

Opportunities and challenges of the Indonesian electrification drive

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EY

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Indonesia's new cabinet has announced a new 35GW power plan to meet rising energy needs

Opportunity to participate in one of Indonesia's largest infrastructure projects

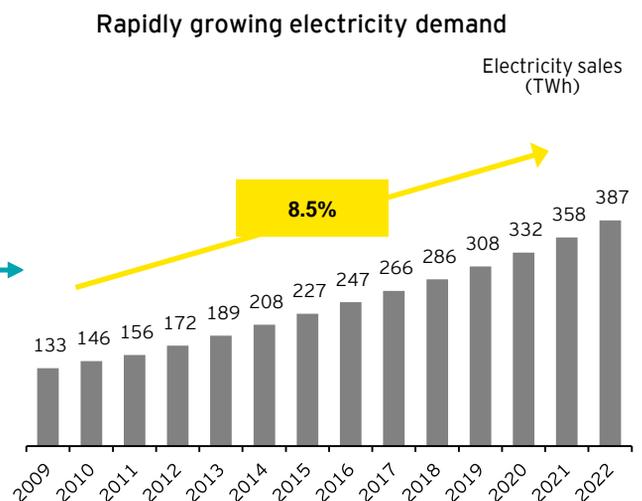
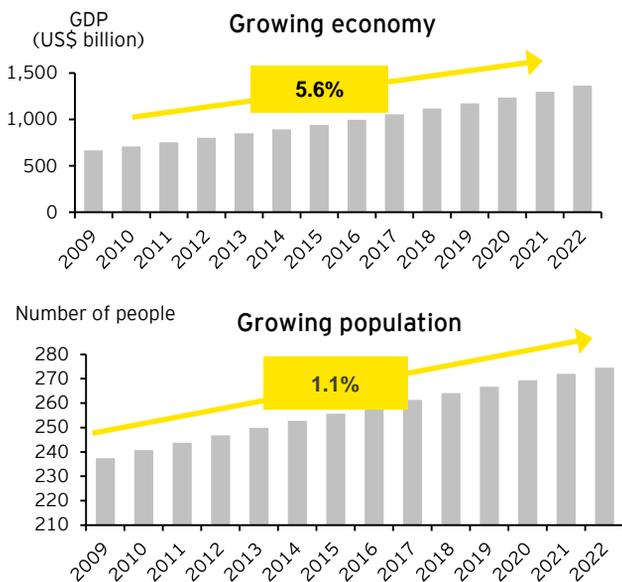
The opportunity

PT Perusahaan Listrik Negara (PLN), a state-owned enterprise on behalf of the Government of Indonesia (GoI) as the only permitted legal entity in supplying electricity for public needs, was tasked by President Joko Widodo (Jokowi) to establish power plants with a total capacity of 35 gigawatt (GW) (the Program) within the next five years. With PLN responsible for 17-GW, new opportunity opens up to the private parties to undertake the remaining 18-GW (the Opportunity). Private parties will create a consortium and operate as an independent power plant (IPP).

For this Program, the GoI targets coal to be the main energy source at more than 60% of the energy mix. This is an ambitious and challenging goal and will determine the new cabinet's ability to deliver its infrastructure development promise.

Infrastructure for the vast archipelago to sustain economic growth

During the APEC CEO Summit in Beijing, President Jokowi announced his crucial goal: to boost Indonesia's electricity production and distribution to facilitate economic growth. He laid out his ambitious infrastructure project plans and pledged to allocate most of his resources in the immediate term to facilitate infrastructure development; supported by the cutback in oil subsidy in mid-November 2014.



Source: Global Insights, RUPTL 2013 - 2022, EY analysis

Though 35-GW is an ambitious target, PLN has past precedents to guide their public-to-private partnership model



With 35GW Program to be completed over the next 5 years, target installed capacity will be 107 GW to maintain the ideal level of 30% reserve margin.

Lessons learned from FTP 1 and 2

PLN has been tasked with similar projects, namely *Fast Track Program (FTP) 1 and 2*. FTP 1, with a target capacity of 10,000, MW has realized 63% of the total planned capacity by end of 2013, and was targeted to complete by 2015, a delay from original scheduled completion of year 2010. FTP 2, with target capacity of 17,900-MW, was scheduled to be completed by year 2016. However, it is yet to be in operation and various projects are estimated to only begin operation in 2016 at the earliest. These delays are due to the following:

- ▶ Licensing issues
- ▶ Land clearing
- ▶ Financing, delay in government-backed loan
- ▶ Construction and various technical difficulties

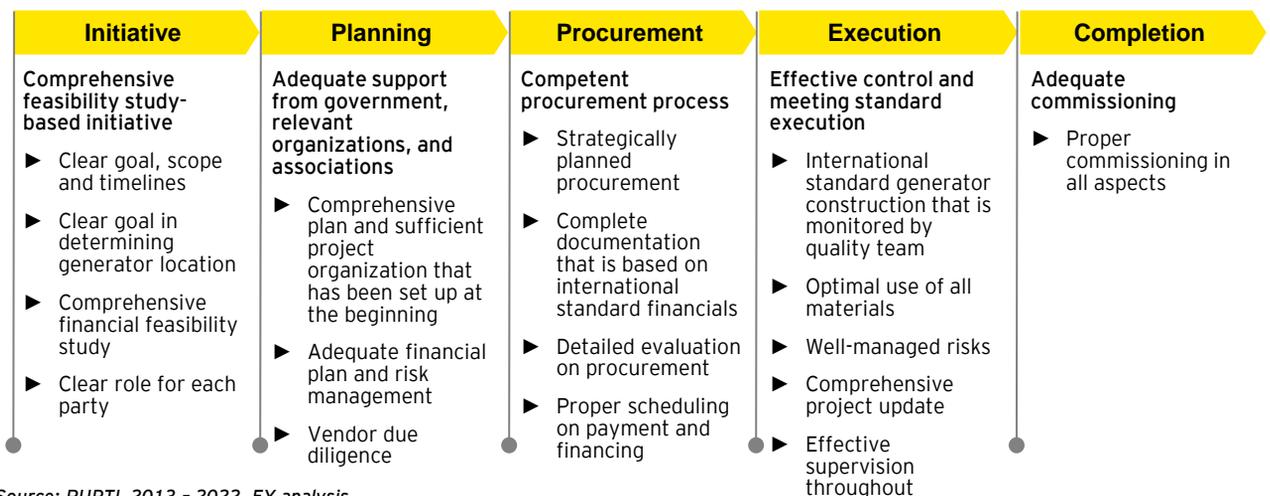
PLN is committed to implementing the 35-GW program as reflected through their concurrent plan to construct approximately 46,000 km of transmission lines and 103,000-MVA of electrical relay stations across over 1,000 locations in the country. PLN is committed to control and monitor the Program and ensure good collaboration among the ministry, central and regional governors.

A pro-business government

Prolonged licensing procedures, difficulty in conducting land acquisition, and setback in Government-guaranteed loan are by far the major barriers in PLN's previous programs. The GoI introduced the so-called one-stop service office for business permit through the Investment Coordinating Board (BKPM); part of the GoI's commitment is to create a more conducive business climate for both local and foreign investors.

PLN's "Good International Industry Practice"

For the Program, all parties involved are recommended to implement the following Good International Industry Practice cycle:



Source: RUPTL 2013 - 2022, EY analysis

The Program aims to secure the reserve margin and improve electrification ratio



By 2022, PLN will need to supply more than a total of 386.6 GWh in demand.

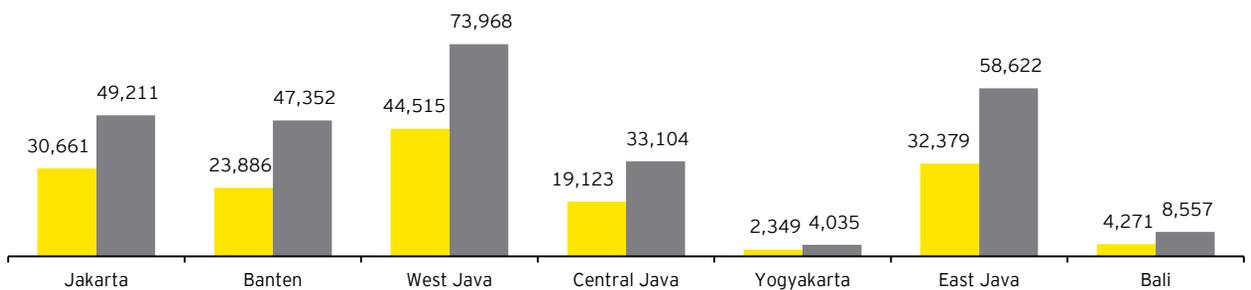
Current and projected electricity demand

PLN divides electricity operational area into three geographical regions:

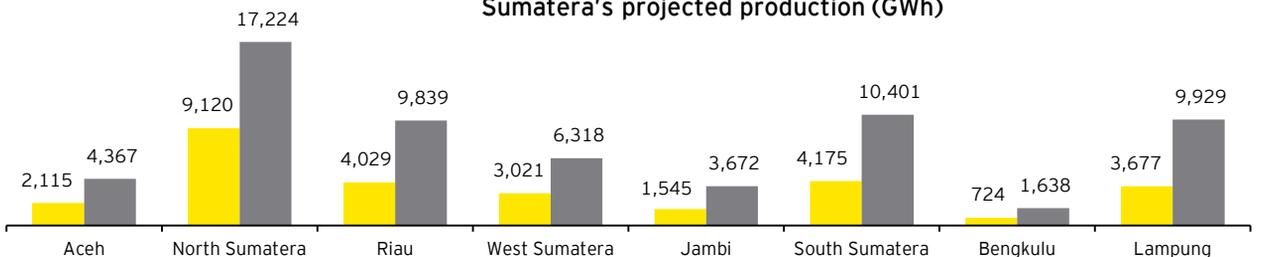
- (i) Java - Bali (captures 72% of total electricity consumption),
- (ii) Sumatera (17%); and
- (iii) East Indonesia. (11%)

PLN supplied up to 206-TWh in 2014 and aims to supply over 383-TWh in 2022 to meet projected demand over the three geographical regions. Most of this demand come from West Java, East Java and Jakarta area. Nonetheless, the increase over an eight- year period in Sumatera, 123%, is more than Java-Bali at 75% and shows optimistic development in the island.

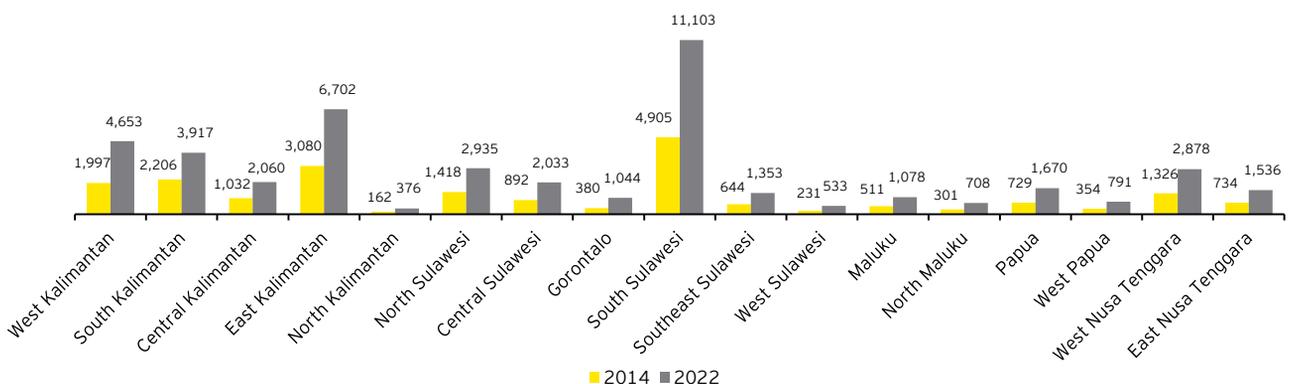
Java-Bali's projected production (GWh)



Sumatera's projected production (GWh)



East Indonesia's projected production (GWh)



Source: RUPTL 2013 - 2022, EY analysis

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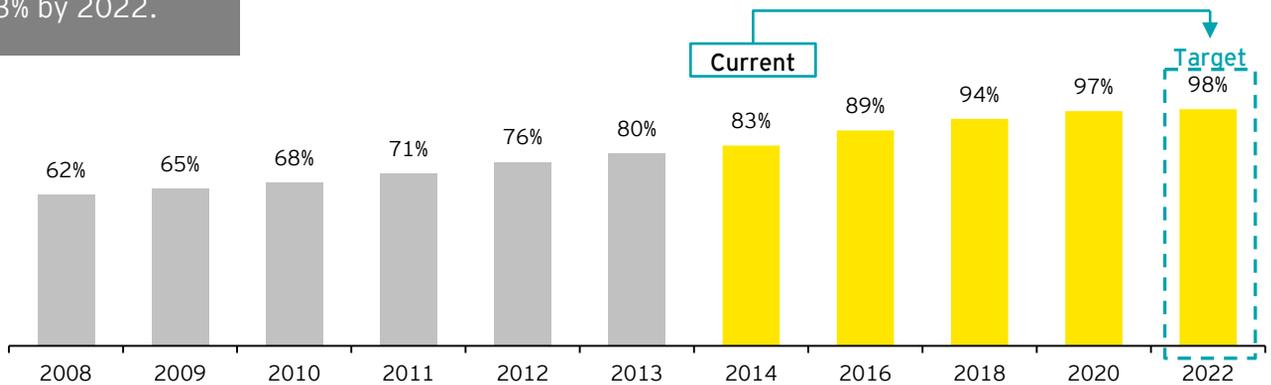


PLN aims to increase electrification ratio to 98% across Indonesia from the current 83% by 2022.

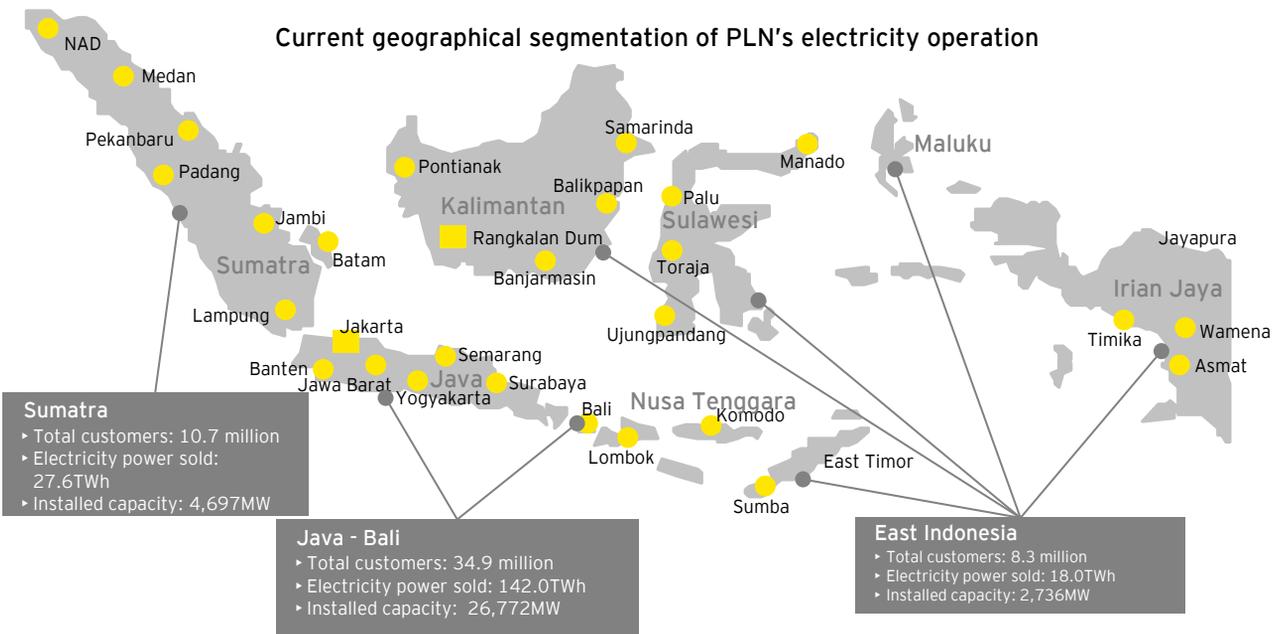
Current and target electrification ratio

Currently, PLN has 44GW installed capacity which supports 54 million subscribers, or an 8.4% increase compared to the previous year. On a national level, electrification ratio reached 80.4% in 2013, an increase from the previous year's 76.1%. Despite this increase, this ratio is still below the average of other countries in Asia, which was 99% (Malaysia, Thailand and Vietnam, even 100% (Singapore and Brunei)). By 2022, the country is expected to have approximately 98% electrification ratio across the country, with IPP taking a significant part of this growth.

Indonesia's projected electrification ratio



Current geographical segmentation of PLN's electricity operation



Source: RUPTL 2013 - 2022, EY analysis

Coal is one of the preferred sources of energy due to its lower cost



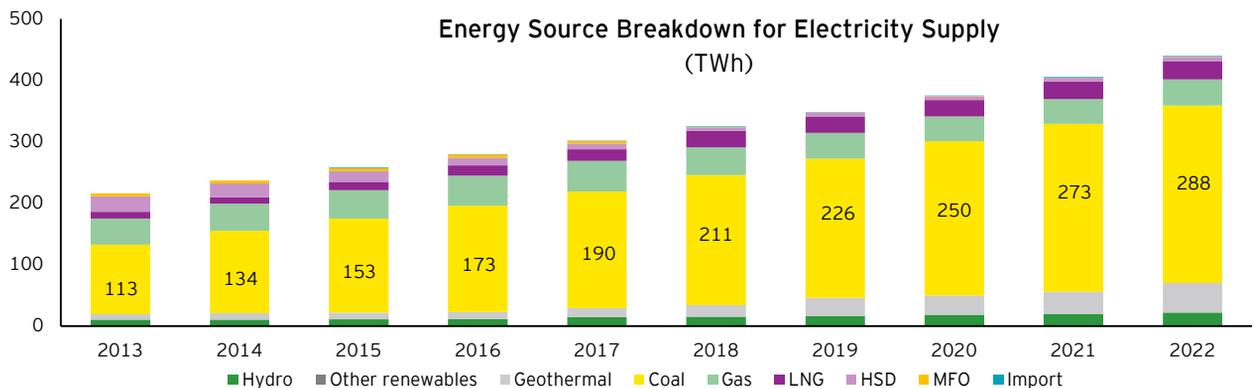
Due to decrease in government subsidy, PLN is looking for a lower-cost energy alternative.

Electricity tariff scheme

The electricity tariffs of six electricity customer categories in Indonesia have started to increase gradually starting from June 2014 to reflect the decrease in subsidy from the government. This is an estimated saving of IDR 8.51 billion in 2014 for GoI. Indonesia's electricity tariff used to be the lowest among its neighboring countries prior to the decrease in subsidy.

To compensate for the subsidy cut, PLN is looking for lower-cost alternatives for its energy supply. Supply of electricity will mainly be generated through the use of coal comprising 65.6% of total fuel mix, followed by natural gas at 16.6%, geothermal at 11%, water at 5.1%, oil and other resources up to 1.7%. Indonesian coal mining association, in its 2025 energy mix long-term plan, has stated that coal will be the main source of energy in the mix.

Estimated effect of reduction in coal usage to cost of electricity in Indonesia



Source: ESDM publication, RUPTL 2010-2019, PLN Statistics 2009, JICA analysis

Low calorific value coal will be an attractive input to the electrification strategy

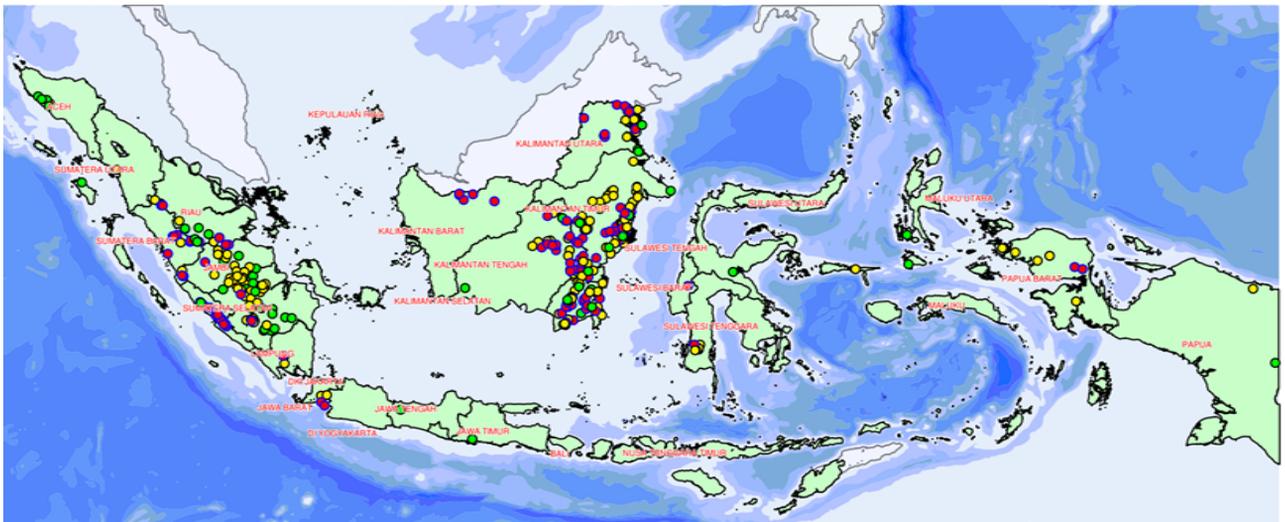


HVDC will aid the supply of electricity to Java where electricity is mostly needed to support manufacturing and other activities that drive economic growth.

Attracting low calorific value coal

Indonesia's abundance of coal reserves has been the main driver behind the Gol's energy mix target, especially the low calorific value (CV) (below 5,100 kcal/kg) (less attractive to the export market) which has typically been utilized for local electricity transmission. These coal resources are located mainly in South Sumatra. Medium CV (5,100-6,000 kcal/kg) coal resources are mostly exported to China and India due to its competitive pricing. These coal resources are mostly located in South Sumatra (48% of total coal resources in Indonesia), South Kalimantan and East Kalimantan (43%, the remaining 9% is located in North Sumatra).

Despite the abundance of coal resources, Indonesia faces high transportation costs in shipping coal across the country. This challenge is one of the causes that has sparked the Gol's initiative to create a more efficient and cost-reduced electricity production while still fulfilling electricity needs across the country. One of the means of doing so is through the planned installation of a high voltage direct current (HVDC). The HVDC will link and transport electrical currents from mine mouth power plants to load centers. The HVDC is proposed to be installed in Sumatra, where the vast majority of lower CV coal is located, all the way to Java, where electricity for economic support is mostly needed. This HVDC will allow transmission of sustainable electricity while reducing costs. With Gol cuts on oil subsidy and tariffs, the realization of HVDC is more feasible.



Low (<5,100 kcal/kg) Medium (5,100-6,100 kcal/kg) High (6,100-7,100 kcal/kg) Very high (>7,200 kcal/kg)

Source: RUPTL 2013 - 2022, EY analysis; <http://www.indonesia-investments.com/doing-business/commodities/coal/item236>

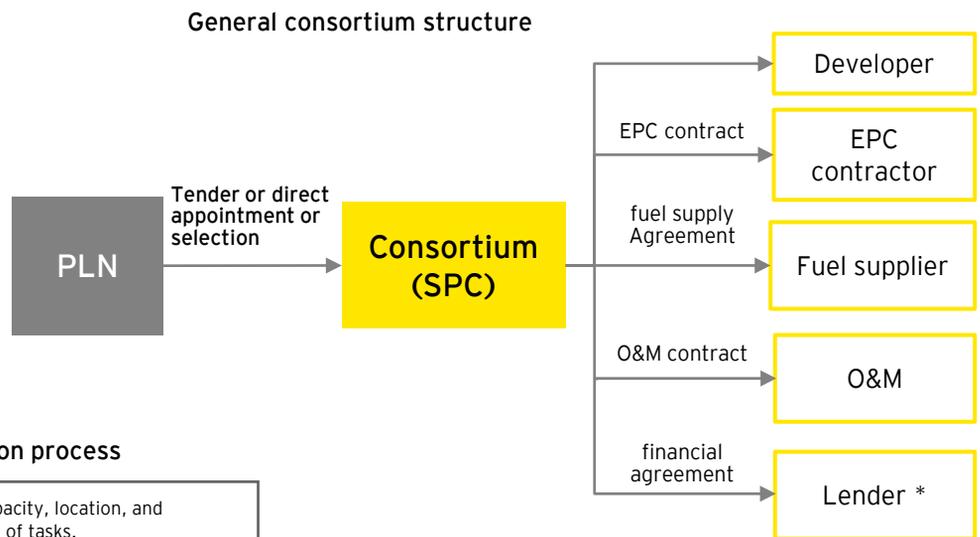
The significant capital, land acquisition and cost efficient requirements may require a consortium approach to make the PPP work



This Opportunity would hedge the risk of fluctuating coal price through a long-term contract (25-30 years) with the GoI through PLN.

Consortium structure and process

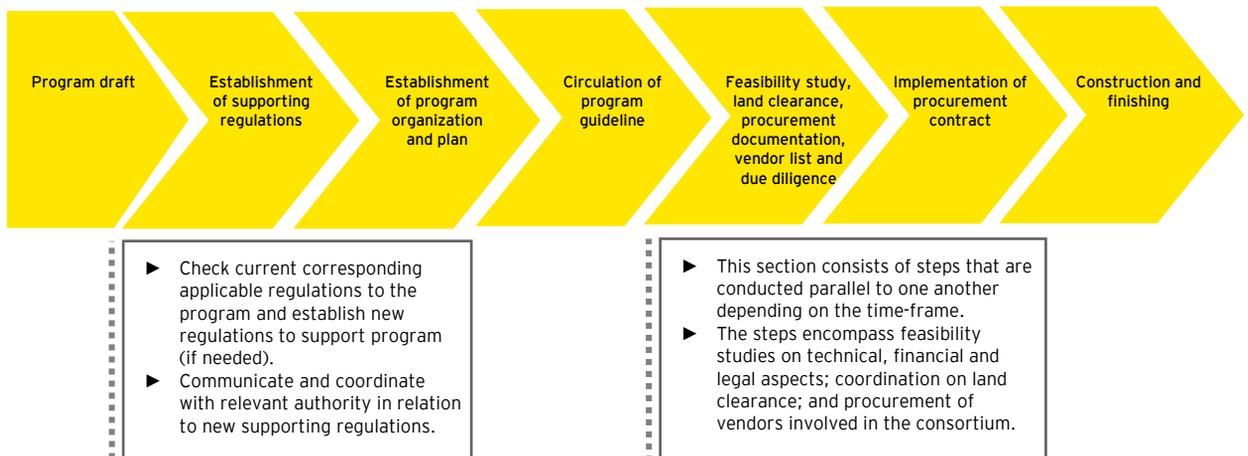
The Opportunity will involve the participation of consortiums in which PLN will hold a tender, or directly appoint or select, the vendors included in the consortium based on certain criteria to operate as an IPP. All parties will have roles and responsibilities relating to the construction of each power plant and the overall success of this Program



Program implementation process

- ▶ Defining the targeted capacity, location, and prioritizing the execution of tasks.
- ▶ Conducting studies and securing supply of primary energy.
- ▶ Establishing realistic time frames to carry out Program.
- ▶ Conducting studies on supply of material or equipment and main contractors in the market.
- ▶ Establishing appropriate funding and procurement

(*) This Program has an approximate value of US\$70 billion, based on estimated power plant construction cost of US\$1.5-2 million per KWh.



Source: RUPTL 2013 - 2022

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