ENERGY SECTOR

Final Sector Review Report

Directorate of Government Support and Infrastructure Financing Management

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List of Terms, Acronyms and Abbreviations

3R	Reduce, Re-use, Recycle
APBD	Regional Budget/Anggaran Pendapatan dan Belanja Daerah
APBN	State Budget/Anggaran Pendapatan dan Belanja Negara
BPP	Cost of Generation Provision. The BPP figures represent the cost to PLN of procuring power from the different systems/sub-systems listed in the 2017 BPP Decree
CAPEX	Capital Expenditures
DPRD	Dewan Perwakilan Rakyat Daerah
ESCO	Energy Service Companies
ESDM	Energy dan Sumber Daya Mineral
GDP	Gross Domestic Products
IPP	Independent Power Producer
ITF	Industry Technology Facilitator
kWh	kilowatt hour
LED	light-emitting diode
MEMR	Ministry of Energy and Mineral Resources
MSW	Municipal Solid Waste
NRE	New relationship energy
OBC	Outline Business Case
OPEX	Operational Expenditures
PGN	Perusahaan Gas Negara
PLN	Perusahaan Listrik Negara
PLTSa	pembangunan pembangkit listrik tenaga sampah
PPA	Power Purchase Agreement
ROE	Regional Owned Enterprises
RPJM	Rencana Pembangunan Jangka Menengah
RPJMN	Rencana Pembangunan Jangka Menengah Nasional
RW	Rukun Warga
SOE	State Owned Enterprises
TPST	Tempat Pengolahan Sampah Terpadu
WTE	Waste To Energy

1. Introduction

This is the Final Sector Review Report on the Energy Sector. The report provides sector specific analysis and recommendations using international best practice and project benchmark comparators and these recommendations are outlined for the purposes of strategy and policy development by DGSIFM to enhance its role as the central PPP Unit at the Ministry of Finance in delivery government support for PPP Infrastructure Projects.

At the same time, the report also annexes rule of thumb measures that can be used at the technical level to guide the project identification, planning, and preparation of projects in the sector pipeline that is considering to be developed as PPP projects. Furthermore, detailed iterative working papers are also annexed to guide technical staff on sector specific considerations that were taken into account in formulating this report. The working papers are the result of consultations and deliberations in May-June 2019 between MoF technical level practitioners and PDF administrators, and a consolidation of advisory inputs from national sector advisors, legal regulatory advisors, environmental and social, financial advisory, and international advisors from Canada. The rule of thumb measures are annexed as Annexes I. The Working Papers for the Energy Sector can be found as Annexes II.

1.1 Background and Objectives

Energy is the master resource or the ultimate raw material for human civilization, because the existence of energy allows humans to provide food, water and other materials needed, heating or cooling houses and operating machinery. Without energy, there is no economy or economic value, because no goods or services can be produced or transported to other places or markets.

Energy is obtained from primary energy sources, which are converted to final energy, which are needed by modern and industrial society in the form of: 1) Electricity; 2) Fuel. The greater the ability of a nation or country to control and utilize the most important energy sources of its time, the greater the production of wealth that may be realized for the welfare of its people. And because wealth often arouses influence, the greater the political power of the country or nation is in the international arena. Therefore, a nation will only become a prosperous nation if it is able to master, apply conversion technologies and energy utilization, and control the most important energy resources of its time.

To provide electricity, the government appointed PT PLN as the only state-owned enterprise in the field of electricity supply, including purchasing electricity from Independent Power Producer (IPP). As for the supply of fuel oil, the government appointed PT Pertamina as the only state-owned enterprise in the field of fuel oil supply.

The experience of PT PLN manages the electricity system in Indonesia, from power plants, transmissions, to customers, making the electricity business scheme in Indonesia already established. And as the only electricity offtaker from the Independent Power Producer (IPP), PT PLN is the determinant of the Power Purchase Agreement (PPA) scheme. With the presence of PT PLN, the IPP and PPA schemes are already running as business as usual, so they do not use Public Private Partnership (PPP) schemes.

The only PPP scheme in the IPP is the Batang 2 x 1,000 MW PLTU with an investment of USD 4.2 billion. This project has a high risk because it was built on a new land in the Batang area, Central Java, and with a very large investment value because of its large generating capacity, so that government guarantees in the form of PPP schemes are needed. However, investment in power plants of this magnitude is very rare. For example, the same capacity PLTU (2 x 1,000 MW) the other uses a private financing scheme, namely the Java 7 PLTU has an investment value of USD 1.8 billion, the planned Indramayu PLTU has an investment value of USD 2.1 billion, Java 9 & PLTU 10 which are 2 generators have an investment value of USD 3.1 billion.

In addition, the capacity of such a powerplant is only possible to be built on the island of Java, where the land price is high, so that in other locations it is very unlikely that an investment with such a risk will be needed. Therefore PPP schemes are very rarely used in the IPP.

Unlike electricity, the provision of fuel is divided into upstream and downstream activities. In the upstream oil & gas scheme, the profit sharing scheme is used, by cost recovery or gross split, between the government and the business entity that becomes a Contractor Partnership Contract (CPC). CPC is responsible for all costs required for the production of crude oil or natural gas and obtains part of the total production. This profit sharing scheme

makes upstream investment can be carried out by the private sector. PT Pertamina's position in the upstream sector is as one of the CPCs that binds contracts with the government. While in the downstream oil & gas. all crude oil processing is carried out at the PT Pertamina oil refinery, so that Pertamina becomes the only crude oil refiner in Indonesia. Pertamina also received an assignment from the government to build a new refinery. Thus, even in the downstream oil & gas does not require a PPP scheme.

PPP schemes in the energy sector are not suitable to be implemented in fields that are already mature, but are more suitable for use in the energy sector that are at high financial risk because they are still newly developed. One of the developing energy sectors is the NRE, but because the scale is too small, this project is not suitable to be built with the PPP scheme.

One source of NRE is Municipal Solid Waste (MSW). MSW is one of the environmental problems that has the potential to become an energy source. MSW to energy (or Waste to Energy) is an alternative management of MSW that has the potential to transform the environmental burden paradigm into a commodity energy source. With environmental benefits and large scale projects, MSW to energy is suitable to be built with PPP schemes by taking into account waste strategies in the area.

In addition to energy use, improving national energy conditions can be done by increasing the efficiency of use, one of which is by replacing conventional lamps with more energy efficient ones such as LEDs. Street lighting is one of the users in a large number, and can be made efficient by replacing it into an LED, and this program is suitable for using PPP schemes by taking into account transportation plans, especially roads in the regions.

2. Basic theory and international best practice

2.1 Planning

2.1.1 Planning Overview

A central goal of governments across the world is to effectively plan, deliver and manage major long-term infrastructure projects which in turn deliver essential services for the economy and society to function. The challenge faced in many jurisdictions, is that important decisions around infrastructure planning (i.e. which projects to be delivered, which sectors to be prioritized, etc.) are typically made through an incremental, reactive process that is often driven by political considerations, budget limitations and numerous other factors rather than being based on a more holistic, long-term approach.

The guidance stated in this section - sourced from international good practices and guidance - is not sector-specific. Upon a robust foundation of centralized, enabling frameworks and policies central governments should layer on an appropriate division of functions and responsibilities between other levels of government. The sections that follow respectively posit sector-specific factors, as well as institutional planning considerations for public sector decision-makers.

An evolving challenge - as detailed in the proceeding section - is the effective division of roles and responsibilities between different public sector actors. Generally, this report refers to the following levels of government:

1. **Central government:** situated at the national / federal level.
2. **Regional government:** situated at the provincial / state level.
3. **Local government:** situated at the municipal / township level.

As noted by the World Bank, globally "the past 20 years have witnessed a shift towards decentralized infrastructure planning and implementation … (with) subnational governments, regional entities and sector agencies delegated responsibility for planning and project selection."[1] While numerous infrastructure projects are identified through decentralized planning, governments often lack the financial and technical capacity to implement the full suite of such projects, thereby contributing to a growing infrastructure gap. This capacity limitation drives a screening and

[1] World Bank Group. "Prioritizing Infrastructure Investment: A Framework for Government Decision-Making." May 2016.

preparation process that forces government to prioritize the funding of projects - instead of planning in a way, which is holistic, rigorous and responsive to the needs of the country's socioeconomic landscape.

Some approaches commonly used, despite their limitations, in infrastructure project prioritization include the following:

1. **Cost-Benefit Analysis:** this approach focuses on comparing costs and benefits of a project over its lifetime (future values adjusted to present value for comparative purposes), to select projects that maximize value to society overall. This approach allows decision-makers to compare and rank all contemplated projects based on a single indicator, and using one that maximizes value for society overall. However, this approach can be limited by the fact that it requires "extensive information about the projects and their projected impacts"[2]. Since such extensive information is often limited and the associated analysis costly, a rigorous cost-benefit approach can be difficult to implement.
2. **Multi-Criteria Decision Analysis:** this approach is reflective of the time, information and capacity limitations that governments typically face when undertaking project selection. This approach includes qualitative factors, alongside quantitative factors, into a weighted (with weighting of categories and criteria determined and calibrated by government decision-makers) decision analysis - and is beneficial "when information or analytical resources are limited".[3] Weaknesses to this approach include subjectivity in the manipulation of weights and criteria, in order to prioritize certain projects over others.

In the context of developing countries supported by international donor organizations, further scrutiny on project prioritization may be required, with the World Bank reporting "recent attention to infrastructure prioritization is grounded on demonstrated government and multilateral organization demand for evidence, comprehensiveness, value and legitimacy in infrastructure decision-making … (which is) also a proposed precursor to identifying opportunities for private sector involvement."[4] Research undertaken by the World Bank also suggests that a lack of holistic planning in infrastructure development creates a number of issues, noting that "the unstructured path to project approval in many countries leaves room for corruption, inefficiency and particularist infrastructure policy that is unlikely to effectively serve development needs."[5]

As an alternative to the two common project prioritization approaches mentioned above, the World Bank has proposed the Infrastructure Prioritization Framework for government consideration. This framework incorporates policy goals, social and environmental sustainability considerations, and long-term development goals alongside traditional financial factors (i.e. the monetary considerations as referenced in Cost-Benefit Analysis).

The implementation of the Infrastructure Prioritization Framework, or any other internationally recognized best practice approach to infrastructure prioritization, is predicated on the following fundamental principles:

1. Account for key goals stated in infrastructure policy, as well as sector strategies and mid-term development plans.
2. Consider the tenets of 'value' and 'effectiveness'. The application of a defensible methodology implies due consideration of said methodology's effectiveness at delivering on goals (e.g. economic growth, human development, etc.), as well as in the value (i.e. creating public value at the least cost).
3. Affirming legitimacy to decision-making. Legitimacy is founded on both inputs and outputs, and in order to fulfill the former - the project prioritization methodology should include a process that is transparent, fair and systematic.
4. Opportunity to innovate. As the infrastructure investment gap grows and governments explore different ways to address it, more attention becomes focused on the enabling conditions that increase the potential for institutional investment and private sector participation. Inherently, a defensible and recognized methodology has the potential to contribute to a well-planned and legitimate project pipeline, which can in turn create the aforementioned enabling conditions.

Best practice guidance from the World Bank also suggests that "while projects may be proposed from different line agencies or subnational government units, prioritization should be managed at the same level ... by an administrative unit with authority over investment decisions to ensure that analysis is effectively utilized."[6] In other

[2] World Bank Group. "Prioritizing Infrastructure Investment: A Framework for Government Decision-Making." May 2016.
[3] World Bank Group. "Prioritizing Infrastructure Investment: A Framework for Government Decision-Making." May 2016.
[4] World Bank Group. "Prioritizing Infrastructure Investment: A Framework for Government Decision-Making." May 2016.
[5] World Bank Group. "Prioritizing Infrastructure Investment: A Framework for Government Decision-Making." May 2016.
[6] World Bank Group. "Prioritizing Infrastructure Investment: A Framework for Government Decision-Making." May 2016.

words, project planning and prioritization should be conducted at a level with administrative authority over investment, and ideally performed in conjunction with budgeting cycles and activities. This aligns with the discourse presented in the following section on institutional framework, regarding the allocation of decision-making responsibility to central governments who commonly possess the appropriate perspective and purview.

An important takeaway from practices in jurisdictions such as the UK, Australia and Canada is that improved coordination and planning should be initiated at a central or regional level of government. Central and regional government possess the perspective to evaluate the needs of the population, establish funding frameworks based on a view of the national budget, and can establish (central) or align (regional)priorities in public investment. Based on this holistic view, central government agencies can develop and disseminate these national objectives - with regional and local governments consequently aligning their respective infrastructure development priorities (particularly if funding from central government budgets is offered).

2.1.2 Energy Sector Planning Considerations

For sake of clarity, it is acknowledged that PPPs in energy is inclusive of the following sub-sectors:

1. Street Lighting.
2. Power generation, including Waste-to-Energy.
3. Power transmission.
4. Power distribution.

Governments in most jurisdictions face a number of challenges with respect to the sustainable development of their energy systems[7]. These challenges commonly include:

1. Attain sufficient energy supply in the long-term;
2. Improve energy security, to reduce dependence on foreign sources;
3. Provide a healthy, unpolluted environment for the citizenry; and
4. Contribute to global climate change mitigation.

Fundamentally, energy (i.e. power generation, transmission and distribution) is a systematic asset class which requires unique considerations. While there are a number of policy, planning and investment decisions governments can make with respect to capital projects planning, there are a number of sector-specific factors to be conscious of[8].

1. Technology and innovation: the production and efficiency of energy assets depend on the adopted technology and processes. Themes the sector grapples with in this respect include the rate of innovation (i.e. technological obsolescence); the scale of the project (i.e. bundling of many of the same assets in a single procurement, or bundling of projects like street lighting into a larger procurement for road infrastructure refurbishment); and the stability of the technology (i.e. proven, stable technologies tend to more readily attract commercial financing).

2. Location: energy tends to be a very socially and political sensitive issue - with citizenry and politicians often being reticent to install these ‘assets in their own backyards’ (e.g. the region may require a waste-to-energy facility, but communities are reticent to accept waste from other locations). Some assets in the energy sector, particularly in transmission, typically traverse local and regional boundaries requiring coordination between different levels of government to efficiently and effectively deliver efficiently. Attaining land access - either through land acquisition or right-of-ways - is a closely related challenge that

[7] International Energy Association. “Joint Public-Private Approaches for Energy Efficiency Finance.” 2011.
[8] World Bank Group. “Revisiting PPPs in the Power Sector.” 2013.

can hamper development of projects in this sector. Should location decisions be swayed by social and political sensitivity, due diligence for the project should take into account potential inefficiencies (e.g. an asset is located in a suboptimal location due to political pressure). Potentially, access rights to the private counterparty may also need to be guaranteed, the risk and cost of which would need to be balanced in the planning framework.

3. Fuel source: the effectiveness and efficiency of energy assets depend on input parameters. In particular, private sector operators will be keen to understand the stability of the fuel source (i.e. where it comes from, the quality of the input, and the volume). Unless private sector operators control the supply value change, government would need to provide acceptable levels of fuel supply and risk protection measures such as put-or-pay contracts and specific acceptance criteria, to the benefit of the private sector. These could include providing expanded audit or rejection rights within the PPP contract.

4. Civil Infrastructure: the interface between energy assets and the surrounding infrastructure requires detailed due diligence and planning. Private sector operators will want to understand interdependency of the PPP scope with exogenous hard infrastructures, and the consequent risk allocation scheme. Any interconnection and/or access issues will need to be articulated and dealt with in the planning stage by the government in order to take most projects to market.

5. Load management: how government manages energy load demand and variability (in developing countries, inefficient methods include the use of expensive fuels, or power cuts which are also economically costly) in a systematic way is important to socioeconomic growth. While larger scale energy projects often work on an availability basis, innovative regimes to incentivize reduced demand and usage may be available for lighting and distribution projects. The government's appetite for providing incentives in any PPP contract would need to be balanced against certainty of payments required by private sector operators.

6. Counterparty issues: effective management and delivery of energy assets (i.e. ones that traverse local, regional or national borders) require intergovernmental coordination. Private sector operators will also be keen to understand the financial reliability of the off-taker. The coordination and allocation of responsibilities is also dependent on the nature of the asset and boundaries across which it traverses. Take for instance microgeneration projects which by definition fulfill the needs of a specific municipality and thus should be managed by local government. On the other hand, generation and transmission projects are largely managed by central government due to their scale.

7. Environmental considerations: not only do the environmental impacts of specific assets be well analyzed, consulted and communicated - government policy and planning should be clear about the national and/or regional approach to accommodating climate-friendly fuel sources and processes (which for the time being may be less cost-effective and consequently require government subsidies).

2.1.2.1 Street Lighting

Street lighting is a key service provided by public authorities at the local level. The benefits of a modern and efficient street lighting system range from enhancing traffic safety and general security, to increased economic activity after dusk.

However, inefficient and outdated networks can account for ~30-50% of a municipality's power consumption[9]. The introduction of PPPs in this sub-sector can, as a concept, allow for greater investment in energy-efficient street lighting systems.

Public sector planners should consider the following salient issues in considering PPPs for this subsector[10], per the World Bank's PPP Legal Resource Center.

1. Supportive regulatory framework. A clear framework that facilitates that promotes private investment is required for the success of PPPs in general, but is particularly important in this sub-sector. For example

[9] PPP Knowledge Lab. "Public Lighting." 2019.
10 World Bank Group. "PPP Legal Resource Center: Energy-Efficient Street Lighting PPPs." 2019.

in Brazil, an important element of success in its street lighting PPPs is a tax via local legislation, which in return presents a reliable source of revenue.

2. Balance scale with local context. Municipalities with greater scale with good credit ratings may be able to "use more traditional PPP schemes where the private partner assumes more risk over the PPP contract life"[11], whereas smaller municipalities would need to adopt different schemes.

3. Bundling of projects. Given the small scale of projects in a singular local government, municipalities may consider pooling together their street lighting needs into a singular, joint procurement. This approach may increase the potential of producing a more competitive procurement.

2.1.2.2 Power Generation and Waste-to-Energy

Power Generation

The roadmap to planning for a more competitive - i.e. with greater private sector involvement - power sector begins with the government's recognition that reform is required. Many jurisdictions are marked by an explicit or virtual monopoly wherein a state-owned entity is charged with power generation as well as a multitude of other roles in the sector. According to international financial institutions such as the Asian Development Bank, the following steps are necessary to planning for a truly competitive power sector[12].

1. Get the investment framework right. This can involve wholesale, long-term changes such as a restructuring of state-owned entities in the power sector. The plan for restructuring must come from central government, and compliance must be sought and gained by relevant ministries and utilities. Attaining the right framework may also include enabling or amending commercial and contract laws (including for PPPs).

    a. Interim measures while these long-term changes are being made include - placing greater incentives for investment (e.g. grace periods for debt, tax relief); assuming foreign exchange risk; and promoting growth of financial mechanisms that allow the private sector to more effectively manage pricing risks (e.g. hedges, and futures).

2. Decide on the goals of restructuring, as well as the ideal industry structure. Steps should be taken to unbundle and properly regulate the power sector - including unbundling and establishing an independent regulator. As is the case in most global jurisdictions, inclusion of non-conventional or renewable sources of energy into the power generation mix is an objective that should be incorporated.

3. Prepare the players to participate in a competitive market. At this stage, it is important to plan how to remove subsidies, without drastic socioeconomic impacts. Preparation for a competitive market requires not only the right regulations, but practitioners at all levels of government who can effectively manage dynamic environments such as procuring, negotiating and managing private contracts including PPPs. Inconsistent policies for tariff-setting and investment between different levels of government, should also be addressed at this stage.

4. 'Privatize' existing and new assets. At this stage of planning, governments should strive to protect socioeconomic interests while still allowing flexibility for private sector innovation. A common challenge is high volumes of layoffs after transition of a state-run asset to a private one. Yet another international good practice would be to not impose the use of government suppliers in the value chain.

Ensure that the competitive market is implemented properly. At this stage, governments should be actively monitoring and ensuring contracted performance is being upheld.

Waste-to-Energy

11 World Bank Group. "PPP Legal Resource Center: Energy-Efficient Street Lighting PPPs." 2019.

[12] Asian Development Bank. "Developing Best Practices for Promoting Private Sector Investment In Infrastructure." 2000.

Waste-to-energy (WTE) infrastructure (i) help manage the volume of solid waste in urban centres; (ii) prevents waste from being land-filled; and (iii) provides an ancillary source of energy generation for governments. When implemented properly alongside solid waste management regimes, WTE can provide a solution for managing waste volumes while also creating limited negative environmental impact.

For the implementation of private sector participation schemes in this sub-sector, the Asian Development Bank has produced guidance for the creation of an enabling environment[13]. The salient considerations for government planners is provided below.

1. Waste management chain. Given WTE is at the end of the chain, the fundamental step is to ensure a proper solid waste system. WTE projects are dependent on the effective collection of waste, storage and transport to the site - consistently and using waste that is of sufficient quality to generate energy.

2. Enabling policies. To reduce barriers and risks for private sector participation, governments can consider enacting related policies on tipping fees, renewable energy development, as well as standardized PPP agreements. Other mechanisms that can be made available with the strategic support of government include the provision of financial incentives through taxation policy, and improving access to low-cost debt financing.

3. Stakeholder Engagement. Allotting land for WTE facilities may face opposition from a variety of stakeholders including the resident community members. Proactive engagement through public consultations can help facilitate understanding of the associated benefits.

2.1.2.3 Power Transmission

Transmission networks serve as the network through which electricity is provided throughout a coverage area. Increased energy generation prompted by growing demand should in turn implicate upgrade and extension of transmission networks[14]. These improvements require significant capital investment. Governments should consider the following factors with regards to private sector participation in transmission.

1. Risk transfer. "While transmission networks must be operated independently to ensure non-discriminatory access,"[15] PPPs can be applied to attain private sector involvement in the finance, build, operate and maintain aspects of a part of the energy grid - in exchange for revenue stream from transmission fees.
2. Land. As afore-mentioned, transmission networks can extend over a significant area of land, which adds a layer of complexity in terms of acquiring right-of-ways as well as to account for social, environmental and political sensitivity. Good practice suggests a forward-looking project design can potentially reduce negative impacts - including proper analysis of line routes and by considering various towering and technology options to reduce footprint.
3. Regulatory framework. A successful transmission PPP requires an enabling framework that maintains a balance between user and investor interests - including the potential application of guaranteed annual revenues during the concession period, contractual guarantees to recover amount of bid in auction, or a revenue cap based on revenue asset base.
4. System planning. While decidedly a public sector responsibility, government must ensure execution of an integrated plan that accounts for the demands of all actors in the industry - including power generators, demand centers, and renewable energy plants (often located in remote areas).

13 Asian Development Bank. "Creating an Enabling Environment for PPPs in Waste-to-Energy Projects." 2018.
14 PPP Knowledge Lab. "Transmission." 2019.
15 PPP Knowledge Lab. "Transmission." 2019.

Box 2-1 Karachi Electric Supply Corporation

Distribution Privatization Example: Karachi Electric Supply Corporation

The strategic privatization of the Karachi Electric Supply Corporation (supported at the time by the World Bank and the Asian Development Bank), is an example of private participation in energy distribution. This transaction was completed in 2005, with the government objectives being (i) to improve the entity's operational efficiencies; (ii) to improve financial sustainability; and (iii) to reduce tariff charged to the user.

To this day there remains a significant amount of public dissatisfaction with the results-to-date of this transaction. World Bank reporting pointed to the following:

- Low-income service areas still experienced severe power outages, ostensibly due to high pilferage. This implies the privatization has not resulted in improved service to the public.

2.1.2.4 Power Distribution

Distributing electricity from the transmission system to users is the final step in the energy value chain. Given the high vulnerability to disruptions as well as technical and commercial losses, this is considered to be a 'weak link' in many energy systems. This characteristic, alongside the need to accommodate increases in generation capacity and user demand, places pressure to provide substantial capital investment to upgrade and extend networks. Governments should consider the following factors with regards to private sector participation in distribution.

1. Risk transfer. In the right context and structured appropriately, PPPs in this area can provide technical rigour (i.e. limiting power outages and reducing losses) and mobilize private capital to finance the upfront investments. PPPs can also be structured - commonly in cases where state-owned utilities are not financially sustainable to credibly transfer risk - to bring in private sector capacity-building and skills and technology transfer.
2. Regulatory framework. A stable framework that establishes a process for tariff-setting and possesses mechanisms to mitigate commercial losses (i.e. provide private operator proper enforcement mechanisms to facilitate collections), represent the foundation for a successful PPP in distribution. Other mechanisms that will help incentivize private sector performance while achieving socioeconomic objectives include connection subsidies for poor households, and financial protection for existing employees.
3. Asset quality. An important challenge with PPPs in distribution, is the lack of detailed or accurate information regarding the condition of the physical assets. Contract mechanisms that ensure private sector operators are properly compensated for rehabilitating the network in spite of worse-than-expected asset quality.

2.2 Institutional Framework

A number of overarching factors impact the institutional framework underpinning responsibility for delivering infrastructure projects between different levels of government. The five main factors - when looking at jurisdictions such as Australia, Canada, the UK, New Zealand and Singapore - can be summarized as follows[16].

1. Sector Pipeline: evidence of a robust pipeline of infrastructure (including PPP) projects, tend to coincide with government decision to centralize responsibility for procurement in a given sector. In some instances, the government enables the formation of purposely-formed statutory authorities to execute on the planning and procurement of projects in sectors with a strong pipeline.
2. Model Complexity: evidence of a sector requiring more complex procurement models (including alternative delivery models such as PPP), tend to involve centralization of procurement functions. Based

[16] For the Ontario Ministry of Infrastructure, Deloitte performed a global jurisdictional of the infrastructure procurement institutional frameworks. This was undertaken by primary data collection using interviews from the Deloitte global network of experts as well as with representatives from agencies in said jurisdictions (i.e. Australia, Canada, the UK, New Zealand, and Singapore.

on the need for greater levels of technical capacity to be successful with such transactions, oftentimes specialized teams are formed within the ministry / central government. In instances where local entities and other would-be project owners lack the experience (particularly with more complex transactions involving private sector investment, such as PPPs) and capability to deliver the capital project(s), responsibility is centralized. Where less experienced agencies are charged with complex procurements, best practice encourages them to engage external advisors and/or seek to draw from expertise from other parts of government.

3. Project Volume & Value: in sectors where project volume is high but individual transaction value is low, responsibility for procurements fall to the responsible ministry. In cases where a sector has large-scale procurements, particularly Greenfield developments, in the pipeline - responsibility is typically assigned to central government or deferred to a purposely-formed statutory authority.

4. Processes: where there exists a strong network of standardized processes and guidance, central government is often relied upon less for delivery of these major capital projects.

Beyond the general factors cited above, the roles and responsibilities between central, regional, and local governments when it comes to infrastructure planning, procurement and delivery varies based on context and sector.

2.2.1 The Role of PPP Units

As governments contemplate shifting from traditional to alternative models such as PPP to procure capital projects, they require new and specialized types of capacity - namely "to design projects with a package of incentives and risks that makes them attractive to the private sector."[17] Other aspects of technical expertise required from governments for PPP delivery include:

1. Assess cost to taxpayers: this is distinct and can be more challenging than traditional delivery, due to the long-term and uncertain nature of government commitments.

2. Oversee contracts over the stipulated duration: public sector needs to be deft and proactive contract management is required, delivered in conjunction with government regulators, third-party inspectors, as well as the dedicated team of the contracted private sector entity.

3. Consensus-building: project owners need to canvass stakeholders, and engage in advocacy and outreach to build broad-based support on (i) the role of PPPs; and (ii) support for specific projects.

As discussed in the prior section, technical capacity for governments in this regard require concentrated commitment to develop and build. A global scan of PPP markets informs of an increasingly common avenue to produce this capacity - by establishing dedicated PPP units. These units are either new central agencies, or dedicated units within a central (e.g. situated within the national Ministry of Finance) ministry.

International practices suggest that the exact role of PPP units will vary widely, and that commonly these agencies exist to 'fill the gaps' left by the existing institutional framework of public sector actors. The figure below illustrates the tasks performed by PPP units from around the world, ranging from upstream capacity-building to government approval of the eventual PPP contract.

In Canada's PPP landscape, PPP units existed at both the central level (i.e. the national entity known as PPP Canada) as well as the regional level (i.e. provinces committed to building PPP programs and pipelines had their own capital projects teams with PPP-specific capacity, such as Infrastructure Ontario). The central PPP unit stayed upstream and focused acting as a resource center to project owners, which included the provision of funding to undertake rigorous project preparation activities. The regional PPP unit by comparison played a more active role in providing hands-on support, funding and approval of specific PPP proposals and projects.

[17] World Bank Group. "Financial and Private Sector Development Vice Presidency: PPP Units." 2006.

Table 2-1 Typical Functions of A PPP Unit Based on Global Scan, Per World Bank.

	Information and guidance		Advisory support and funding				Approval
	Resource center (dissemination)	PPP guidance material	Intensive project-specific advice	Funding for PPP preparation[a]	Role as project developer[b]	Role in contract monitoring	De jure or de facto approval power over PPPs
Andhra Pradesh, India: AP Infrastructure Authority	✓	✓	✓				✓[c]
British Columbia, Canada: Partnerships BC	✓	✓	✓		✓	✓[d]	
Gujarat, India: Gujarat Infrastructure Development Board	✓	✓	✓	✓	✓	✓[d]	✓
Ireland: National Development Finance Agency	—[e]	—[e]	✓		✓[f]		
Italy: Project Finance Unit	✓	✓	✓				
Netherlands: PPP Knowledge Center	✓	✓	✓			✓	
Philippines: BOT Center	✓	✓	✓	✓		✓	✓[g]
South Africa: PPP Unit, National Treasury	✓	✓	✓	✓			✓
United Kingdom: Partnerships UK	✓	✓	✓	✓	✓	✓[d]	✓[h]
Victoria, Australia: Partnerships Victoria	✓	✓	✓			✓[i]	

An overview of the functions provided by PPP units is summarized below.

1. Information & Guidance: PPP units can provide information and guidance to governments, on the preparation of PPPs - ranging from provision of international resources to standardized PPP contracts and clauses for streamlined use in procuring PPPs.

2. Advisory Support & Funding: PPP units can provide hands-on technical support to public sector project owners, to supplement the oft-limited resources of a regional or local entity who lack PPP experience. International best practice suggests that PPP units should play a hands-on role in starting up a regional or local entity's PPP program at the inception of the same in order to build capacity. On the other hand with departments who have experience and capacity, the advisory support role of the PPP unit can be light-touch in nature. PPP units can also - on behalf of a central entity such as the Ministry of Finance - provide funding to help project owners acquire the expertise necessary to perform appropriate and rigorous project planning (e.g. provision of funding to hire independent transaction advisors).

3. Approval: PPP units can play a role in assessing whether the proposed PPP aligns with the quality, affordability and expected fiscal cost that is within the threshold of the central government.

To reiterate, international best practices recommend the establishment of PPP units in a prominent and influential position (i.e. dedicated unit located in the national Ministry of Finance) - with the specific functions of each unit to be customized depending on the relative technical capacity and experiences of existing government actors in the landscape of capital projects procurement.

2.2.2 Energy Sector Considerations

In addition to the generic considerations for infrastructure development, what is imperative for the energy sector to appropriately determine delineation of responsibilities between government agencies include the following main steps[18]:

1. Examination of responsibilities under current regulations and institutional arrangements within the jurisdiction. As mentioned in the prior section, many jurisdictions around the world are plagued by virtual monopolies or conditions wherein state-owned entities play multiple roles along the power value chain. If this is the case, sectoral reform is required to this institutional framework.

2. Decide the level of government responsible for power generation. Depending on scale, this responsibility is generally shared between central and regional governments.

3. Decide the level of government responsible for power transmission. This is usually a regional responsibility, and deferred to central only when projects traverse boundaries of states / provinces.

18 Asian Development Bank. "Developing Best Practices for Promoting Private Sector Investment in Infrastructure". 2000.

4. Decide the level of government responsible for power transmission. This is usually a regional or local responsibility.
5. Understand and/or decide the levels of government responsible for power sector related issues such as tariff calculation and setting, environmental permitting and protection.

When examining the power sector, government should be mindful of the presence of the following principles:

1. Users can, to some extent, choose power suppliers as well as the characteristics and features of how they receive and use power.
2. There is a multiplicity of buyers and sellers - i.e. no one entity is overtly influencing pricing.
3. Any monopolistic segments of the sector are well-regulated, and incentivized to perform.
4. The competitive segments of the sector are not regulated in a prescriptive manner, but are monitored for contractual compliance, environmental compliance, and general user protection.

Given the type of services provided by power PPPs, the importance of allocating government responsibility around key regulatory aspects - including tariff regulation, environmental protection and service monitoring - cannot be overstressed. While there are models that adopt a compromise between local and central government functions - international best practice has found that roles requiring streamlined setting, benchmarking and monitoring of standards are best assigned to specialized, central units at the national level.

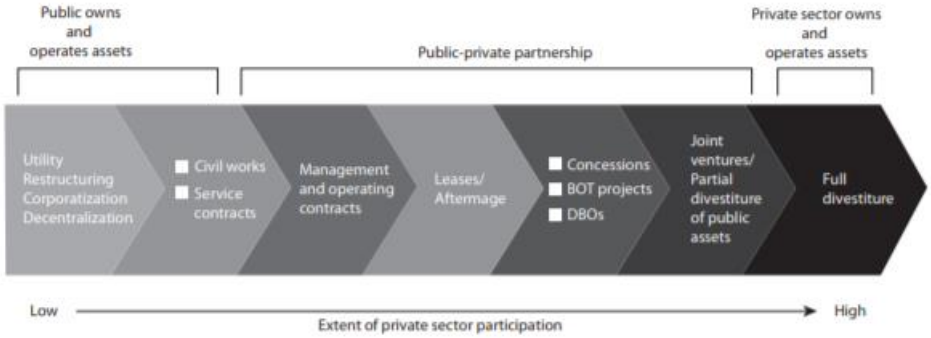
2.3 International Project Models

2.3.1 Project Models & Case Studies

The fundamental role of the public sector - regardless of the type of infrastructure - revolves around defining scope, specifying objectives and outputs of the asset/service, and holistically establishing tools for successful PPPs. There are a number of internationally-recognized models for power projects, each with different implications in the ways and extent to which they involve private sector participation.

As provided in the figure below, there is a wide range of international models for private sector participation.

Figure 2-1 Spectrum of Private Sector Participation in The Energy Sector, Per World Bank PPIAF.



The most prevalent model - and the one that is still truly a PPP scheme (without being outright privatization) while fulsomely transferring risks effectively to the private sector - is the concession model.

2.3.1.1 Power Generation

For power generation, a common avenue as validated by international good practice is to contract the private sector is the Power Purchase Agreement ('PPA'). The contractual structure involves a **Build-Own-Transfer** concession for a power generation asset, between an offtaker (often a state-owned utility) and a privately owned power producer. Key characteristics of the PPA include the following:

1. The PPA contract sets out the requisite design, outputs, and operations and maintenance specifications for the power asset.

2. The PPA contract binds the private party to make available to the public sector the predetermined capacity of energy.

3. The payment mechanism is usually pass-through: the price charged for the power will consist of a charge (availability charge) to cover the private sector's fixed costs (including a reasonable rate of return) plus a variable charge to cover variable costs. The availability charge relates to the availability of the power asset and the variable charge is calculated according to the quantity of power supplied.

4. The PPA may allow for third-party sales to cushion against risks in demand from the main offtaker. Typically the public sector offtaker wants to maintain exclusivity, and in a compromise may prescribe such during a limited period in the contract.

5. The PPA will provide for penalties or liquidated damages for failure to perform, as well as for delayed delivery of the asset itself.

6. The PPA will involve an independent engineer to certify levels of contracted capacity, reliability and fuel efficiency or heat rate.

The principle of applying PPAs are when there exists the following factors:

1. PPA provides price and volume certainty. Project revenues would otherwise be wholly market-based, and thus some guarantee as to quantities purchased and price paid are required to make the project viable.

2. PPA provides some degree of certainty, and protection from overt competition. There is a possibility of competition from cheaper or subsidized domestic or international competition.

3. Major customer is an off-taker. For example, a government utility may be purchasing the power generated by a power plant. The government will want to understand how much it will be paying for its power and that it has the first call on that power. The project company will want certainty of revenue; and,

4. The offtaker(s) wishes to secure security of supply.

An example of the PPA model in the power sector[19] is provided for in the figure below.

Box 2-2 Case Study: Hydropower Generation Project, Brazil

Case Study: Hydropower Generation Project, Brazil
The project involved a PPA (or Build-Operate-Transfer) agreement, for a hydropower plant with a capacity over 70 MW. Financial close was reached in 2010, with a duration of 35 years. The project was part of nation-wide program to add ~2600 MW of generation capacity.
Project Owner: ANEEL, the Brazilian Electricity Regulatory Agency
Scope: Project Co had responsibility for design and construction of the asset, using the basic design set out in the PPP contract. Construction permits, including environmental licenses, were wholly the responsibility of Project Co. Prior to entering operations, Project Co had to attain the grid operator's approval, who was involved in the plants commissioning to ensure smooth integration with the grid.
In operations Project Co sells the energy generated to the free market (in absence of an offtake agreement), as well as to utility providers.
Funding & Repayment: The project owner was successful in structuring the PPA such that fees paid to Project Co would be lessened if generation dropped below a certain level, while balancing concerns of the private sector by cutting Project Co payments to transmission line operations if the network became unstable. Project Co had no access to payment prior to completion of construction and availability of the asset.
Contract Management: The project owner actively monitored activities during construction, however once commercial operations commenced passed on most of the performance monitoring to the grid operator.
There were delays in delivery due to difficulty in obtaining environmental approval licenses. Per the PPA both parties had some form of responsibility to ensuring the approvals were obtained. This is a key lesson learned for proactive contract management in this sector - which have been incorporated into future contracts in Brazil.

[19] Global Infrastructure Hub. "Managing PPP Contracts After Financial Close." 2018.

2.3.1.2 Waste-to-Energy

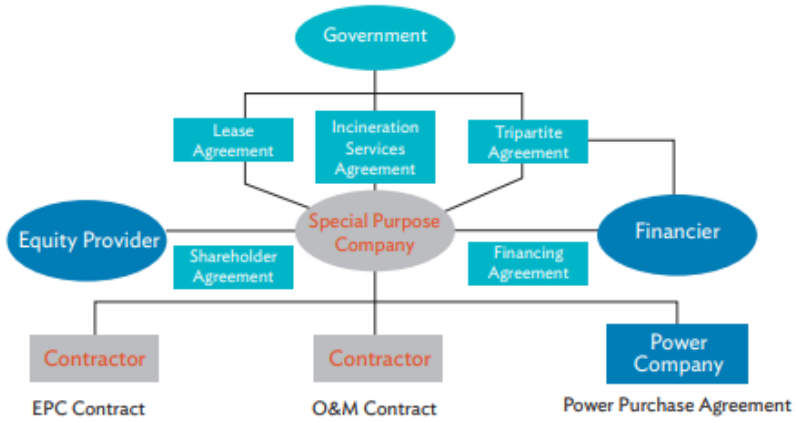
Guidance from the Asian Development Bank indicates the common PPP scheme for WTE projects is the Design-Build-Own-Operate model[20]. Project Co is responsible for the delivery of the facility, as well as the operations and maintenance over a 25-30 year contracted period. Project Co will also have a PPA which allows it to generate revenue from the generated power. An illustration of this PPP model is provided in the figure below.

Box 2-3 Municipal Waste to Energy Project in China

PPP Case Study: Municipal Waste to Energy Project, China
Since 2009, the Asian Development Bank has funded several WTE projects in multiple Chinese cities. The first such venture involved the construction and operations six WTE facilities, with an aggregate capacity of 132 MW. The Asian Development Bank provided loans directly to Project Co, a subsidiary of China Everbright.
Project Owner: People's Republic of China; municipal governments in Jinan, Zhenjiang, Suzhou, Pizhou and Sanya.
Scope: Project Co (separate Project Co for each facility) undertook 25-30 year concessions, and had the responsibility to build, operate and maintain the WTE plant. Project Co had a PPA executed to sell all volume of generated power to the local state grid.
Funding & Repayment: Project Co's revenue sources were secured through PPAs with local grids, with the price set at price premiums (i.e. $x/kWh more than coal-fired plants).
Project Co received the necessary funding to undertake capital investments primarily through the Asian Development Bank loans, backstopped by a corporate guarantee from Project Co's parent entity. Project Co further supplemented the Asian Development Bank loans with commercial loans from local banks.
Contract Management: The project introduced state-of-the-art technologies which ameliorated the urban waste management problems faced by these municipalities. Robust environmental & social monitoring was undertaken by the Asian Development Bank, on the basis of international standards.

The model above has been applied, with the support of the Asian Development Bank, in several markets in Southeast Asia. A case study describing one such project is provided below[21].

Figure 2-2 Typical WTE PPP model, per Asian Development Bank



EPC = engineering, procurement, and construction, O&M = operation and maintenance.

2.3.1.3 Power Transmission

With regards to power transmission, the focus for the public sector when considering PPPs to increase technical and financial efficiencies to provide te population with a dependable supply of electricity. A commonly implemented model is a privatization. An example of the privatization model in power transmission is provided in Box 2-4[22].

[20] Asian Development Bank. "Creating an Enabling Environment for PPPs in Waste-to-Energy Projects." 2018.
[21] Asian Development Bank. "Loan Municipal Waste to Energy Project (People's Republic of China". 2015.
[22] Global Infrastructure Hub. "Managing PPP Contracts After Financial Close." 2018.

Box 2-4 PPP Case Study: Brazil Electricity

Case Study: 500kV Tucurui-Jurupari Transmission Line, Brazil
The project involved the design, build, finance, operations and maintenance of a transmission line between Tucurui and Jurupari in Brazil. The PPP duration is 30 years, with the line running through six municipalities, and connects three substations to the national grid.
Project Owner: ANEEL, the Brazilian Electricity Regulatory Agency
Scope: Project Co is responsible for connecting three substations, and in the process a number of isolated cities, to the national grid. The line route runs through the difficult terrain of the Amazon forest and covers a linear distance of ~500 kilometres.
Funding & Repayment: Project Co received no payments until the asset was complete and the transmission line was in operation. Project Co receives payments as per the PPP contract. In addition to base transmission payments, Project Co can generate revenue from other sources by providing transmission-related services to other parties (on the condition that profits are shared with the grid users). The base transmission payments take into account inflation and deductions based on performance indicators (including unavailability of facilities, revenues of facilities out-of-service, and outages). Project Co did not assume demand risk, and was instead provided payments by the public sector grid operator.
Contract Management: The project owner monitored pre-operation activities through the use of a shared (between the owner and Project Co) software system that tracks major milestones from financial close to commercial operations. The project owner's role lessens to oversight during operations, with the grid operator taking on active role in performance monitoring thereafter.

2.3.1.4 Street Lighting

As afore-mentioned, the exact PPP scheme for the street lighting sub-sector will vary based on the scale and context of the local government. Below is a case study of a PPP delivered in the UK, for the City of Birmingham[23]

Box 2-5 PPP Case Study: Birmingham Street Lighting, UK

PPP Case Study: Birmingham Street Lighting, UK
The project involved the contracting of a private sector partner to provide 97,000 points of light throughout the second largest urban centre in the UK. The objectives of the government were to capitalize upgrades and modernization of street-associated infrastructure including lighting. The project (as part of a broader program to revitalize the municipality's streets and highways) involved a two-stage program, where (i) was a five-year period of installation and replacement of luminaires focused on the areas in worst conditions; and (ii) was a 20-year operational period during which the focus was to maintain higher performance standards.
Project Owner: City of Birmingham
Scope: Project Co assumed risk of energy consumption as well as all energy savings, doing so by accepting output specifications with lighting design standards. The PPP contract also allowed for Project Co to investigate advances in lighting technology, and subject these advances to cost analysis, and possible implementation. Given that energy savings accrued to Project Co's bottom line, they were incentivized to thoroughly pursue avenues of technological innovation.
Project Co's scope, in addition to installation and replacement of luminaires, also included upgrades to the associated infrastructure such as columns.
Funding & Repayment: Project Co was allotted the responsibility of determining what luminaires were procured and funded, in return for a monthly unitary payment for the capital and maintenance expenditures. Energy savings were accrued to Project Co's benefit.
Contract Management: Project owner audited Project Co's performance on the basis of contracted performance targets and infrastructure delivery requirements. Periodic progress was also charged to a jointly appointed independent certifier, who approved of a monthly unitary increase in payment by 4% until the end of the first phase (i.e. the first five years, when most of the capital intensive work was undertaken).

2.3.2 Lessons Learned

From the implementation of the above-mentioned PPP models in the energy sector, spanning specific case studies in the UK, Brazil, and China the following takeaways should be noted for good practice.

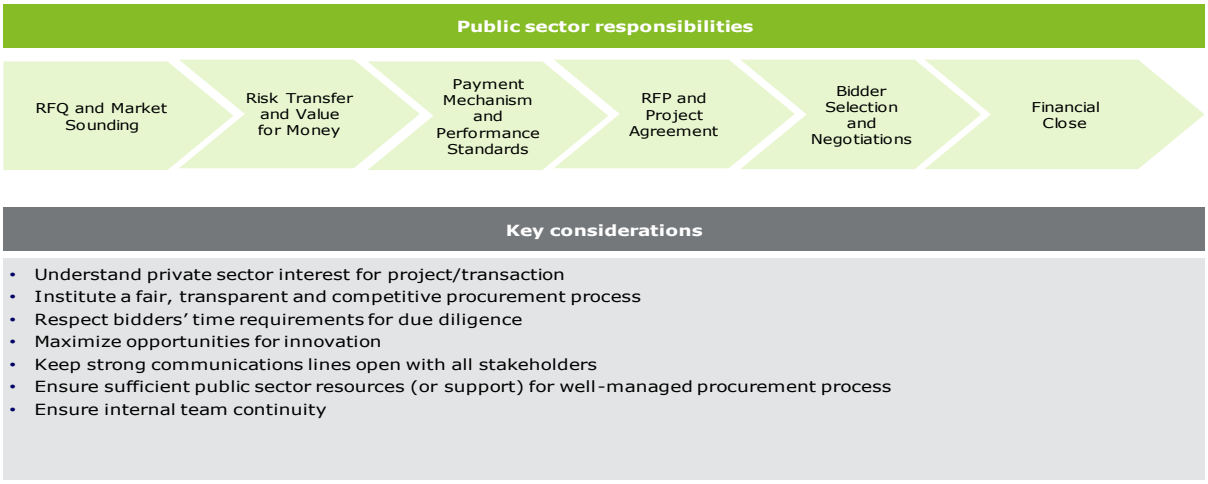
[23] World Bank ESMAP. "Proven Delivery Models for LED Public Lighting: PPP Case Study." 2019.

1. Power Generation PPA in Brazil
    - Appropriate risk allocation: as afore-mentioned, the assumption of responsibility in gaining approvals necessary to deliver a power generation asset should be shared between the public and private sectors. This project suffered delays in commencing operations due to government permitting issues - and in retrospect the project owner could have taken a more proactive approach to ensuring approvals were on-track.
2. Power Transmission PPP in Brazil
    - Managing key risks: as afore-mentioned a major risk and management consideration to transmission projects is the extended geographical footprint. In the case of this project, what was supposed to be a three year construction period ended up being delayed for two years - due to a combination of delays in securing environmental permits, and adverse site conditions related to weather and protests. Given the revenue-generating period was cut short by delays and it was the interpretation of Project Co that some responsibility was on the private sector, it sought recourse via renegotiation of the PPPs. This dispute has been escalated to court, in accordance with the contract's dispute resolution mechanism. In retrospect, government could have reconsidered to the allocation of risks (including attaining environmental permits) could have warranted greater consideration, as well as the timeline to reach commercial operations.
3. Street Lighting PPP in the UK
    - Incentivizing innovation: in the case of street lighting, accepting and integrating technological innovation during the life of a PPP contract can save a significant amount in energy consumption. However if not structured correctly, the private sector operator will not be incentivized to pursue these innovative options. For this Birmingham Street Lighting PPP, Project Co was contractually allowed to accrue the financial benefits of all energy savings. Consequently, Project Co explored technological innovations that would allow this accrual to increase. This resulted in the adoption of LED technology that maximized energy savings and extend the lifetime of the luminaires used on the streets of Birmingham.
4. WTE PPP in China
    - Quality partnerships: the private sector operator's technical and financial capacity plays a crucial role in the success of a PPP. In the case of this project, the Asian Development Bank loans were made only on the basis of the corporate guarantee provided by Project Co's parent company.
    - Technology and knowledge transfer: as afore-mentioned, the WTE sector is facing the convergence of rapid urbanization and a lack of widely accepted technologies and treatment practices in solid waste management. In the case of the WTE PPP in China, the adopted technology and practices have produced environmental and energy efficiencies - which have since been replicated by jurisdictions throughout the country.

2.4 Procurement Management

The public sector has a crucial role to play in the procurement process, with the project owner and its central agency stakeholders being responsible for selecting the private partner to enter into the PPP contract. A number of critical success factors for the public sector to consider during the procurement phase of the PPP lifecycle are provided in the figure below.

Figure 2-3 Public Sector Responsibilities



Using the Canadian PPP market as reference, there are a number of foundational principles for government project owners and policymakers to follow or consider in the design and implementation of a robust procurement process.

1. Transparency: project objectives should be explicit, with evaluation criteria well-defined. Bidders and other stakeholders should understand the procurement process, and the basis for evaluations and project award.
2. Robust & Fair: the procurement process should be resilient to problems encountered during procurement, and should allow for a level playing field with all bidders.
3. Cost-effective and timely: the cost and duration of the bid should be commensurate with the potential rewards of winning. Best efforts should be made to follow the procurement schedule.
4. Efficient financial close process: bidders are generally required to provide RFP submissions (against a final version of the Project Agreement) with committed financing. This in turn allows for an effective financial close period, of ~ three months in duration.

There are a number of mechanisms available for project owners to follow these principles, as provided below.

1). **Independent Oversight**

A competitive and transparent PPP procurement can benefit from the presence of a fairness monitor. The fairness monitor serves as an objective third party who observes, reports on, and where applicable advises in-situ on the impartiality of the procurement process. The involvement of this entity grants bidders and taxpayers confidence that the procurement is being conducted in a fair manner that serves public interest.

The fairness monitor remains active throughout the procurement process and focuses on ensuring project owner's communications are clear, unbiased and based on actual requirements; ensuring transparency and equal access to information while not breaching bounds of confidentiality; and overall ensuring the procurement and evaluation process is executed in a way that is consistent with the documented plan and generally adheres to best practices.

2). **Information Sharing & Protection**

A competitive and efficient PPP procurement process will involve the two-way conveyance of project and bidder-specific information and data. Communications between different members of the project owner - including parties such as the local government; funding and oversight agencies; legal, commercial and technical advisors - particularly when it comes to sharing documents that require multiple and sometimes concurrent layers of review and edits also require a confidential, centralized and expedient repository. The standard practice in Canada, is for the project owner team to establish an electronic data room. This data room is hosted on a secure website, with levels of access (i.e. there will be folders available to different stakeholders, be they on the public or private side) to be designed and determined by the project owner. This data room therefore represents the sole place where project documents can be accessed, and both (i) centralizes all formal communication throughout the process; and (ii) ensures confidentiality in the information being provided by all parties.

3). **Public-Private Interactions (RFIs & CCMs)**

In supplement to the electronic data room, it is standard practice in Canada to provide confidential and transparent avenues for bidders to interact with the project owner. These avenues inherently provide greater opportunity for bidders to develop optimal solutions for the project, and be as responsive to the project owner's requirements and needs.

A continuous way this is governed and promoted throughout the procurement process - is through the Request for Information ('RFI') channel. This allows bidders to ask clarification questions to the project owner. Canadian practice typically promotes the use of the electronic data room to host both the questions, as well as the responses - which are available for access by all bidders. The data room will stipulate a format within which bidders will pose their questions - one of which will ask the bidder to specify whether they consider a particular question to be confidential.

Competitive procurement processes also provide an opportunity for face-to-face, one-on-one interaction between each bidder and the project owner. Canadian best practice governs and promotes the use of **Commercially Confidential Meetings** ('CCMs') - during which the project owner can provide their position on the rationale behind the project requirements; bidders can seek detailed answers to questions on bid compliance and better understand requirements; and bidders can posit potential changes to the project requirements and rationale therein.

Typically the dates for Commercially Confidential Meetings (subject to updates) will be set out in the draft RFP. The RFP may further define that within a certain number of business days prior to, each bidder must provide to the project owner their desired and customized agenda and accompanying materials. Proponents typically will prepare a presentation - to be submitted via the electronic data room - prioritized topics for discussion as well as specific questions, and if applicable suggestions for changes to requirements. The project owner will likewise have prepared a presentation - uniform across all bidders - covering its prioritized topics for discussion. Beyond these presentations, no other information is allowed to be shared in this forum.

4). **Evaluation of Bids**

The culmination of the procurement process is the submission of bids in response to the final draft of the RFP and Project Agreement. Upon receipt, the project owner will undertake an evaluation process to determine the preferred proponent. The following elements support the rigour behind the evaluation process in a PPP procurement:

1. The project owner develops an evaluation plan - including methodology, approach, and processes - for the receipt, evaluation and scoring of bidder submissions.
2. Evaluators and supporting evaluation personnel must declare conflicts of interest, and must not hold any subordinate relationships to any entities or individuals belonging to any of the bidders.
3. Submissions from bidders are separated into discrete packages containing technical content and financial content, with some jurisdictions practicing staggered evaluation (i.e. technical evaluations completed prior to opening of financial packages).

5). **Efficient Path to Financial Close**

What distinguishes the Canadian PPP procurement process from other jurisdictions such as the UK, is that of a short (typically three months in duration) financial close period.

From a procurement perspective project owners balance the requirement for bidders to return the RFP submission with committed financing, with relatively light design requirements[24]. It should be noted this is only possible with a robust design development protocol, as well as experienced practitioners on both the public and private sides of the agreement.

This shortened process in turn becomes more attractive to potential lenders, who consequently are potentially more prepared to offer a strong level of commitment in support of the RFP submission.

6). **Energy Sector Considerations**

There are a number of issues with respect to properly procuring energy projects specific to **power generation** - which can be avoided using prudent management from the government.

[24] The implication is that detailed design work takes place during the design and construction period, post-financial close.

1. Commercial Viability. The financial viability of the main offtaker(s) is a concern for the private sector developer, particularly in the cases where a public sector utility is the main customer. If the offtaker is considered not creditworthy, a guarantee from the central government or a third party may be required. International best practice borrow from common solutions from other PPP arrangements, wherein a security package as an alternative to guarantees (including letters of credit, or escrow accounts) can be used to supplement the viability of the offtaker.
2. Interface. The ability to efficiently produce power is reliant on the broader electricity infrastructure network. When planning for projects - and undoubtedly private sector bidders will seek to clarify during procurement - public sector must ascertain the following to ensure interface:
    a) Grid condition
    b) Load balance of the utility
    c) Likelihood of grid failure
    d) Capacity of transmission system
    e) Ability of offtaker (public sector) to make necessary capital expenditures to reinforce the broader network.

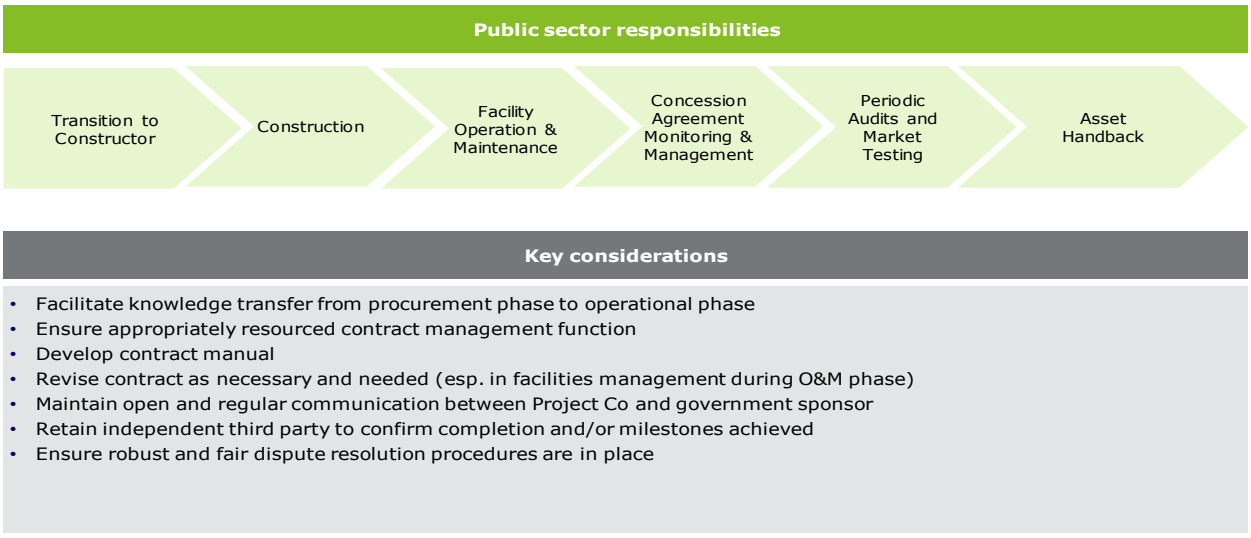
With respect to **street lighting**, an important factor to keep in mind during procurement is how to properly incentivize the timely and cost-effective adoption of technological advancements in lighting. In the case study provided, Project Co was given the entire benefit of energy savings. Alternatively, project owners could seek to include in the PPP contract periodic refreshes of technology.

For the **WTE** sector, the integration of efficient technology and treatment practices are important to help with project affordability, technical performance, as well as associated environmental and economic benefits. It is suggested that appropriate due diligence for the appropriate technologies and design requirements be performed, to ensure adequate flexibility and adaptability.

2.5 Contract Management

Central to ensuring success of the PPP arrangement is for the public sector to maintain robust monitoring, reporting and management during the contract management phase. A number of critical success factors for public sector to consider during the contract management phase of the PPP lifecycle are provided in the figure below.

Figure 2-4 Public Sector Responsibilities



Energy Sector Considerations

Energy sector PPPs have a number of common challenges that arise during the life of a contract - that require proactive management from the public sector.

1. Pre-operations period. Contractual obligations in a PPA or similar model commonly include a 'reasonable efforts' obligation by Project Co to obtain necessary consents and approvals from the government. Given

the status of the offtaker as (usually) a government utility, the offtaker should similarly strive to provide assistance in this respect to prevent any delays.

2. Monitoring and reporting. While robust contracts will have already stipulated practices for such, the public sector should be wholly coordinated in making best efforts to test and monitor performance. The PPA will require an accurate and up-to-date operations log, and international best practice dictates that the offtaker should keep a similar record of their own accord. Regular exchanges of information - including metering results - should be undertaken by both parties, as well as an independent certifier as deemed relevant.
3. Interface. As aforementioned, the offtaker (or broadly the public sector) is responsible for the interface of the electricity network with the power asset. An understanding of the elements as repeated below, throughout the contract, is required for sound, proactive contract management in this sector.
    a. Grid condition
    b. Load balance of the utility
    c. Likelihood of grid failure
    d. Capacity of transmission system
    e. Ability of offtaker (public sector) to make necessary capital expenditures to reinforce the broader network.

2.6 International Best Practices on Risk Allocation

At the core of every PPP transaction is the identification, allocation and ongoing management of project risks. A sound understanding of the risk allocation arrangements is essential to the drafting of a successful PPP contract[25]. The robust application of risk allocation principles contributes to the PPP project fulfilling government objectives, achieving Value for Money, and becoming financially viable for the private sector.

2.6.1 Principles of Risk Allocation in PPPs

The fundamental principle of PPP risk allocation, is that a given risk should be allocated to the party best-suited (or best-incentivized) to bear said risk. This best-suited party is the party who is (i) best able to manage the likelihood of the risk occurring; and (ii) best able to manage the impacts if the risk does occur.

PPP project risks vary between sectors and projects. The individual characteristics of each project implicate that risk allocation should be a bespoke process (ideally building from a foundation of national, or international best practice), as opposed to using a 'one-size-fits-all' framework. From the project owner's perspective, timely inclusion of stakeholders in the risk identification, allocation and management process is important.

A typical risk analysis process will estimate the likelihood and potential impact of each risk, allowing the project owner to make an informed decision on whether the risk should be retained or transferred.

Risk allocation as an exercise, is also subject to the maturity of the PPP market in question. As a jurisdiction gains more successful experience[26] in procuring PPP projects, a greater number potential bidders will become involved creating a more competitive environment. This may allow project owners to transfer more risk to the private sector.

2.6.2 Energy PPP Risk Allocation

In most jurisdictions, a power generation project will be governed by a long-term power purchase agreement, including a partial or full off-take from the government. As with all assets in this sector, power generation PPPs are highly dependent on the relevant regulations and public policy - ranging from regulation of tariffs, length of PPA term or requirements for competitive bidding of projects.

Based on international best practice, this section will provide for a list of the main risks to be considered in a hydro power PPP project. As aforementioned a specific project's individual characteristics and context must be integrated into the risk allocation exercise. What is provided are common risks for the build, own, finance, operation, and

[25] Global Infrastructure Hub. "PPP Risk Allocation Tool 2019 Edition - Energy, Communications and Industrial Parks." 2019.
[26] It is worth noting that conditions to generating this success can include - a stable economic, legal and political environment.

transfer of a new, large-scale (i.e. greater than 100 MW) hydro power plant[27]. A discussion of the key risks for energy PPPs is provided below[28].

- Land acquisition and site risk. Obtaining the (comparative to vertical infrastructures) substantive land and rights-of-way is a risk commonly assumed by the project owner. Site risk - to the extent accurate and fulsome due diligence can be undertaken - can be transferred to the private operator.
- Environmental and Social. Environmental and social scrutiny is heightened in the context of an energy project, where communities may take the 'not-in-my-backyard' stance. The project owner and private operator must develop sound social and environmental management plans before construction begins.
- Construction and operation commencement. The private operatory typically bears the risk of construction cost and time overruns. Operations commencement is similarly a key risk (i.e. particularly given difficult underground terrain and potential unanticipated asset condition issues emerge), and is typically managed by the private operator to the extent possible.
- Input risk. For hydro power projects, hydrological risk is the main input risk once they become operational. The sufficiency of the water supply should be assessed, as well as the impact of seasonality on the generation capacity of the project throughout the year. The effect of climate change or third-party activities upstream from the project should also be considered.
- Conflict risk. Many hydro power projects are in remote locations with less government control, which can be prone to local conflicts.

A summary table containing the suggested risk allocations / risk sharing between project owner and the private operator, in context of a hydro power generation PPP, is provided below.[29][30]

Risk Category	Description	Suggested Risk Allocation		
		Public	Shared	Private
1. Site risk	Risks associated with project land, as well as site conditions.	√	√	
2. Design, construction and commissioning risk	Risks associated with project design, construction and commissioning.		√	√
3. Sponsor risk	Risks associated with the private operator and/or its sub-contractors' fulfilment of contractual obligations.		√	√
4. Financial risk	Risks associated with financial viability of the project.		√	
5. Operating risk	Risks associated with performance in the operations phase.		√	
6. Revenue risk	Risks associated with demand and consequent implications to revenue available for the private operator.	√		
7. Network connectivity risk	Risks associated with government-controlled elements interrupting private operator's ability to perform.			

[27] The scope may feature a large dam and reservoir, may require extensive tunneling works to divert water to the power station, and may include associated infrastructure (i.e. electricity transmission infrastructure, roads to and around the project site) which would be handed over to the relevant government authorities upon completion.

[28] Global Infrastructure Hub. "PPP Risk Allocation Tool 2019 Edition - Energy, Communications and Industrial Parks." 2019.

[29] Global Infrastructure Hub. "PPP Risk Allocation Tool 2019 Edition - Energy, Communications and Industrial Parks." 2019.

[30] Guidance from the Global Infrastructure Hub's international best practices, has been adapted (i.e. in terms of risk categorization) to align with the Indonesia Infrastructure Guarantee Fund's categories - for purposes of comparative analysis.

Risk Category	Description	Suggested Risk Allocation		
		Public	Shared	Private
8. Interface risk	Risks associated with delivery from either partner frustrating the delivery the other's ability to perform.			
9. Political risk	Risks associated with government action that materially and adversely impacting the project and the private operator.	√		
10. Force majeure risk	Risks associated with events wholly outside the control of either partner.		√	
11. Asset ownership risk	Risks associated with the economic value of the asset deteriorating during or at the end of the contracted term.		√	√

1). Site risk.

a. Land availability, access, site. This sub-category refers to the selection and acquisition of the land, obtaining necessary approvals, as well as site access and condition.

i. Public Risks: Prevalent practice is for the project owner to select and to bear land / site acquisition risk, based on the fact that government holds legal authority to acquire land from property owners (including indigenous groups). For parts of the site where detailed geotechnical due diligence has not been conducted prior to award, the risk is retained by the project owner - which can be significant depending on how much of the network is underground. The project owner has responsibility to ensure electricity is distributed via the transmission and distribution network.

ii. Private Risks: The private operator may have to rely on the project owner's provision of information relating to site acquisition and condition (e.g. right-of-way, covenants affecting use or disposal, encroachment issues) - to price in certain risks during the bidding (procurement) process. The private operator assumes risk - by way of indicating the suitability and sufficiency of the land / site in the design and construction plan. To the extent the accurate data on the condition of existing assets are shared with the private operator, they can usually bear the corresponding risk.

iii. Shared Risks: Responsibility for utility relocation / access is typically shared, mainly due to lack of data which makes it difficult for the private operator to credibly assess and price in. The partners will need to agree the extent to which private operator should be risk for construction of new access roads, as well as impact on access roads of heavy loads (i.e. based on the fact that many hydro power projects are remotely located). Site security is typically a private operator risk, but the project owner may want to be involved (given the remote location of the hydro project).

b. Social. This sub-category refers to the affected peoples, impact on adjacent properties, resettlement, indigenous land rights, and industrial action.

i. Public Risks: The project owner is responsible for carrying out social impact studies to mitigate adverse effects, and is furthermore responsible for carrying out active stakeholder engagement from project conception all the way through to construction and operations. Any resettlement activities (i.e. removal of housing and/or businesses, paired with compensation as well as relocation of the same) is typically a project owner responsibility.

ii. Private Risks: The private operator is responsible for non-compliance with any contractual and legal social risk obligations.

iii. Shared Risks: Labour disputes and strike action may be a shared risk, depending on the political stability of the jurisdiction.

c. Environmental. This sub-category refers to environmental conditions, approvals, events, and climate change.

i. Public Risks: The project owner is responsible for pre-existing environmental conditions on the site. If exogenous environmental events are caused by government, the project owner is responsible.

ii. Private Risks: In the execution of the project (i.e. construction and operations), the private operator is responsible for complying with all applicable environmental laws, and any environmental obligations set forth in the contract (likely via adoption of internationally recognized standards). While the project owner will review the robustness of the environmental plans, the private operator is ultimately responsible for environmental events caused by the project.

iii. Shared Risks: Given the long gestation of most approvals in this aspect, to the extent possible the project owner should strive to obtain or initiate environmental authorizations. At a specified point in time, the private operator can take over the risks related to obtaining more detailed environmental permits and licenses. Both partners share the risk of exogenous (non-government) environmental events. A growing challenge - and a shared risk - to integrate in planning for major capital projects is climate change, and how the same might be mitigated through resilience design, construction and rehabilitation.

2). Design, construction and commissioning risk.

a. Design. This sub-category refers to design suitability, approvals, and changes.

i. Public Risks: The project owner should aim to transfer design risk, but the extent to which this is possible depends on how the design requirements are specified in the tender documentation. The project owner will likely specify whether the project should feature a dam and reservoir (as opposed to a run-of-river project). If a performance specification is too prescriptive, the extent to which the project owner can wholly transfer said risk is consequently constrained.

ii. Private Risks: Fundamentally the private operator should assume design suitability risk, but the degree to which depends on the specifications as requested by the project owner. Ideally the specifications are output driven, allowing the private operator room to innovate while meeting minimum standards. The private operator may also bear risk to deliver and hand over associated infrastructure including access roads and transmission facilities.

iii. Shared Risks: The project owner should ideally steer project design using output specifications and engaging in iterative dialogue, but should ensure risk is assumed by the private operator. In instances where the project owner is wholly prescriptive in specifying design, this risk will be retained. Changes to the design after the PPP contract is executed as a risk item, is dependent on the origin of the change (e.g. a private operator risk if the design is deficient; and a project owner risk if changes are requested by the same).

b. Construction. This sub-category refers to cost overruns, delays project management, defects, and other items related to construction.

i. Public Risks: n/a.

ii. Private Risks: The private operator is responsible for construction cost overruns, construction defects, construction delays, vandalism, intellectual property, project management risks, health and safety compliance, and interface with other works and facilities (with exception to works that are the responsibility of the project owner). Following minimum insurance requirements set out in the PPP contract, the private operator will be liable for death, injury and property damage.

iii. Shared Risks: To the extent that regulatory standards on quality change after the PPP contract comes into effect, the risk may have to shared. The project owner could increase compensation to comply, or the private operator may be excused if the standard is not mandatory.

c. Variations. This sub-category refers to changes requested by either partner, impacting construction or operations.

i. Public Risks: n/a.

ii. Private Risks: n/a.

iii. Shared Risks: The risk and cost of changes implemented following either partner's request is allocated according to the same. The project owner will need to consider how best to fund these variations (i.e. requiring private operator to procure committed but undrawn funding as a reserve account, at the expense of driving up the bid price).

3). Sponsor risk.

a. Sponsor risk. This category refers to private operator or subcontractor failure, change in private operator ownership, change in project owner's status, disputes, and permitted step-ins.

i. Public Risks: Project owner bears the risk of change to its status which adversely affects the PPP (e.g. where its financial covenant and credit are adversely impacted).

ii. Private Risks: Failure to possess requisite financial or technical capacity, on the part of the operator as well as its subcontractors, to deliver the project is a private operator risk. The private operator's ownership composition / shareholding may be locked in for a period, and any change in ownership control will be restricted as well (a balance should be struck by project owner to retain involvement of key participants with private sector's desire to recycle their investment into other projects.

iii. Shared Risks: Step-in (primary concern is to provide continuity of service, or emergencies, or intervention to protect against social and environmental risks) is generally a shared risk, with allocation determined based on grounds and whether it was the private partner's fault or not.

4). Financial risk.

a. Financial risk. This category refers to changes in financial markets affecting private operator's performance.

i. Public Risks: Inflation during operations is a project owner risk.

ii. Private Risks: Inflation during construction is a private operator risk. Refinancing risk - in terms of risk of failing to raise the required capital - is a private operator risk.

iii. Shared Risks: Exchange rate fluctuations are a shared risk. Between bid and financial close the private operator bears the risk. However in jurisdictions with a lot of volatility and the long-term currency swap markets are illiquid, the private operator may be ill-equipped - and instead ask for payments to be in a stable foreign currency such as USD. During project implementation the private operator will mitigate exchange risk via hedging arrangements to the extent possible. Interest rate fluctuations may be shared between the two partners if the jurisdiction has a long gestation period between bid and financial close. Insurances are typically a private operator responsibility, however there are instances where neither partner is better-suited to control risk of insurance coverage becoming expensive or unavailable. When refinancing creates additional project risks, both partners will be responsible. Potential refinancing gains should also be shared between the project owner and private operator.

5). Operating risk.

a. Operating risk. This category refers to cost overruns, poor performance, and other events during the operations period.

i. Public Risks: The project owner has a responsibility to enforce the performance mechanism and ensure the indicators are attainable and tailored based on relevant market data.

ii. Private Risks: The private operator broadly bears risk for events which inhibit performance and cause cost overruns. Depending on the payment mechanism in the PPP contract, the private operator's poor performance and maintenance of the asset (e.g. availability of minimum contracted capacity) may additionally lead to deductions in payments. The private operator generally assumes risk for ensuring a consistent and cost-effective flow of operational resources including utility provision. The private operator also assumes risk for

obtaining intellectual property, health and safety compliance, and liability for death, injury and property damage.

iii. Shared Risks: Certain contexts may require risks to be shared in relation to availability of utilities and local source materials - such as labour disputes, embargoes or other political risks. The sufficiency and quality of water supply - or hydrological risk - is the major risk affecting the sustainability of hydro generation projects. The allocation of risk will depend on a number of factors including quality of available hydrology data, and whether analogous projects are operating in the region.

6). Revenue risk.

a. Revenue risk. This category refers to actual user levels deviating from projections, and the consequences for revenue and costs.

i. Public Risks: With respect to hydro power generation, the project owner assumes the risk that the system does not require the electricity that the project is generating.

ii. Private Risks: n/a.

iii. Shared Risks: n/a.

7). Network connectivity risk.

a. Network connectivity risk. This category is not referenced as a major category or subcategory in global guidance.

i. Public Risks: n/a.

ii. Private Risks: n/a.

iii. Shared Risks: n/a.

8). Interface risk.

a. Interface connectivity risk. This category is not referenced as a major category or subcategory in global guidance.

i. Public Risks: n/a.

ii. Private Risks: n/a.

iii. Shared Risks: n/a.

9). Political risk.

a. Material adverse government action. This sub-category refers to actions within public sector purview that create an adverse impact on the project or private operator.

i. Public Risks: The project owner bears the risk of government actions that impede private operator's ability to perform contractual obligations. These events include - deliberate acts such as nationalization or expropriation of the PPP, a moratorium on international payments and foreign exchange restrictions, not granting approvals or failing to ensure utility connections. The underlying principle of relief is to place the private operator into the position it had been in, prior to the adverse government action occurring. Typically in mature, politically stable markets bidders do not expect these types of actions to arise.

ii. Private Risks: n/a.

iii. Shared Risks: n/a.

b. Change in law. This sub-category refers to the risk of compliance with applicable law, and changes in law affecting performance of the project.

i. Public Risks: The project owner is bears the risk for failure to enforce compliance onto third parties which cause adverse effect on the project. Generally the project owner bears the risk of unexpected changes in law which cause the private operator's performance to be restricted. In the event change in law benefits the private operator, the project owner may want to benefit from the positive financial consequences as well.

ii. Private Risks: The private operator is responsible to comply with applicable laws and regulations. With a track record of a successful PPP program and an established, stable legal environment, in some cases private operators may be amenable to more risk transfer in this sub-category.

iii. Shared Risks: There are ways in which the project owner can attempt to mitigate risk assumption or to share the risk. The PPP contract can allow for a monetary threshold up to which the private operator accepts change in law risk, and any amount above is borne by the project owner. Another alternative is for the private operator to assume consequences for changes in law except for laws which are discriminatory, specific (i.e. to the energy sector or to investors in energy businesses), require capital expenditure in operations.

10). Force majeure risk.

a. Force majeure. This category refers to unexpected events beyond the control of either partner.

i. Public Risks: The project owner should consider ways to limit risk by carefully defining events that qualify for force majeure (e.g. only earthquakes above a certain magnitude). Provided the private operator made reasonable efforts to mitigate and to the extent it was not responsible, the project owner may have to provide relief to the private operator. PPP contracts may include a clause allowing for private operator to opt for termination following prolonged force majeure. The project owner may want to include an option to continue the PPP, provided the private operator is sufficiently compensated (i.e. compensation and extensions of time to reach substantial completion during construction; as well as compensation and relaxed performance standards during operations).

ii. Private Risks: n/a.

iii. Shared Risks: This is usually a shared risk given neither private operator nor project owner are better-suited to bear full responsibility. Typical events include armed conflict, nuclear or biological contamination, as well as discovery of species-at-risk or important artefacts. The fundamental principle is that each partner bears its own losses.

11). Asset ownership risk.

a. Disruptive technology. This sub-category refers to new or emerging technologies that unexpectedly displaces established technology, as well as the equipment and other materials used becoming obsolescent.

i. Public Risks: In context of a transaction where the project owner has assumed all demand risk under a long-term PPA, this risk is not applicable.

ii. Private Risks: n/a.

iii. Shared Risks: n/a.

b. Early termination. This sub-category refers to the a project being terminated prior to its signed expiry.

i. Public Risks: The project owner will be concerned with a number of risks associated with early termination, including reputation, continuity of service delivery, reaching substantial completion and/or maintenance, as well as potentially retendering the project. In instances of project owner default termination, the private operator should be compensated as if the PPP had gone as planned. The project owner should ensure other mitigating mechanisms are applied to reduce the termination amount - including insurance proceeds, bank accounts, hedge break entitlements and surplus maintenance funds. Similarly in event of change in law, and other government actions proving adverse to the function of the project, the project owner will be responsible for compensating the private operator. PPP contracts typically also include an option for the project owner to terminate for convenience, for which the same compensation principles apply.

ii. Private Risks: The private operator bears risk of termination for severe failures to deliver on performance - in either a technical or financial sense. Opportunities to rectify should be provided to the extent possible. The typical level of compensation expected for a private

operator may be an amount equal to scheduled outstanding debt, minus applicable deductions (which are likely if default is related to performance failure).

iii. Shared Risks: With the private operator losing its expected revenue stream and the project owner losing the delivery of the public service, this is a shared risk to mitigate and bear. The fundamental legal principle in many jurisdictions is that the project owner should not be "unjustly enriched" by receiving an asset for which it has not paid the full contractual price. For instances of force majeure, the private operator will be compensated on the principles of it being neither party's fault and that the financial consequences should be shared. If the PPP was financed in a sharia-compliant manner, how ownership will be transferred following termination must also be considered.

c. Condition at handback. This sub-category refers to the project assets / land not being provided in the contractually stipulated condition at time of handback to the project owner.

a) Public Risks: n/a.

b) Private Risks: The private operator is contractually obligated to ensure the project asset and land are handed back to the project owner in the stipulated conditions. Typical contract mechanisms include an advanced survey of conditions and remediation as appropriate. A power generation asset would typically have an operating life beyond the PPP contract term.

c) Shared Risks: n/a.

3. Regulatory And Legal Basis

3.1 Review of National Development Plan

The utilization of MSW, including MSW to energy, has a huge effect, because it reduces the environmental burden and produces beneficial products for the community. Whereas energy saving can be said as hidden energy sources, very cost effective because saving 1 kilowatt hours (kWh) is much cheaper than producing 1 kWh.

The 2015-2019 RPJMN does not specify the targets or plans for processing MSW to energy or street lighting, but there are policy directions and strategies to increase the use of EBT in general and increase efficiency in the use of electricity. The target for using EBT in the energy mix is 10-16% in 2019, while for energy conservation the primary energy intensity is targeted to decrease 1% per year from 487 TOE (ton-oil-equivalent) per 1 million USD GDP in 2014 to 463.2 in 2019 TOE per 1 million USD GDP. The decrease in primary energy intensity by 1% per year is equivalent to 5 barrel oil equivalent (TOE) per billion rupiah.

Because there are no specific targets for MSW to energy or street lighting in National Development Plant, there is a high probability that this infrastructure will not much be proposed as a PPP project. However, because these projects were initiated by the local government, it is probable that these projects can be encouraged if the difficulties to propose a PPP scheme are eliminated or made easier. A PPP project in both fields that has been successfully carried out will be a good example of creating future projects.

Because in National Development Plant target approach in the energy sector cannot be relied on, the approach that can encourage the development of MSW to energy is to pay attention to sanitation management targets, especially the management of MSW. So that consideration of MSW to energy infrastructure needs is driven more by sanitation needs than energy. For street lighting, in addition to replacing existing ones, an approach that is accurate enough to be obtained from its needs is linked to the target development of the road.

3.2 Policy and Sector Strategy

Constitution relating to MSW to Energy and Street Lighting are:

1. Law Number 30 of 2007 concerning Energy.
2. Law No. 28 of 2009 concerning Regional Taxes and Regional Levies.
3. Law Number 30 of 2009 concerning Electricity

4. Government Regulation Number 19 of 1965 concerning the Dissolution of the General Leadership Body of the State Electricity Company and the Establishment of the State Electricity Company (P.L.N.) and the National Gas Company (P.G.N.)
5. Government Regulation Number 70 of 2009 concerning Energy Conservation
6. Government Regulation Number 14 of 2012 concerning Electricity Supply Business Activities as amended by Government Regulation Number 23 of 2014;
7. Government Regulation Number 81 of 2012 concerning Waste Management
8. Government Regulation Number 79 of 2014 concerning National Energy Policy.
9. Presidential Regulation Number 4 of 2016 concerning the Acceleration of Electricity Infrastructure Development which subsequently changes in Presidential Regulation Number 14 of 2017
10. Presidential Regulation Number 22 of 2017 concerning the General Plan for National Energy.
11. Presidential Regulation Number 35 of 2018 concerning the Acceleration of the Construction of Waste Processing Installation into Green Energy-Based Electric Energy
12. Regulation of the Minister of Energy and Mineral Resources No. 13 of 2012 concerning Electricity Saving
13. Regulation of the Minister of Energy and Mineral Resources No. 14 of 2016 concerning Implementation of Energy Conservation Services Business
14. Regulation of the Minister of Energy and Mineral Resources No. 50 of 2017 concerning Utilization of Renewable Energy Sources for Electricity Supply

3.2.1 Conditions for Municipal Solid Waste to Energy Policy

In particular for municipal solid waste to electricity, the Government has issued Presidential Regulation No. 35 of 2018 concerning the Acceleration of the Construction of Waste Processing Installation into Green Technology-Based Electric Energy, which is decided on-site:

1. DKI Jakarta Province;
2. City of Tangerang;
3. South Tangerang City;
4. Bekasi city;
5. Bandung;
6. Semarang city;
7. Surakarta City;
8. City of Surabaya;
9. Makassar city;
10. City of Denpasar;
11. Palembang city; and
12. Manado City.

This Presidential Regulation is a substitute for Presidential Regulation No. 18 of 2016 concerning the Acceleration of the Construction of Waste-Based Power Plants in DKI Jakarta, Tangerang City, Bandung City, Semarang City, Surakarta City, Surabaya City and Makassar City which was canceled by the Supreme Court Institutional Aspects Assessment.

However, the construction of the MSW power plant requires no small amount of funds which would be very difficult to be funded by the APBN / APBD. For this reason, an appropriate business model and policies that can support investment are needed. Some fundamental things that need to be considered based on applicable regulations:

a. Selection of Technology

   Based on the Waste to Energy Guidance Book issued by MEMR (WTE Handbook), many factors need to be considered as assessments for selecting existing technologies. Thus further studies are needed to

assess the suitability between existing waste and the technology to be selected. Regarding technology selection in Presidential Regulation 35/2018 it is not explicitly regulated, only mentioned using environmentally friendly technology. Thus the study of the feasibility study will be the basis for consideration of the selection of waste powerplant technology.

b. Tipping Fee

Based on the WTE Handbook, Tipping Fee is compensation provided by the central / local government to those who manage urban waste management activities. The basis that can be used as a reference for compensation is regulated in Law No. 18/2008 which states that the central and / or local governments are obliged to finance waste management activities originating from the APBN / APBD. Problems Tipping Fee is one of the crucial problems because it is the main income to finance operations. So far, a number of local governments have been reluctant to give Tipping Fees or only budgeted very little Tipping Fee to be paid to the Management.

In addition, there is no standard formula for calculating and giving Tipping Fee, so it requires a political process in the DPRD due to the use of regional budgets. However, specifically for 12 cities, Presidential Regulation 35/2018 provides an indication that the Local government can provide a Tipping Fee rate of a maximum of IDR 500,000 (five hundred thousand rupiah) per ton of MSW processed.

c. Feed in Tariff and Electricity Purchases

Feed in Tariff or Electricity Selling Rates are basically set in Permen ESDM No.50 / 2017 Jo Kepmen ESDM No 1772 K / 20. Based on this regulation, electricity tariffs for PLTSa are based on Production Cost (BPP) which varies by region.

However, specifically for 12 regions, the rates are as follows:

i. For a capacity of up to 20 MW, the tariff is USD13.35 which is interconnected to high, medium or low voltage networks;

ii. For the amount of capacity of more than 20 MW interconnected in high, medium or low voltage networks, the tariff is USD14,54 - (0.07 x PLTSa capacity sold to PT PLN.

For the record, both based on ESDM Regulation 50/2017 and Perpres 35/2018, PT PLN is obliged to buy electricity from PLTSa. The procedure for purchasing electricity by PLN starts from the Assignment of the Minister of Energy and Mineral Resources to PLN to buy PLTSa electricity after the Local Government provides document information (a) designation letter and profile of the designated PLTSa developer; (b) PLTSa location and capacity; (c) COD plan.

d. Waste Power Plant Development Financing

Basically, PLTSa facilities can be financed through APBN / D, Assignment of BUMN / D or Collaboration with Business Entities. However, as mentioned above, the financing of the construction of the waste powerplant project will be difficult to implement by only relying on sources from the APBD even if assisted by the APBN. Thus the option that can be passed is by assigning to BUMN / D or Collaborating with Business Entities.

This is in line with the acceleration of waste powerplant development in 12 regions where based on Article 6 of Presidential Regulation 35/2018, the acceleration of waste powerplant development, Local Governments can assign BUMD or conduct Business Competition. In the event that there is no BUMD or Business Entity that is capable or interested, then the Local Government can propose assignments to SOEs.

Other funding needed to carry out the acceleration of waste powerplant can be sourced from the APBD and can be supported by APBN / other legitimate sources.

e. Mechanism of Cooperation with Business Entities

In the case of Business Entity competition, Article 6 (3) of Presidential Regulation 35/2018 mandates to refer to laws and regulations in the field of procurement of government goods / services or provisions of government cooperation with Business Entities in the provision of infrastructure. Thus, in the event that the waste powerplant project will be built and funded by the Business Entity, then this mandate refers to Perpres 38 of 2015 Jo Perka LKPP 19 of 2015.

f. Obligations of Local Governments

As a prerequisite for procurement, regional goverments must prepare (a) pre-feasibility studies that at least cover the volume and composition of available waste, conditions and availability of land, availability of water resources, processing of residues, project schedules, funding commitments, socio-cultural, legal and technological; (b) ensuring the availability of waste according to waste powerplant economics; (c) ensure the processing method is in accordance with the regional waste Renstra; and (d) ensuring location availability in accordance with the Local Government RTRW.

g. Licensing

In the case of licensing, waste managers and waste powerplant developers must obtain environmental permits and power producers in accordance with applicable laws and regulations. Thus, the Local Government and the relevant Ministries / Agencies need to provide appropriate support for authority.

3.2.2 Conditions for Street Lighting policy

In the energy conservation sector, the output of PPP projects is the efficiency of energy use. Energy efficiency projects can include PJU electricity efficiency using LED lights and / or solar power usage. In Regulation of the MEMR No. 14/2016, the output of the ESCO (Energy Service Company) project used as the basis of payment is the energy saving performance. Regarding the regulation of output, considering that the Project output expected in a PPP Street Lighting is the availability of services specified in the Cooperation

Agreement, then the provisions of the ESDM Regulation No. 14/2016 is not used as the main reference in the implementation of the Project. In the Project, energy efficiency is part of the implementation objectives, but the service output or performance of the work carried out by the SPC stipulated in the Cooperation Agreement is a public street lighting service based on agreed standards. Generally, SPCs make investments to provide, operate, and maintain infrastructure facilities and services for a certain period. Considering the existing regulatory aspects, the Availability Payment (AP) scheme is a PPP scheme choice in this sector.

This scheme is applied to PPP Public Street Lighting (PJU) by considering that PJU services are not a user charge, even though the community pays PJU taxes quoted by PLN, but the availability of services. PJU tax that is quoted is a retribution that cannot be income for BU. Therefore, the AP scheme can be an option. The Project PJPK depends on the status of the road and the assets on the road, so legal aspects need to be studied first.

This street lighting PPP scheme does not involve the Directorate General of New and Renewable Energy and Energy Conservation (NREEC) under MEMR.

3.3 Regulatory Framework for Energy

Provision of Energy in Indonesia is stipulated in regulations from the President, Parliament, MoEMR and MoF. Existing regulations range from Law, Government Regulation, Presidential Regulation and Ministerial Regulation.

Table 3-1 PPP Regulatory Framework for Electricity

No	Regulation	Subject
1	Law 30/2007	Energy
2	Law 30/2009	Electricity
3	GR 14/2012	Electricity as amended by GR 23/2014
4	PR 4/2016	Acceleration of Electricity Infrastructure Provision as amended by PR 14/2017
5	MEMR Regulation 10/2017	Principles of Power Purchase Agreement
6	MEMR Regulation 12/2017	Utilization of Renewable Resources for Electricity as amended by MEMR Regulation 53/2018
7	MEMR Regulation 24/2017	Benchmarking Tariffs to the PLN average electricity generation cost (*Biaya Pokok Pembangkitan*)
8	MEMR Decree 55/2019	Benchmarking Tariffs to the PLN for the year of 2018

Table 3-2 PPP Regulatory Framework for Waste Management

No	Regulation	Subject
1	Law 18/2008	Waste Management
2	GR 101/2014	Hazardous Waste Management
3	GR 81/2012	Household Waste Management
4	PR 35/2018	Acceleration of Development of Waste to Energy Projects
5	MoHA Regulation 33/2010	Guidelines of Waste Management
6	MoHA Regulation 19/2016	Utilization of Regional Assets
7	MoPWH Regulation 3/2013	Implementation of Waste Infrastructure and Facility

Table 3-3 Cross Sector Regulation in General

No	Regulation	Subject
PPP Regulation		
1	PR 38/2015	Public-Private Partnership
2	PR 78/2010	Public-Private Partnership Guarantee
3	Bappenas Regulation	Guidelines of PPP Implementation
4	LKPP Regulation	IBE Procurement (Unsolicited)
5	MoHA Regulation 33/2010	IBE Procurement (Solicited)
Others		
1	Law 5/1999	Business Competition
2	Law 25/2007	Investments
3	Law 40/2007	Limited Liability Companies
4	Law 32/2009	Environment
5	Law 2/2012	Land Procurement
6	Law 23/2014	Local Government
7	GR 26/2008	National Spatial Planning
8	GR 27/2014	Utilization of State Assets
9	GR 28/2018	Regional Cooperation

3.3.1 Regulatory Aspect on PPP in Electricity

It is acknowledged that the main purpose of energy infrastructure is to promote infrastructure development and to provide social service activities. Those activities differentiate energy infrastructure as social infrastructure and economic infrastructure, in which economic infrastructure aims to encourage and/or support the economic activities of a country. In Indonesia, the implementation of energy infrastructure refers to Presidential Regulation 38/2015 and its implementing regulation such as Bappenas Regulation 4/2015.

3.3.1.1 Authority on Electricity Sector Regulation & Implementation

Under Article 5 Law 30/2009, Central Government has the authority on providing electricity infrastructure, as follows:

1. Policy determination on national electric power policy.
2. Policy determination on electric power sector regulations.

3. Policy determination on electric power sector guidelines, standard, and criteria.
4. Policy determination on electric tariff guidelines for user.
5. Policy determination on national general electric power plan.
6. Policy determination on business area.
7. Policy determination on cross-countries electric power purchase license.
8. Policy determination on electric power supply business license for the following business entity:
    a) Cross-province business area.
    b) Performed by state enterprises.
    c) Carries an electric power and/or lease an electric power to electric power-supply business license holder, which is determined by the Government.
9. Policy determination on operational license of cross-province installation facility.
10. Policy determination on electricity tariff for user of electric power-supply business holder, which is determined by the Government.
11. Policy determination on power purchase fee agreement and electric power lease from electric power-supply business license holder, which is determined by the Government.
12. Policy determination on excessive power purchase fee agreement from the operational license holder, which is determined by the Government.
13. Policy determination on electricity supporting business license, which is determined by a state enterprises or foreign capital investment/the majority of its holding own by a foreign capital investor.
14. Policy determination on electric power utilization permit for telecommunications, multimedia, and information on networks owned by electric power-supply license holders or operational license determined by the Government.
15. Guidance and supervision of electric power business whose permits are determined by the Government.
16. Appointment of electric power inspector.
17. Guidance of the electric power inspector functional position for all levels of the governance.
18. Policy determination of administrative sanctions to a business entity whose license is determined by the Government.

3.3.1.2 Determination of GCA

In each PPP Project, the determination of GCA plays important role for the continuity and successfulness of the PPP Project. The definition of GCA regulated under Presidential Regulation 38/2015 and Bappenas Regulation 4/2015 (“PPP Regulation”). In connection with that matter, PPP Regulation describes that the authorities to conduct as Government Contracting Agency (GCA) is Minister, Head of Institution, Head of Region and Director of SOE/ROE. On the Energy sector, Law 30/2009 explains that electricity power supply is controlled by the State. Considering the authority of electricity, the authorized GCA for electricity project is Central Government and local government as pursuant to Article 4 paragraph (1) of Law 30/2009. Electricity power supply is conducted by the Central Government and local government through state-owned enterprise and regional-owned enterprise. Article 11 paragraph (2) of Law 30/2009 describes that state-owned enterprise is given priority rights over the electricity supply business throughout Indonesia.

Based on Presidential Regulation 4/2016 regarding Acceleration of Development of Electricity Infrastructure, government agencies in charge for electricity sector is Ministry of Energy And Mineral Resources. In conducting the electricity power supply, the Central Government and local government assign state-owned enterprise. In this case, PT Perusahaan Listrik Negara (Persero) (“PLN”) acts as an SOE that has the priority rights over electricity supply business to conduct electrical power supply on behalf of Central Government and/or local government. Thus, the suitable authority to conduct as GCA in the PPP Electricity Project is Ministry of Energy And Mineral Resources through assignment to PLN.

However, in the renewable energy-based electricity, MoPWH Regulation 9/2016 on PPP Implementation of Water/Mini/Macro Hydro Power Plant ([PLTA/PLTM/PLTMH) Infrastructure Utilization enables the concept of joint

GCA. Article 6 of MoPWH Regulation states that the GCA for the utilization of water resource infrastructure consists of Minister of Public Works Housing and Minister of Energy and Mineral Resources.

There is no clear reference to state that PLN shall act GCA for every PPP projects in the Electricity sector. However, we believe that Ministry of Energy And Mineral Resources shall also conduct as GCA together with PLN to increase the bankability and to enforce the successfulness of the PPP projects in Electricity sector.Scope of Work

The scope of work for Implementing Business Entity ("IBE") in implementing PPP in Energy sector generally governed under Law 30/2009. Such regulation also determines the concession period of PPP. In accordance with Bappenas Regulation 4/2015, scope of PPP works are as follows:

3.3.1.3 PPP Scope of Works

In relation to the implementation of PPP Energy Project, it is understood that the availability scope of works is directly proportional to its PPP modality. The modality that will be utilized in the project is depiction of necessity aggregate in the implementation of the project.

Eligible scope of works based on PPP Regulation include electrical power generation, electrical power transmission, electrical power main station and electrical power distribution. Under Electricity Law, scope of works that can be cooperated with private sectors includes electrical power generations, electrical power transmission, electrical power distribution and/or sale of electrical power.

Table 3-4 Scope of PPP Electricity

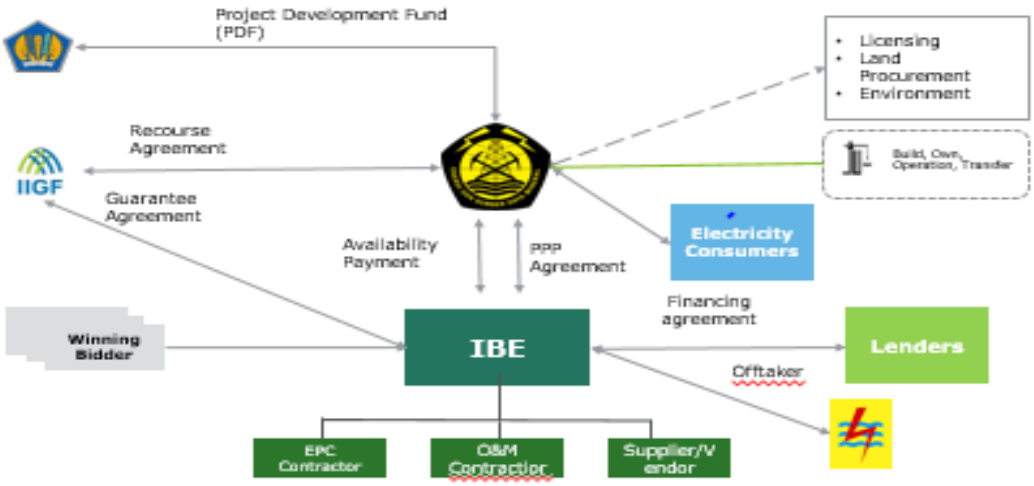
Electrical Power Supply	Electrical Power Support
Electrical Power Generations	Consulting
Electrical Power Transmission	Construction & Installation
Electrical Power Distribution	Operation & Maintenance
Electrical Power Main Station	Research & Development
	Education
	Training & Certification
	Equipment Testing & Certification
	Power Tools
	Power Equipment Supply

To date, Article 4 paragraph (2) of Law 30/2009 permits the participation of private sectors, cooperatives and self-reliant community in conducting the electricity power supply business. However, there is no clear reference to specify the inclusion of power purchase agreement in the PPP agreement since scope of works in the energy and electricity sector does not include electricity power purchase as one of main PPP scope of works based on PPP Regulation.

3.3.1.4 PPP Modality & Project Structure

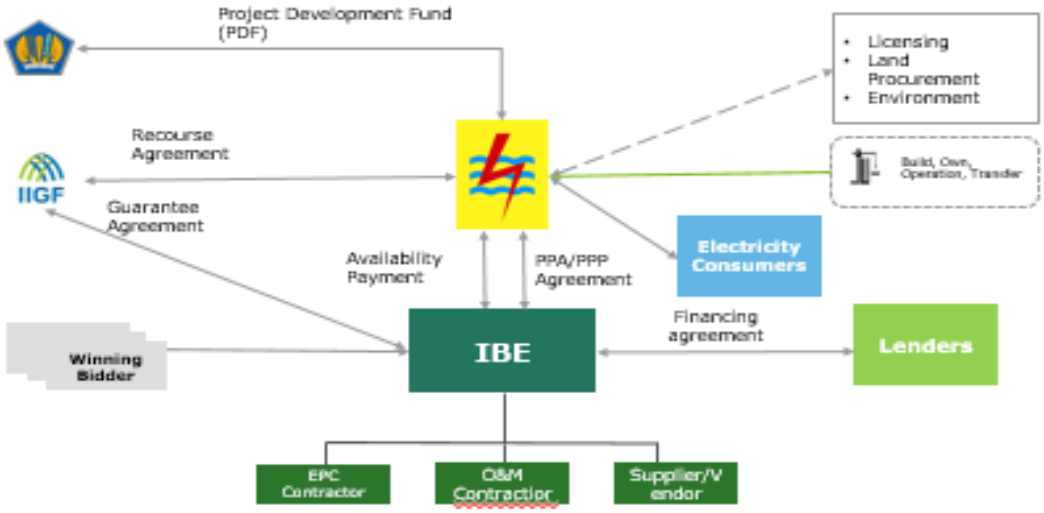
Return of investment scheme for IBE can be divided into 2 (two) schemes, which are Availability Payment and Tariff. The following is project structure using AP as the payment:

Figure 3-1 Energy Project Structure Using Availability Payment



In relation to types of project structure based on its return on investment, the following is the project structure that uses Tariff.

Figure 3-2 Energy Project Structure Using Tariff



3.3.1.5 Foreign Investment

Regulations surrounding the provision of Electricity services may serve as a basis for the PPP project team to set objectives, technical standards and service level agreement. Pursuant to Presidential Regulation 44/2016, Negative Investment List highlights the Indonesian government's willingness to open up energy sector to domestic and foreign investors.

Foreign investment for Electricity as stipulated under Presidential Regulation 44/2016 on Negative Investment List (known for *Daftar Negatif Investasi)*. The following is several types of business activity that are related to energy and power plant infrastructure provisions:

Table 3-5 Negative Investment List on Energy Sector

KBLI Code	Negative Investment List	Requirements
35101	Power Plant < 1 MW	No restrictions on foreign investment (100%)
35101	Power Plant (small scale: 1 – 10 MW)	Maximum foreign investment is 49%
35101	Geothermal Power Plant ≤ 10 MW	Maximum foreign investment is 67%
35101	Power Plant > 10 MW	Maximum foreign investment is 95% (Maximum of 100% if it is conducted through PPP)
35102	Power Transmission	Maximum foreign investment is 95% (Up to maximum of 100% if it is conducted through PPP)
35103	Power Distribution	Maximum foreign investment is 95% (Maximum of 100% if it is conducted through PPP)

Explanation in regards to the regulatory framework for investment criteria above are limited only to power plant infrastructure business activity.

3.3.1.6 Return on Investment

Article 11 of Presidential Regulation 38/2015 states that the GCA shall determine the form of investment return which covers the capital cost, operational cost and profit of the implementing business entity. Such return on investment of the Implementing Business Entity in the provision of infrastructure is sourced from Tariff, Availability Payment and other forms which are not contradictory with applicable laws and regulations.

Central AP deriving from State Budget (APBN) is based on MoF Regulation 260/2016 in which the APBN is being allocated in each budgeting year by GCA (during concessions period) upon the completion of construction period and the start date of operation period. Further, Article 6 of MoF Regulation 260/2016 states that PPP agreement should consist at least:

1. Output Specifications and Performance Indicator;
2. Agreed formula of AP Payment; and
3. The monitoring system that is effective on performance indicator.

Central AP shall be provided to PPP projects based on the following criteria:

1. Infrastructure projects which provide great economic and social benefits to the public as service user;
2. The return of investment from the project does not come from the users (tariffs) or in the event the project receives revenue from user tariffs, the GCA is not allowed to use such revenue to be included in the AP for the IBE; and
3. The procurement of IBE for the project shall be conducted by way of fair, open and transparent tender process, as well as by considering healthy business competition principles.

Prior to the preparation stage, in order to implement AP, MoF shall issue initial confirmation upon receiving Preliminary Study from GCA by concluding that GCA preparation to use AP in the PPP project is aligned with its objectives, criteria and principles that prevail under MoF Regulation 260/2016.

Prior to transaction preparation, MoF shall carry out final confirmation before the issuance of RfP from GCA. This final confirmation is not intended yet as an approval of GCA in order to implement AP. Simply put, final confirmation of MoF for AP Payment is intended to as GCA is ready to implement the IBE procurement. In the later stage, GCA shall attach the final confirmation in the RfP documents in order to enforce as potential lenders for bidding.

a. Regional Availability Payment (Regional AP)

Other than Central AP deriving from APBN, AP Payment may also derives from Regional State Budget (APBD) as we understand that the type of return of investment for IBE in the implementation of Regional PPP may be in the form of Regional AP that is provided by respective local government.

Based on MoHA Regulation 96/2016, Regional Budget (APBD) is being allocated in each budgeting year by GCA (during cooperation period) for AP Payment upon the completion of construction period and the start date of operation period. Considering that Regional AP derives from APBD share equal nature in the agreement, Article 5 of MoHA Regulation 96/2016 states that the PPP agreement should consist at least:

a. Output Specifications and Performance Indicator;

b. Agreed formula of AP Payment; and

c. The monitoring system that is effective on performance indicator.

Regional AP shall be provided PPP projects based on the following criteria:

a. Infrastructure projects that provide great economic and social benefits to the public as service user.

b. The return of investment from the project does not come from the users (tariffs).

c. Under MoHA Regulation 96/2016, it is noteworthy to undertake DPRD approval as the AP Payment shall burden regional budgeting. Pursuant to Article 4 paragraph (3) MoHA Regulation 96/2016, DPRD shall be taken into account its approval in order to implement AP allocated by GCA.

In order to proceed, GCA shall also obtain recommendation from MoHA by submitting OBC or FBC as well as projected accounting for AP Payment.

b. Feed-in Tariffs

In regards to return of private investment, the determination of feed-in tariff is set by PLN. Pursuant to Government Regulation 23/1994, PLN is obligated to conduct electricity for public's interests. Thus, PLN shall recommend the threshold of such generation cost in order to determine tariff.

Based on MEMR Regulation 24/2017 on Mechanism of BPP Determination, PLN shall submit recommendation of Generation Cost/*Biaya Pokok Pembangkitan* ("BPP") amount in no later than 2nd week of March in the current year. Minister of Energy and Mineral Resources evaluates and determines the BPP recommendation. Such evaluation shall be no later than 14 (fourteen) days after receipt of BPP recommendation. Upon the evaluation and determination phase, Ministry of Energy and Mineral Resources issues the BPP determination. Issuance of BPP determination is effective from the month of April in the current year until the end of the following year of March. Based on its mechanism of BPP determination, it shall be adjusted each year and determined in the Ministry of Energy and Mineral Resources Regulation. Currently, BPP determination is regulated under Ministry of Energy and Mineral Resources Decree 55/2019 on the Benchmarking Tariffs to the PLN average electricity generation cost year 2019 (BPP 2019).

Electricity Law recognizes the provision of feed-in-tariff that shall prevail under power purchase agreement in respect of Non Renewable Energy that PLN conducts. The following is mechanism of tariff determination regarding power purchase in non-renewable energy. In relation to power purchase agreement, MEMR Regulation 10/2017 as amended lastly by MEMR Regulation 10/2018 states that the minimum contents of power purchase agreement is based on the following terms:

Table 3-6 Minimum Contents of Power Purchase Agreement

Minimum Contents of Power Purchase Agreement	
a.	Period of PPA
b.	Rights & obligations
c.	Risk allocation
d.	Project implementation guarantee
e.	Commissioning and cod
f.	Fuel supplier

Minimum Contents of Power Purchase Agreement	
g.	Transaction
h.	Operation system monitoring
i.	Penalty
j.	Termination of PPA
k.	Transfer of assets
l.	Requirements of price adjustments
m.	Dispute settlement
n.	Force majeure

Further, PPA is implemented for maximum period of 30 (thirty) years after staring of commercial of operation date (COD).

3.3.2 Regulatory Aspect on PPP in Waste to Energy Sector

3.3.2.1 Authority on Energy Sector Regulation & Implementation

Waste to Energy (PLTSa – "WTE") is carried out as the scope of Law 18/2008 on Waste Management and Law 30/2009 on Electricity. Considering that local government conducts utilization of energy through waste management, one part of such utilization concerning waste management shall refer to Law 18/2008. However, the production of electricity through WTE, activity of such electricity operation shall refer to Law 30/2009.

Table 3-7 Authority on Energy Sector Regulation & Implementation

Article 9 of Law 18/2008 on Waste Management	Article 11 of Law 30/2009 on Electricity	Article 6 of Presidential Regulation on Acceleration of Waste to Energy Development
By implementing waste management, Regents/Municipalities shall authorize to implement waste management in the regent/mayor.	State-owned enterprise that operates in the provision of electricity (PLN) holds main priority to conduct provisions of electricity for public service obligation.	By implementing acceleration of WTE development, Regent/Mayor is able to conduct direct appointment to ROE or tender of corporation partnership

In accordance with Article 10 paragraph (1) of MEMR Regulation 50/2017, PLN shall conduct purchase of electricity from WTE produced through providing assistance to Central Government and/or local government in order to overcome or implement municipal waste management.

3.3.2.2 Determination of GCA

Article 4 of Law 18/2008 regulates that the implementation of waste management is intended to increase the quality of public health service and environment as well as to convert waste into energy resources. Further, Article 9 Law 18/2008 states that in the stage of waste management, Regent/Municipalities shall authorize to implement waste management in the regent/mayor government

Table 3-8 Determination of GCA

Regent/Municipal Government	Provincial Government	Central Government
To determine waste management policy and strategy and to conduct waste management in the region of Regent/Municipal City.	To determine waste management policy and strategy in the region of Province and to facilitate cross regional cooperation within one province, partnership and network of waste management,	To determine national waste management policy and strategy and to conduct coordination, mentorship and monitoring to local government regarding waste management program

Based on the authorities above, the determination of GCA (Central Government, Provincial Government, or Regent/Municipal Government) will be referred to coverage of waste management.

3.3.2.3 PPP Scope of Works

Article 6 Law 18/2008 states that the local government shall (among others), facilitate, develop, and conduct efforts to reduce, manage, and utilize waste, as well as conduct waste management and facilitating provision of waste management facility and infrastructure.

PPP Scope of Works based on Article 5 of Bappenas Regulation 4/201 states that provision infrastructure in the waste sector includes waste management system infrastructure which includes PPP scope of works is as follows:

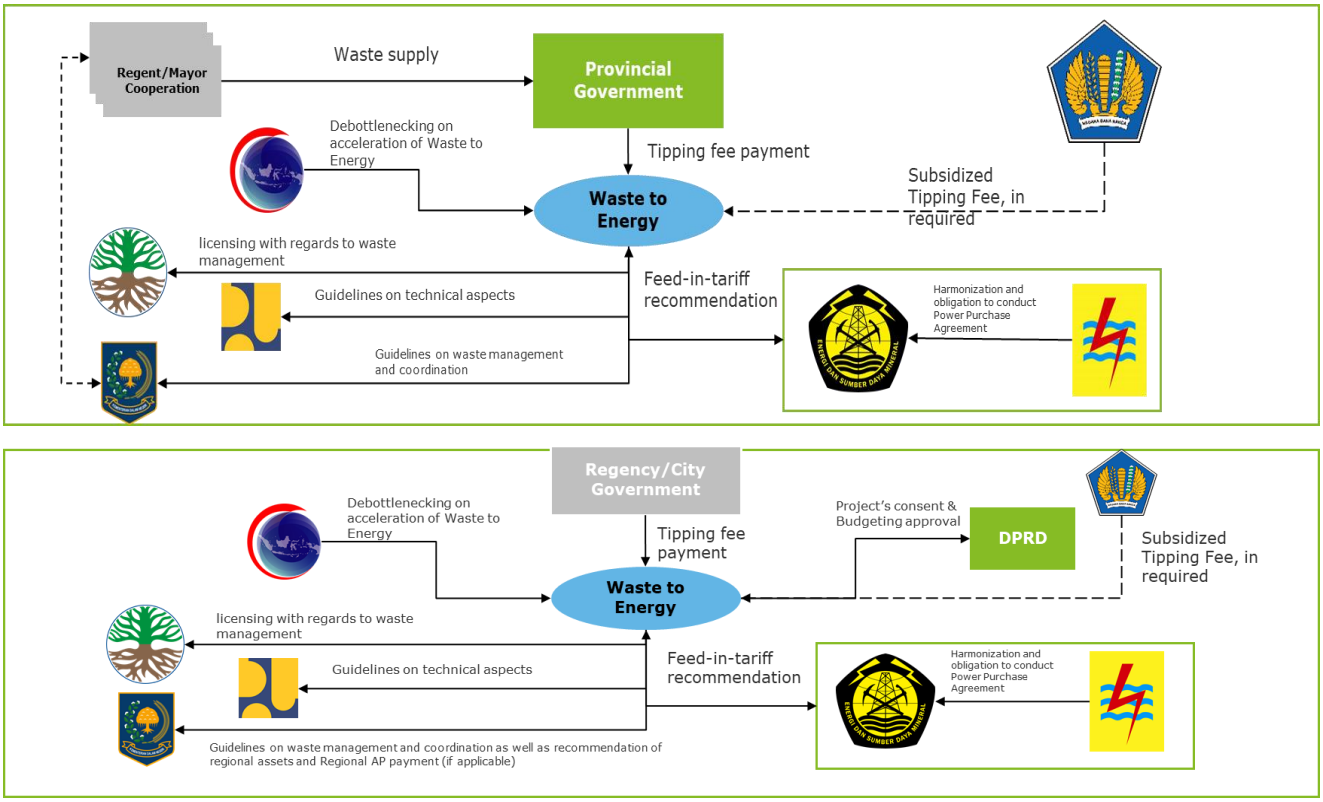
1) Transporting;
2) Processing; and/or
3) Final processing of waste.

Further, Law 18/2008 on Waste Management recognizes layers of waste management process that should be put in place during the implementation of waste to energy. To date, scope of works that are eligible under Law 18/2008 on Waste Management are tangible to scope of works that is applicable under PPP Regulation.

3.3.2.4 PPP Modality & Project Structure

Project Structure of WTE PPP Sector, is as follows:

Figure 3-3 WTE Project Structure



3.3.2.5 Foreign Investment

Regulations surrounding the provision of Electricity services may serve as a basis for the PPP project team to set objectives, technical standards and service level agreement. Pursuant to Presidential Regulation 44/2016, Negative Investment List highlights the Indonesian government's willingness to open up energy sector to domestic and foreign investors.

Foreign investment for Waste Management as stipulated under Presidential Regulation 44/2016 on Negative Investment List (known for *Daftar Negatif Investasi)*. The following is several types of business activity that are related to waste management and waste to energy provisions:

Table 3-9 Negative Investmet List

KBLI Code	Negative Investment List	Requirements
38211	Management and Disposal of Non Hazardous Waste	No restrictions on foreign investment (100%)
38220	Management and Disposal of Hazardous Waste	No restrictions on foreign investment (100%)

Regulatory framework for investment criteria are limited only to power plant infrastructure business activity.

3.3.2.6 Return on Investment

Article 24 of Law 18/2008 regulates that Central Government and local government shall finance the implementation of waste management. Such financing derived from national/regional budgeting (APBN/APBD). In terms of implementation of waste management, such financing of waste management conducts in a form of tipping fee. Based on Article 24 paragraph (1) & (2) of Law 18/2008 state that Central Government and local government are obligated to finance the implementation of waste management. Provisions with regards to financing of such implementation of waste management shall be regulated further under Government Regulation and/or respective regional regulation. To date, no clear implementing regulations/provisions regulate tipping fee mechanism just yet. Otherwise, Article 15 paragraph (2) PR 35/2018 accommodates a maximum of IDR 500.000 per tonnage of waste as a subsidized tipping fee, if required.

To date, there is no implementing regulations/provisions to state a clear technical mechanism of tipping fee payment. This could be a challenge for Central Government and/or local government to ensure the bankability of the Waste to Energy projects since such payment shall that also reflect on the feed-in-tariff under Power Purchase Agreement with PLN as the sole power purchaser. However, PR 35/2018 accommodates the incentive in a form of subsidized tipping fee, if required by Central Government and/or local government.

Presidential Regulation 35/2018 and MEMR Regulation 50/2017 regulate applicable feed-in tariff that PLN shall comply and enter into power purchase agreement as part of assignment from Central Government to National Owned Enterprise in the electricity business activity.

Table 3-10 Presidential Regulation 35/2018 and MEMR Regulation 50/2017

Presidential Regulation 35/2018		MEMR Regulation 50/2017		
Capacity	Applicable Feed-in-Tariff	Local BPP	BPP National Average	Applicable Feed-in-Tariff
≤20MW	USD 13.35 ¢/kWh	Appendix MEMR Decree 55/2019	Rp 1.119/kWh (USD 7,86¢/kWh)	Article 10 paragraph (5) of MEMR Regulation 50/2017
>20MW	14.54 – (0,076 x amount of capacity being sold to PLN			

3.3.3 Regulatory Aspect on PPP in Street Lighting Sector

3.3.3.1 Authority on Energy Sector Regulation & Implementation

Pursuant to the Annex of Law 23/2014, the allocation of government authority for street lighting management sub-affairs between the central government, provincial government and municipal government.

Minister of Transport Regulation 96/2015 defines that the authority for Public Street Lighting management and traffic engineering shared between the national, provincial and municipal governments, depending on the status of the road.

All public roads, other than national roads, provincial roads and toll roads, located within the administrative boundaries of the city, generally have the status of municipal roads. Thus, either Central Government, Provincial

Government, Regent/City Government, or Sub-Department can become the authority of the street lighting project, depends with the type of the road (national road, provincial road or regional road).

Besides the government perspectives, PLN also has roles in street lighting project. PLN has a significant role in relation to street lighting, which includes: (1) collection from electricity power users and payment to the City Government in relation to street lighting tax, (2) supply of electrical power and (3) provision of infrastructure support, e.g. conducting certain installation of metering and access to PLN's poles.

It is recommended that the GCA and PLN enter into an agreement or letter of support to stipulate PLN's acknowledgment and responsibilities clearly, especially in relation to the use of PLN's assets (e.g. PLN's electricity poles) and other support to be performed by PLN (e.g. the installation of the cabling system and meter) for the Project.

The following table illustrates the allocation of authority for street lighting between the GCA and PLN.

Table 3-11 Allocation of Authority for Street Lighting between the GCA and PLN

Authority	Street Lighting Tax Collection and Payment	Supply of Electricity	Provision of Infrastructure
GCA	No	No	Provision of street lighting infrastructure on municipal roads
PLN	PLN must deposit the street lighting tax collection into the regional government cash accounts	Electricity provider	Provision of cabling and meter up to the connection point/meter

3.3.3.2 Determination of GCA

Pursuant to the Annex of Law 23 of 2014 on Regional Government (Law 23/2014), the following table illustrates the allocation of government authority for street lighting management sub-affairs between the central government, provincial government and municipal government.

Table 3-12 Allocation of Government Authority for Street Lighting Management Sub-Affairs

Central Government	Provincial Government	Regent/City Government
Implementation of road equipment on national roads	Implementation of road equipment on provincial roads	Implementation of road equipment on municipal/regency roads

MoT Regulation 96/2015 defines that the authority for Public Street Lighting management and traffic engineering are shared between the national, provincial and municipal governments, depending on the status of the road.

Based on the illustration above, it concludes that the party that acting as GCA in street lighting project are the Government (either Central Government, Provincial Government or Regent/City Government), depends on the type of the roads (national road, provincial road or regional road).

3.3.3.3 PPP Scope of Works

PPP Scope of Works based on Article 87 of MoT Regulation 27/2018 states that provision infrastructure in the street lighting sector include:

1) Planning;
2) Placement and installation;

3) Operation;

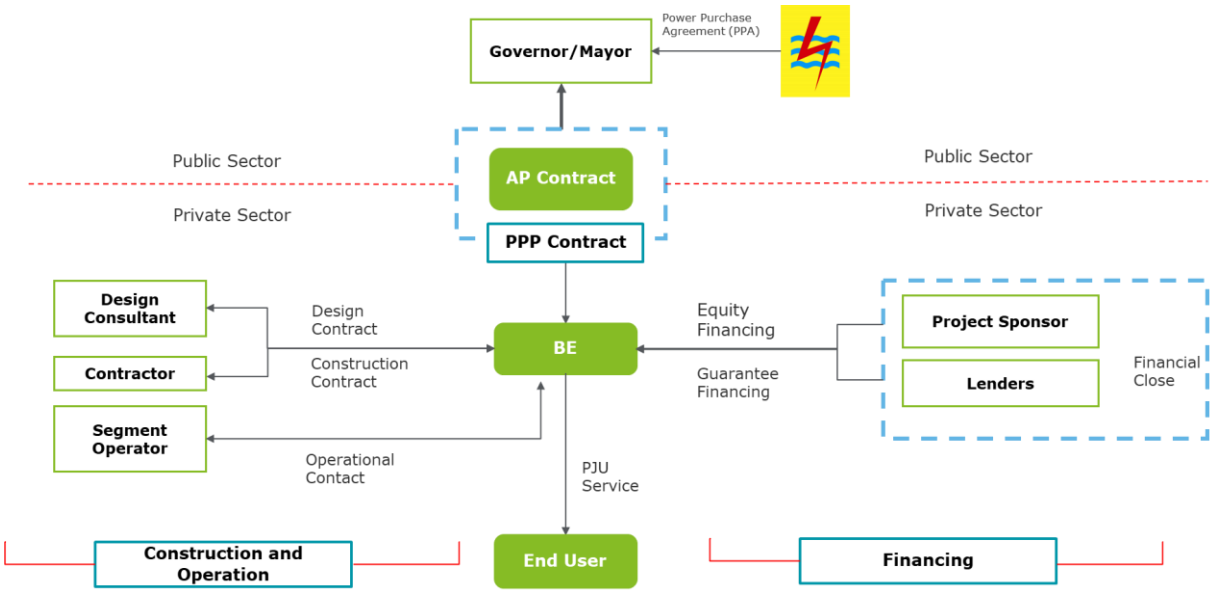
4) Management;

5) Replacement; and

6) Termination.

3.3.3.4 PPP Modality & Project Structure

Figure 3-4 PPP Modality and Project Structure



3.3.3.5 Foreign Investment

Certain business sectors are subject to foreign ownership limitations as stipulated in PR 44/2016. The current applicable limitation with respect to foreign ownership under the Indonesia Standard Industrial Classification/ Klasifikasi Baku Lapangan Usaha Indonesia ("KBLI") is stipulated under Head of *Badan Pusat Statistik* ("BPS") Regulation Number 95 of 2015 on Standard Indonesian Business Field Classifications ("BPS Regulation 95/2015").

The following table summarizes the KBLI and the limitation of foreign ownership pursuant to PR 44/2016 applicable to this Project:

Table 3-13 Summary of the KBLI and the Limitation of Foreign Ownership Pursuant to PR 44/2016

KBLI	Business Sector	Maximum Foreign Ownership
43211	Installation of Electrical Installation System: *High Voltage	Maximum Foreign Ownership 49%
43211	Installation of Electrical Installation System: *Low Voltage	Maximum Foreign Ownership 0%
43211	O&M of Electrical Installation System	Maximum Foreign Ownership 95%

Source: PR 44/2016

* The criteria for high and low voltage are determined based on the electricity sector regulation.

In accordance with the above limitations, if there is foreign participation, the IBE could only be established and registered as a provider of electrical O&M service (subject to 95% foreign shareholding). If the IBE has foreign ownership, it would be required to appoint a third party (100% domestic) contractor to carry out the installation of street lamps.

3.3.3.6 Return on Investment

Return on Investment of street lighting infrastructure could be conducted through:

1) Availability Payment

Article 3 (1) of MoHA Regulation 96/2016 states that the AP mechanism aims at assuring the availability of quality infrastructure services to the community, optimizing the state budget/regional budget, and AP must be set taking into account the fiscal capacity, fiscal continuity, fiscal risk management and target of AP usage.

In accordance with Article 2 of MoHA Regulation 96/2016, the AP applies for projects complying with the following criteria:

(a) The Project has economic and social benefits for society; and

(b) Return on investment is not sourced from user tariffs (user fee) paid directly to the IBE.

For projects involving AP, the relevant GCA must allocate the budget for such APs for the entire duration of the PPP agreement. In the event that the IBE is operating the infrastructure in accordance with the PPP agreement, then the GCA must pay the AP to the IBE[31]. AP can only be made upon fulfillment of the following conditions:

(a) The infrastructure has been completed and is ready for operation;

(b) The GCA determines that the infrastructure meets the service indicators provided in the relevant PPP agreement.

Based on considerations above, the AP must be paid only when commercial operations/service are available.

2) Street Lighting Tax

Based on Article 2 paragraph 2 point (e) of Law Number 28 of 2009 on Regional Taxes and Incentives ("Law 28/2009"), street lighting tax is included in the district/municipal taxes category. The object of street lighting tax is the usage of self-generated electricity power or electricity power obtained from other sources. Meanwhile, the subject of street lighting tax is a person or entity, which uses the electricity power. This will be regulated further in detailed based on its respective provincial or regent/city governments. PLN collects the street lighting tax for households/communities served by PLN. Households/communities not served by PLN must pay the street lighting tax directly to the provincial or regent/city governments.

PLN must transfer all street lighting tax collected to the City's general cash account. Expenses out of the street lighting tax must be budgeted for in the regional annual budget, which must be approved by the DPRD.

3) Electricity Payment for Street Lighting

The responsibility for street lighting electricity bill payment can be transferred to the IBE. The mechanism if the IBE conducts the electricity payment is as follows:

(1) PLN deposits street lighting tax into the provincial or regent/city governments'sgeneral treasury account;

(2) The GCA will then pay AP that also covers the street lighting electricity cost component (which has been allocated to the Regional Budget) to the IBE; and

(3) The IBE shall then directly make the payment to PLN.

This payment mechanism can be implemented, but will have the following implications:

(1) The IBE will be exposed to electricity payment risk (e.g. if the electricity tariff increases);

(2) This structure is not consistent with the contract that has just been signed between provincial or regent/city governments and PLN (regarding street lighting tax and electricity payment);

(3) The existing electricity contracts between the provincial or regent/city governments and PLN must all be amended to change the customer's identity to the IBE, which could be administratively burdensome; and

(4) If the customer is the IBE, then PLN will apply a penalty mechanism for late payment (which penalty would not apply if the payer is the provincial or regent/city governments).

Based on the above considerations, it is recommended that the payer of the electricity remain the provincial or regent/city governments (following the existing mechanism).

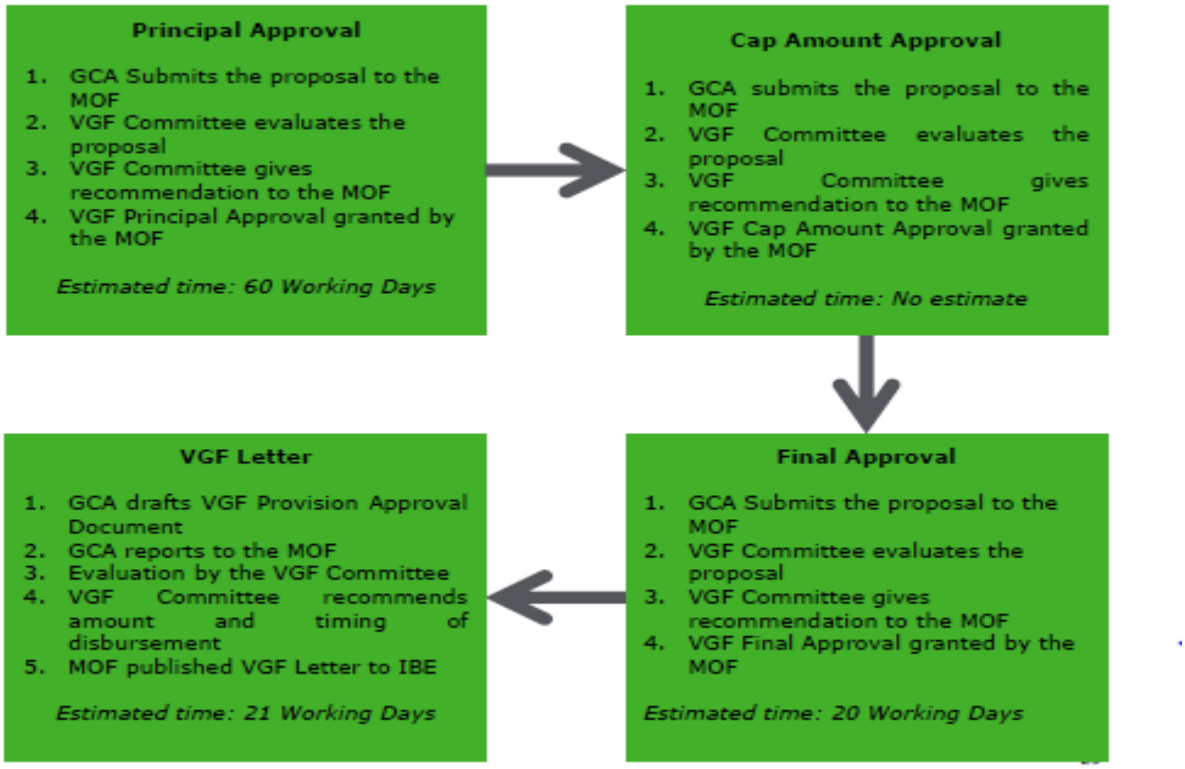
[31] Article 13 of PR 38/2015.

3.3.4 Government Support

3.3.4.1 Types of Government Support for Energy PPP Project

Under PPP Regulation, Government Support consists of (i) Project Development Fund (PDF) in which such PDF is the facility that the government provides for a comprehensive and complete feasibility study for the project; (ii) Viability of Gap Fund (VGF); and/or (iii) Tax Incentive. In relation to VGF, it is divided into 3 (three) main stages, which are (i) Principal Approval; (ii) Cap Amount Approval; and (iii) Final Approval, as pursuant to MoF Regulation 223/2012.

Figure 3-5 VGF Scheme Mechanism



Source: MoF Regulation 223/2012

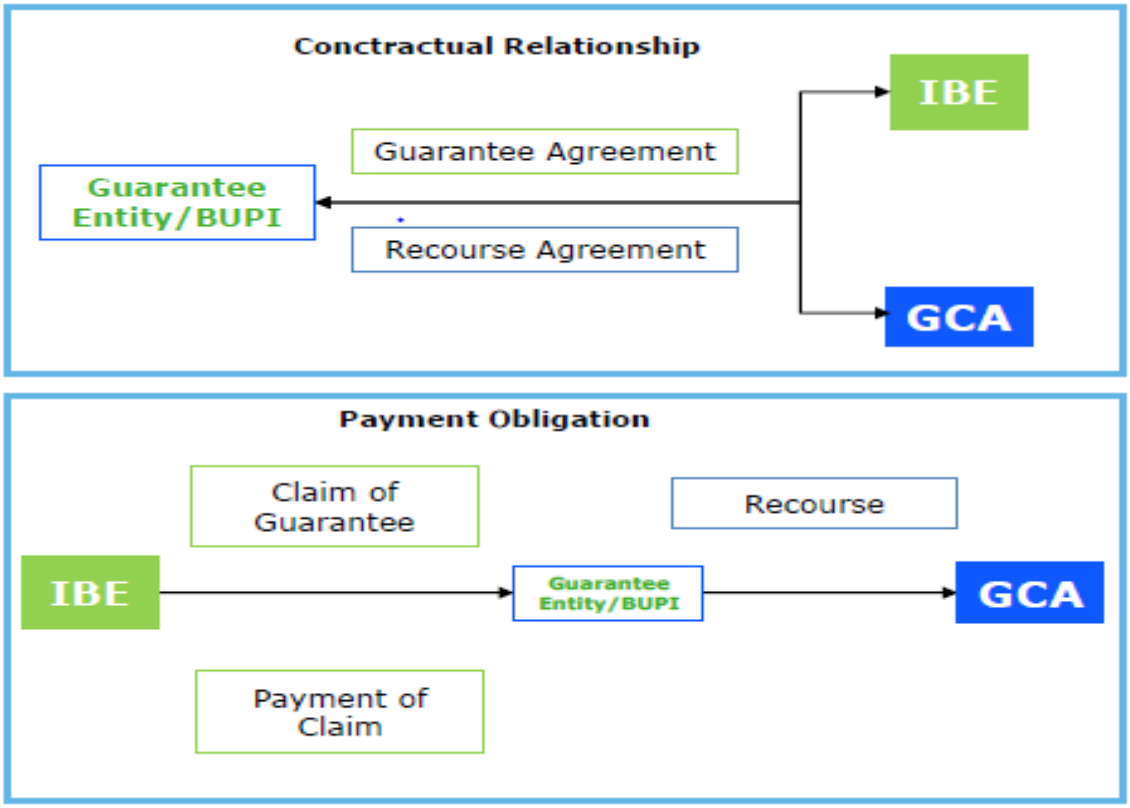
3.3.4.2 Types of Government Guarantee for Energy PPP project

In accordance with PPP Regulation, Government Guarantee may be granted to IBE for:

1. Political risk;
2. Demand risk;
3. Change of Law;
4. Payment and/or Operation Default; and/or
5. Maintenance (including connectivity).

Pursuant to Presidential Regulation 78/2010, PPP scheme allows mechanism of Government Guarantee provision by ensuring that PPP project is well monitored, specifically for the allocation of risks shared by PPP contractual parties. In essence, the diagram for contractual scheme for provision of Government Guarantee is as shown below:

Figure 3-6 Government Guarantee Scheme



Source: Presidential Regulation 78/2010

3.3.5 PPP Agreement

In relation to PPP agreement, there is no specific regulation minimum contents of PPP agreement for Energy PPP sector. However, PPP agreement for Energy sector shall refer to the minimum contents as intended under Article 32 of PR 38/2015 and Annex of Bappenas Regulation 4/2015.

Table 3-14 Minimum Content of PPP agreement

• Scope of Work • Period of Cooperation • Implementation security • Tariff and adjustment mechanism • Rights and obligations including risk allocation • Standards of service performance • Transfer of shares • Sanctions in the event the parties fail to meet the terms of the agreement • Termination of agreement • Ownership status of the assets • Dispute resolution mechanism • Mechanism to monitor performance of the IBE in procurement implementation	• Mechanism for variation in the works and/or services • Step-in right mechanism by the government • Use and ownership of the infrastructure assets and/or its management to the GCA • Return of the infrastructure assets and/or its management to the GCA • Force majeure • Claims and warranties of the parties • Use of language in agreement (Bahasa Indonesia prevails) • Implementation management of PPP agreement • Applicable law (Indonesian law)

4. Institutional Framework

4.1 Institutional and Stakeholders Mapping

For PPP power plant, the institutions involved are :

1. Minister of Energy and Mineral Resources (“MoEMR”), as an authority to create and implement the policy and regulation related to electricity in Indonesia.
2. State Electricity Company (“PLN”), as the only distributor of electricity and may have a responsibility to become a provider of electricity of last resort
3. Minister of National Development Planning/National Development Planning Board (“Bappenas”), as the responsible party to conduct the national development planning
4. Investment Coordinating Board (“BKPM”), Since the beginning of year 2019, BKPM is also known as Online Single Submission Institution (Lembaga OSS), has the authority to issuing business license, including business license for power plant, on behalf of the authorized government (Minister/Governor/Mayor/Regent)
5. Committee for the Acceleration of Prioritized Infrastructure Development (“KPPIP”), as the coordinating committee with the main objective to coordinate the decision making process between several Ministers.
6. Minister of Finance (“MoF”), as the authority to approve tax incentives, review loan arrangement, and recommends the maximum level of electricity subsidy to PLN. Moreover, The Directorate of Government Support Management and Infrastructure Financing within MoF has several responsibilities, such as do provide technical guidance, review the government support, and evaluate the financing.
7. Indonesian Infrastructure Guarantee Fund (“PT PII), as the authority who has a responsibility to provide guarantees for infrastructure projects under PPP scheme.
8. Ministry of Environment and Forestry (“MoEF”), as a provider of environmental permits and monitoring the implementation of it.
9. Government Procurement of Goods and Services Policy Board (LKPP), as the authority to develop and plan the procurement of goods and service policy.
10. Regional Government, as the authority of spatial planning and zonation.
11. Electricity User, as the user of electricity and they will be subjected to tariff.

For PPP waste to energy, the institutions involved are:

1. The governor or mayor/regent as proposer, the party most in need of the WTE and the most potential as a PPP initiator
2. Waste Management, as the operator of the waste power plant
3. The waste power plant developer, as a provider of environmentally friendly technology
4. Minister of Energy and Mineral Resources, as the assignor for assigning the purchase of PLTSa electricity by PT PLN (Persero)
5. PT PLN (Persero), as an electric offtaker
6. Ministry of Environment and Forestry, as provider of environmental permits

Specifically for waste to energy, Presidential Regulation No. 35 of 2018 also forms a Special Coordination Team for the Acceleration of Development of waste power plants, which have the task of coordinating and monitoring and providing assistance needed to enhance the acceleration of the construction of waste power plants. The structure of the Team comprises as follows:

1. Chairperson: Coordinating Minister of Maritime Affairs.
2. Deputy Chairman: Coordinating Minister for the Economy Member:

a. Ministry of Environment and Forestry;
b. Ministry of Energy and Mineral Resources;
c. Ministry of Home Affairs;
d. Ministry of PUPR;
e. Ministry of Finance;
f. Ministry of BUMN;
g. Ministry of Law and Human Rights;
h. Ministry of ATR / BPN;
i. Ministry of PPN / Bappenas;
j. Cabinet Secretariat;
k. BKPM;
l. BPPT; and
m. LKPP.

For new and renewable energy, in addition to the above institutions added with the Directorate General of New and Renewable Energy and Energy Conservation, as the most potential as a PPP initiator in NRE project.

For PPP Street Lighting, the institutions involved are:

1. Ministry of MEMR
    a. Issuance of Electricity Permit
    b. Guidance and Supervision of Compliance with Engineering Requirements
    c. Setting Tariff for Street Lighting
    d. Establishing the National Energy Conservation Master Plan
    e. Publish a Certificate of Registered Energy Conservation Services Business
    f. Establish Energy Conservation Policies related to Public Road Lighting through the Directorate General of Renewable New Energy and energy conservation
    g. Supervision of Electricity Usage Saving Program
2. PT Perusahaan Listrik Negara (Persero): As an electricity provider for Street Lighting and public street lighting tax collectors from the community.
3. Ministry of Transportation

    Authority in management and traffic engineering for national roads

    The Minister of Transportation has authority regarding the procurement and installation of street lighting as road equipment for national roads, including:

    i. Inventory of road equipment needs in accordance with the policy of road network usage and movement of prescribed traffic;
    ii. Determination of the number of needs and locations for installation of road equipment;
    iii. Determination of the detailed location of installation of road equipment;
    iv. Preparation of technical specifications equipped with technical drawings of road equipment; and
    v. The activity of installing road equipment in accordance with the policy of road network usage and the movement of traffic that has been determined.
4. Ministry of Public Works and Public Housing

The PUPR Minister has general road supervision authority covering supervision of national roads, provincial roads, district / city roads, and village roads. The authority over supervision of national roads is the authority of the Minister of PUPR, while the supervision of provincial roads is the authority of the Governor, supervision of district roads and village roads is the authority of the Regent and supervision of city roads is the authority of the Mayor.

5. Ministry of Home Affairs The Minister of Home Affairs coordinates the development and supervision of the administration of Local Government nationally regarding aspects of planning, budgeting, organizing, implementing, reporting and evaluating.
6. Governor
    a. Authority in provincial road supervision
    b. Authority in management and traffic engineering for provincial roads and review of proposed implementation of planning and engineering of management activities and traffic engineering on national roads in the regions
7. Mayor / Regent

    Based on Law No. 28 of 2009 concerning Regional Taxes and Regional Retributions, Street Lighting Taxes are a type of district / city tax. Therefore the PJPK in PPP Public Street Lighting is the Regent / Mayor.

8. DPRD -- if necessary, local legislative provide approval for AP

4.2 Government Engagement in Project Structure

In the PPP energy sector the government will play a role as:

1. Contracting Agency
    a. Government as partner
    b. Risk is allocated between business entities and government
    c. Government can involve as a licensing agency and spending agency in accordance with contractual agreements
    d. Generally involves direct fiscal and contingency obligations
2. Licensing Agency
    a. The government as the issuer of permits
    b. Generally it does not involve fiscal obligations or physical / technical involvement
    c. Full funding from the private sector

Based on presidential regulation 38/2015, the Government plays a role as the Government Contracting Agency (GCA)

a. Minister / Head of Institution or party delegated to act on behalf of Ministries / Institutions / Regional Heads / State-Owned Companies / Regionally-Owned Companies.
b. PPP projects can be carried out by bundling 2 or more types of infrastructure where the Minister / Head of Institution / Regional Head acts together as the GCA by signing a memorandum of understanding regarding the GCA and appointing the party who is the coordinator of the GCA.
c. State-owned companies / regional-owned companies can act as GCA as long as it is regulated in the laws and regulations of the sector.

The determination of the PPP GCA depends on the authority and responsibility regulated by the laws and regulations in the cooperated sector, and the owner of the state / property belonging to the area used in the PPP.

4.3 Authority on Energy Sector Regulation & Implementation

Waste to Energy (PLTSa – “WTE”) is carried out as the scope of Law 18/2008 on Waste Management and Law 30/2009 on Electricity. Considering that local government conducts utilization of energy through waste

management, one part of such utilization concerning waste management shall refer to Law 18/2008. However, the production of electricity through WTE, activity of such electricity operation shall refer to Law 30/2009.

Table 4-4-1 Authority on Energy Sector Regulation & Implementation

Article 9 of Law 18/2008 on Waste Management	Article 11 of Law 30/2009 on Electricity	Article 6 of Presidential Regulation on Acceleration of Waste to Energy Development
By implementing waste management, Regents/Municipalities shall authorize to implement waste management in the regent/mayor.	State-owned enterprise that operates in the provision of electricity (PLN) holds main priority to conduct provisions of electricity for public service obligation.	By implementing acceleration of WTE development, Regent/Mayor is able to conduct direct appointment to ROE or tender of corporation partnership

In accordance with Article 10 paragraph (1) of MEMR Regulation 50/2017, PLN shall conduct purchase of electricity from WTE produced through providing assistance to Central Government and/or local government in order to overcome or implement municipal waste management.

4.4 Determination of GCA

Article 4 of Law 18/2008 regulates that the implementation of waste management is intended to increase the quality of public health service and environment as well as to convert waste into energy resources. Further, Article 9 Law 18/2008 states that in the stage of waste management, Regent/Municipalities shall authorize to implement waste management in the regent/mayor government.

Table 4-1-2 Determination of GCA

Regent/Municipal Government	Provincial Government	Central Government
To determine waste management policy and strategy and to conduct waste management in the region of Regent/Municipal City.	To determine waste management policy and strategy in the region of Province and to facilitate cross regional cooperation within one province, partnership and network of waste management,	To determine national waste management policy and strategy and to conduct coordination, mentorship and monitoring to local government regarding waste management program

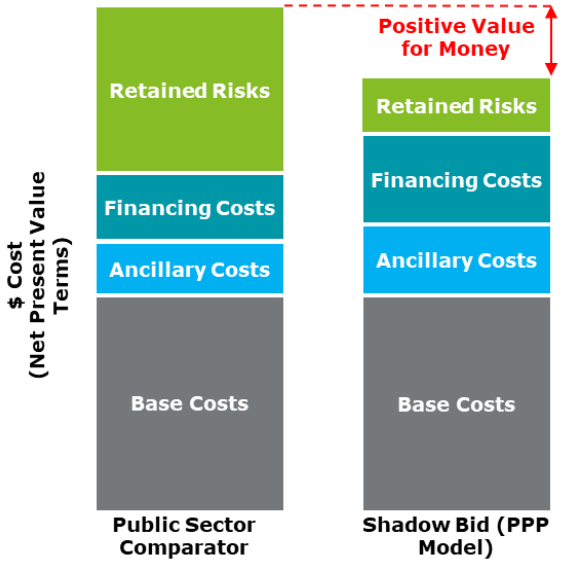
Based on the authorities above, the determination of GCA (Central Government, Provincial Government, or Regent/Municipal Government) will be referred to coverage of waste management.

5. Financial Analysis

Private financing is one of the key features of PPP transactions. Through it, the government is able to accelerate the development of infrastructure and anchor transfer of contractual risks to the private sector. The former in particular is one of the main drivers for governments in EMDE countries to pursue PPPs as private capital can bridge the gap between the infrastructure needs and the comparatively limited public financial resources available. The large-scale mobilization of private capital in EMDE countries remains a major challenge largely due to investors' risk appetite that is driven by a number of factors including political stability, economic volatility, transparency concerns, etc.

Compared to the public sector cost of borrowing, private capital typically comes at a premium. In the context of government having the financial resources to undertake an infrastructure project through traditional delivery models, this warrants important consideration. Understanding the value that comes with such relatively expensive private capital is a key consideration for the public sector during the decision-making process. This is where the risk transfer feature of PPP projects becomes very important. While quantifying the fiscal cost of a project may prove a PPP approach to be more expensive than traditional, government-funded procurement, quantifying the risk-adjusted cost may reveal a different picture. This is the basic premise of a typical quantitative Value for Money (VFM) assessment as is presented in the figure below.

Figure 5-1 Basic Elements of A Typical VFM Analysis, As Per Deloitte



In order to balance the trade-off in a PPP between achieving risk transfer and increasing project costs through private capital premiums (i.e. to maintain project affordability), it may be beneficial in some cases for public sector funding to partially cover some of the project's capital costs. This may be referred to as Viability Gap Funding, in others words it is the amount of public capital required for the project to financially viable from a private capital perspective when faced with limitations around long-term revenues (either through an limited AP or due to limitations in user revenue).

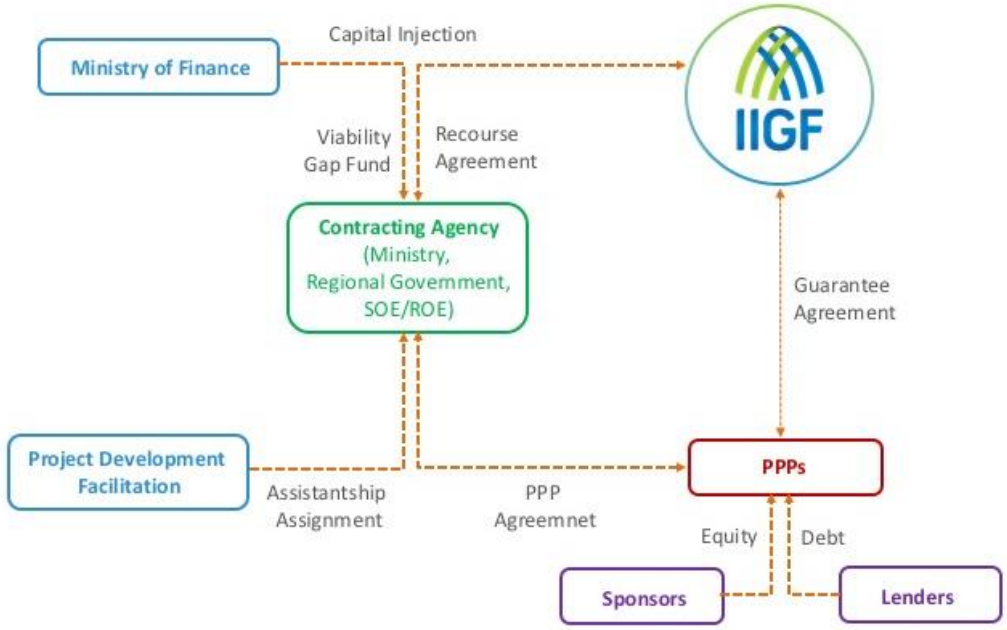
Private capital in a PPP project comes in the form of debt or equity with both being used on a typical project. Each of those broad categories has its own financial instruments, come with different cost implications and have different risk profiles. Key features of these forms of private capital are discussed below.

5.1 Debt

In simple terms, debt refers to financing that is obtained through third-party financial institutions, typically banks or bonds raised in the capital market. PPP projects are typically implemented under a project-finance structure whereby a Special Purpose Vehicle (SPV) is set-up by the private sector as a standalone entity with the sole purpose of delivering the project. Debt and equity are injected into the SPV to enable it to cover the capital costs of the project. Once the project is in operations, the SPV receives revenues from the project and these revenues are generally its only source of revenue which it uses to cover operating costs and repay the debt and equity investments. This is the basic structure of a project finance model where lenders only have recourse to the project's revenues (and whatever guarantees are put in place with respect to the SPV's obligations).

Out of the two forms of private capital, debt has a lower cost. However, the cost of debt (i.e. the interest rate) can vary due a number of reasons with a key one being the lenders' view of project risks. When it comes to lending into projects where the public sector sponsor / off-taker has a sovereign credit rating that is low or when the sponsor is a local government entity (e.g. municipality) with limited financial resources, the cost of debt increases. Guarantee facilities, such as those provided by IIGF can play an important role in de-risking a project to enable it to lower the cost of, or even attract, private debt. The figure below outlines the overall financial and contractual structure of a PPP transaction that includes Viability Gap Funding, a Guarantee facility and private capital (debt and equity) injected into the project.

Figure 5-2 Financial and Contractual Structure of A PPP Transaction



It should be noted that the availability of debt with sufficiently long-term tenors that matches the duration of a PPP contract is a major issue facing many EMDE financial markets. In Indonesia this risk is present as most banks do not offer debt with tenors of 20-30 years. This introduces refinancing risks to the project. An alternative for investors would be to seek long-term debt externally, however that typically comes in hard currency and therefore introduces currency exchange risk. Practice in Indonesia has also been to secure debt based on corporate lending rather than limited-recourse project financing. Corporate lending is reliant on the strength of the borrower's balance sheet and the guarantees they can provide to secure the lending. This is not a sustainable approach due to standard debt limitations on borrowers and therefore access to capital to finance PPP projects at a large-scale may be significantly impacted.

5.2 Equity

Equity refers to the cash invested in a projected by investors making them shareholders of the SPV. In a non-recourse, project finance structure, the liability exposure of shareholders is limited to their shareholding in the SPV. Equity can be invested in a PPP project directly (e.g. cash injection from investors) or indirectly through funds or in some cases through subordinated debt instruments. From a cashflow perspective, equity is subordinated to debt meaning that in the event of shortfalls, debt lenders have higher rights to receive available funds. This additional risk that equity investors assume comes with a pricing premium. It is standard for equity invested in a project to target an Internal Rate of Return (IRR) that is higher than the interest rate payable to debt lenders.

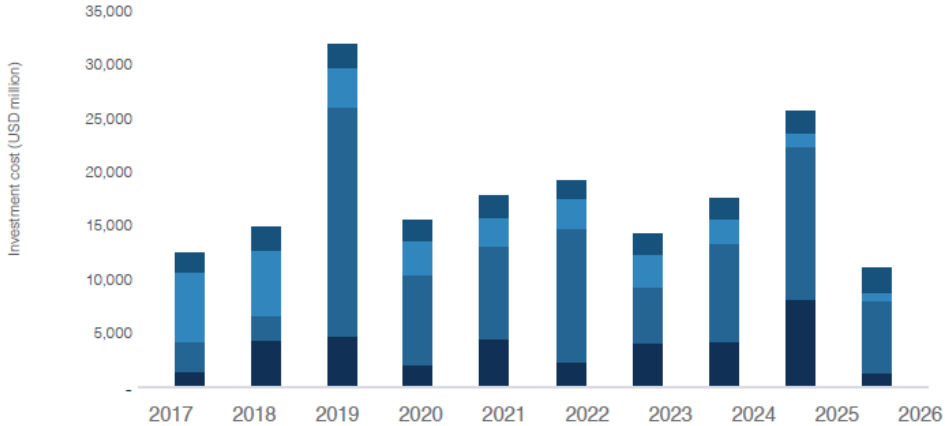
The IRR on equity is typically estimated using the variant of Capital Asset Pricing Model ("CAPM"). CAPM computes the required rate of return on equity as a function of the rate of return on a risk-free investment, plus an equity risk premium (the return stockholders expect above the return on a risk-free investment), multiplied by the "beta" for the investment. A standard proxy for the risk-free rate is the sovereign cost of borrowing. The yields of such bonds (30-year Indonesian Sovereign Bond) as of 31 December 2018 for Indonesian Sovereign Bond yields in IDR was 9.09%, while Bond Yield in USD was 5.20% (data taken from Bloomberg analysis 2019, refer to annex 1). Adding the necessary layers for risk premiums (country risks, project risks, etc.) an indicative cost of equity in IDR can be expected to be approx. 19.5%, meanwhile the corresponding cost of equity in USD can be assumed at 15.5%.

Alternatively, the estimated cost of debt in Indonesia, based on the Indonesian IDR and USD lending rates published by Bank Indonesia as of 31 December 2018, are approx. 10.37% and 5.52%, respectively. While it may appear more efficient to finance a project entirely based on debt (being the less costly form of private capital), lenders typically dictate a minimum level of equity to be invested in the project. This equity acts as a "buffer" that protects the project's ability to service the debt in case of cash shortfalls. The ratio of debt-to-equity (also referred to leverage) on a project is dependent on a number of factors, paramount among them being the lenders' view of the project's overall risk profile.

5.3 Sector-specific Considerations

The energy sector in Indonesia, like most countries, is characterized as requiring significant investments. In the electricity space for example, investments ranging from $15 to over $30 are projected for the period 2019 to 2026 as presented in the figure below.

Figure 5-3 Investment on Electricity Space

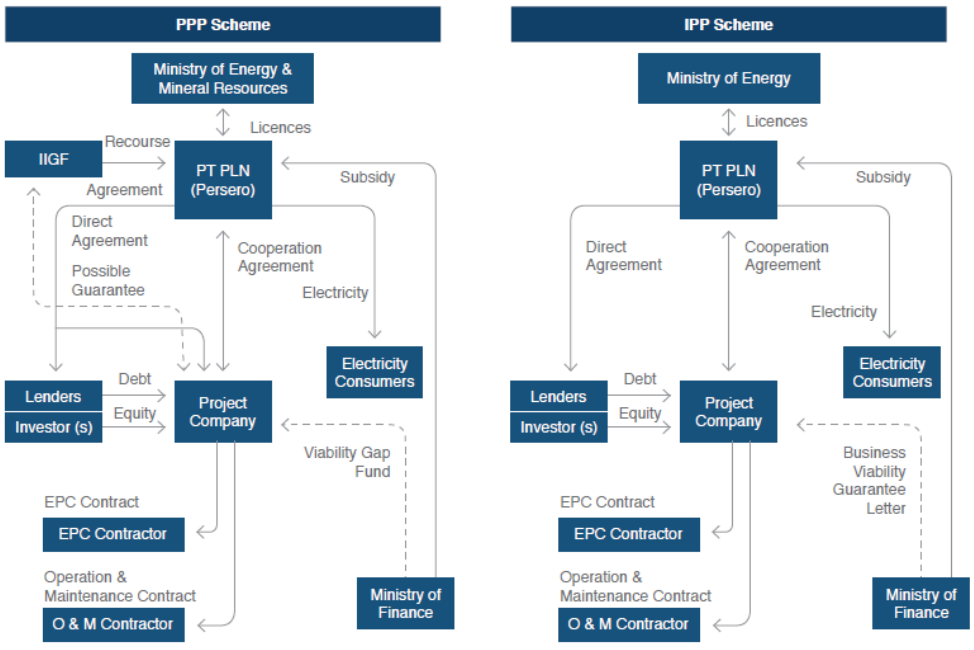


	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Distribution	1,794	2,257	2,371	2,193	2,091	1,838	1,972	2,084	2,263	2,409
Transmission	6,414	5,911	3,656	2,859	2,493	2,570	2,670	2,065	1,239	285
Generation - IPPs	2,884	2,489	21,305	8,576	8,921	12,604	5,617	9,380	14,192	7,112
Generation - PLN	1,367	4,236	4,633	2,020	4,315	2,250	3,974	4,069	8,028	1,240
TOTAL	12,460	14,893	31,945	15,648	17,821	19,261	14,233	17,598	25,722	11,046

Source: ECA 2017 "Indonesia Electricity Cost of Service & Tariff Study", based on RUPTL 2017-2026.

While major investments are projected from the private sector in the energy sector over the coming years, tariff issues and government commitment to brining in private sector participation in the sector remain major concerns. It should be noted however that there are subtle differences in IPP contracts, the more common form of private sector participation in the electricity generation space, and PPP contracts. These differences are illustrated in the figure below.

Figure 5-4 Private Sector Participation in the Electricity Generation Space



Source: PT SMI (Infrastructure Investment 2014).

In regards to return of private investment based on a feed-in tariff model, the determination of such tariff is set by PLN. Based on MEMR Regulation 24/2017 on Mechanism of BPP Determination, PLN shall submit their recommendation of Generation Cost/*Biaya Pokok Pembangkitan* ("BPP") amount in no later than 2nd week of March in the current year. The Minister of Energy And Mineral Resources evaluates and determines the BPP recommendation. Such evaluation shall be no later than 14 (fourteen) days after receipt of BPP's recommendation. Upon the evaluation and determination phase, Ministry of Energy And Mineral Resources issues the BPP determination. Issuance of BPP determination is effective from the month of April in the current year until the end of the following year of March. Based on its mechanism of BPP determination, it shall be adjusted each year and determined in the Ministry of Energy And Mineral Resources Regulation. Currently, BPP determination is regulated under Ministry of Energy And Mineral Resources Decree 55/2019 on the Benchmarking Tariffs to the PLN average electricity generation cost year 2019 (BPP 2019).

The Electricity Law recognizes the provision of feed-in-tariff that shall prevail under power purchase agreement in respect of Non Renewable Energy that PLN conducts. The following is mechanism of tariff determination regarding power purchase in non-renewable energy. In relation to power purchase agreement, MEMR Regulation 10/2017 as amended lastly by MEMR Regulation 10/2018 states that the minimum contents of power purchase agreement is based on the following terms:

Table 5-1 Minimum Contents of Power Purchase Agreement

Minimum Contents of Power Purchase Agreement	
1.	Period of PPA
2.	Rights & obligations
3.	Risk allocation
4.	Project implementation guarantee
5.	Commissioning and cod
6.	Fuel supplier
7.	Transaction
8.	Operation system monitoring
9.	Penalty
10.	Termination of PPA
11.	Transfer of assets
12.	Requirements of price adjustments
13.	Dispute settlement
14.	Force majeure

Beyond electricity generation and transmission in which IPP models have been in place in Indonesia for many years, there are other emerging areas in the broader energy sector were PPPs can be introduced following a number of models used in other countries as noted earlier in this report. Two such notable areas are Waste-to-Energy ("WTE") projects and street lighting. While these project do not tend to be very capital-intensive, they have a number of different cost components which can vary from project to project and result in a significant variance in cost. The major cost components are listed in the table below.

No	Cost	WTE	Street Lighting
1	Capital Cost (CAPEX)	• Civil works & Building • Main Equipment • Utility • Waste treatment	• Faoundation & cable excavation • Street lighting pole • Lamp • Control room

No	Cost	WTE	Street Lighting
		• Electrical & Lighting • Instrumentation & Control Installation, testing & commissioning • Operating permit, certification, etc	• Sensors • Electric meter • Installation, testing & commissioning • Certification, proper operation, etc.
2	Operational & Maintenance (OPEX)	*Fixed cost*: • Employee / employee salary, • Management fees, • Facility maintenance costs, etc.	*Fixed cost*: • Employee / employee salary, • Management fees, • Facility maintenance costs, etc.
		Variable cost: • Spare parts • Chemicals • Waste handling • Maintenance of equipment • Consumable parts	*Variable cost:* • Spare parts • Maintenance of equipment • Consumable parts
		Fuel Cost	Electricity cost

From a revenue perspective, WTE and street lighting projects have very different value propositions to the public sector and private sector players involved in these transactions. Revenues in a WTE project are typically obtained through the following main channels: Tipping fee; Electricity sales; Sales of recycle materials, including materials that have the potential to become alternative fuels.

The viability of the above-noted revenue streams can vary widely based on a number of factors including regulation, project location, and other market-based factors. Streel lighting PPP projects on the other hand have typically been associated with the introduction of energy-saving technologies such as the introduction of LED lighting. The corresponding savings in energy costs are typically used as a contract performance management metric and the source of funding available by local government entities to cover project costs. Given their lower costs and technical nature, street lighting PPP tend to have shorter contract durations than those typically seen in other sectors.

6. Risk Analysis

The analysis and allocation of project risks in the PPP context is an important consideration for the Government of Indonesia. A robust understanding of the risk allocation arrangements is essential to ensuring government objectives are met and Value for Money is achieved. National guidelines containing suggested risk allocations across different sectors, is provided by the Indonesia Infrastructure Guarantee Fund.

This section as follows, will provide for a summary allocation and discussion of key risks in the energy PPP sector[32]. A summary table containing the national suggested risk allocations / sharing between project owner and private operator, in context of a power generation PPP, is provided below[33].

Table 6-1 Risk Analysis in Energy Sector

Risk Category	Description	Suggested Risk Allocation		
		Public	Shared	Private
1. Site risk	Risks associated with project land, as well as site conditions.	√		√
2. Design, construction and commissioning risk	Risks associated with project design, construction and commissioning.			√
3. Sponsor risk	Risks associated with the private operator and/or its sub-contractors' fulfilment of contractual obligations.			√
4. Financial risk	Risks associated with financial viability of the project.	√		√
5. Operating risk	Risks associated with performance in the operations phase.	√		√
6. Revenue risk	Risks associated with demand and consequent implications to revenue available for the private operator.	√		√
7. Network connectivity risk	Risks associated with government-controlled elements interrupting private operator's ability to perform.	√		
8. Interface risk	Risks associated with delivery from either partner frustrating the delivery the other's ability to perform.	√		√
9. Political risk	Risks associated with government action that materially and adversely impacting the project and the private operator.	√		√
10. Force majeure risk	Risks associated with events wholly outside the control of either partner.		√	
11. Asset ownership risk	Risks associated with the economic value of the asset deteriorating during or at the end of the contracted term.			√

1. Site risk. This category of risk refers to land acquisition, resettlement, site conditions, land tenure, contamination, and other social, environmental and health issues.

   a) Public Risks: The project owner is responsible for land acquisition and right-of-access activities, and as such bears the risk of setting the project location, securing technical and financial resources, resettlement, and securing legal compliance. The project owner holds primary responsibility over socializing the project as early as possible, including developing a project communication strategy, mapping of social issues, determining fair compensation, and general stakeholder engagement.

   b) Private Risks: Once contracted as the partner, the private operator has a secondary responsibility to socialize the project and prevent downstream issues with social disruption. The private operator also

[32] Indonesia Infrastructure Guarantee Fund. "Risk Allocation Guideline: PPP in Indonesia." 2019.
[33] Indonesia Infrastructure Guarantee Fund. "Risk Allocation Guideline: PPP in Indonesia." 2019.

possesses primary risk on good construction practices, to the extent they were provided knowledge (by the project owner) of limitation including artifacts and antiquates. From an environmental and social perspective, based on environmental impact analysis and AMDAL studies, the private operator should be responsible for complying with robust environmental protection practices.

c) Shared Risks: n/a.

2. Design, construction and commissioning risk. This category refers to design specifications, construction performance, as well as operation and commission testing.

   a) Public Risks: n/a.

   b) Private Risks: The private operator is broadly responsible for the management of risks - performance, cost, timing - during the design, construction and commissioning period. Good practices suggested include having active communication during the tender process to clarify design specifications, selecting credible contractors and subcontractors who possess the right experience.

   c) Shared Risks: n/a.

3. Sponsor risk. This risk category refers to default by the private operator and its related stakeholders including the lender.

   a) Public Risks: n/a.

   b) Private Risks: The private operator is responsible for all risks in this regard. Good practices suggested include selecting credible sponsors and lenders during the procurement process.

   c) Shared Risks: n/a.

4. Financial risk. This risk category refers to changes in financial markets / funds on which the project was dependent on, which affect private operator's performance.

   a) Public Risks: The project owner, and the government by extension, is responsible for the disbursement of government support (including VGF) and the refund of land bailouts. Good practices suggested include robust budgeting processes that ensure availability of said funds.

   b) Private Risks: The private operator is responsible for failure to achieve financial close, foreign exchange rate risk, inflation and interest rate risk, and insurance risk. Good practices suggested include the consideration of appropriate mitigation mechanisms including hedging instruments, and securing financing in Rupiah.

   c) Shared Risks: The IIGF guide suggests that in instances of extreme fluctuations, foreign exchange rate, inflation and interest rate risk can be shared between the project owner and the private operator.

5. Operating risk. This category refers to cost overruns, poor performance, and other events during the operations period.

   a) Public Risks: The project owner has a responsibility to, using robust project control measures, monitor and enforce the contractual mechanisms included in the PPP. In the context of a power sector PPP, the project owner also has responsibility for inputs on which the project is dependent - including availability, volume and prices of fuel inputs.

   b) Private Risks: The private operator broadly bears risk for events which inhibit performance and cause cost overruns - including availability of facilities, poor performance against the output specifications, industrial action (e.g. strikes), project management failures, cost overruns including lifecycle expenditure, and delay in delivery of medical equipment.

   c) Shared Risks: n/a.

6. Revenue risk. This category refers to actual user levels deviating from projections, and the consequences for revenue and costs.

   a) Public Risks: The project owner is responsible for risks such as demand risk, end users' willingness-to-pay, as well as the determination and adjustment of tariffs,

   b) Private Risks: The private operator is responsible for the risk of tariff estimates being miscalculated.

   c) Shared Risks: n/a.

7. Network connectivity risk. This category refers to connectivity, smoothness and competitor facilities' risk.
    a) Public Risks: The project owner is responsible for breaches in government obligation to build and maintain the required network, managing tariff around the site which impacts service performance during operations, and to not build a competing facility / route.
    b) Private Risks: n/a.
    c) Shared Risks: n/a.
8. Interface risk. This category refers to disparity in the delivery (i.e. quality and time) of works, in service standards, and in miscommunication of relations.
    a) Public Risks: n/a.
    b) Private Risks: The private operator should bear risk for differences in service standards, given the PPP contract should be clear on the applied standards / methods on delivery.
    c) Shared Risks: Both partners share the risk in miscommunicating causing delays, and for disparities in time and quality of works.
9. Political risk. This category refers to risks such as change in law, government actions, and availability of currency.
    a) Public Risks: The project owner the risk of adverse government actions including currency inconvertibility and non-transfer, expropriation of assets, discriminatory changes in law, delays in approvals and consents, and parastatal risk.
    b) Private Risks: The private operator is responsible for bearing the risk of any general changes in law.
    c) Shared Risks: n/a.
10. Force majeure risk. This category refers to unexpected events beyond the control of either partner.
    a) Public Risks: n/a.
    b) Private Risks: n/a.
    c) Shared Risks: The occurrences of natural disasters, political force majeure and extreme weather conditions, and prolonged force majeure, are all shared risks. Insurances procured by the private operator will be used to cover, and beyond this the financial consequences are borne by the project owner.
11. Asset ownership risk. This sub-category refers to issues related to loss of the asset, or the asset transfer after the PPP contract ends.
    a) Public Risks: n/a.
    b) Private Risks: In the event of asset loss due to catastrophic events, the private operator is responsible and will likely have procured insurance per the PPP contract requirements. In the event the asset transfer process is hampered, the private operator is held responsible as well.
    c) Shared Risks: n/a.

7. Procurement, Transaction & Contract Management

WTE's performance is very dependent on the design of the technology being applied. The owner needs a process guarantee that ensures the process technology used can meet the expected criteria. Therefore technology design becomes part of the contractor's work with the term Design and Build Procurement. Design and Build Procurement was chosen because:

1. The contractor is responsible for the design and implementation of construction, in exchange for a certain payment value which is generally certain (lump sum fixed price).

2. Owner can arrange requests or information needs in the form of Term of Requirement (TOR) that must be followed by the contractor.
3. The selection of the Contractor was carried out in a two-stage tender, the technical stage and the commercial stage. So that it can still maintain the technological competition offered between participants and price competition.
4. The owner has control over the design elements specified in the TOR, but does not have direct control over the development of the detailed design carried out by the Contractor
5. Since the contract was signed, full design responsibility was with the Contractor
6. The deadline or deadline for completion of work that has been determined is a definite date and must be fulfilled by the Contractor, with concessions for late completion can be given by the Owner, in accordance with conditions that affect the work stipulated in the signed contract

Advantages of the Design and Build Procurement system:

1. The design and construction process can run parallel or together, thus shortening the overall completion time of the project compared to other systems
2. Certainty of the value of work carried out can be more guarded as long as the Owner does not ask for fundamental changes that are not covered by the TOR
3. It does not always require an independent MK Consultant, for the needs of decision making or instruction from the Owner, it can be done by hiring or assigning competent personnel and can act on behalf of the Owner
4. Changes to the design or specifications are still possible to be carried out by the Owner, but must consider the aspects or consequences of direct costs (implementation), costs arising due to disruption to the implementation of work in progress (overhead) and additional time that may be needed, which in general will submitted by the Contractor
5. If the preparation of the TOR and evaluation of proposals or design proposals related to compliance with TOR is carried out properly and carefully, this system has a relatively small risk factor, with the potential risk of lack of control ability over the development and detailed design and quality of implementation at the time of execution.

Disadvantage of Design and Build Procurement systems:

1. Adequate time is needed to prepare a TOR that is in accordance with the needs of the Owner, and in general assistance from the Consultant is needed
2. If the TOR is not well prepared, and is not monitored properly the suitability of the proposal or design proposal submitted by the Contractor with the given TOR, it has the potential to result in a risk of cost overruns due to changes that must be made during the work that also affect the deadline. planned and determined time
3. The contractor must also be given sufficient time to prepare a complete proposal with analysis for the offer to be submitted
4. The evaluation process is generally more difficult because it has to compare proposals or different design proposals with the price
5. Offered, including checking proposals or design proposals submitted by the Contractor whether
6. They have fulfilled the TOR desired by the Owner

While the type of contract used is usually EPC (Engineering Procurement and Construction). EPC is a particular form of contracting arrangement used in some industries where the EPC contractor is made responsible for all the activities from design, procurement, construction, commissioning and handover of the project to the end-user or owner. The EPC contractor coordinates all design, procurement and construction work and ensures that the whole project is completed as required and in time. The EPC contractor may or may not undertake actual site work, because it is allowed to use a sub-contractor.

8. Analysis and Recommendations for Indonesia

8.1 Recommendations on Planning

The determination of minimum proportion of electricity generation from renewable resources by the Government or its state-owned electricity company may ensure that the market will be incentivized to develop larger numbers and/or scale of renewable energy. It ensures a level of guarantee on the purchase of the electricity generation from these reneable resources.

National development planning policies need to ensure compliance to international commitments regarding energy diversification and/or reduction of emissions through renewable energy generation. The Sustainable Development Goals (SDG) mainstreaming in government national development planning will also help to raise greater numbers of renewable energy generation.

There also needs to be balanced based on actual needs. Particularly in the case of WTE as a unique case of the circular economy that is yet to be incorporated in the development planning. Its potential is versatile as it not only provides a cheap and clean source of energy, but it can also be a solution for landfill problems, which are evident in a number of metropolitan cities across Indonesia.

8.2 Recommendations on Regulatory Framework

Indonesian law recognizes the regulatory framework that can be applicable for the implementation of the power sector. However, it is noteworthy to consider any preferences based on international best practices, which can be relevant to the current regulatory framework that exists under Indonesian law. Besides the regulatory framework, it also serves equal importance to forsee a clear institutional arrangement that is recognized within the Energy Sector and its sub sectors.

In general, the power sector needs to be enforced by a legal and regulatory framework that is effectively implemented and applicable in the PPP scheme. A legal framework is necessary for several reasons, such as

i. The law guarantees legal certainty;

ii. The relevant stakeholders (which include administrative authorities, waste producres, treatment and disposal companies, citizens etc.)

It must be assumed that environmental legislation in most developing and emerging countries does not explicitly deal with the application of MSW incineration technology. This makes the entire process of impact assessment and operation licensing more complicated and time consuming. If comprehensive and legal binding standards are not available, these could first be developed and should follow application of internationally recognized standards. One of the main issues arising in the power sector (specifically on the waste processing into electricity) the emission limit values for incineration as well as It also needs good capacity for monitoring and enforcement within public institutions. This should be reinforced through a tehnical regulations relating to waste processing as well as the involvement of society in addressing the environmental preventive efforts.

Besides the regulatory framework that receives international best practise's recognition, it also needs to consider the environmental framework and a national waste act that could determine the objectives and fundamental rules of WTE activities for MSW including emission control principles. In particular, it should contain:

i. Planning and tendering;

In general, the national standards are considered when planning new infrastructure. However, when looking at WTE options, it is recommended to apply internationally recognized emission and safety standards for any tendering process to minimize risks for decision makers.

Obligations of operators;

The legislation should require that WTE installations are subject to an environmental impact assessment and permitting under the national emission control and/or waste law

ii. Prerequisites for permitting;

In general terms, the act should provide the obligations of plant operators to ensure that no harmful effects on the environment or other hazards, significant disadvantages and significant nuisances to the general public and the neighbourhood may be caused by such installation or the surrounding premises

iii. Safety and environmental standards;

The emission thresholds and safety requirements have to be controlled on the basis of legally binding standards. Emission limit values imposed on Waste to Energy should comply with internationally recognized and applied standards. The application of low and inadequate environmental standards will lead to additional hazards for public and environmental costs.

iv. Monitoring of the complience with safety and environmental standards

Monitoring is the core responsibility of a competent and independent regulating authority. National laws should lay down air quality standards ensure compliance near Waste to Energy installations.

8.3 Recommendations on Project Benchmark

Based on international project benchmarks, financial risk-sharing with investors during the construction phase may take a relativity long period of consession. Moreover, the scope of processing municipal solid waste into certain forms of energy (notably electricity power supply) should be limited to processing municipal solid waste and/or waste to energy in order for it to become viable. These best practices may improve the attractiveness of waste to energy projects in Indonesia to investors both domestic and international.

8.4 Recommendations on Procurement & Transaction Management

The interfacing in WTE is unique as it involves multiple GCAs as it not only generates electricity, but also is core public service delivered by particularly metropolitan governments to reduce and process waste. Both GCAs need to jointly develop a united front regarding the procurement and bidding strategy and proper divisions of roles and responsibilities in administering the procurement and transaction process.

On top of that, establishment of a collective understanding between GCAs is essential to ensure that the specified output of the project meets the objectives of both GCAs. In WTE, power generation directly relates to the amount of waste processed. Therefore, it is advisable that a standardized working relationship to be adopted by the regulators in order to provide guidance for GCAs in implementing a WTE project.

8.5 Recommendations on Contract Management

According to the guidelines in Bappenas Regulation Number 4/2015, The contract management of PPP in Indonesia is conducted in order to ensure every parties related to contract has fulfilled their obligations which stated in the contract. Further, the guidelines regulate that the contract management is being carried out into 4 stages, which are Pre-Construction, Construction, Commercial Operation, and PP Agreement Termination Period.

1. Pre-construction stage, the management contract at this stage starts from the financial signing until the financial close. The one who has the contrat implementation monitoring authority is PPP node. PPP Node can be assisted by PPP Team.
2. Construction stage, the construction stage starts from the beginning of thr construction until PPP project is commercially operated. PPP Node has a big role in monitoring and manage the implementation of the contract, such as manage the new facility design which will be provided, manage the change of construction schedule, monitor the conformity between technical plan and the construction, manage labor issues, and manage the risk that will be borne by GCA. PPP node is also responsible to conduct the several actions if there is a transfer of SPC shares prior to PPP project commercially operated.
3. Commercial Operation Stage, it starts from the beginning of commercial operation of PPP until the end of PPP agreement. Still, PPP node plays a crucial role in this stage. PPP Node has to conduct a management toward the implementation of PPP contract and monitoring the provision standard service in accordance with PPP contract. PPP Node will coordinate with BUPI related with BUPI in monitoring the implementation of guarantee appropriation.
4. PPP Agreement Termination Period, in this period, PPP node has to considerate some issues, such as re-transfer asset to GCA, PPP agreement has to regulate specific conditions of the project that required on the period of PPP agreement is terminated, and the PPP is transferred to GCA. Besides, PPP node is also responsible for the asset assessment and asset transfer process.

Pursuant to the principles that are recognized in the international best practice above, It is noteworthy that the explanation above is solely limited to PPPP regulation, and may not be enforcable to determine the technical challenge that may arise during the implementation.

8.6 Recommendations on Risk Analysis

In a comparative analysis of the guidance on risk allocation and sharing for PPPs in the energy sector, the following observations and recommendations can be made.

1. Site risk.

    a) Associated infrastructure: international guideline provides a specific reminder that the delivery of associated infrastructure (including connecting roads) is often required in power generation projects which are remotely-located. This implicates greater risk-sharing or greater costs integrated into the bid price, if risk is borne by the private sector.

    b) Labour disputes and strike action: discussion in national risk guidelines suggests this is purely a private risk to bear, whereas international guidelines propose a more nuanced approach to the issue. The parsing of the issue will depend on the political stability of the jurisdiction, but ultimately it is suggested the PPP contract provide clear provisions for events of labour unrest.

    c) Contamination and pollution of site: national risk guidelines suggest this is a private risk to bear. To the extent that the project owner's due diligence unearths the existence of known contamination; and it is consequently disclosed and priced in by the private bidder - this is true. However international guidance suggests that in cases of previously unknown contamination, there are contractual mechanisms that share responsibility between the partners.

2. Design, construction and commissioning risk.

    Design specifications and changes therein: national risk guidelines appear to assume the project owner will be output based in design specifications, which would inherently transfer design risk to the private operator. However in practice this is not always the case based on regulation-based or project-specific needs. International guidance provides a more nuanced perspective, suggesting that to the specifications are output-driven the risk can be fulsomely transferred to the private sector. In instances where there are consequent changes to the design and construction requirements - whether it be project owner-dictated or as required by law - the risk may have to be shared.

3. Sponsor risk.

    Step-in: while both national and international guidance supports the premise that private operator non-performance risk is borne by the private party, the latter supports a more nuanced approach to the trigger of step-in rights. The project owner (and by extension the public sector) is primarily concerned with providing continued public services, and in some instances will want to step-in despite it not being the fault of the private operator (i.e. emergencies, intervention to protect against social and environmental risks).

4. Financial risk.

    Refinancing: while national guidance does not provide detailed suggestion in this regard, international guidance suggests a proactive approach (i.e. by stipulating a mechanism in the PPP contract) from the project owner to share refinancing risks. Precedent mechanisms include a sharing of refinancing losses and gains between the two partners.

5. Operating risk.

    Interface: while both national and international guidance supports the premise that private operator bears primary responsibility during the operations period, the former notes some additional contexts for which sharing risk may be considered. Specific to the energy sector, international guidance suggests the private operator is generally responsible for ensuring a consistent and effectively flow of operational resources. However national guidance is more nuanced in suggesting that inputs such as fuel input availability, volume and prices, may be retained by the project owner.

6. Revenue risk.

Demand: national and international guidance largely converge on this issue, and suggest that the project owner is best-suited to assume true demand risk of the end user (whereas the private operator is compensated by an off-take contract for the power generated).

7. Network connectivity risk.

   Connectivity: national guidance is not specific as to how the named risks would apply to an energy project. International guidance is silent on this risk category.

8. Interface risk.

   Interface: national guidance is not specific as to how the named risks would apply to an energy project. International guidance is silent on this risk category.

9. Political risk.

   Change in law: national guidance and international guidance largely converge in perspective on this risk category. Importantly, both suggest the approach of having the private operator assume risk of changes in law beyond those that are sector-specific or otherwise discriminatory towards the project.

10. Force majeure risk.

    Option to continue: national guidance and international guidance largely converge in perspective on this risk category. International guidance does provide some suggestions for instances wherein the private operator wishes to terminate the PPP following prolonged force majeure, but it is in the public sector interest to continue (i.e. contractual mechanisms to ensure private operator is sufficiently compensated and incentivized to continue the PPP).

11. Asset ownership risk.

    Early termination: while national guidance appears to be silent, international guidance provides best practices on determining cause and compensation for early termination.

Annexes

Annex I: Rule of Thumb Investment Parameters for the Indonesian Energy Sector

This Annex I is provided to equip personnel that are involved in identifying, planning, and preparing for PPP projects, in particular for the MoF PPP Unit to assist in executing its PDF role, with tools in the form of parameters that are based on rule of thumb general principles. The rule of thumb-based indicators are based on current data obtained and analyzed through the financial market data to obtain an understanding of market perceptions on indicators that the market considers bankable on a particular sector in the emerging market and Indonesian contexts

Use of a Rule of Thumbs as Comparative Tools

Investopedia (2019) as a 'guideline that provides simplified advice regarding a particular subject defines the rule of thumb principle*. It is a general principle that gives practical instructions for accomplishing or approaching a certain task. Typically, rules of thumb develop as a result of practice and experience rather than from scientific research or theory.'*

Noting the variance of project proposals being identified and entering the sector PPP infrastructure project pipeline, the rule of thumb approach may be useful to identify potential statistical outliers as they are based on very broad general principles. Variance in projects entering the pipeline is due to the case-by-case basis as each project proposal shall have a unique approach in its project design to deliver its unique value proposition and this will be the main pillar of its business model that will in turn affect assumptions regarding the cost structure, the expected revenue stream, and the value chain partnerships that need to be established.

Such broad sector based composition of cost structures, however can be established as a rule of thumb. Renewable Energy will be based on this following assessment: 1) with project, 2) without project.

Without a project, there are only costs that exists. Firstly, there will be continued increase in existing energy cost of production because only a limited number of countries have large amount of non-renewable energy reserves e.g. fossil fuel. Secondly, there will be continued increase in government subsidy on energy production. Thirdly, there will be continued air and water pollution, which will lead to potential health problem.

With a project, many benefits arise. During the operation period, there will be a decrease in existing energy cost of production due to sustainability of renewable energy sources. Besides that, renewable sources generally processes by introducing more efficient and high technology. Moreover, air and water pollution will decrease because renewable energy sources produce emissions of clean energy and directly impact to less CO2 emission release to the atmosphere.

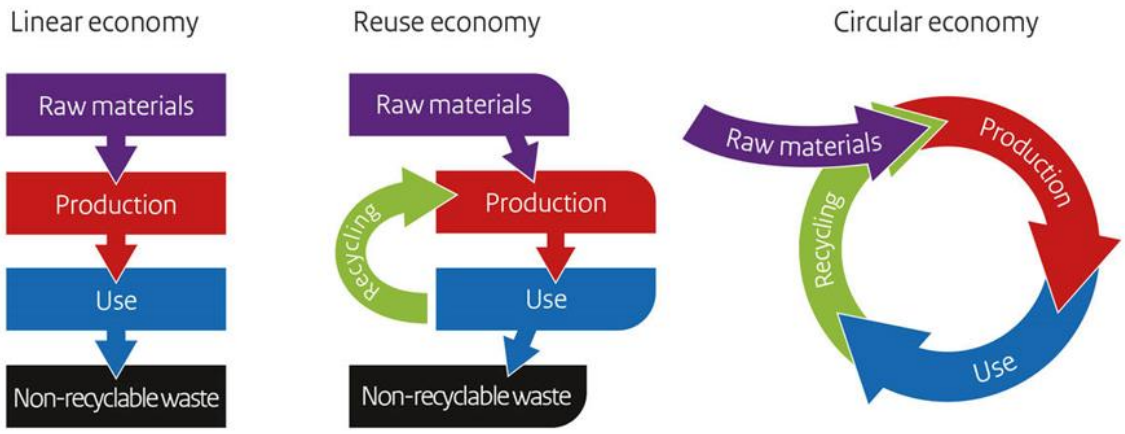
The costs associated with the renewable energy projects is project capital and operational expenditure. These cost would mostly depends on type of renewable energy source, selection of technology and size of project. The social and environmental impacts during the construction process would be noise and air pollution as well as loss of vegetation (although minimal). Another social impact is that the project might force people to reallocate or resettle from existing site population to other areas.

This table will summarize the information given above:

CBA Summary: Renewable Energy Sector	
With Project	
Costs	Benefits
Capex Opex Social and Environmental Costs Noise and Air Pollution during construction Loss of vegetation Reallocation or resettlement of existing on site population	Decrease in existing energy cost of production Decrease in Government subsidy on energy production Reduce in air and water pollution Reduction of CO2 emissions Energy sustainability
Without Project	
Costs	Benefits
Continued increase existing energy cost of production Continued air and water pollution	N/A

Cost Structure

Cost Structure that Constructs Financial Assessment

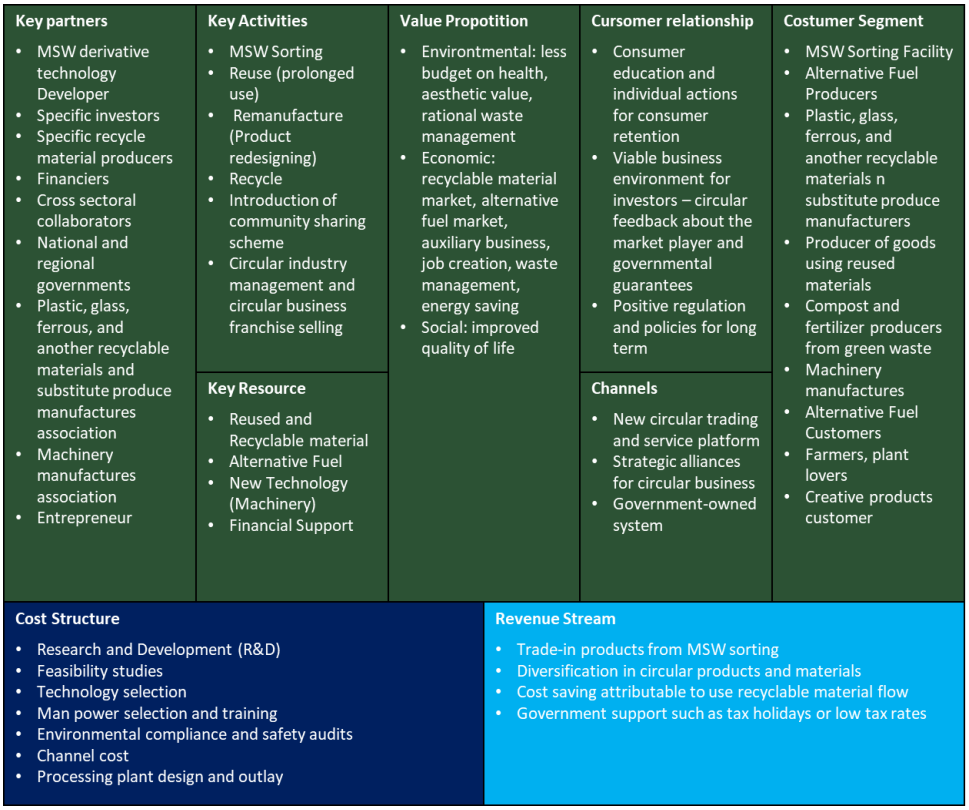


MSW management in Indonesia still uses the Linear Economy system. Some regions have started to recycle some of the waste, using the Reuse Economy system, but the scale is still very small, not yet covering one city. Whereas MSW management uses a Circular Economy system, where conceptually there is no waste left, all materials are recycled into other industrial raw materials.

Circular Business Model

To form a circular economy system, the circular business model that is built is as follows:

Figure 1 Circular Business Model



Of the various WTE technologies available, the most widely used are WTE via steam turbine incineration and WTE via the Gas engine gasification. The difference in technology is both very influential on construction costs, area, operational costs, number of employees, maintenance costs, etc. because of the different complexity of the system.

Table 1 Cost Structure

No	Cost	WTE	Street Lighting
1	Capital Cost (CAPEX)	Civil works & Building Main Equipment Utility Waste treatment Electrical & Lighting Instrumentation & Control Installation, testing & commissioning Operating permit, certification, etc	Faoundation & cable excavation Street lighting pole Lamp Control Room Sensors Electric meter Installation, testing & commissioning Certification, proper operation, etc.
2	Operational & Maintenance (OPEX)	Fixed cost: Employee / employee salary, Management fees, Facility maintenance costs, etc.	Fixed cost: Employee / employee salary, Management fees, Facility maintenance costs, etc

No	Cost	WTE	Street Lighting
		Variable cost: Spare parts Chemicals Waste handling Maintenance of equipment Consumable parts	Variable cost: Spare parts Maintenance of equipment Consumable parts
		Fuel cost	Electricity cost
3	Cost of Finance	Loan interest	Loan Interest
4	Other Cost	Construction of power lines from the step-up transformer at the generator to the nearest PLN substation	

Customer Segment

1. MSW Sorting Facility: The main MSW users, sort the materials that can be reused
2. Alternative Fuel Producers: using materials sorted from MSW, which can be converted into alternative fuels
3. Plastic, glass, ferrous, and another recyclable materials and substitute produce manufactures: using recycle material as a substitute for raw materials
4. Producer of goods using reused materials: using materials sorted from MSW, which can be reused, but does not have the potential as an alternative fuels
5. Compost and fertilizer producers from green waste
6. Machinery manufactures: supplying equipment for new industries, such as the MSW Sorting industry, Manufacture of Alternative fuels, etc., as well as new consumers using MSW derivative materials such as alternative fuels, etc.
7. Alternative fuel costumer/users derived from MSW
8. Farmers, plant lovers are users of compost and fertilizer from green waste
9. Creative products customer are users of products from recycle materials

Value Proposition

1. Environmental: less budget on health, aesthetic value, rational waste management
2. Economic: recyclable material market, alternative fuel market, auxiliary business, job creation, waste management, energy saving
3. Social: improve quality of life

Distribution Channels

1. New circular trading and service platform for MSW derivatives
2. Establishing strategic alliances for circular business with parties with an interest in the MSW derivative industry
3. Government owned system incudes State-owned enterprises and Regional-owned enterprises as economic drivers of MSW-based derivatives

Customer Relationship

1. Consumer education and individual actions for consumer retention
2. Viable business environment for investors – circular feedback about the market player and governmental guarantees
3. Positive regulation and policies for long term

Revenue Stream

1. Trade in products from MSW sorting
2. The establishment of a new trading system to distribute MSW derivative products
3. Diversification in circular products and materials
4. Use of cheaper recycle and reuse materials to substitute existing raw materials or to create new product segments
5. Cost saving attributable to use recyclable material flow
6. It reduces the environmental burden and creates economical value products
7. Government support such as tax holidays or low tax rates
8. Fiscal relief provided by the government to encourage the development of the MSW derivative industry

Key Resources

1. Reused and Recyclable material
2. As substitute raw materials for existing industries, as well as raw materials for new industries that are growing because of the utilization of MSW derivatives.

Alternative Fuel

As a new fuel or substitution of existing fuels

1. New Technology (Machinery)
2. New equipment as a result of the development of MSW derivative raw material utilization.

Financial Support

Financial products specifically packaged as support for Circular Economy Industry

Key Activities

1. MSW Sorting so that a variety of materials are not mixed
2. Reuse (prolonged use) material that does not become discarded
3. Remanufacture (Product redesigning) the product so that it can be reused after it is used
4. Recycle by reusing unused products becomes the raw material for other economically valuable products
5. Introduction of community sharing scheme to increase people's insight into the superiority of the circular economy and the economy sharing system that can be developed.
6. Circular Industry Management and Circular Business Franchise selling includes developing a management system for new industries and create a franchise system to make it easier for investors to join their business.

Key Partnership

1. MSW Derivative technology developer
2. Technology development utilizing MSW derivatives opens up new economic opportunities.
3. Specific investors

4. As a new industry, the MSW derivative industry has different opportunities and risks than other industries, only investors who can use it are interested in investing.

5. Specific recycle material producers

   Some MSW derivative materials have different characteristics than existing industrial raw materials, so some specific producers need special equipment to process them into economically valuable products.

6. Financiers

   MSW derivative industry requires financial support from financiers who understand in depth its superiority.

7. Cross Sectoral Collaborators

   As a new industry that is engaged in the environment and social sector, cross sectoral collaboration is needed as a party that can bridge it with other fields, such as the economy, industry, trade, etc. so that more parties are interested in developing it.

8. National and regional governments

   Regulators in the central and regional governments that regulate policies around environment, industrial development, trade, and economy.

Cost Structure

The government must take a proactive role. For example, it may give incentives, such as tax holidays, subsidies, technical support, and favorable legislation, among others, to stimulate a favorable response from other key players. Some of these costs are stated below:

1. Research and Development (R&D)
2. Feasibility studies such as profitability, pilot test, SWOT analysis, production costs, CAPEX and OPEX estimation
3. Technology selection – process, mechanical, and electrical
4. Man power selection and training
5. Environmental compliance and safety audits
6. Channel cost – raw material and vendor selection
7. Processing plant design and outlay

Revenue Structure and Stream

WTE revenue is obtained from:

1. Tipping fee
2. Electricity sales
3. Sales of recycle materials, including materials that have the potential to become alternative fuels

Investment Parameter

Average Interest on Investment Loans (Data from Bank Indonesia)		
	IDR	**USD**
Bank Persero	10.06%	5.48%
Bank Umum Swasta Nasional	10.67%	5.79%
Bank Umum	10.38%	5.28%
Average without BPD	**10.37%**	**5.52%**
BPD	11.21%	
Average including BPD	**10.58%**	

Indo Government Bond Rate	**IDR**	**USD**	**Interest Rate Difference**
10 years	8.03%	4.50%	3.53%
20 Years	8.41%	5.40%	3.01%
30 Years	9.09%	5.20%	3.89%

Weighted average cost of capital

WACC represents an investor's expected return to fund the assets of an enterprise. WACC is computed by summing the cost of each capital component multiplied by its proportional weight.

Generally, an enterprise is funded by debt and equity. Hence, we can calculate WACC using the following formula:

WACC = [E / C] * Cost of equity + [D / C] * (1 - tax rate) * Cost of debt

where:
C = Debt + Equity
E = Equity
D = Debt

Cost of Equity

The required rate of return on equity is estimated using the variant of Capital Asset Pricing Model ("CAPM").

CAPM computes the required rate of return on equity as a function of the rate of return on a risk-free investment, plus an equity risk premium (the return stockholders expect above the return on a risk-free investment), multiplied by the "beta" for the investment.

Beta measures the relationship between the price movements of ownership participants for individual companies to price movement of a fully diversified stock portfolio.

The Cost of Equity formula is as follows:

$$K_e = R_f + ß * [E (R_m) – R_f] + SP$$

where:
K_e = Cost of equity
R_f = Risk free rate
***ß = Measure of the sensitivity* of the asset returns to market returns**
E (R_m) = Expected market return
SP = Company specific risk premium

Risk-Free Rate (Rf)

The CAPM implicitly assumes the presence of a single risk-less asset, that is, an asset perceived by all investors as having no risk. Return on such assets is the risk-free rate of return.

We have used the 30-year Indonesian Sovereign Bond yields computed by Bloomberg as a proxy for the Indonesia risk-free rate. The yields of such bonds as of 31 December 2018 for Indonesian Sovereign Bond yields in IDR was 9.09%, while Bond Yield in USD was 5.20%.

Beta (ß)

Risk associated with the asset (non-diversifiable or systematic risk) is measured by the Beta coefficient. It can also be defined as the sensitivity of the asset returns to market returns. It is estimated by regressing assets excess return against the market portfolio's excess return. Slope of the regression equation is beta. As a proxy we have considered median unlevered beta of a listed peer group.

Such beta is then adjusted to reflect the difference between the effective tax rate and capital structure of the peer company. The result is called "unlevered beta".

The "unlevered beta" is readjusted for the capital structure and applicable tax rate. The following formula is used to adjust for the difference in the capital structure and the tax rate.

Based on the Damodaran's data extracted as of 31 December 2018, the estimated unlevered beta for Energy sector is 0.61. The estimated re-levered beta is 1.00.

Levered Beta = Unlevered Beta * [1 + (1 - tax rate) (D / E)]

where:

D/E = Debt to equity ratio

Market Risk Premium ("MRP")

The equity market risk premium represents the additional return an investor expects to receive for investing in a risky asset i.e. stock market as compared to investing in risk-free assets.

According to Damodaran, the market risk premium as of 31 December 2018 was 5.96%.

Country Equity Risk Premium

The equity market risk premium represents the additional return an investor expects to receive for investing in a risky asset i.e. stock market as compared to investing in risk-free assets.

Country equity risk premium ("CERP") represents risk premium attributable to the risks specific to the country. It is designed to account for macroeconomic factors such as political instability, volatile exchange rates and economic turmoil which are possibly not reflected elsewhere.

CERP is estimated by multiplying country default spread ("CDS") with 1.23x being the global average of equity to bond market volatility (which is the country equity risk multiple ("CERM")).

Indonesia CDS is sourced from Damodaran, which is 2.15%. By multiplying that number by 1.23x, we obtained Indonesia Risk Premium of 2.64%.

Cost of Equity

From the above analysis, we obtain a cost of equity in IDR of 15.51%, meanwhile for cost of equity in USD is 11.62%.

Target Capital Structure (Debt to Equity Ratio)

Theoretically, an "optimal" capital structure should be used to estimate a company's WACC in the case of an acquisition. Deciding on an "optimal" capital structure is a subjective exercise.

Based on this premise, the estimated capital structure range based on the capital structure of Energy sector, is 45.9% debt and 54.1% equity.

Assumption regarding use of Damodaran – Derived Investment Parameter

The ratios and or other investment parameters produced are based on international financial markets estimations. Such estimations capture the appetite of international markets to a particular sector in emerging markets for project financing specifically unlevered for the Indonesian context.

Thus, there are only parameters which may or may not reflect actual practice and most notably not indicative of the national banking sector appetite as these are varied based on the project and the unique value proposition and potential monetization it may bring.

Furthermore, variances between local market perceptions and international market perceptions may also occur. In some cases, it may even be a deliberate policy action to stimulate local industries into having a portfolio in particular sector in an attempt to create a domestic market.

Tax Rate

We have used the statutory corporate tax rate in Indonesia of 25.0%.

Cost of Debt

Cost of debt for Indonesia is estimated based on the Indonesian IDR and USD lending rate as of 31 December 2018, published by Bank Indonesia which is 10.37% and 5.52%, respectively. Hence, the cost of debt after tax is 7.78% for IDR and 4.14% for USD.

WACC

Based on information presented previously, using Capital Asset Pricing Model (CAPM) the estimated WACC for Energy sector in IDR is 11.96%, while WACC in USD will be 8.19%.

The feasibility of WTE, as well as other business fields, is determined by return on investment. The return on investment is the amount of electricity purchased, tax relief, and facilities for preparation and construction, such as the availability of land.

Especially for waste to energy, the Presidential Regulation Number 35 of 2018 regulates

1. The price of purchasing electricity by PT PLN (Persero) based on the amount of PLTSa capacity provided that:
    a. ≤ 20MW: 13.35 US cents / kWh
    b. > 20MW: 14.54 - (0.076 x PLTSa capacity) US dollars / kWh
2. Tipping fee assistance: max Rp. 500,000 (five hundred thousand rupiahs) / ton of garbage.

For street lighting, investment decisions are closely related to the amount of AP obtained.

Return on Investment

Article 11 of Presidential Regulation 38/2015 states that the GCA shall determine the form of investment return which covers the capital cost, operational cost and profit of the implementing business entity. Such return on investment of the Implementing Business Entity in the provision of infrastructure is sourced from Tariff, Availability Payment and other forms which are not contradictory with applicable laws and regulations.

Central AP deriving from State Budget (APBN) is based on MoF Regulation 260/2016 in which the APBN is being allocated in each budgeting year by GCA (during concessions period) upon the completion of construction period and the start date of operation period. Further, Article 6 of MoF Regulation 260/2016 states that PPP agreement should consist at least:

1. Output Specifications and Performance Indicator;

2. Agreed formula of AP Payment; and
3. The monitoring system that is effective on performance indicator.

Central AP shall be provided to PPP projects based on the following criteria:

1. Infrastructure projects which provide great economic and social benefits to the public as service user;

The return of investment from the project does not come from the users (tariffs) or in the event the project receives revenue from user tariffs, the GCA is not allowed to use such revenue to be included in the AP for the IBE; and

2. The procurement of IBE for the project shall be conducted by way of fair, open and transparent tender process, as well as by considering healthy business competition principles.
3. Prior to the preparation stage, in order to implement AP, MoF shall issue initial confirmation upon receiving Preliminary Study from GCA by concluding that GCA preparation to use AP in the PPP project is aligned with its objectives, criteria and principles that prevail under MoF Regulation 260/2016.

   Prior to transaction preparation, MoF shall carry out final confirmation before the issuance of RfP from GCA. This final confirmation is not intended yet as an approval of GCA in order to implement AP. Simply put, final confirmation of MoF for AP Payment is intended to as GCA is ready to implement the IBE procurement. In the later stage, GCA shall attach the final confirmation in the RfP documents in order to enforce as potential lenders for bidding.

a) Regional Availability Payment (Regional AP)

Other than Central AP deriving from APBN, AP Payment may also derives from Regional State Budget (APBD) as we understand that the type of return of investment for IBE in the implementation of Regional PPP may be in the form of Regional AP that is provided by respective local government.

Based on MoHA Regulation 96/2016, Regional Budget (APBD) is being allocated in each budgeting year by GCA (during cooperation period) for AP Payment upon the completion of construction period and the start date of operation period. Considering that Regional AP derives from APBD share equal nature in the agreement, Article 5 of MoHA Regulation 96/2016 states that the PPP agreement should consist at least:

a. Output Specifications and Performance Indicator;
b. Agreed formula of AP Payment; and
c. The monitoring system that is effective on performance indicator.

Regional AP shall be provided PPP projects based on the following criteria:

a. Infrastructure projects that provide great economic and social benefits to the public as service user.
b. The return of investment from the project does not come from the users (tariffs).
c. Under MoHA Regulation 96/2016, it is noteworthy to undertake DPRD approval as the AP Payment shall burden regional budgeting. Pursuant to Article 4 paragraph (3) MoHA Regulation 96/2016, DPRD shall be taken into account its approval in order to implement AP allocated by GCA.

   In order to proceed, GCA shall also obtain recommendation from MoHA by submitting OBC or FBC as well as projected accounting for AP Payment.

b) Feed-in Tariffs

In regards to return of private investment, the determination of feed-in tariff is set by PLN. Pursuant to Government Regulation 23/1994, PLN is obligated to conduct electricity for public's interests. Thus, PLN shall recommend the threshold of such generation cost in order to determine tariff.

Based on MEMR Regulation 24/2017 on Mechanism of BPP Determination, PLN shall submit recommendation of Generation Cost/Biaya Pokok Pembangkitan ("BPP") amount in no later than 2nd week of March in the current year. Minister of Energy And Mineral Resources evaluates and determines the BPP recommendation. Such evaluation shall be no later than 14 (fourteen) days after receipt of BPP recommendation. Upon the evaluation and determination phase, Ministry of Energy And Mineral Resources issues the BPP determination. Issuance of BPP determination is effective from the month of April in the current year until the end of the following year of March. Based on its mechanism of BPP determination, it shall be adjusted each year and determined in the Ministry of Energy And Mineral Resources Regulation. Currently, BPP determination is regulated under Ministry of Energy

And Mineral Resources Decree 55/2019 on the Benchmarking Tariffs to the PLN average electricity generation cost year 2019 (BPP 2019).

Electricity Law recognizes the provision of feed-in-tariff that shall prevail under power purchase agreement in respect of Non Renewable Energy that PLN conducts. The following is mechanism of tariff determination regarding power purchase in non-renewable energy. In relation to power purchase agreement, MEMR Regulation 10/2017 as amended lastly by MEMR Regulation 10/2018 states that the minimum contents of power purchase agreement is based on the following terms:

Table 2 Minimum Contents of Power Purchase Agreement

Minimum Contents of Power Purchase Agreement	
1.	Period of PPA
2.	Rights & obligations
3.	Risk allocation
4.	Project implementation guarantee
5.	Commissioning and cod
6.	Fuel supplier
7.	Transaction
8.	Operation system monitoring
9.	Penalty
10.	Termination of PPA
11.	Transfer of assets
12.	Requirements of price adjustments
13.	Dispute settlement
14.	Force majeure

Further, PPA is implemented for maximum period of 30 (thirty) years after staring of commercial of operation date (COD).

Potential Investor and Financier

The increasing issue of global warming has a positive impact on Indonesia. With a position crossed by the equator, Indonesia is exposed to the sun for 365 days perfectly. As a result, biodiversity in Indonesia has become one of the richest in the world. Our nation is also known as the ring of fire because of the many active volcanoes that indirectly help fertilize the archipelago and become geothermal energy potential. When the issue of global warming is emerging, Indonesia then plays the most important role in counteracting these impacts through efforts to prevent the rate of deforestation and forest degradation that are considered

Currently financial institutions in the world are focusing on environmental issues, so that energy projects that are still based on fossil fuels are less in demand, whereas non-fossil-based energy projects are in great demand. Funding for green infrastructure is an alternative financing for new and renewable energy infrastructure projects.

To finance fossil energy infrastructure, financing in the form of ordinary business investment, direct investment, where the project must provide a return on investment that is quite attractive to investors. At present the World Bank has no longer financed the construction of fossil energy infrastructure.

In general, energy infrastructure funding can be in the form of:

1. Direct Investment
2. Semi Direct Investment
3. Indirect Investment

The figure below shows the differences between the three types of investments:

Figure 2 General Funding Scheme

Source: Kaminker, C. Et al (2013),"Institutional Investor and Green Infrastructure Investment: Selected Case Studies"

The implementation of the NRE is strongly influenced by conversion technology, so a potential Investor for NRE power plant is the technology supplier.

Here are some alternative financing for new and renewable energy.

1) Green Bond and Green Sukuk

Unlike ordinary loans, bonds as investment instruments provide flexibility for investors to manage their financial risks. Whereas for the issuer, bonds free the issuer from installments. This flexibility has resulted in the bond market becoming an attractive type of financing for infrastructure development. Increasing environmental issues make investors avoid bonds that are used for unsustainable development and seek bonds used to finance green infrastructure called green bonds.

Green bonds are fixed-income financial instruments (bonds) linked in some way to climate change solutions. Green Bonds, or also known as cilmate bonds are a relatively new asset class, but they are growing rapidly. International Finance Corporation (IFC) estimates the potential opportunities for green financing are around $274 billion by the year 2030.[34]

Green Sukuk have the potential to further broaden this market as well as to help bridge the gap between he conventional and Islamic financial worlds. The Sukuk should be attractive to conventional investors if they offer reasonable risk-adjusted returns and are properly marketed. A sukuk that meets those criteria and provides funding for an environmentally sustainable project could be particularly attractive to environment-focused investors for two principal reasons.

First, Sukuk provide investors with a high degree of certainty that their money will be used for a specific purpose. In order to comply with the underlying Shari'ah principles, the funds raised through the issue of a sukuk must be applied to investment in identifiable assets or ventures. Therefore, if a sukuk is structured to provide funds for a specified infrastructure project, such as a renewable energy project, there is little chance the investors' money will be diverted and used for another purpose.

Second, many more environment-focused investment products exist on the equity side of the capital markets than on the fixed income side. Since most environmentally sustainable investors want to know precisely how their money will be used, bonds that are general obligations of an issuer have limited appeal unless all of the activities of the issuer meet the investor's environmental standards. Sukuk, which are most similar to a conventional fixed income security, could help fill the fixed income supply gap for environmental investors to the extent the proceeds of a sukuk are remarked for a particular environmentally beneficial purpose.

Indonesia, has sold a sovereign green sukuk in February 2018. The $1.25bn five-year sukuk is the world's first sovereign green sukuk and was priced at a yield of 3.75 per cent and also raised US$1.75 billion via a 10-year sukuk sold at the same time as the green issuance. The non-green sukuk was sold at a coupon rate of 4.4%.

[34]Philippe H. Le Houérou (IFC Executive Director), August 2018, "A Catalyst For Green Financing In Indonesia"

2) Grant

Grant funds are one of the funds that have been successfully used to improve the development of new and renewable energy infrastructure in Indonesia. Through a competitive selection process, Indonesia was chosen as the recipient of the Compact Grant. On 19 November 2011, the Millennium Challenge Compact Grant Agreement was signed by both parties in Bali. Secretary of State Hillary Rodham Clinton represented the U.S. Government, while Finance Minister Agus D. W. Martowardojo represented the Government of Indonesia. Indonesia became the recipient of the Compact program, the largest commitment of the United States of America in the last three decades in Indonesia.

Compact Grant is one of the main pillar of the Comprehensive Partnership between U.S. and Indonesia. This grant aims to reduce poverty through economic growth in Indonesia, and takes place for five years, from 2013 until 2018. The grant is used to fund three projects: Green Prosperity, Community-Based Health and Nutrition to Reduce Stunting, and Procurement Modernization.

Different from other grants, MCC gives flexibility and authority for the partner country to develop programs initiated with the involvement of many stakeholders. The involvement of multi-stakeholders from various government ministries/agencies, academics, the private sector, and civil society organizations, is a novelty and never happened before in designing a grant program from foreign partners.

Among the compact grants, one of them is The Green Prosperity Project, that supports the Government of Indonesia's commitment to reduce intensity of carbon emissions and to achieve a more sustainable future. The mission of this project is to catalyze sustainable development at the local level. The objectives of this US $ 308.35 million project are:

1. To increase agricultural productivity and household livelihoods by improving land use practices and natural resource management.
2. To reduce reliance on fossil fuels and emissions of land-based greenhouse gases by expanding the utilization of renewable energy, through:
   a. The Renewable Energy Grant for Community, and
   b. The Renewable Energy Co-Financing Grant

   The Renewable Energy Grant for Community is a program that supports the design, development, building and operations of off-grid community-based renewable energy projects. It aims to facilitate isolated local communities who are less likely to have inadequate and inaccessible access to electricity by PLN. This facility will be owned, managed, and maintained by rural communities.

   The Renewable Energy Co-Financing Grant is a program that seeks to increase private private energy investment projects connected to the PLN network distributed by the MCA-Indonesia Green Prosperity Facility. This grant is intended for Private Power Generators (PLS), Promoters / Sponsors of PLS, or entity groups that have commercial-scale renewable energy generation projects.

   In the case of the MCA-Indonesia Green Prosperity Facility, private party that have a green energy management concept introduced the concept to local governments. The local government approved the plan for implementing the concept in the area. The private party calculates the costs needed for the implementation project. With the coordination of Bappenas, local governments and private party propose to MCA-Indonesia to be funded by the implementation project, provided that the infrastructure built will be a local government asset, operated by the community or regional owned enterprise, and construction will be built according to international specifications by competent EPC companies.

   MCA-Indonesia reviews proposals, interviews, and technical discussions before approving the proposal.After the proposal is approved, MCA-Indonesia establishes a construction supervisory body and discusses payment terms. Funds are submitted according to the terms of direct payment to the EPC company, not by the local government and the private sector as the implementor.

   After the construction is completed, and declared technically feasible, the facility is handed over to the local government and subsequently operated by the regional owned enterprises or communities.

3) Endowment Funds

Indonesia has a special body for oil palm development, namely the Indonesia Oil Palm Estate Fund (Badan Pengelola Dana Perkebunan Kelapa Sawit/ BPDPKS). BPDPKS manages endowment funds obtained from CPO exports. One of these funds is used to develop research and production of palm oil-based biofuels, both CPO and

non-CPO. One result, Indonesia is the largest biodiesel producer in the world and the highest user of biodiesel mixtures, one of them is B20.

In 2016, CPO export levies managed by BPDPKS reached 11.7 trillion rupiahs. Some of these funds will be managed by investment managers. Based on Presidential Regulation Number 61 of 2015 concerning Collection of Funds for Oil Palm Plantation and Government Regulation Number 24 of 2015 concerning Collection of Plantation Funds, the allocation of the use of these funds is used for the development of oil palm plantations, especially:

a. Human Resource Development,

b. Research And Development,

c. Promotion,

d. Plantation Rejuvenation,

e. Procurement of Facilities and Infrastructure.

f. Downstream Industry,

g. Supply and Utilization of Biofuels.

4) Blended finance

Blended finance is a strategic use of development finance and philanthropic funds to mobilize private capital flows to emerging and frontier markets,resulting in positive results for both investors and communities. Blended finance creates funding schemes that are attractive to the private sector by involving funding from the government and international institutions with philanthropy in the form of soft loans, grants, and guarantee mechanisms. Blended finance offers the possibility to scale up commercial financing for developing countries and to channel such financing toward investments with development impact.

Blended finance contributes to development objectives by:

1. Increasing capital leverage: Extends the reach of limited development finance and philanthropic funds as they are used strategically to facilitate larger volumes of private capital that are channelled to investments with high development impact
2. Enhancing impact: The skillsets, knowledge and resources of public and private investors can increase the scope, range, and effectiveness of development-related investments.
3. Deliver risk-adjusted returns: Risks can be managed to realise returns in line with market expectations, catalyzing private funds to development projects.

Supporting mechanisms have been traditionally used by development funders in a Blended Finance package to attract and support private sector investors by managing risks and reducing transaction costs. These mechanisms can generally be classified as providing:

1. Technical Assistance, or grant funds to supplement the capacity of investees and lower transaction costs.
2. Risk Underwriting, to fully or partially protect the investor against risk through appropriate risk mitigation
3. Market Incentives, guaranteed payments contingent on performance of future pricing and/or payment in exchange for upfront investment in new or distressed markets.

The Sustainable Development Investment Partnership and Convergence are two platforms that put blended finance into practice. Their goal is to bring relevant entities from the public and private sector together, connecting interests and resources to initiatives. Both of these platforms provide capital suppliers with access to a pipeline of individual blended finance project transactions, effectively scaling up the participation of both public and private investors in transactions.

While blended finance is showing promising initial interest and results, these platforms will help assess the efficiency of the model over time.

Two new and renewable energy projects in Indonesia have been included in the blended finance program. The two projects are the Wind Power Plant in Jeneponto, South Sulawesi, and the Solar Power Plant in Likupang, North Sulawesi, with a total investment of USD 160 million.