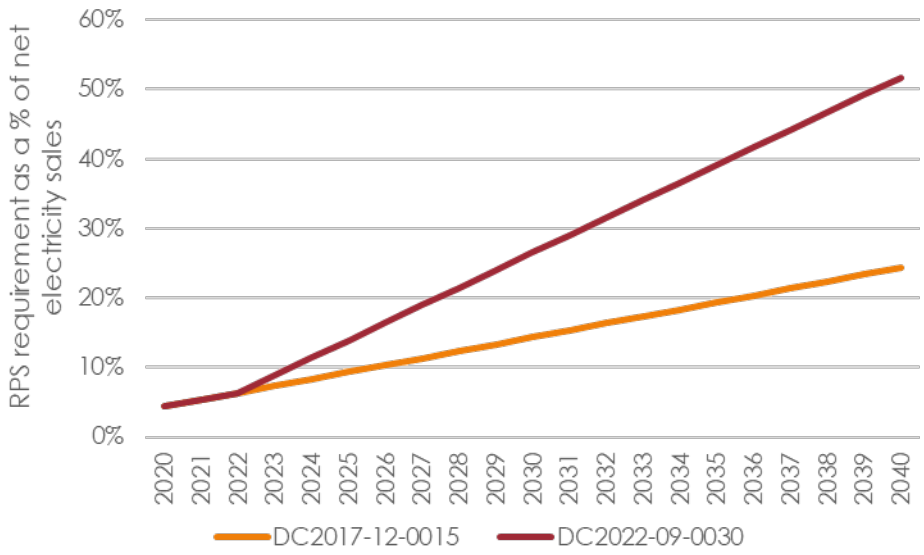
monthly peak demand of 100 kW and above to source their power from renewable energy sources.

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,[58] 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."[59] 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[60] 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 4.1 and as illustrated by Figure 17.

Figure 17 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

[58] 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.

[59] 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.

[60] 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 9 in 2012.[61]

Table 9 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[62] and 7.40 PhP/kWh for the additional 200 MW of wind[63]. 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,

[61] Energy Regulatory Commission (2012): Resolution No. 10, series of 2012: Resolution approving the feed-in tariff rates. Link.

[62] Energy Regulatory Commission (2015): Resolution No. 6, series of 2015: Resolution adopting the new solar feed-in tariff (FIT) rate. Link.

[63] Energy Regulatory Commission (2015): Resolution No. 14, series of 2015: Resolution adopting the wind feed-tariff (wind-FIT2) rate. Link.

in November 2021.[64] 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.[65]

Table 10 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

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

[65] 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.[66] Some of the reasons for the shortfall in bids received for GEA-2 are analysed further in Section 4.4, together with discussion of the rationale used by DOE to determine the targets presented in Table 11.

Table 11 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 12 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.

4.3. Governance of renewable energy procurement

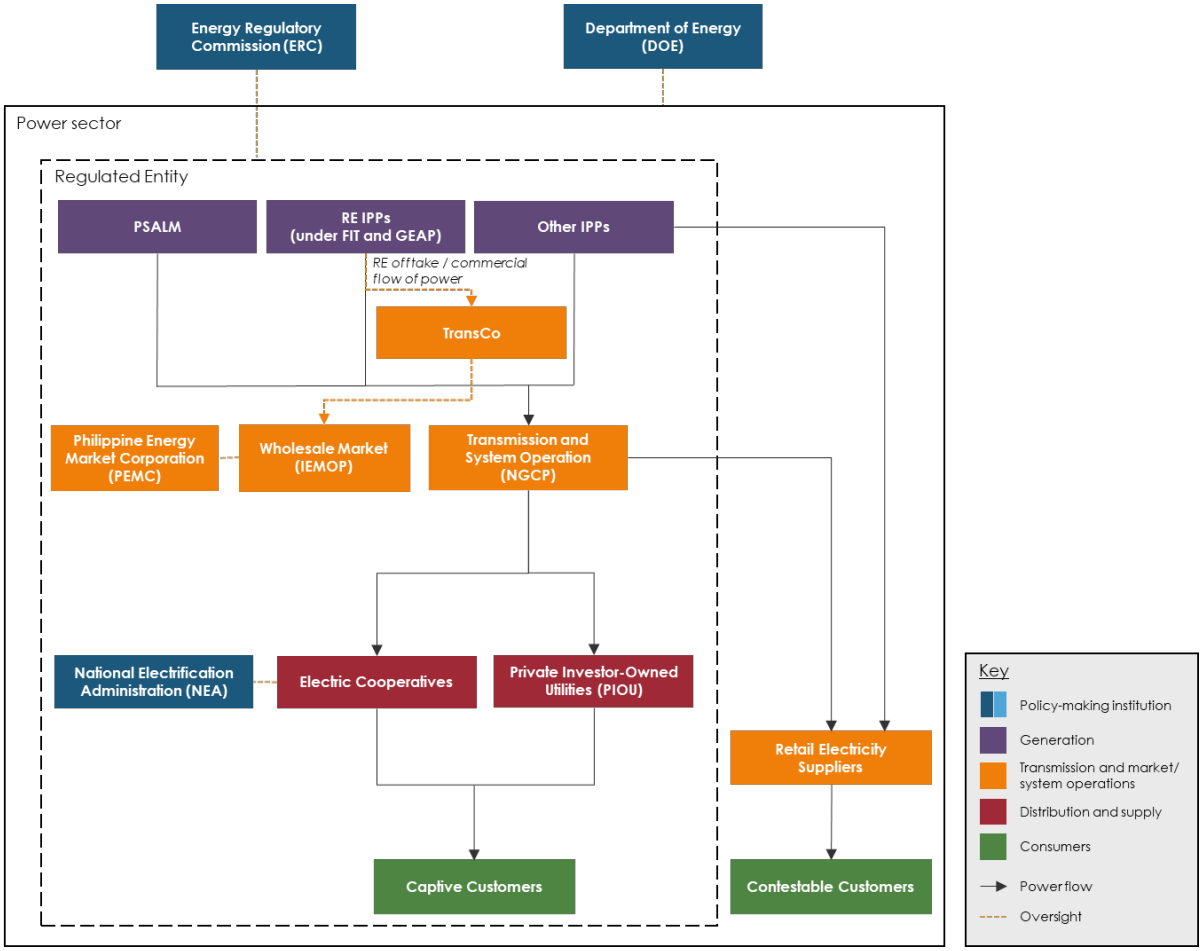
The electricity sector in the Philippines is unbundled; as a result, there are many more stakeholders involved in renewable energy procurement than in either Indonesia or Vietnam. The Electric Power Industry Reform Act (EPIRA) of 2001[67] resulted in fundamental changes to the structure of the electricity sector in the Philippines. The law resulted in the privatisation of

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

[67] 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 18.

Figure 18 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).

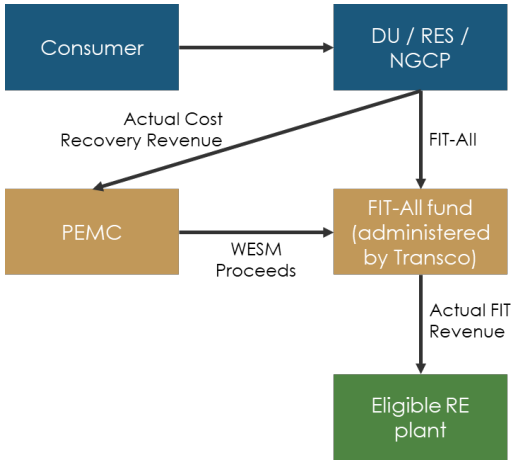
The Department of Energy (DOE) oversees policy making and is tasked with ensuring that renewable energy targets are met. DOE is responsible for the design and implementation of the market mechanisms provided for in the RE Act through the issuance of Department Circulars (policy). The DOE is also responsible for implementing the Green Energy Auction Program (GEAP), which is used to procure new renewable energy capacity, as already discussed in Section 4.2.

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 19). This includes generators who have been successful in the GEAP.

Figure 19 Flow of funds as defined under the FIT-All Guidelines[68]



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 4.4.4.

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

[68] 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 4.2.

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.

4.4. 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 4.4.1.
- **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 4.4.2.
- **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 4.4.3.
- **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 4.4.4.

4.4.1. Auction design

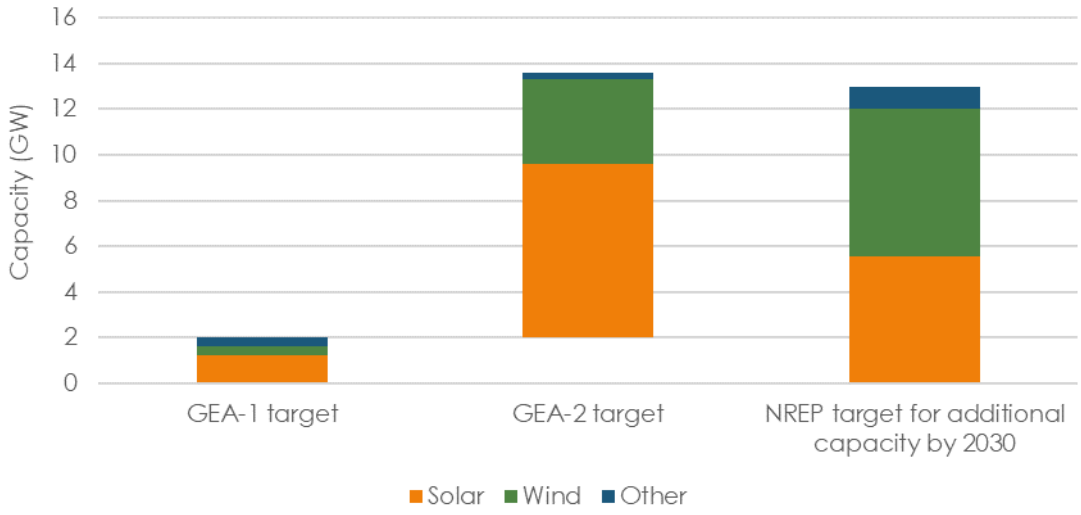
The Green Energy Auction Program (GEAP) has had mixed results in securing new renewable energy generation capacity. To reach the target of 35% of electricity generation being sourced from renewable energy by 2030 (as set out in the NREP), the Philippines has several mechanisms. The GEAP has been successful in attracting ~5.4 GW of new capacity over two auction rounds, as already presented in Section 4.2. 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.[69] For GEA-2, the amount targeted increased significantly, to a total of 11,600 MW.[70] Figure 20 shows that had both auction rounds

[69] Department of Energy (2022): Terms of Reference, Green Energy Auction-1. Link.
[70] 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.

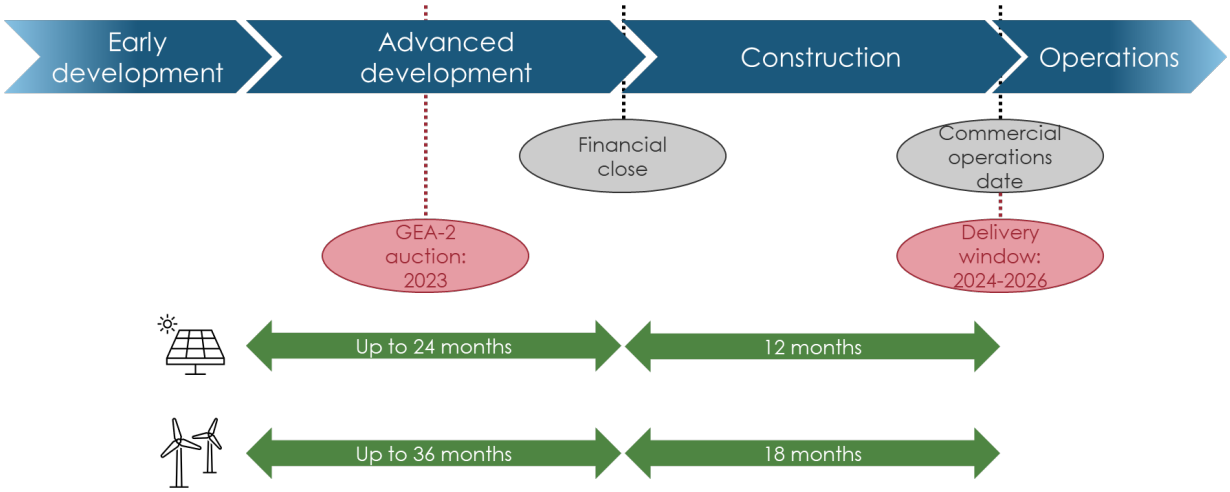
Figure 20 Alignment of GEA target with NREP target



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 21. Having realistic and sufficient lead times would help to encourage increased participation in future auction rounds.

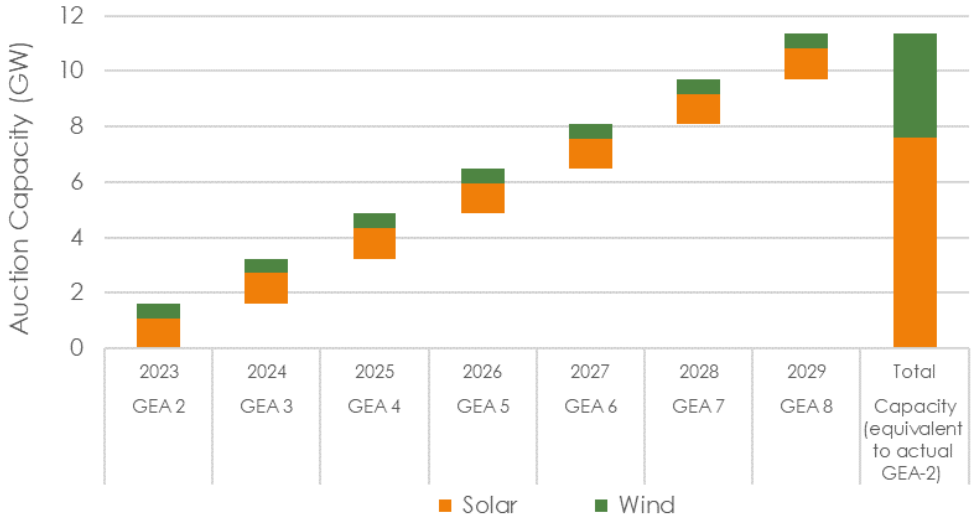
Figure 21 Lead times for development



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 22. 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 22 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 20 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 4.2) 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 4.4.3.

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 12, 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%.[71] 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).[72] 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,[73] 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

[71] 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.

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

[73] 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.

4.4.2. 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[74] approved template contracts for projects operating under the FIT scheme that was implemented in the Philippines as described in Section 4.2. 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 19. The FIT-All Guidelines[75] in turn define the Actual FIT Revenue as being calculated with reference to the relevant FIT Rate. Subsequently, a new DOE Department Circular[76] has been issued to clarify that the Green Energy Tariff (which in turn is defined in the GEA Guidelines[77] 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[78] 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 23 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 4.4.4.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. Deemed energy payments will normally be quantified using an estimate of the

[74] 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.

[75] 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.

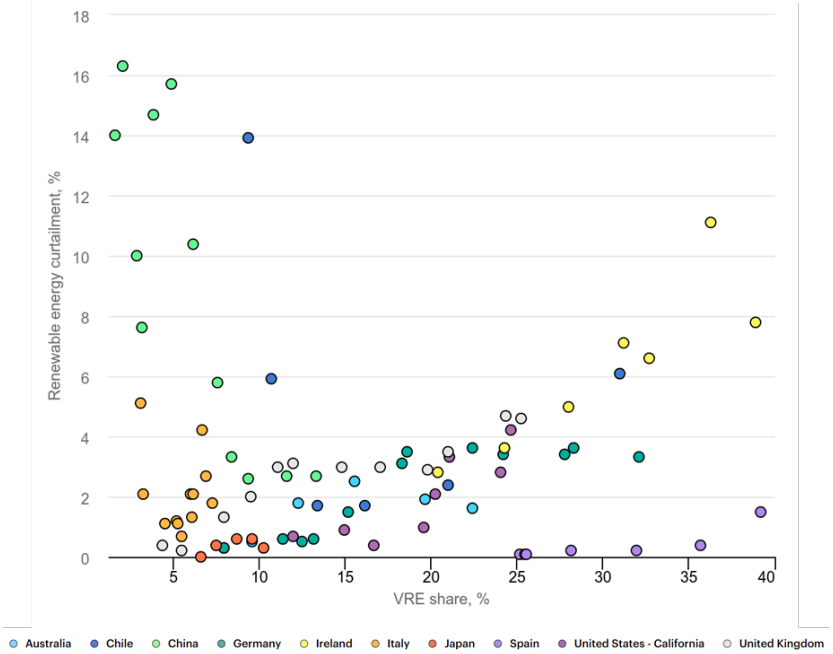
[76] Department of Energy (2023): Department Circular No. DC2023-09-0027: Amendment to Department Circular No. DC2021-11-0036 titled providing the revised guidelines for the green energy auction program in the Philippines. Link.

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

[78] 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.

energy that would have been generated (e.g., with reference to site wind or solar resource measurements) without the curtailment event.

Figure 23 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.

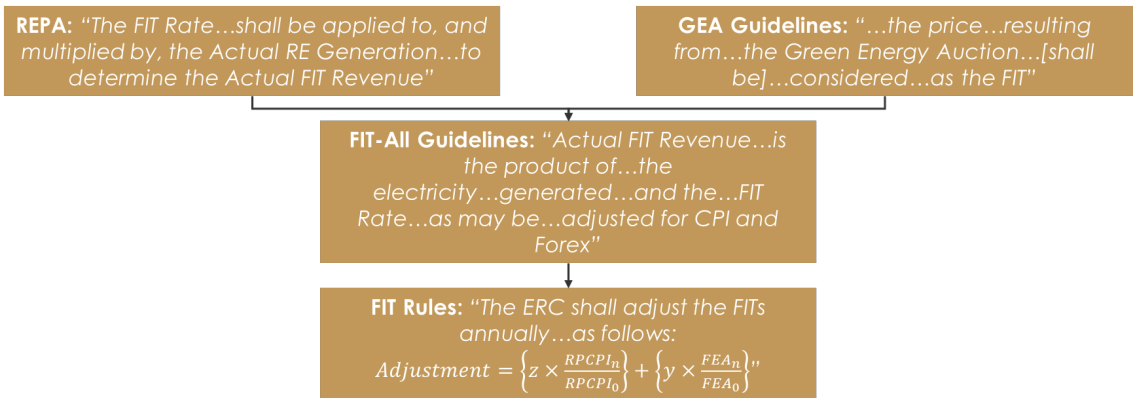
The REPA is a short document, with many provisions signposted to related regulations. The template REPA[79] is only 12 pages in length, which is much shorter than many PPAs. This is partly because some of the terms that would typically be drafted in full within the PPA are covered instead in related 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.[80] Clause 1.4.1.1 notes that the foreign exchange adjustment is further defined in Clause 2.10 of the FIT Rules.[81] 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 24, the GEA Guidelines confirm that the submitted auction prices are equivalent to the FIT. However, it was understood by most developers that GEA prices would not be indexed.

[79] 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.
[80] Ibid.
[81] Energy Regulatory Commission (2010): Resolution No. 16, series of 2010: Resolution adopting the feed-in tariff rules. Link.

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 24 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[82] 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.

4.4.3. 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 4.2, there are many mechanisms in place for the procurement of renewable energy. Most of these originate from the Renewable Energy Act.[83] 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.

[82] 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.

[83] 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 4.4.1, 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 4.4.1) 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;[84] 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[85] 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)[86] is presented in Figure 25. This shows how the DUs typically have committed supply-side resources for the next few years. The committed capacity shown in Figure 25 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[87] requires DUs to "supply electricity in the least cost manner to its captive market". A department circular from 2021[88] issues guidelines on the development of the DDP and reiterates this requirement while also noting the obligation that DUs have under the RPS.

[84] Ibid.

[85] 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.

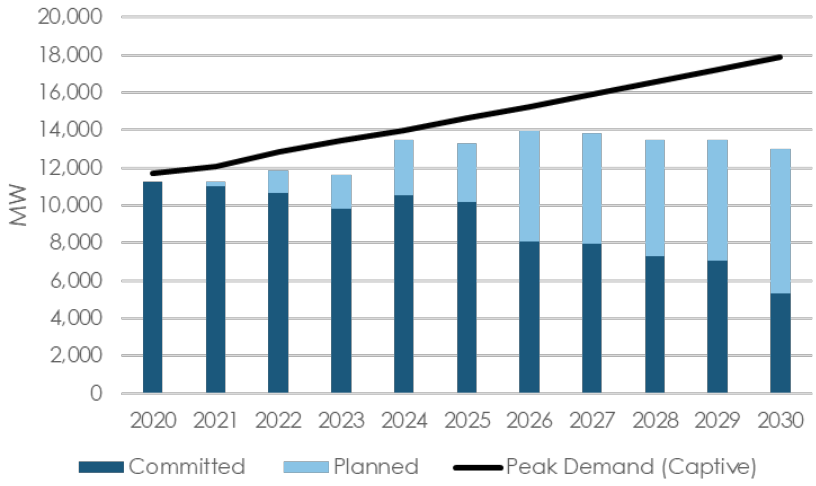
[86] Department of Energy (2023): Distribution Development Plan, 2021-2030. Link.

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

[88] 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 25 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[89] 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

[89] 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.[90] 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.[91] 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,[92] 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

[90] Ibid.

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

[92] 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,[93] Section 10, which refers to the opt-in mechanism, would be removed.
2. Also in the GEA Guidelines,[94] 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,[95] 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[96] could be greatly simplified. This is likely to be the most substantial change, but a simplification. This regulation would need to confirm that RPS

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

[94] Ibid.

[95] 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.

[96] 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[97] 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 19, 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[98] "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[99] 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 26. The FIT-All charge calculation for 2023[100] was based on WESM prices over the 36 month period from April 2019 to April 2022. As shown in Figure 26, 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.

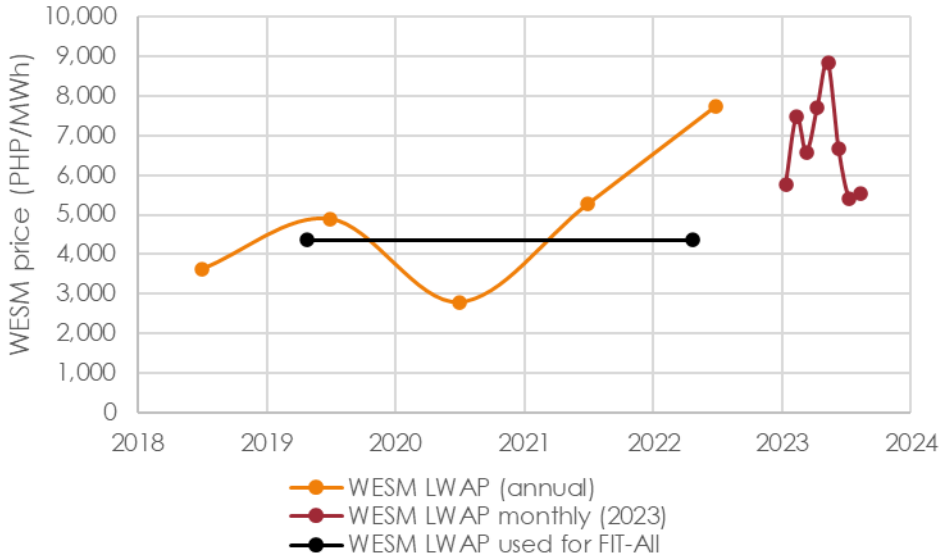
[97] Energy Regulatory Commission (2013): Resolution No. 24, series of 2013: a resolution adopting the guidelines on the collection of the feed-in tariff allowance (FIT-All) and the disbursement of the FIT-All fund. Link.

[98] 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.

[99] 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.

[100] 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 26 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.[101]

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

[101] 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.

4.4.4. 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),[102] 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,[103] 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

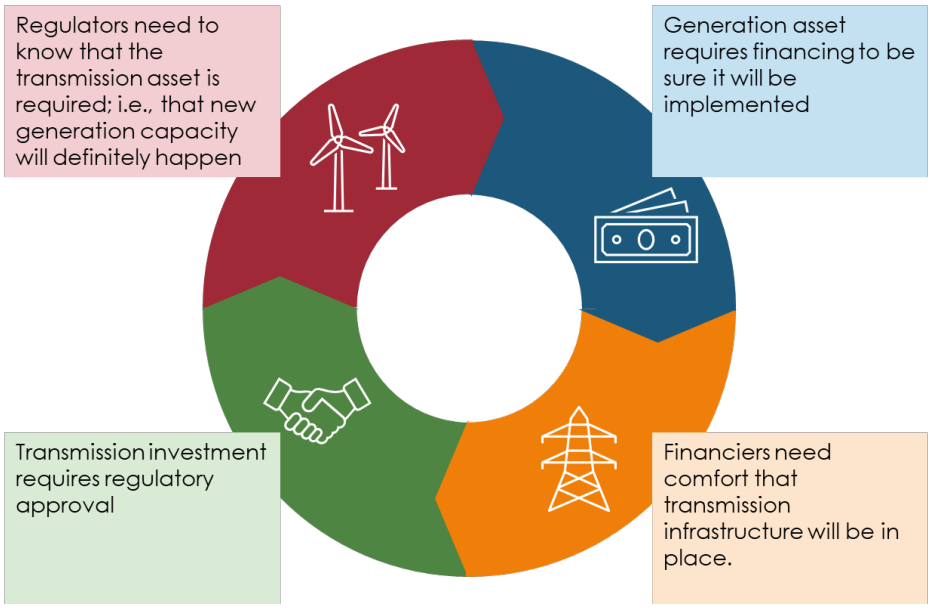
[102] Greenmap (2022): The Philippines Green Energy Auction Program Survey 2022: Report of results and conclusions.

[103] 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.[104] 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 27, which is adapted from the NGCP's Transmission Development Plan.[105]

Figure 27 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,[106] 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

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

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

[106] 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,[107] 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.

4.5. 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.

[107] 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 4.4.3, 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 4.4.3, 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 4.4.4, 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 4.4.1, 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 22, 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 4.4.2, 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 4.4.2, 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 4.4.3), 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 4.4.4). 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 13 Summary of recommendations and their prioritisation, Philippines

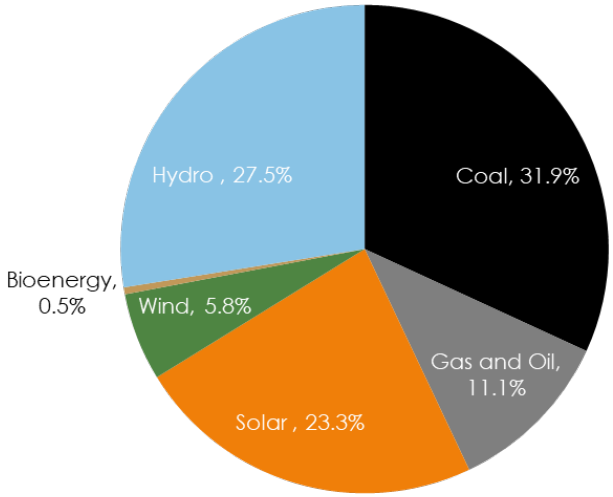
Recommendation	Responsible party	Timing
Ensure that GEA-1 and GEA-2 projects can proceed on a timely basis, potentially accelerating actions listed below where necessary.	DOE with support from other sector stakeholders	Immediate
Ensure that RPS compliance is feasible. This is likely to require either 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

5. Diagnostic and roadmap: Vietnam

5.1. Renewable energy in the electricity mix

Renewable energy accounts for over half of installed power generation capacity in Vietnam. Thermal power plants, especially coal-fired plants, still have a big presence in the mix as seen in Figure 28. In 2022, coal, hydro, and variable renewable energy (VRE) accounted for a similar share of the power generation mix. Substantial progress has been made in incorporating VRE since the late 2010s, with solar accounting for 23% and wind accounting for 6% of installed capacity by 2022.

Figure 28 Installed capacity mix in Vietnam, 2022

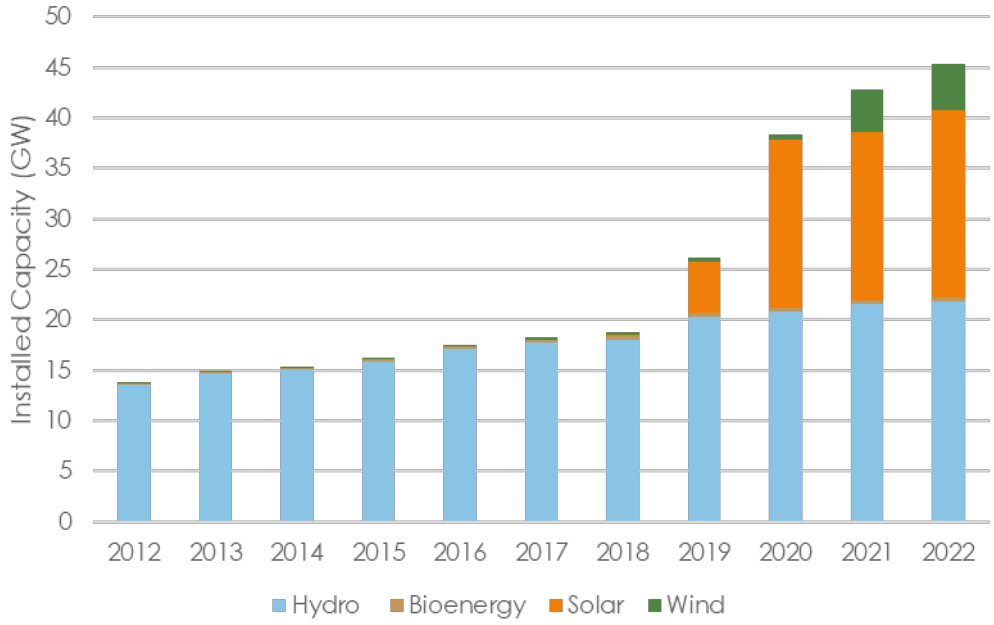


Source: Kuungana analysis EVN Annual Report and IRENA Data

Most of the installed solar and wind generation capacity has been added in the last few years. This is the result of a FIT regime that Vietnam implemented (see Section 5.2). Vietnam was able to deploy solar, with installed capacity increasing from near zero in 2017 to 18.5 GW in 2022, as shown in Figure 29.[108] These solar installations resulted in a rapid increase in total installed capacity over this period. However, the FIT has since expired as is discussed further in Section 5.2, and in recent years the installation of renewable energy has slowed, largely because of there being no new mechanism in place to replace the FIT for most renewable energy projects.

[108] International Renewable Energy Agency (2023): Renewable Capacity Statistics 2023. Link.

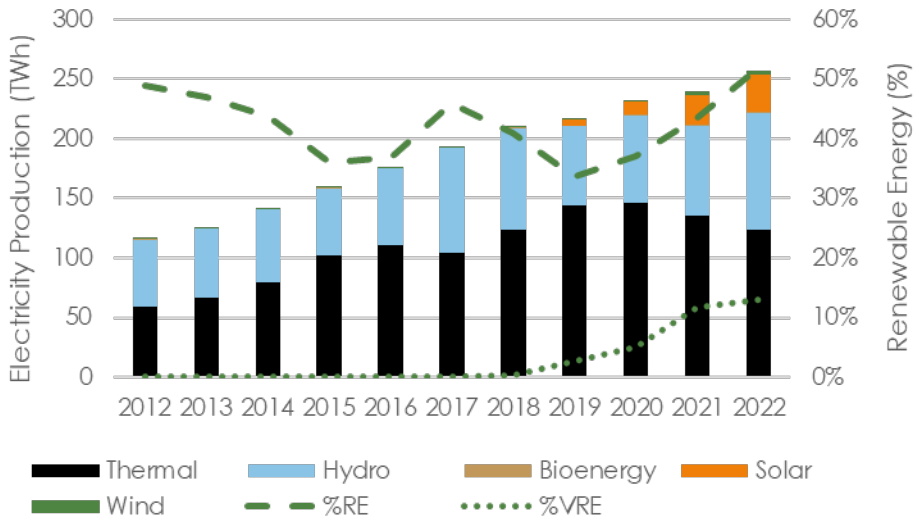
Figure 29 **Installed renewable energy generation capacity, 2012-2022**



Source: Kuungana analysis EVN Annual Report and IRENA Data

The share of electricity generation from renewables has therefore also increased. Generation of electricity primarily comes from thermal power plants and hydro generation. Although the share of variable renewable energy in the installed capacity mix has increased in recent years, generation from renewables has not increased as rapidly. In 2022, the share of VRE was at 13% of total generation despite the huge increase in capacity. The share of generation from renewable technologies with hydro included dropped in 2019 because of drought conditions that resulted in lower hydro output. The share (including hydro) recovered to 37% in 2020 and increased to 52% in 2022. Generation from fossil fuels has been dropping in recent years as shown in Figure 30, due to the growing presence of renewables and imports from Laos and China.

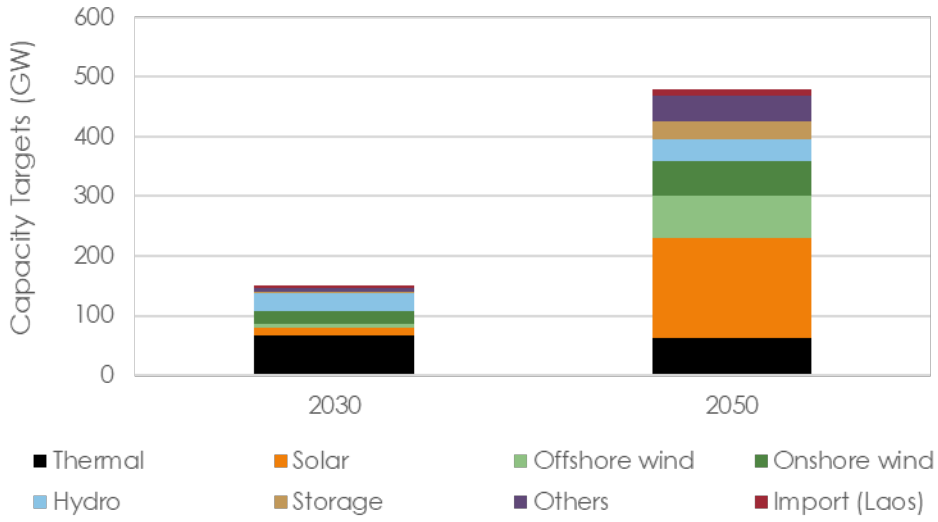
Figure 30 **Electricity generation in Vietnam, 2012-2022**



Source: Kuungana analysis EVN Annual Report and IRENA Data

The recently finalised Power Development Plan 8 (PDP8)[109] includes very ambitious targets to install more renewable energy capacity. PDP8 is the country's latest and main energy planning document, drafted by the Ministry of Industry and Trade (MOIT) and approved by the Prime Minister and Parliament. The PDP8 covers the period of 2021-2030 with goals toward 2050 (see Figure 31). It includes an ambitious increase in capacity for variable renewable energy. PDP8 includes total capacity targets and includes specific projects that have been approved for construction. For VRE, it aims for an additional 22 GW onshore wind, 6 GW offshore wind, and 2.6 GW of solar by 2030. As more intermittent resources are added to the system the plan also includes additional pumped hydro and a 300 MW battery by 2030.

Figure 31 PDP8 projected capacity mix



Source: Kuungana analysis of PDP8
Notes:
1. Solar capacity totals exclude existing rooftop solar power.
2. Storage includes both pumped hydro and batteries. By 2030, Vietnam plans to have 300MW of BESS included in this total.
3. Thermal includes coal, gas, and LNG. By 2050, PDP8 indicates that these plants are converted to run on biomass, ammonia, or hydrogen.
4. Others include biomass, WTE, co-generation, and flexible power source.

5.2. Renewable energy procurement to date

Vietnam's feed-in tariff mechanism has received global attention in recent years. As illustrated previously in Figure 29, the feed-in tariff resulted in a rapid increase in the installed capacity of wind and solar. This is especially true of solar, which has increased from negligible capacity in 2017 to 16.7 GW by the end of 2021 and 18.5 GW by the end of 2022. The largest increase in capacity was achieved during 2020 (an increase from 5.0 GW to 16.7 GW).

A remarkable portion of this growth was a result of rooftop solar installations. It is understood that much of this development was in response to the Prime Minister's Decision 13/2020/QD-TTg.[110] This decision came after the expiry of an earlier feed-in tariff mechanism in 2019[111] and permitted developers to connect projects until the end of 2020. The decision also provided for behind-the-meter corporate PPAs, allowing for more innovative commercial and financing

[109] Prime Minister of the Socialist Republic of Vietnam (2023): Decision Number 500/QD-TTg approving the national power development plan for the period 2021-2030, with a vision to 2050. Link.
[110] Prime Minister of the Socialist Republic of Vietnam (2020): Decision Number 13/2020/QD-TTg on mechanisms to encourage solar power developments in Vietnam. Link.
[111] Prime Minister of the Socialist Republic of Vietnam (2017): Decision Number 11/2017/QD-TTg on the support mechanisms for the development of solar power projects in Vietnam. Link.

arrangements between solar project developers and businesses and institutions that might host solar rooftop projects or had taken on corporate renewable or clean energy goals. Rooftop projects were seen as being especially attractive in Vietnam, where land acquisition can be challenging (this is discussed further in Section 5.4). The feed-in tariff for solar rooftop projects was set at the equivalent to 8.38 US$c/kWh during this period.

Vietnam's boom in renewable energy production largely relied on the mobilisation of local developers and local capital. Most projects were developed by Vietnamese and other regional developers and conglomerates. Corporate finance (i.e., on balance sheet finance) was often used rather than project finance (i.e., where funds are lent on a non-recourse basis to a dedicated project company). Where project finance was used, it is understood that this was largely provided by banks that had existing strong relationships with conglomerates. This allowed banks to draw comfort from the presence of an existing, trusted client and allowed funds to be provided even if the commercial arrangements did not meet the standards typically required for non-recourse project finance.

The boom outstripped all expectations; this arguably contributed to the current pause. The previous power development plan, PDP7, which was approved in 2016, included 2,030 MW of wind power and 3,935 MW of solar.[112] Vietnam's centralised planning process typically requires projects to have been included in the PDP for them to be allowed to proceed. The volumes accepted to the FIT mechanism exceeded those included in the PDP. While there were good reasons for this (delays experienced by coal projects meant that the country was experiencing power shortages), it is understood that the deviation from the previous PDP has contributed to a cautiousness in approaching any new activity to procure renewable energy capacity.

Despite the recent surge in solar capacity, government interest in wind pre-dates the solar feed-in tariff. The Prime Minister's Decision 37/2011/QD-TTg[113] established a feed-in tariff for wind, which was originally set at 7.8 US$c/kWh for a 20-year period. Initially, this rate attracted little investment in new capacity, with 136 MW installed by the end of 2015. Many judged this initial tariff to be too low for most projects. In 2018, Decision 39/2018/QD-TTg[114] increased the tariff for onshore wind projects to 8.5 US$c/kWh (the rate for offshore wind projects was set at 9.8 US$c/kWh); installed capacity subsequently increased to 4.6 GW by the end of 2022 (albeit also benefiting from substantial falls in capex over the preceding decade). These tariffs were granted to projects able to reach commercial operations by 1st November 2021.

37 wind projects were stranded and were unable to secure access to the FIT under the old regime.[115] This compares to nearly 150 wind farms with a PPA by late 2021.[116] The November 2021 deadline for wind projects under the increased feed-in tariff meant that many projects were caught up in restrictions and delays associated with the Covid-19 pandemic. This was not deemed to trigger force majeure under the PPAs signed by developers, and this resulted in many wind project developers defaulting on their PPAs because of missing the deadline for commissioning. These projects were not connected and were stranded from the EVN grid.

Based on discussions with affected project developers, it is understood that the commercial terms for many of these projects have been renegotiated, and roughly two thirds of the affected projects have been connected. The framework for bilateral negotiations with these projects was set by MOIT Circular 15/2022/TT-BCT,[117] and ceiling tariffs based on this framework

[112] Prime Minister of the Socialist Republic of Vietnam (2016): Decision Number 428/QD-TTg on approval for adjustment of the national electricity development plan for the period 2011-2020 taking into account 2030. Link.

[113] Prime Minister of the Socialist Republic of Vietnam (2011): Decision Number 37/2011/QD-TTg on mechanisms to support the development of wind power projects in Vietnam. Link.

[114] Prime Minister of the Socialist Republic of Vietnam (2018): Decision Number 39/2018/QD-TTg modifying and addition of an article to Prime Minister's Decision No. 37/2011/QD-TTg dated June 29, 2011, on mechanisms to support the development of wind power projects in Vietnam. Link.

[115] International Union for Conservation of Nature (2022): Opportunities and challenges in expanding wind in Vietnam's electricity mix. Link.

[116] Ha-Duong, Minh (2022): Dataset of wind power projects in Vietnam, 2022-05. Link.

[117] Ministry of Industry and Trade (2022): Circular Number 15/2022/TT-BCT prescribing methods for formulating price brackets for solar power plants, transitional wind power plants. Link.

were subsequently published in MOIT Decision 21/QD-BCT.[118] Where new terms have been agreed, these have typically been agreed only for one year and will require further negotiation for a long-term solution. The pricing agreed has typically only been sufficient to cover debt repayments and has been in Vietnamese Dong (the cap price in Decision 21 is 1,587.12 VND/kWh for onshore wind, which is roughly equivalent to 6.5 US$c/kWh in early 2024), rather than in US Dollar terms, which had been the case in the original PPAs.

Experience in other markets suggests that the use of conventional project finance would have required due diligence that would likely have mitigated the risk of such an outcome. International developers and lenders would typically have required due diligence on the commercial terms that would have resulted in terms more aligned with international norms. While it is impressive that Vietnam has achieved such a scale-up in the role of renewables without the participation of these entities, the issues that have arisen might result in some local developers and lenders being more cautious during future procurements. This might limit the pool of capital available for future investment.

The government intends to move towards competitive procurement of renewables, but progress has stalled. Decision 13/2020/QD-TTg,[119] which catalysed the development of rooftop solar projects, also stated that projects that were not ready in time for the FIT would be paid a price determined through competitive mechanisms. More recently, the use of an auction was suggested by MOIT as a solution for determining prices for the stranded wind projects mentioned above. However, no material progress has been made in developing the framework for such competitions. It is understood that this is at least partly a result of challenges that are very specific to Vietnamese law, as discussed in detail in Section 5.4.1.

While progress within Vietnam itself has stalled, some wind projects are being developed in Laos under a separate feed-in tariff. A price cap for these projects of 6.95 US$c/kWh was set in 2020 for these projects. Projects subscribing to this tariff are required to be online before the end of 2025.

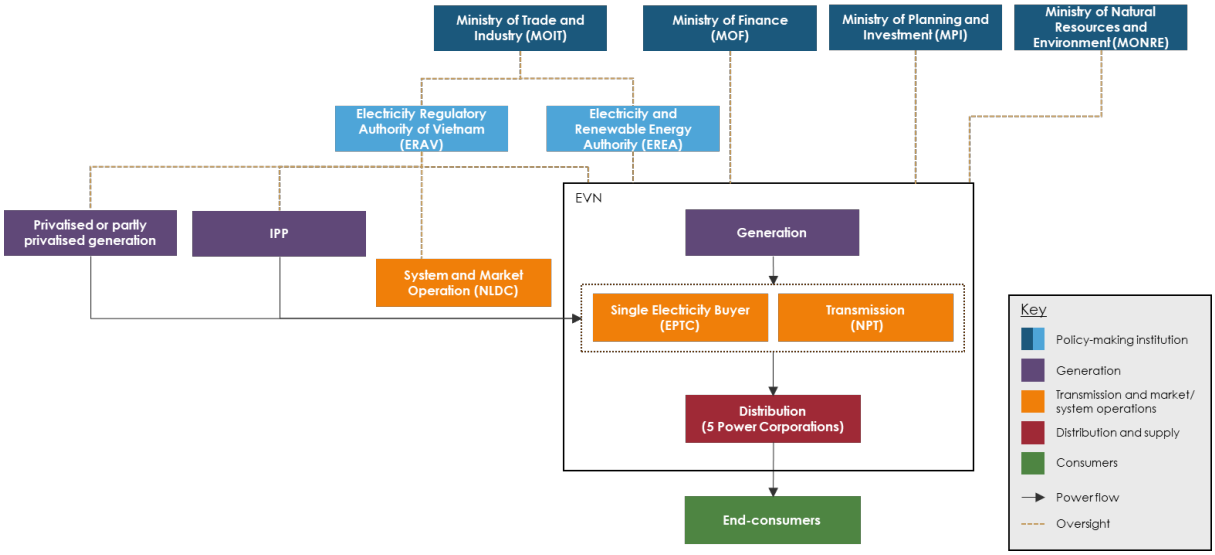
5.3. Governance of renewable energy procurement

Vietnam's electricity sector continues to be dominated by the incumbent vertically integrated utility. This is shown in Figure 32, which provides a schematic representation of the structure of the power sector. IPPs have increased the role of the private sector in generation (and are dominant in the development of renewable energy projects), but the remainder of the value chain remains dominated by EVN. While a wholesale market has been established, this is in effect controlled by and dominated by EVN.

[118] Ministry of Industry and Trade (2023): Decision Number 21/QD-BCT promulgating the price brackets for electricity generation from solar power plants, transitional wind power plants. Link.

[119] Prime Minister of the Socialist Republic of Vietnam (2020): Decision Number 13/2020/QD-TTg on mechanisms to encourage solar power developments in Vietnam. Link.

Figure 32 Structure of the power sector, Vietnam



Source: Kuungana analysis

The Ministry of Industry and Trade (MOIT) is the government body in charge of policy making and managing the energy sector of Vietnam. It formulates and implements policy, regulations, or mechanisms to develop the energy sector in the country. MOIT is the main government agency in charge of developing the PDP, which serves as the national plan for ensuring electricity supply in the country. MOIT has overall responsibility for overseeing implementation of renewable energy procurement (including through the feed-in tariff mechanisms described in Section 5.2), for developing key contracts such as the model PPA for feed-in tariff projects (discussed further in Section 5.4.2), and for coordinating with the Provincial People's Committees (PPCs), which play an important role in local planning.

The two departments within MOIT most relevant to the development of renewable energy are:

1. **Electricity Regulatory Authority of Vietnam (ERAV),** which is responsible for regulating electricity activities and advising the Minister on enforcing the policies and regulations mandated by the Ministry of Industry and Trade (MOIT) in the sector. During 2023, ERAV was also made responsible for the National Load and Dispatch Centre (NLDC), which is responsible for market and system operations, and was previously part of EVN.
2. **Electricity and Renewable Energy Authority (EREA)** formulates and submits policies, mechanisms, strategies, plans (e.g., the PDP) to MOIT. EREA is also the agency responsible for organising and selecting Build-Operate-Transfer (BOT) projects.

The **Ministry of Planning and Investment (MPI)** is the government body in charge of overseeing investment in the country. MPI also oversees arrangements for BOT transactions and international investments in the energy sector. It develops and implements a National Energy Development Strategy while coordinating with other ministries in implementing laws and regulations to implement energy plans in Vietnam. MPI is also responsible for developing schemes to encourage the development and manufacture of electrical equipment in Vietnam.

Ministry of Finance (MOF) also has an important role in the sector. It manages the debt and liabilities of EVN and works with MOIT in developing policies relating to electricity tariffs.

Minister of Natural Resources and Environment (MONRE) is the lead agency tasked to manage land, water resources, mineral and geological resources, environment, climate change among others. It is the main government body tasked with the implementation of the JETP in Vietnam, coordinating with MOIT, MPI, and MOF.

Electricity Vietnam (EVN) is the state-owned vertically integrated utility in charge of generation, transmission, distribution activities, and the wholesale and retail electricity markets. EVN is still the dominant player in the generation sector accounting for most of the electricity production in the country. In addition to the generation companies that sit within EVN, the remaining component parts of EVN include:

- **National Power Transmission Corporation (NPTC)** under EVN owns and operates the transmission system and is responsible for developing the system across Vietnam.
- **Electricity Purchase and Trading Corporation (EPTC)** is the single buyer of all electricity. It purchases all generated electricity from IPPs (including renewable energy IPPs) and EVN's own generation. It then sells this power to the power corporations through the wholesale market, which it operates.
- There are five **Power Corporations**, all of which are subsidiaries of EVN, which are responsible for the distribution and supply of electricity in Vietnam. After purchasing electricity from EPTC, the corporations distribute power through their networks for sale to end-consumers. The power corporations operate on a regional basis:
    - North Power Corporation
    - Central Power Corporation
    - South Power Corporation
    - Hanoi Power Corporation
    - Ho Chi Minh City Power Corporation

Independent Power Producers (IPP) and **privatised or partly privatised generation** sell their power directly to EVN, as mentioned above. Foreign investments are permitted in the sector under a BOT arrangement.

5.4. Recommendations to accelerate competitive procurement of renewable energy

The current hiatus in the procurement of renewable energy projects in Vietnam highlights fundamental challenges that need to be addressed to facilitate the development of future projects. There are material gaps in the fundamental legal building blocks required to implement competitive procurement mechanisms, which means that the nature of the challenges highlighted in this section is different to those highlighted earlier in the report for Indonesia and for the Philippines. The issues and related recommendations (shown in light blue boxes) are covered under two headers:

- **Legal framework for renewable energy procurement.** While the government has stated its desire to move towards competitive procurement for future renewable energy projects, the current legal framework does not allow for this. This is discussed further in Section 5.4.1.
- **Risk allocation in PPAs.** As in the Philippines, the risk allocation in the template PPA published for wind and solar projects is not aligned with international norms. The template PPAs are also very short compared to many PPAs for renewable energy projects. This is discussed further in Section 5.4.2.

5.4.1. Legal framework for renewable energy procurement

The government has clearly stated its intention to use competitive bidding processes for future procurement of renewable energy. As noted previously in Section 5.2, Decision 13/2020/QD-TTg[120] stated that solar projects that were not ready in time for the FIT would be paid a price

[120] Ibid.

determined through competitive mechanisms. PDP8[121] also notes that the government will research and develop an auction or bidding mechanism to select projects.

Development of a competitive mechanism for the selection of projects is, in part, being held up by complexities that are unique to Vietnamese law. Under Vietnamese law, references to "auctions" and "bidding" have very specific and distinct meanings. Under the Law on Investment (Article 33),[122] auctioning is referred to as being limited to the auctioning of land rights. Deploying "auctions" as a mechanism for the procurement of renewable energy would require the land on which a project is to be built to be pre-defined. This might work for a solar park-type project, for example. However, if developers are to select their own sites and acquire the required land rights (as was the case for FIT projects) this would instead be aligned with the process of "bidding" under Vietnam's Law on Investment. In Vietnam, reference is typically made to introducing competitive bidding, rather than auctions, because of this legal distinction.

This situation is made more complex because the mechanism used also interacts with legal provisions concerning the pricing of land. Land rights are at the heart of the distinction between bidding and auctions. Land prices are regulated locally by Provincial People's Committees (PPC). The price bracket within which transactions can take place will typically reflect the current land use. This will often be agriculture for land proposed to be used for a solar or wind project. Being restricted to these prices means that it can be difficult to secure the required land; at least, without the assistance of the PPC. The auction and bidding processes offer two potential ways forward, but both have their own challenges:

- **Auctions:** As mentioned, under Vietnamese law, auctioning is essentially defined in the context of the auctioning of land use rights. Land use rights can only be auctions for certain commercial purposes defined under the Law on Land.[123] The Law on Land confirms that land used for power generation (and transmission) projects would be classified as being for "public purpose" which in effect means that pricing of that land must be regulated by the PPCs. The exception to this might be cases where the State has aggregated land and auctions this land to a developer.
- **Bidding:** projects are therefore likely to be treated under provisions in the Law on Land for selecting investors to implement projects involving land use. This means that the price of land is regulated by the PPCs.

The strict regulation of land prices means that individual land users may feel they have not been fully compensated for the loss of their land, which can lead to resistance to the sale of land use rights.

This highlights the important role that Provincial People's Committees have in any project requiring land. PPCs oversee the administration of land rights and regulate the price at which land rights are exchanged, PPCs are therefore an important stakeholder for developers planning to implement a renewable energy project.

Table 14 summarises some of the approvals and processes that a new project passes through. The final column of the table highlights some of the areas where barriers currently exist to the development of a competitive procurement mechanism for renewable energy projects. Specifically:

- There are no implementing regulations for a bidding process for the selection of investments for renewable energy projects.
- Regardless of whether an auction or bidding process is used, it is understood that the current legislative framework would only allow for site-specific competitions.

[121] Prime Minister of the Socialist Republic of Vietnam (2023): Decision Number 500/QD-TTg approving the national power development plan for the period 2021-2030, with a vision to 2050. Link.
[122] Socialist Republic of Vietnam (2020): Law Number 61/2020/QH14, Law on Investment. Link.
[123] Socialist Republic of Vietnam (2013): Law Number 45/2013/QH13, Law on Land. Link.

- Bidding is required to take place at the province level. There is no legal framework for a nationwide competition for projects.
- Restrictions on the pricing of land mean that prices can deviate from a true market value.

Table 14 Key pre-construction activities for developing a power generation project in Vietnam

	Stage	Tasks and approvals required	Agency/office with oversight	Barrier to competitive procurement mechanisms?
1	Alignment with planning	The project should be consistent with existing masterplans and, specifically the Power Development Plan (PDP). Whereas PDP7 contained lists of specific projects to be built, PDP8[124] just included target capacities for renewable energy technologies, so individual projects do not need to be named in the PDP.	Prime Minister	No
2	Approval of investment policy	Under the Law on Investment,[125] investment in the project then requires approval from the National Assembly, the Prime Minister, or the PPC, depending on the type of investment. This can normally be provided by PPC, but approval from the Prime Minister or the National Assembly in cases where a large amount of land is required or in cases where there is a particularly high impact on communities or the environment.	Provincial People's Committee Prime Minister National Assembly	No
3	Investor selection	This stage is largely controlled at the province level. If an auction of land use rights is held, the relevant PPC together with the district-level board of MONRE will plan the auction, the outcome of which is then approved by the PPC. In the case of bidding, the competition would be planned by MPI together with the relevant PPC. As with the land auction process, the outcome of the competition would ultimately be approved by the PPC. In the absence of a competitive process (as has been and continues to be the case), the investor requests approval from MPI, who forwards the request to the relevant PPC, which provides the approval.	Provincial People's Committee MPI MONRE	YES: No implementing regulations exist for bidding for renewable energy projects. Law on Investment[126] requires bidding to be at the province level. National level competitions would require a change in law.
4	Investment certificate and enterprise registration certificate	Additional authorisations are required by projects involving foreign investment. It is understood that these approvals are typically straightforward where the investment policy (stage 2) has been approved.	MPI	No

[124] Prime Minister of the Socialist Republic of Vietnam (2023): Decision Number 500/QD-TTg approving the national power development plan for the period 2021-2030, with a vision to 2050. Link.
[125] Socialist Republic of Vietnam (2020): Law Number 61/2020/QH14, Law on Investment. Link.
[126] Ibid.

	Stage	Tasks and approvals required	Agency/office with oversight	Barrier to competitive procurement mechanisms?
5	Access to land	If an auction for land use rights has been held, a certificate of land use rights is issued by the PPC responsible for the auction. In other cases, land clearance is subject to PPC approval and governed by the Law on Land.[127]	PPC	YES: Current regulations relating to the pricing of land could act as a barrier for some projects. It is understood that a new draft Law on Land partly addresses this concern by allowing land price brackets to be updated more frequently by PPCs to reflect market rates.
6	Detailed construction planning	The planning process requires a series of more detailed permits and opinions to be issued. Many of these are again overseen by the relevant PPC, but other agencies are involved; for example, in approving fire safety, environmental impact assessments, connection to share infrastructure, etc.	PPC MONRE Other specialist government agencies	No
7	Construction permit	Once the relevant permits have been secured, the project can then apply for a construction permit, which is again awarded by the relevant PPC.	PPC	No
8	Electricity license	Prior to commencing construction, the investor is also required to secure (a) a connection agreement from EVN transmission, (b) a PPA with EVN, and (c) an electricity operations license. The license is approved by MOIT/EREA in most cases, although can be approved by the PPC for some small projects.	EVN MOIT/EREA PPC	No

Source: Kuungana analysis of NHQuang[128]

Several legal changes are required for renewable energy capacity to be procured through competitive mechanisms. Discussions with NHQuang, a law firm engaged by ETP to advise on the legal regime for competitive bidding mechanisms in Vietnam, as well as with other energy sector stakeholders in Vietnam, have suggested that at least the following legal changes would be required before such mechanisms could be implemented:

- The Law on Procurement[129] would require guidance (in a separate document to the Law itself) on how bidding should be applied to power generation projects. Currently, the Law on Procurement requires projects involving land to be tendered according to the bidding processes set out in the Law on Land.[130]
- Changes may also be required to the Electricity Law to allow for competitive procurement.

[127] Socialist Republic of Vietnam (2013): Law Number 45/2013/QH13, Law on Land. Link.
[128] NHQuang (2023): Report on Vietnam's legal system and summary of difficulties in investment of power generation, power transmission projects.
[129] Socialist Republic of Vietnam (2023): Law Number 22/2023/QH15, Law on Procurement. Link.
[130] Socialist Republic of Vietnam (2013): Law Number 45/2013/QH13, Law on Land. Link.

- Some stakeholders have suggested the addition of a separate Law on Renewable Energy, although it is noted that there is no consensus on this point.
- Secondary legislation, specifically to cover the procurement of renewable energy would likely also be required. These regulations would replace the now expired regulations for implementing the feed-in tariff mechanisms described in Section 5.2. Given the above prerequisites, some stakeholders have suggested that this would be difficult to implement prior to 2025/26.

RECOMMENDATION: Expedite legal amendments to facilitate competitive procurement of renewable energy

The legal gaps that act as a barrier to the competitive procurement of renewable energy capacity in Vietnam should be addressed. Legal support will be required to ensure that the policy and regulatory framework is robust. Because multiple laws are involved (Law on Procurement, Law on Investment, Law on Land as well as the Electricity Law), this will be a complex drafting process and will involve multiple ministries. Coordination from senior leaders in government will likely be required. At the very least, input will be required from MOIT, MONRE, MPI. Because of the key role that PPCs have in regulating land use in the provinces, engagement with PPCs is also likely to be important. The policy-making institutions led by MOIT will need to consult extensive with industry on the changes proposed to ensure that they meet the requirements of project developers and investors.

While these recommended legal amendments should be made, an interim solution is required so that the procurement of renewable energy capacity can resume. Because of the complexity of the legal changes required, it is likely to take a considerable amount of time to successfully implement these changes. Some stakeholders have suggested that the legislative changes required could take 2-3 years even with considerable high-level political support. If Vietnam is to resume the procurement of renewable energy capacity prior to these changes being implemented, an interim solution will therefore be required.

MOIT has recently established an interim framework for setting the price for wind and solar prices. Circular 19/2023/TT-BCT defines the calculation methodology for the feed-in tariff to be applied to these technologies in future.[131] However, at the time of writing the prices calculated using this methodology have not yet been published by ERAV. It is also noted that the circular appears to require the prices to be amended annually, rather than providing a price fixed for 20 years as has been the case for previous tariffs in Vietnam. Prices can also only be defined in VND/kWh under the new Circular.

It seems likely that to attract substantial investment, some longer term price security will be required. The price setting methodology suggests that it is expected that plants will be at least partly debt financed. International projects finance lenders are likely to require at least a floor on prices that support debt service requirements. The new Circular sets a floor of 0 VND/kWh, which is unlikely to be bankable. It is less clear whether the new framework will be acceptable to local banks, who have previously demonstrated a much higher risk appetite.

An alternative to reforming the new pricing framework might be to implement a solar park project or similar. The rationale for this option is that land acquisition has been highlighted as a challenge above. In this case, the government would take on the land risk, determining a site on which a project or multiple projects are developed. Private sector developers would then compete for access to that site, to instal power generation capacity. This is a well-established model that has been used in many countries, especially in countries that are at an early stage in developing renewable energy projects, including in next-door Cambodia.[132] Some of the legal changes highlighted above might still need to be addressed, to allow for any form of competitive bidding, but such a solution would at least reduce the complexity in

[131] Ministry of Industry and Trade, Socialist Republic of Vietnam (2023): Circular Number 19/2023/TT-BCT on methods to determine the electricity generation price brackets applicable to solar power plants and wind power. Link.

[132] Asian Development Bank (2022): News article: ADB-supported National Solar Park in Cambodia Connects to Grid. Link.

the interim. It is possible that a solar park could be implemented through the 'auction' mechanism in the Law on Land, for example.

RECOMMENDATION: Interim solutions for renewable energy procurement

Because of the time and complexity involved in making the legal changes highlighted above, Vietnam should consider an interim solution to be able to continue procuring renewable energy capacity over the next few years. This might include reforming the new feed-in tariff pricing framework and/or implementing site-specific projects, for example, through solar parks. The former option has the advantage of requiring less change and being familiar to existing participants in the electricity sector. The latter option would have the benefit of unlocking competition, potentially bringing down prices, but would likely require at least some of the legal changes highlighted during the above discussion to be implemented. This will require coordination between MOIT (as the implementing ministry) and EVN (as the procuring entity). Some of the legal changes already highlighted might still be required, in which case some coordination with other ministries would be required.

5.4.2. Risk allocation in PPAs

Vietnam does have template PPAs in place for both solar and wind projects. MOIT Circular Numbers 16/2017/TT-BCT[133] and 02/2019/TT-BCT[134] contain template PPAs for solar PV and wind projects respectively. These template PPAs have been used for contracting with projects commissioned under the feed-in tariff mechanism. The solar template includes provisions for rooftop solar projects (which, as noted in Section 5.1, have had a major role in Vietnam), including provisions for net metering arrangements.

The template PPAs are light on detail in some areas (described below) and contain terms that are not always aligned with international norms. The local context will always have some impact on the appropriate legal terms to be included in the PPA. However, there are several areas where the current template PPA departs from international norms (i.e., the commercial terms typically required to address the interests, concerns, and priorities of investors) in a way that is likely to be unacceptable for international investors. This is likely to be one of the factors behind most existing projects having been funded by local and/or regional investors. While it is clearly positive that these pools of capital are available, depending solely on local capital might act as a barrier to scaling the sector and may also limit the potential for price competition if a competitive procurement mechanism is introduced in future.

Most notably the PPA templates do not provide any protection to projects for curtailment. As is the case in the Philippines (see Section 4.4.2), the template PPAs simply pay projects for electricity generated. In the solar PPA, Article 2, paragraph 2, notes that "…the Buyer shall purchase all electricity generated…", i.e., no mention is made of electricity that would have been generated if EVN had been able to accept that power. Similar wording exists in the template wind PPA. In the solar PPA, paragraph 7 of the same article states that "the Buyer shall not have to fulfil its obligations or receive power…" in some situations; for example, when the transmission grid is unavailable, or when EVN requests the plant to generate less power to maintain grid stability. Most international investors will require at least some protection against curtailment; at the very least, they will typically the require the amount of curtailment that can take place without compensation to be capped.

RECOMMENDATION: Include protection against curtailment events in the PPAs

The pool of investors willing to invest in renewable energy projects in Vietnam 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 through the feed-in tariff, changes to the template PPA are

[133] Ministry of Industry and Trade, Socialist Republic of Vietnam (2017): Circular Number 16/2017/TT-BCT on project development and model power purchase agreements applied to solar power projects. Link.

[134] Ministry of Industry and Trade, Socialist Republic of Vietnam (2019): Circular Number 02/2019/TT-BCT on wind power project development and power purchase agreement for projects thereof. Link.

likely to be required to provide such protection. MOIT would need to issue a circular to implement such changes.

The PPA templates contain gaps relating to dispute resolution and termination. Both template PPAs include provisions for resolving any disputes relating to the agreement. In each case there is a clause noting that, "if agreement and consensus cannot be reached, the parties have the right to send a written request to EREA for support in resolving the dispute(s)." The solar PPA (which was developed two years prior to the wind PPA) refers instead to the "General Directorate of Energy" which was a predecessor agency to EREA, which was also part of MOIT. Typically, investors will require disputes to be resolved by an independent party if outside intervention is required. This might, for example, include the appointment of an independent expert (if the dispute is technical in nature), or referral to an internationally recognised arbitration court. While it is unclear what EREA support would entail, international investors are likely to view referral to MOIT as acceptable or sufficiently independent.

In the event of termination, the PPAs include no buy-out terms. Such clauses are again typically required by international lenders to ensure that debt is always repaid, even in the case of termination.

The new interim pricing mechanism introduced by Circular 19/2023/TT-BCT[135] results in additional risk allocation concerns that were addressed by the original PPA templates. Annual adjustment of the price undermines the benefit of a fixed price offered by previous tariffs, as well as the exchange rate indexation included in the PPA templates.

RECOMMENDATION: Test future PPA templates with international lenders

Ahead of launching any competitive procurement of renewable energy capacity (which, as already discussed in Section 5.4.1, is likely to take time), MOIT and/or EVN should test the PPA to be used to contract with successful projects (e.g., through a comprehensive market sounding exercise) with international investors. There is no set number of investors that should be consulted, but the exercise should include a range of developers, equity investors, and lenders.

5.5. Prioritisation and summary roadmap

The immediate priority for EREA and EVN should be to develop an interim strategy for procuring renewable energy capacity. As noted in Section 5.4.1, substantial and complex legislative changes are likely to be required to support the move to a competitive framework mechanism for procuring renewable energy. The complexity of these changes means that it is likely to take many years to implement the changes. A short- to medium-term solution is therefore required. Without an interim solution, the risk that Vietnam does not meet the ambitious goals set out in PDP8 is high.

In the short-term, adjusting the new pricing mechanism for solar and wind introduced by MOIT is likely to be the most straight-forward answer. While the feed-in tariff mechanism has not been without its flaws, as discussed in Section 5.2, the mechanism has successfully attracted substantial investment in the past. However, this would be at odds with the government's stated intention to move towards competitive procurement.

Another option might be to launch a solar park tender, rather than inviting developers to bring their own projects forward in an open tender. The rationale for such a model, as described above, is that challenges regarding land acquisition would be partly addressed. A solar park would still require some of the legislative changes required to support competitive procurement but would mean that government (or EVN) is responsible for managing land risk. This could be simpler to implement than a fully open auction, because of the complex

[135] Ministry of Industry and Trade, Socialist Republic of Vietnam (2023): Circular Number 19/2023/TT-BCT on methods to determine the electricity generation price brackets applicable to solar power plants and wind power. Link.

interaction between the Law on Investment[136] and the Law on Land[137] in Vietnam (discussed further in Section 5.4.1).

The terms and conditions under which renewable energy projects are contracted (i.e., the template PPAs) should be revised. As noted above, the existing template PPAs include terms that are not aligned with international norms. However, despite this, these PPAs have been used to contract >20 GW of solar and wind capacity. It is likely that there is a limit to how much more capacity can be contracted by Vietnam without contractual terms that are internationally bankable. For example, it is likely that new investors entering the Vietnamese market would require some protection against curtailment risk, which is not offered by the existing template PPA.

In parallel, cross-government collaboration will be required to make the legislative changes required to support the eventual implementation of a competitive framework for procuring renewable energy. Specifically, this process of developing and consulting on legislative changes will need to involve MONRE, MPI, and PPCs as well as MOIT in its role overseeing the energy sector. A competitive framework for procurement will help to achieve better value for money for Vietnamese electricity consumers over the long-term. The government has acknowledged this through its commitment to a shift towards competitive procurement, for example in PDP8. However, as discussed in detail in Section 5.4.1, there are multiple laws that may need revision or implementing guidance to be developed. The regulatory environment for land in Vietnam is unique and means that the regulatory mechanisms for implementing competitive procurement of renewable energy are also likely to be specific to Vietnam.

At the very least, it has been suggested that the following will be required:

- The Law on Procurement[138] would require guidance (in a separate document to the Law itself) on how bidding should be applied to power generation projects.
- Changes may also be required to the Electricity Law to allow for competitive procurement.
- Some stakeholders have suggested the addition of a separate Law on Renewable Energy, although it is noted that there is no consensus on this point.
- Secondary legislation, specifically to cover the procurement of renewable energy would likely also be required.

Table 15 Summary of recommendations and their prioritisation, Vietnam

Recommendation	Responsible party	Timing
Implement interim solutions to procure renewable energy capacity ahead of competitive procurement being introduced, e.g., through reform of the recently introduced price mechanism for solar and wind projects and/or solar park projects or similar.	MOIT/EVN	Immediate / as soon as possible
Refine the risk allocation in the template PPAs for renewable energy projects, market testing the proposed terms with potential investors, including international lenders.	MOIT/EVN	Medium-term
Expedite amendments to laws and regulations to facilitate the transmission to competitive procurement of renewable energy projects.	MOIT, plus MONRE, MPI, PPCs	Long-term

[136] Socialist Republic of Vietnam (2020): Law Number 61/2020/QH14, Law on Investment. Link.
[137] Socialist Republic of Vietnam (2013): Law Number 45/2013/QH13, Law on Land. Link.
[138] Socialist Republic of Vietnam (2023): Law Number 22/2023/QH15, Law on Procurement. Link.

6. 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 this report. While the roadmap recommendations presented in Sections 3 to 5 of the report are tailored to the circumstances in each country, and there are challenges that are unique to each country, there are also common themes evident in the analysis, which are summarised below.

6.1. 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, as explained in Section 3.4.1, 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 4.4.1, 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 4.4.2, 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. As discussed in Section 5.4.1, 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.

6.2. 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 4.4.4), 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.[139] 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,[140] 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.[141]
- **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.

6.3. 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, and in Vietnam have been identified and analysed in Sections 3.4.3, 4.4.2, and 5.4.2 respectively.

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

[139] Ofgem (2023): Connection and Use of System Code (CUSC) CMP376: Inclusion of Queue Management process within the CUSC, Final Decision. Link.
[140] Council of European Energy Regulators (2023): CEER paper on alternative connection agreements. Link.
[141] Ofgem (2022): Decision on accelerating onshore electricity transmission investment. Link.

exposed to is unlimited. As mentioned above in Section 6.1, 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. As discussed further in Section 3.4.3, 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.

6.4. 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 6.3, 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 (see Section 5.1). 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
Indonesia		
MEMR	Policymaker	Bilateral meetings and workshop
PLN	Utility	Bilateral meetings and workshop
UPC	IPP	Bilateral meeting
USAID	Development partner	Bilateral meeting
GIZ	Development partner	Bilateral meeting
UNDP	Development partner	Bilateral meeting
UK Mentari	Development partner	Bilateral meeting
Nah'r Murdono Law Office	Law firm	Bilateral meeting
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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