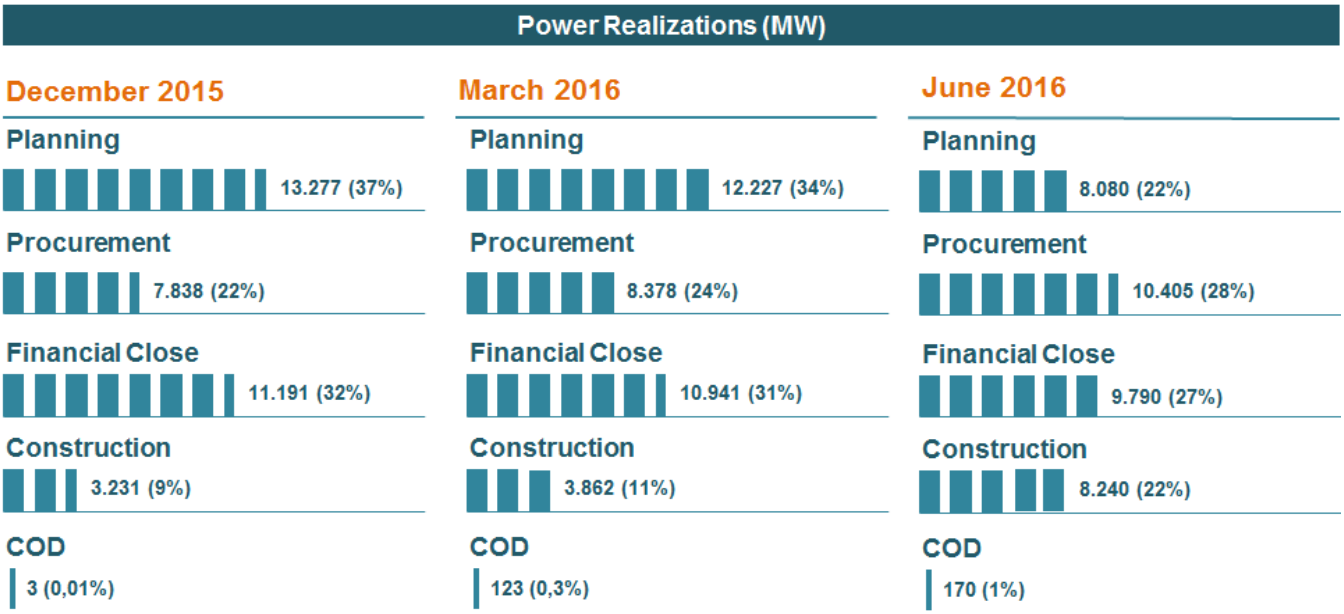
"In order to meet electricity growth needs to boost national economic development and achieve electrification ratio target, additional 35.000 MW capacity is required for 2015-2019"

Electricity

Electricity is a primary need that must be provided by the Government to the community and it is impossible to stimulate the economy without the presence of electricity infrastructure to support of economic activities. Moreover, in reality, the electrification ratio in Indonesia is still lacking behind the other neighboring countries in Southeast Asia. When compared with neighboring countries in ASEAN, Indonesia's electrification ratio is among the lowest. As of the end of 2015, the realization of Indonesia's electrification ratio stood at only 88.3%. These achievements are far behind compared to other neighboring countries such as Singapore (100%), Brunei Darussalam (99.7%), Thailand (99.3%), Malaysia (99%) and Vietnam (98%) . (PT PLN, 2015)

In the next 5 years, the demand for electricity is expected to grow by an average of 8.7% per year, with the target of electrification ratio of 97.35% at the end of 2019 (RUPTL 2016-2025). In order to manage the growing demand for the electricity, the Government has planned a program of additional capacity of 35,000MW aside from the 7,000MW from Fast Track 1 and 2 program which are already running. Figure 1 shows the progress of the construction of power plants 35,000MW per June 2016.

Figure 1. Realization of the 35,000 MW electricity generation development has shown good progress despite speeding up processes are required.

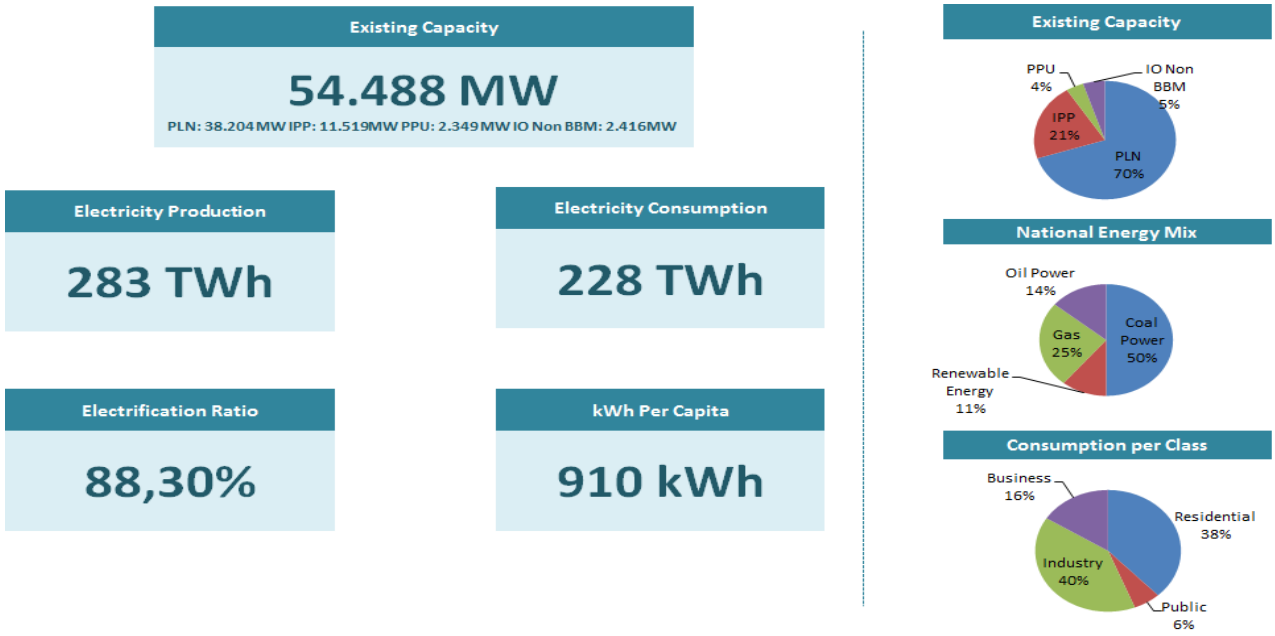


Source: PT PLN (Persero) June 2016, processed by PT SMI

Electricity Condition in Indonesia

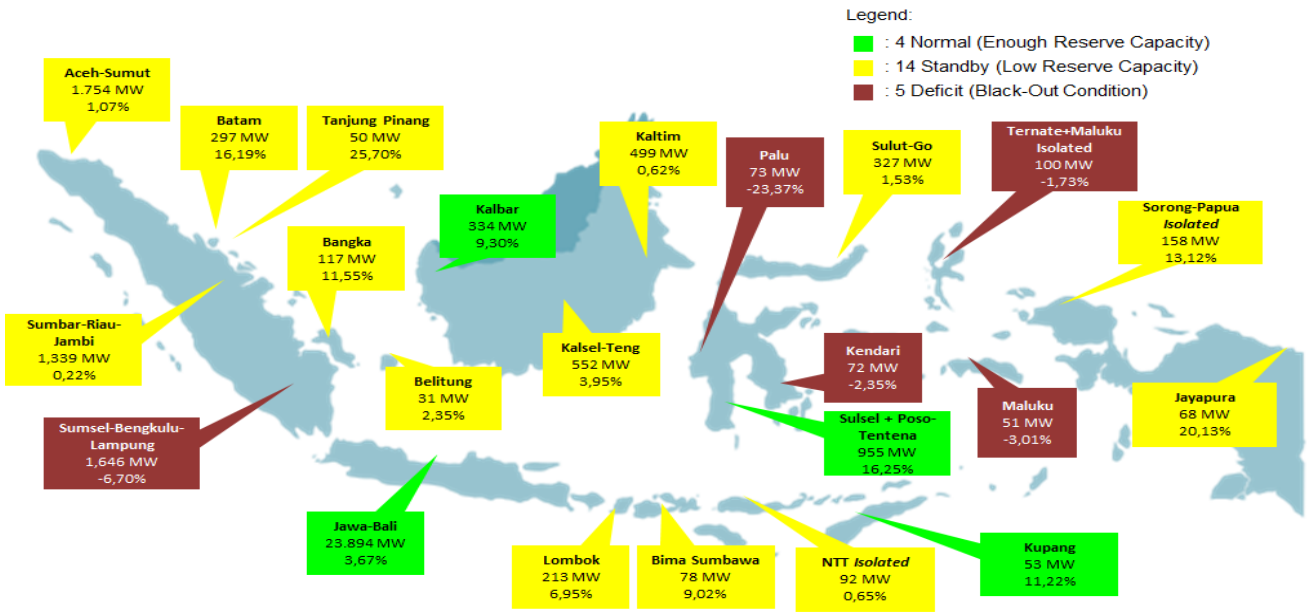
With a vast territory, the provision of electricity in Indonesia has become a challenge, especially for Eastern Indonesia, where four regions in eastern Indonesia is still experiencing power deficit, such as the city of Palu, North Maluku and Ternate, Maluku, and Kendari. It is caused by the existing installed generation capacity can not meet the needs of electric power consumption. Nevertheless, the national electric power production capacity is larger than consumption.

Figure 2. Until the end of 2015, total installed generating capacity in Indonesia amounted to 54.488 MW of which 70% of installed capacity comes from PT PLN. The remaining 21% comes from Independent Power Producer (IPP), Private Production Utility (PPU) by 4%, and Operating Permit non-fuel by 5%. In terms of energy mix, 50% of the electricity generated comes from coal power.



Source: PT PLN (Persero) June 2016, processed by PT SMI

Figure 3. Until the end of April 2016, there are five areas experiencing power deficit. There are only 4 regions with the status of normal. Therefore, the needs of additional electrical capacity especially for Eastern Indonesia is an urgency matters and can not be delayed any longer.

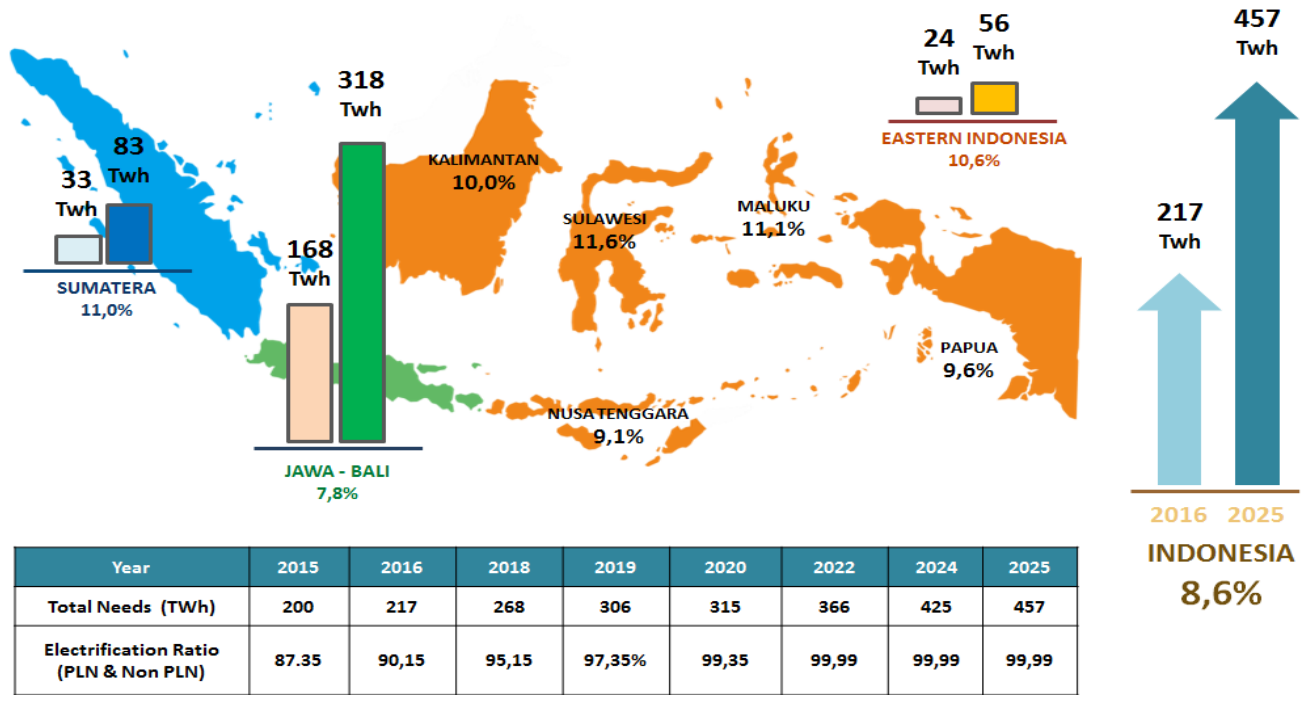


Source: PT PLN (Persero) June 2016, processed by PT SMI

Urgent Needs for Additional Capacity of 35,000 MW

In the Electricity Supply General Plan (RUPTL) 2016-2025 which is prepared by the Ministry of Energy and Mineral Resources (ESDM) it is stated that in 2025, the total need for electricity is at 457 Terra Watt Hour (TWh), or an increase in the mean average of 8.6% per year. To fulfill the needs, the Government has implemented the electricity development program for 35,000MW. The program includes the development of power plants, transmission lines, sub-stations and distribution networks. The program is to meet the economic growth of an average of 6.6% per year and electrification ratio 97.35% in 2019. This program is part of the development plan of electricity for the next 10 years that is expected to COD in 2019.

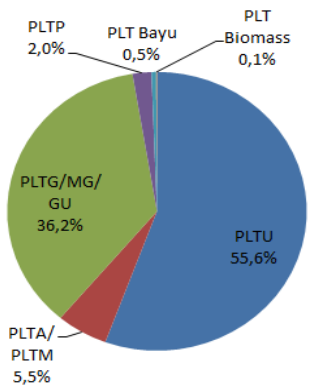
Figure 4. During the period between 2016-2025 electricity needs will increase from 217 TWh in 2016 to 457 TWh in 2025, or with average mean of increase of 8.6% per year. The region with the biggest needs are in Sumatera and Eastern Part of Indonesia with 11.0% and 10.6% per year.



Year	2015	2016	2018	2019	2020	2022	2024	2025
Total Needs (TWh)	200	217	268	306	315	366	425	457
Electrification Ratio (PLN & Non PLN)	87.35	90,15	95,15	97,35%	99,35	99,99	99,99	99,99

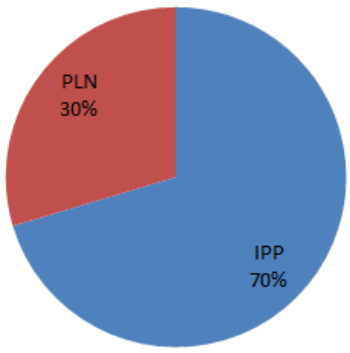
Source: RUPTL 2016-2025, processed by PT SMI

Figure 5. The largest electricity generation portion for 35,000 MW program comes from Coal Fired Power Plant (55,6%).



Source: RUPTL 2016-2025, processed by PT SMI

Figure 6. Based on Government Policy for 35,000 MW program, private sector role will be increased. IPP will contribute up to 25.068 MW or 70% of total capacity.

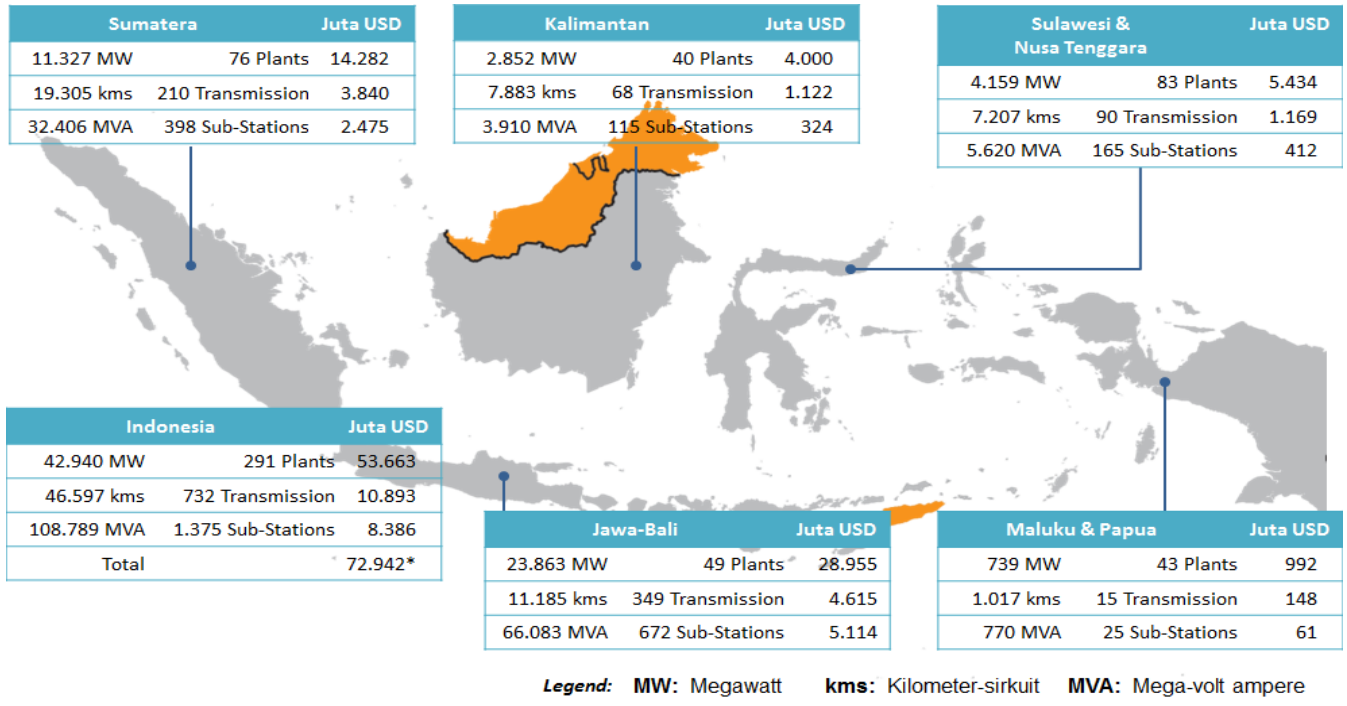


Source: RUPTL 2016-2025, processed by PT SMI

Electricity Financing Needs for 2016-2025

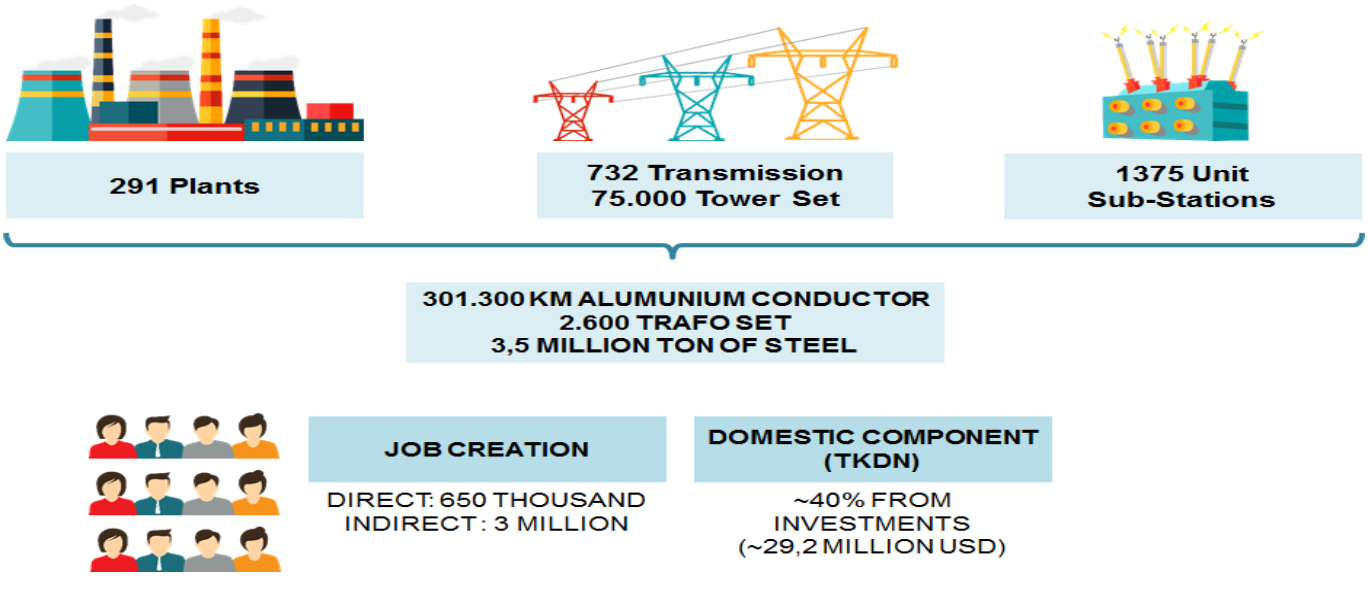
In order to finance power capacity increase of 80,539MW until 2025, according to the estimation, PT PLN need funds amounting to 72.9 billion USD (~ 984 IDR trillion). The amount does not include funds for land acquisition, interest during construction (IDC), and other taxes. The funding needs required for strengthening the Java-Bali and Sumatra power system. Up to 2025, it requires 291 new power plants, 732 new transmission lines and 1,372 substations. The project will absorb 650 thousand workers directly and 3 million indirect labors. (Ministry of Energy, 2016)

Figure 7. Total funding required for electricity provision between 2016-2015 is USD 72.9 billion where 39,69% of the total amount is required for Java-Bali System.



Source: Ministry of Energy, 2016

Figure 8. Until 2025, electricity projects shall bring economic and social benefits where direct job creation reach 650,000 and indirect labor of 3 million workers.

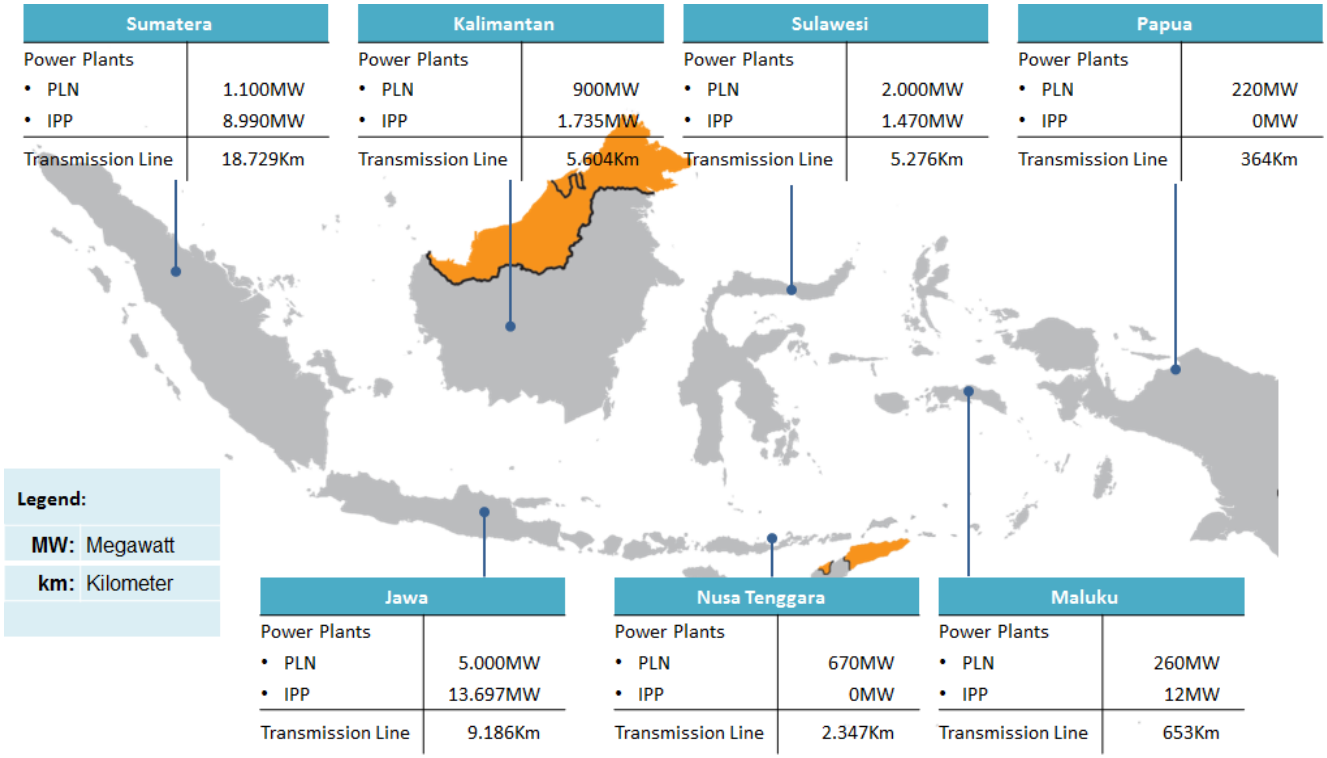


Source: Ministry of Energy, 2016

Investment Opportunities in Electricity for 2016-2025

Due to the enormous needs in the electricity sector which, according to estimates up to 2025 needed funds amounting to USD 72.9 billion (~ 984 IDR trillion), then the future role of private investors will be even greater. Out of the total electricity requirement of 80.539 MW, the share of private investors (IPP) reached 45.674 MW or 56.7% of the total demand. While PLN's share is 18,222MW, or 22.6%, and another 16.643 MW or 20.7% is yet to be allocated by the Government. As shown in Figure 9, the majority of investment opportunities for IPP are located in Java and Sumatra with respective capacity of 13.697MW and 8.990MW

Figure 9. Investment opportunities for private sector (IPP) in electricity sector are accessible along with the investment opportunities in Java, Sumatera, and Kalimantan. On the other side, the Government through PT PLN should focus in the Eastern Part of Indonesia (Sulawesi, Nusa Tenggara, Maluku, and Papua).



Source: RUPTL 2016-2025, processed by PT SMI

Figure 10. Based on the type of power generation, private sector investment opportunities (IPP) are mostly in coal fired power plants. Besides that, in line with the Government's energy mix policy, private sector opportunities are also available in Geothermal and Hydro.

Jenis Pembangkit	PLN	IPP	*Unallocated*	Total
Batubara	7.962	25.125	1.714	34.801
Geothermal	400	5.060	690	6.150
Gas/Combined Cycle	7.096	6.780	9.310	23.186
Hydro/Mini-Hydro	2.749	6.787	4.929	14.465
Lain-lain	15	1.922	-	1.937
Total	**18.222**	**45.674**	**16.643**	**80.539**

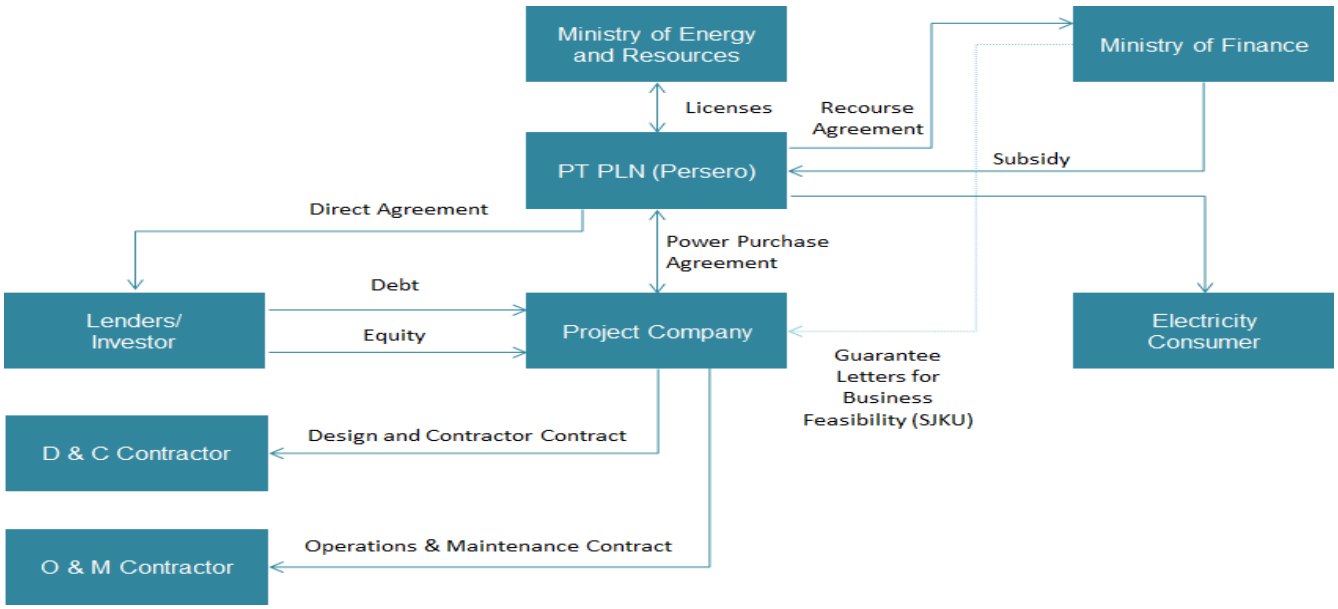
Source: RUPTL 2016-2025, processed by PT SMI

In power generation, coal fired power plants are still occupying the largest share of the needs of the supply of electricity, and it is also coupled with the magnitude of IPP opportunities for this type of generation, with total capacity of 25.125MW or 72.2% of total required coal power plants. Moreover, in line with the government policy of energy mix, IPP also have the opportunity to enter in the renewable energy sector in geothermal with opportunities 5.060MW or 82.3% of total required geothermal power plants.

Electricity Generation Financing Scheme

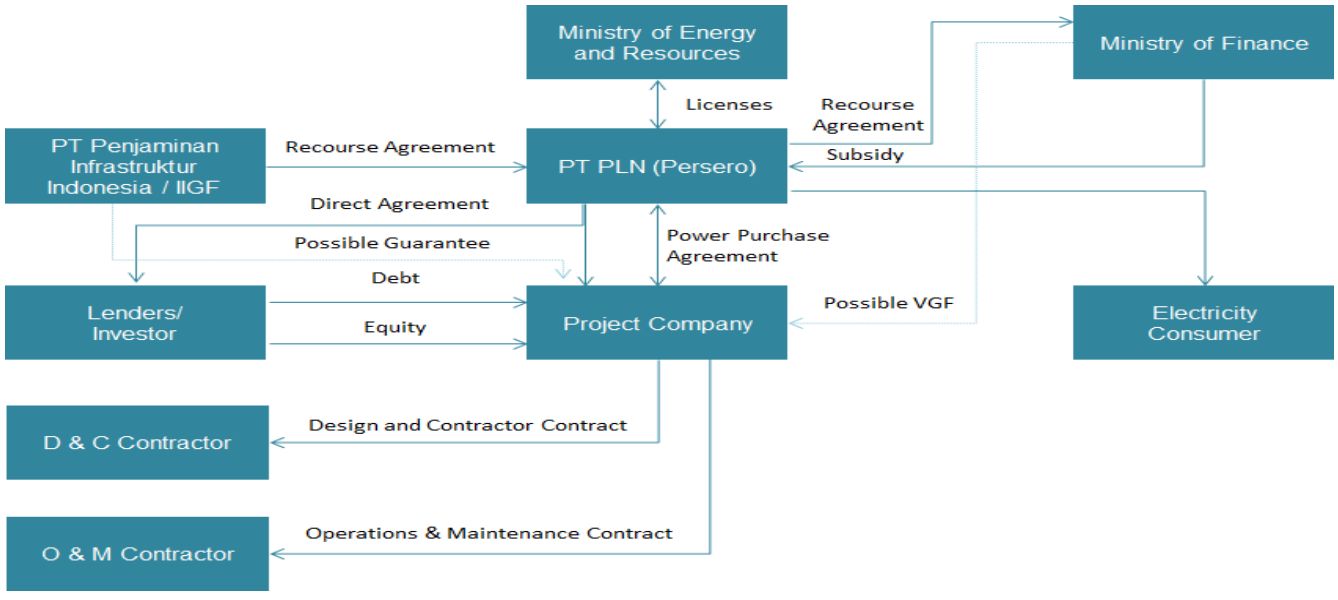
In order to speed up development of electricity infrastructure with the increase of private sector participation, there are two financing schemes, namely financing through IPP scheme and Public Private Partnership (PPP) in accordance Presidential Decree No. 38 of 2015. In the IPP scheme, the Government provides support in the form of the *boorgtocht* (full guarantee) and guarantee letters of business feasibility (SJKU). While in PPP scheme, the government provides support in the form of guarantees given by the Indonesia Infrastructure Guarantee Fund (IIGF).

Figure 11. This scheme is the collaboration between PT PLN and Independent Power Producer (IPP) supported by the Government in the form of guarantee letters of Business Feasibility (*SJKU).* SKJU is given in order to guarantee PLN's ability to fulfill its financial covenant to the project company as governed in the Power Purchase Agreement (PPA) between PLN and the project company.



Source: Ministry of Finance, 2016, processed by PT SMI

Figure 12. The following scheme is under Private Partnership Scheme (PPP) as stated in the Presidential Decree No. 38 Year 2015 which the Government provides fiscal support through IIGF in the form of viability gap fund (VGF) to increase feasibility of the project.



Source: Ministry of Finance, 2016, processed by PT SMI

Case Study: Central Java Power Plant 2x1000 MW PPP Project

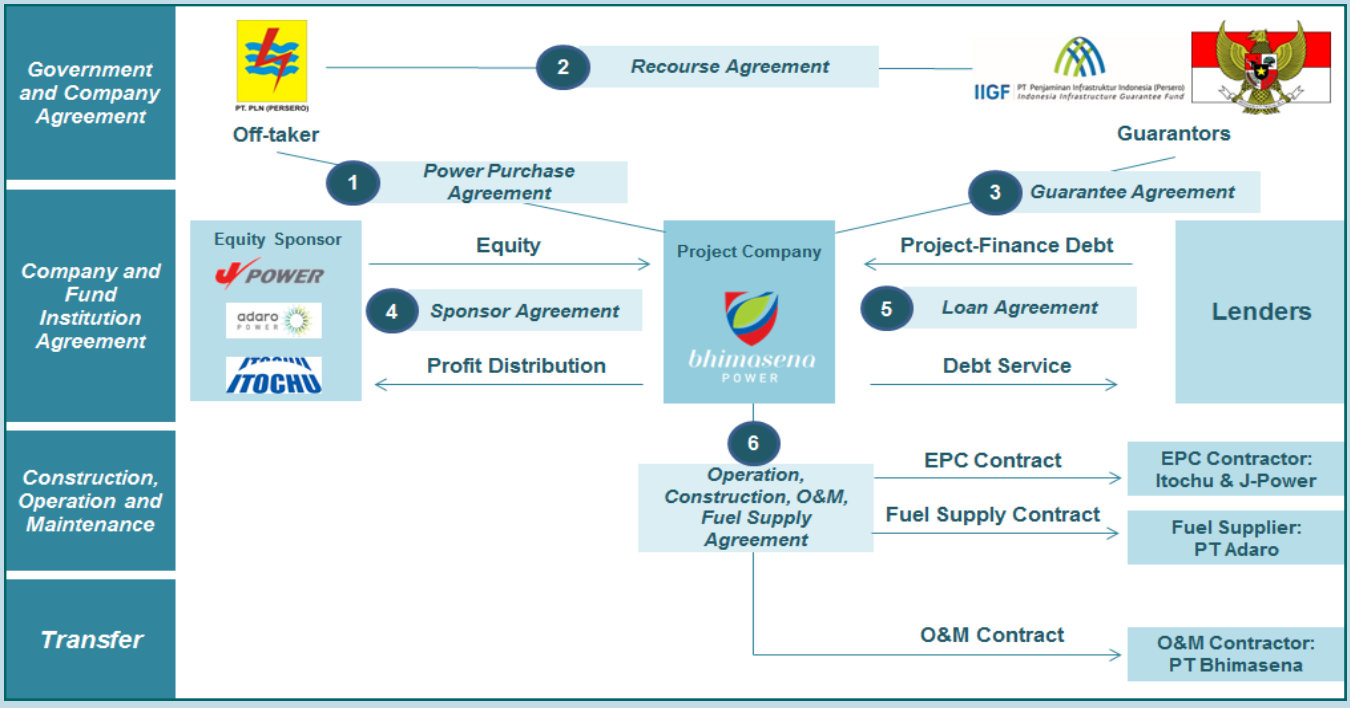
Central Java Power Plant Project is a coal-fired power plant project with a capacity of 2 x 1,000 MW located in Batang, Central Java. The investment worth USD 4 billion or more than IDR 40 trillion will be built by a consortium of PT Bimasena Power Indonesia (BPI) with Build-Operate-Transfer scheme during the concession period of 25 years. The sponsors of the project are J-Power, Adaro Power, and Itochu Corporation.

Central Java Power Plant is the first infrastructure project under PPP scheme which successfully realized by obtaining joint guarantee facility by IIGF and the Government (Ministry of Finance) in accordance with Presidential Decree No. 78/2010.

Although it was hampered by several problems such as delays in the issuance of some required permits, the completion of the environmental impact assessment (EIA) process, as well as the completion of the land acquisition for the project, in the end, Financial close the project was reached at the State Palace on June 9, 2016, witnessed by the President of the Republic of Indonesia Joko Widodo, Minister coordinator of Economic Affairs as Chairman of the Committee for the Acceleration of Infrastructure Provision Priority (KPPIP), National Development Planning Minister, Minister of Finance, Minister of Energy and Mineral Resources, the Minister of State-Owned Enterprises and the Minister for Agricultural and Spatial Planning.

Coal fired power plant 2x1.000 megawatt (MW) received funding from the Japan Bank for International Cooperation (JBIC) and several syndication of international commercial banks to PT Bhimasena Power Indonesia (BPI) as the project company. With the achievement of the project's Financial Close, the project can immediately resume construction to achieve the completion target.

Figure 13. Central Java Power Plant (CJPP) 2x1000 MW is the first project with PPP Scheme in Indonesia for electricity sector. With the financial close, it is hopeful that more power and utilities projects will be able to use similar scheme.



Source: Ministry of Finance, IIGF, PT BPI, edited

Government Support in Electricity (Presidential Decree No.4/2016)

To accelerate the provision of electricity, the Government in regards to this matter the President, has issued a decree of President of the Republic of Indonesia Number 4 Year 2016 on the Acceleration of Infrastructure Development of Electricity in where the Government provides supports to PT PLN in order to improve its funding capacity, with these following form of supports:

1. Article 6 of the Presidential Decree:

a. State equity participation;
b. Loan channeling from the Government borrowing from overseas and / or domestic;
c. Loan PT PLN (Persero) from financial institutions;
d. Granting exemption from income tax in the event of asset revaluation; and / or
e. Other funding in accordance with the provisions of the legislation.

2. Article 7 of the Presidential Decree:

In the implementation of the loan by PT PLN (Persero) as referred to in Article 6 paragraph (1) letter c, the Central Government provides government guarantees against payment obligations of PT PLN (Persero). Government guarantee referred to in paragraph (1) is a full guarantee on the payment obligations of PT PLN (Persero) to the lender.

Electricity Provision Challenges

1. System connection and synchronization between capacity and demand needs to be prioritized since planning and the needs to be continuously evaluated.
2. Land acquisition takes 488-742 days (Law 2/2012) and the resolving of the conflicting regulations.
3. Licensing requires alignment and acceleration by the Central Government and the Regions.

Key Success Factors of Electricity Programs

1. Government Support

a. Government Guarantee for PLN to obtain more efficient funding
b. Strengthening PLN's balance sheet through capital injection and profitability through tariff restructurisation
c. Central and Local Government support for land acquisition, permits, and primary energy.

2. PT PLN's Internal Readiness

a. Human capital and organization strengthening to manage and execute programs, including decision-making acceleration
b. Good implementation of program management
c. Complete program milestones as planned

3. Business Environment Readiness

a. Business environment readiness, such as contractor, IPP, supplier, consultant, lenders, and communities.

Appendix: Total Energy Capacity Needs (MW)

Tahun	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Jumlah
PLN											
PLTU	1.822	251	1.294	1.945	500	150	0	0	0	2.000	7.962
PLTP	0	0	65	105	55	0	55	0	40	80	400
PLTGU	0	1.280	2.650	150	0	0	0	0	0	0	4.080
PLTG	409	1.301	759	150	177	160	20	10	0	30	3.016
PLTD	0	0	0	0	0	0	0	0	0	0	0
PLTM	0	6	2	63	5	0	0	0	0	0	76
PLTA	0	0	88	284	22	77	187	446	251	277	1.632
PS	0	0	0	1.040	0	0	0	0	0	0	1.040
PLT Lain	13	0	0	0	1	1	0	0	0	0	15
Jumlah	2.244	2.838	4.858	3.737	760	388	262	456	291	2.387	18.221
IPP											
PLTU	1.205	773	2.103	15.223	4.001	921	300	300	300	0	25.126
PLTP	85	350	255	485	525	450	285	935	750	940	5.060
PLTGU	0	35	4.200	1.350	0	0	250	0	0	0	5.835
PLTG	350	83	476	20	10	6	0	0	0	0	945
PLTD	0	0	0	0	0	0	0	0	0	0	0
PLTM	32	72	112	229	76	86	196	26	257	201	1.287
PLTA	45	57	87	73	118	254	230	1.351	980	2.305	5.500
PS	0	0	0	0	0	0	0	0	0	0	0
PLT Lain	179	279	346	266	308	63	46	129	30	276	1.922
Jumlah	1.896	1.649	7.579	17.646	5.038	1.780	1.307	2.741	2.317	3.722	45.675
Unallocated											
PLTU	0	0	0	7	47	710	100	400	200	250	1.714
PLTP	0	0	0	0	0	0	0	0	460	230	690
PLTGU	0	0	0	0	0	0	800	260	4.340	3.600	9.000
PLTG	0	0	0	0	21	88	125	16	10	50	310
PLTD	0	0	0	0	0	0	0	0	0	0	0
PLTM	0	0	0	0	0	0	0	0	0	0	0
PLTA	0	0	0	8	8	0	222	75	350	1.368	2.031
PS	0	0	0	0	0	0	0	450	450	2.000	2.900
PLT Lain	0	0	0	0	0	0	0	0	0	0	0
Jumlah	0	0	0	15	76	798	1.247	1.201	5.810	7.498	16.645
Total											
PLTU	3.027	1.024	3.397	17.175	4.548	1.781	400	700	500	2.250	34.802
PLTP	85	350	320	590	580	450	340	935	1.250	1.250	6.150
PLTGU	0	1.315	6.850	1.500	0	0	1.050	260	4.340	3.600	18.915
PLTG	759	1.384	1.235	170	208	254	145	26	10	80	4.271
PLTD	0	0	0	0	0	0	0	0	0	0	0
PLTM	32	78	114	292	81	86	196	26	257	201	1.363
PLTA	45	57	175	365	148	331	639	1.872	1.581	3.950	9.163
PS	0	0	0	1.040	0	0	0	450	450	2.000	3.940
PLT Lain	192	279	346	266	309	64	46	129	30	276	1.937
Jumlah	4.139	4.487	12.437	21.398	5.873	2.965	2.816	4.398	8.418	13.607	80.538

Source: RUPTL 2016-2025