Developments in the Indonesian power sector

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April 2016

THE LANTAU GROUP
strategy & economic consulting

Agenda

Introduction to The Lantau Group

Regional context within ASEAN

Indonesia

- Overview
- Supply and demand fundamentals
- The role of fuels
- Renewable energy
- Regulation and policy
- Financing and competition

Summary

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Summary

Who we are

Electricity and Gas Experts

Competition, Markets, Regulation, Policy

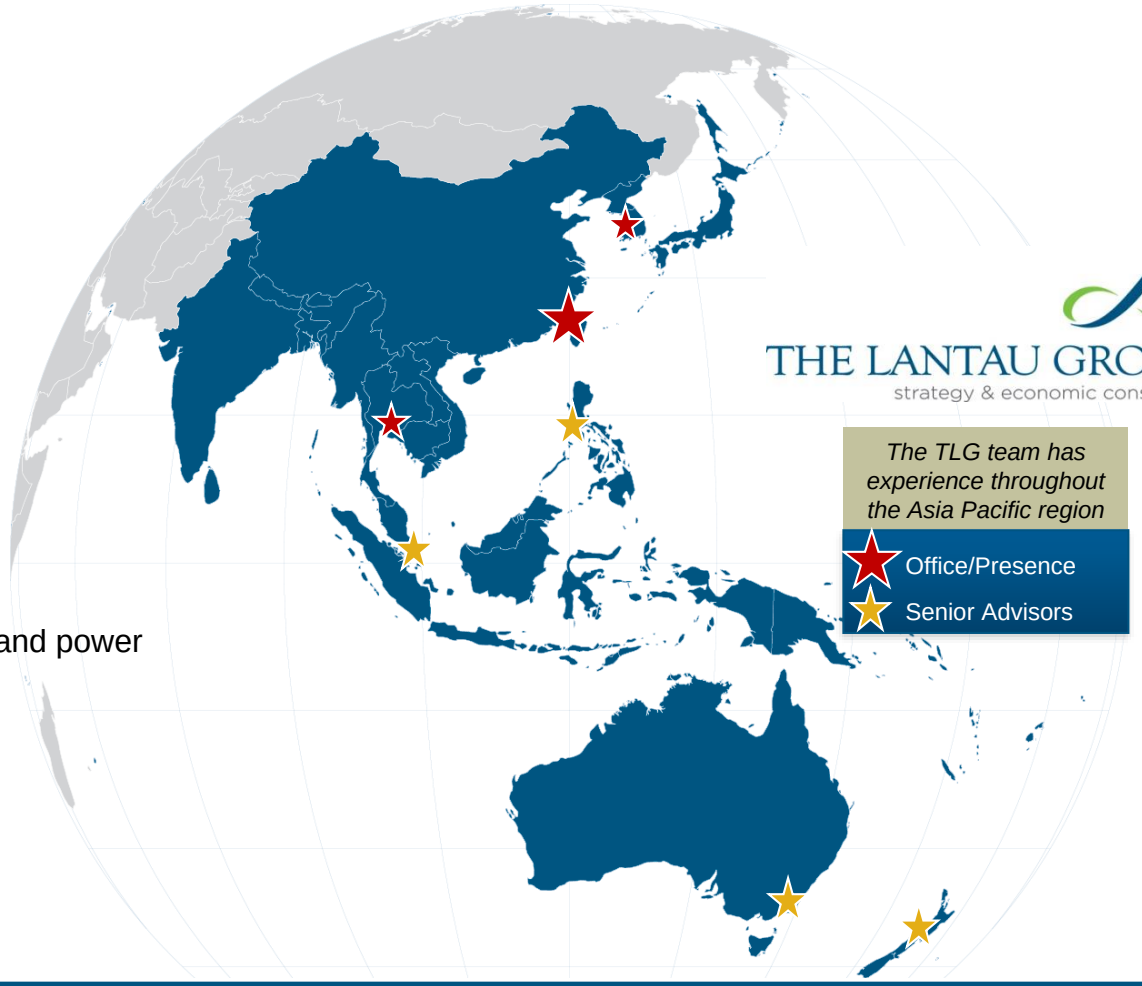
Decisions Support Analysis | Disputes

Market Analysis | Asset Valuation

Strategy and Advanced Analytics

Offerings:

- Strategic, commercial, and regulatory support
- Ability to connect the dots between fuel markets and power
- Analysis-based recommendations
- Highly relevant international experience
- Accessible experts focussed on the region



Deeply experienced economic consulting firm to the energy sector based in Asia

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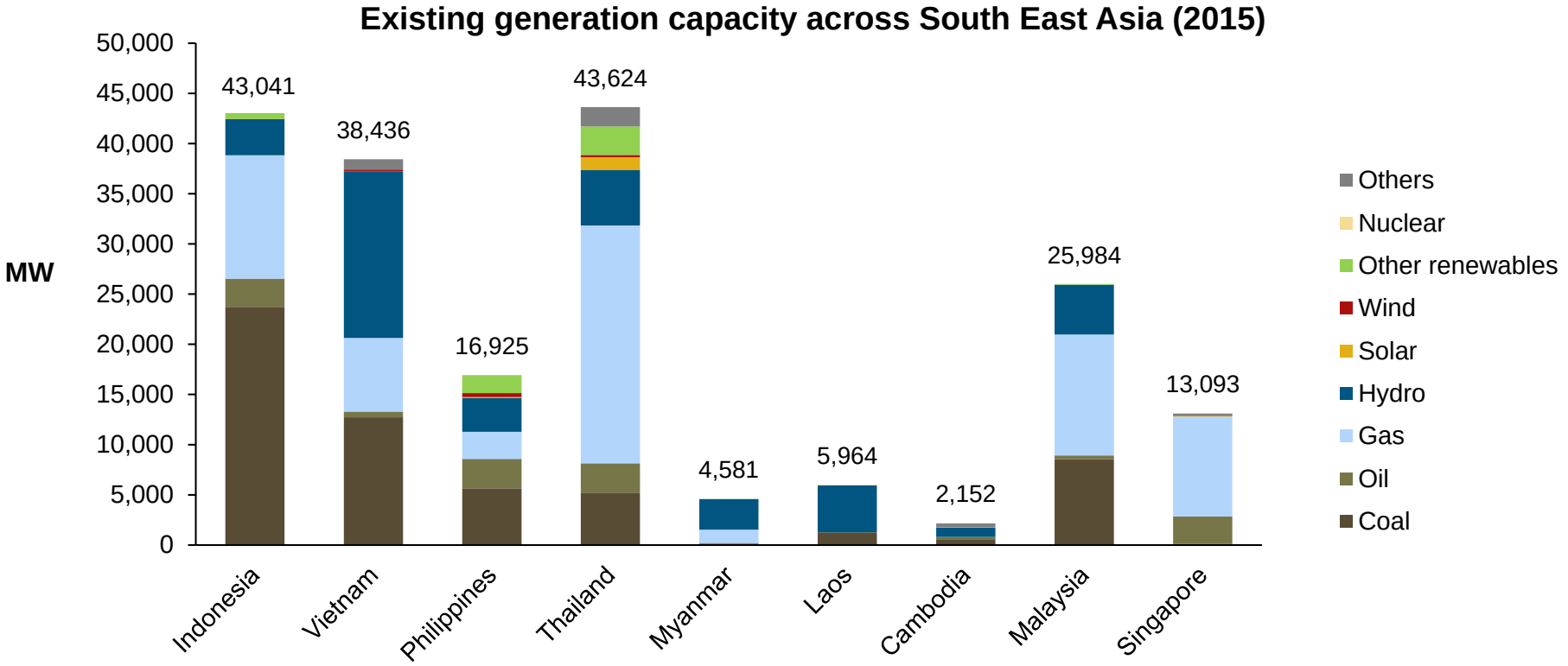
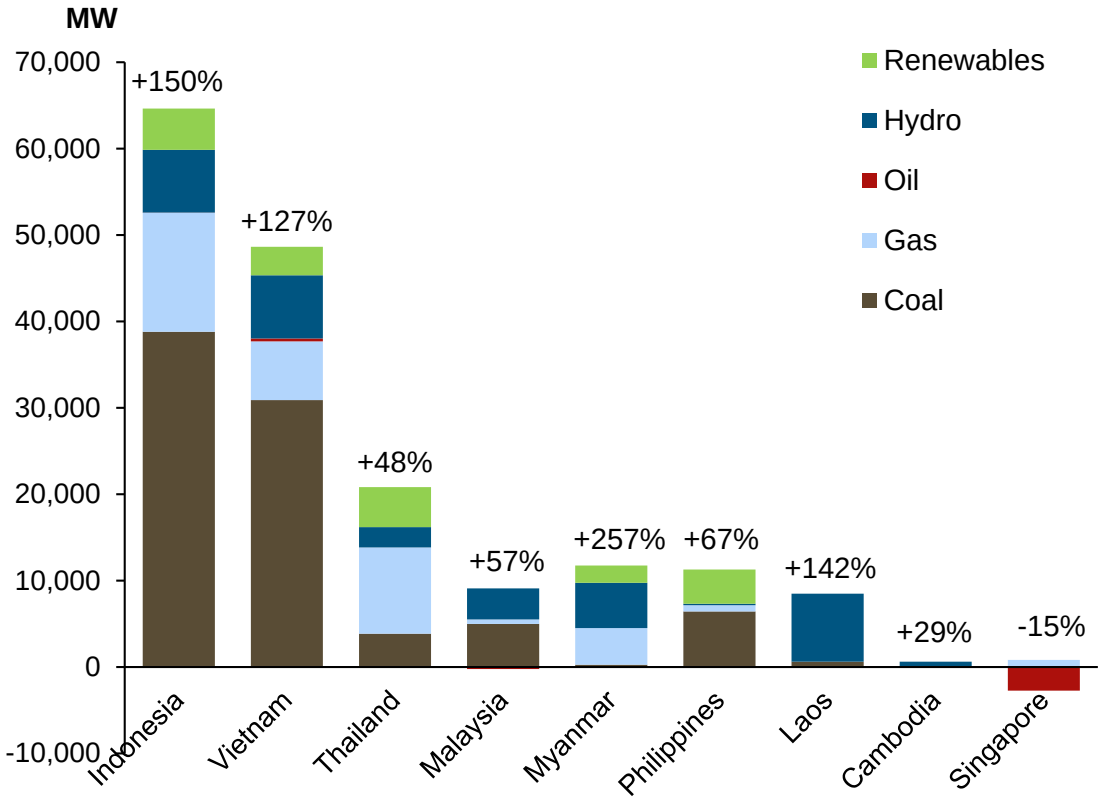
Across the ASEAN region, installed capacity is dominated by both gas-fired and coal-fired generation, with Indonesia having one of the largest fleets

- Indonesia (alongside Thailand) ranks as having the largest amount of installed generation capacity, of which over half is coal-fired plant
- The role of gas generation in South East Asia has been predicated on a history of cheap gas with countries needing to find use for their domestic gas resources



Indonesia is also the standout contributor in terms of capacity additions across the ASEAN region, in which installed capacity is forecast to double overall

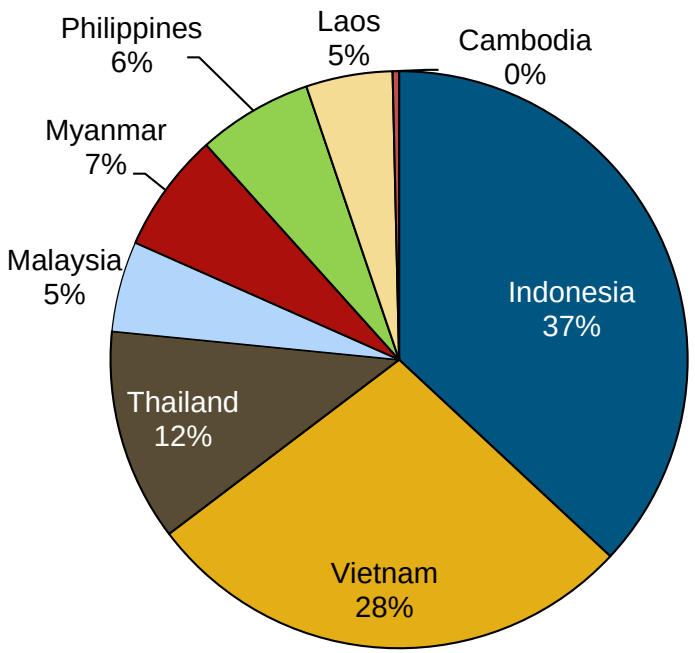
Capacity addition by technology (2016-2025*)



*ASEAN countries include Indonesia, Philippines, Thailand, Vietnam, Malaysia, Singapore, Cambodia, Laos and Myanmar

*Cambodia forecast is only available through 2020, Indonesia forecast is through 2024.

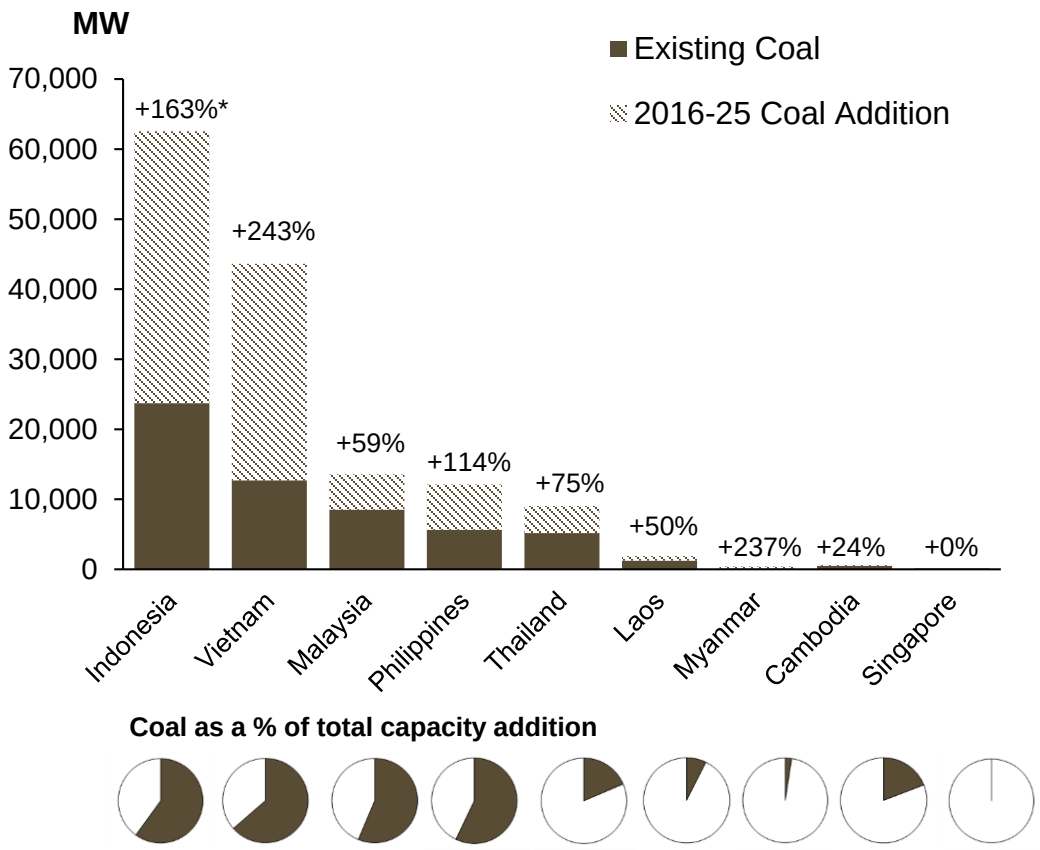
Capacity addition by country (2016-2025)



Source: TLG research and analysis

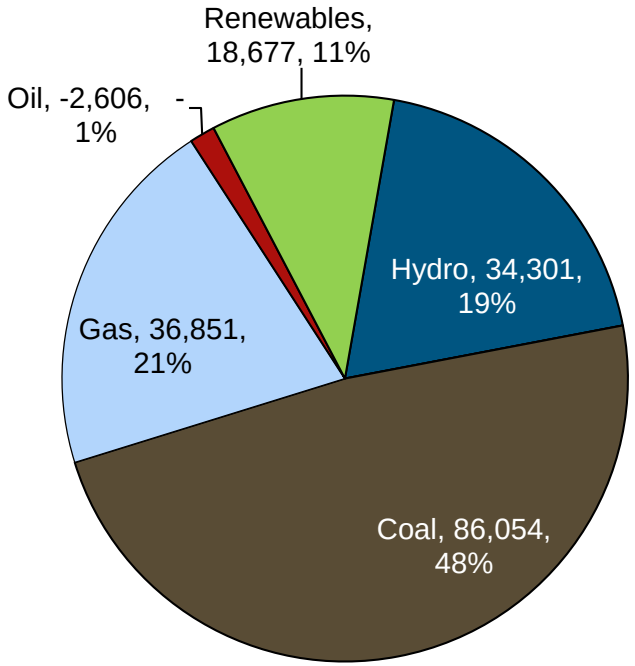
Capacity additions in ASEAN are set to total 170 GW by 2025. Coal-fired plant will account for nearly half, with **Indonesia** alone seeing a 39 GW increase

ASEAN coal existing and capacity addition 2016-25



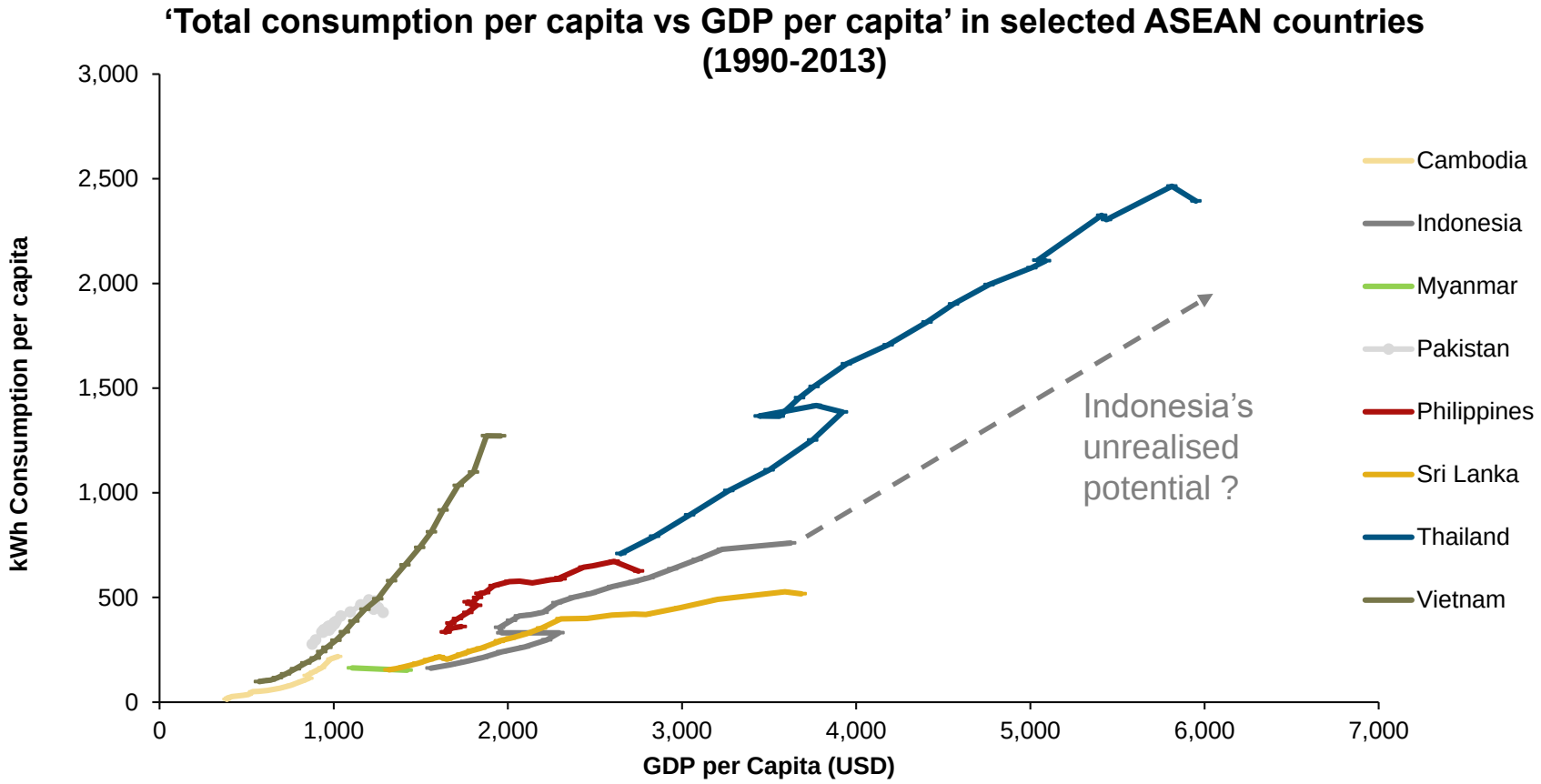
*% represents total percentage increase of coal capacity in the next 10 years

ASEAN change in generation capacity mix (2016-2025)



Demand growth in many South East Asian nations is yet to be fully realised

- In 2014, Indonesia's power consumption level was only 800 kWh/capita, equating to around only one third of that seen in Thailand and thus highlighting the potential for acceleration



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Indonesia is the largest economy in SE Asia, spanning a vast archipelago and with a population of over 250 million dispersed across more than 1,000 islands

Installed capacity (Sept 2014)	43,457 MW + 3,640 MW rented *(33,499 MW Java-Bali, 6,166 MW Sumatra, 3,842 East Indonesia)*
Peak demand (2015)	27,061 MW (Java-Bali)
Generation (2014)	196,400 GWh
Generation fuel mix (2013)	Coal: 51% Gas: 27% Geo: 5% Hydro: 8% Diesel: 9% Other: 1%
Reform law	Electricity sector reform attempts stalled in 2004
Wholesale market	Perusahaan Listrik Negara (PLN) is the sole buyer
Retail market	PLN is the sole supplier
Independent regulator	None *Regulated by the Ministry of Energy and Mineral Resources*
Consumption per capita (2014)	800 kWh
Electrification (2012)	81% (32% in rural areas)
Private sector participation	Stalled attempts to develop a PPP program

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Indonesia has robust demand fundamentals that are beginning to outstrip GDP growth

- Indonesia has strong, albeit slowing, GDP growth of over 6% pa. in 2010 – 2012, falling to 4.7% pa. in 2015. The country also has a low debt/GDP ratio
- Electricity demand is set to outstrip GDP growth, due to a growing transmission infrastructure and rising household incomes
- Latest demand forecasts project an 8.7% per annum increase in consumption 2025, including a steep rise from 199 TWh in 2014 to 307 TWh in 2019

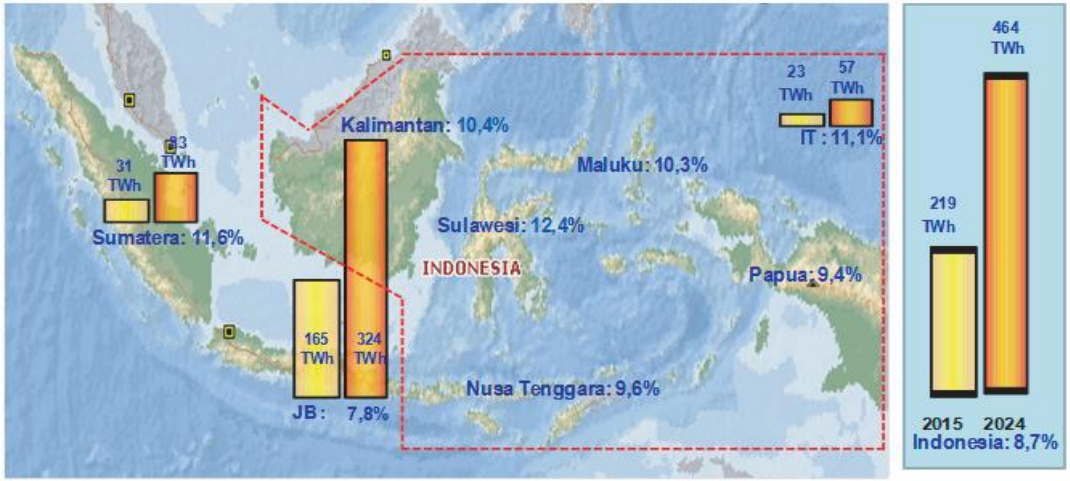
Significant power demand growth is expected, especially across Java-Bali

- Between 2015-2025, demand is expected to grow by 8.7% per year, rising from 219.1 TWh to 464.2 TWh
- PLN's customers will rise from 60.3 million in 2015 to 78.4 million by 2022, an increase of 2.2 million per annum
- Demand growth between 2015-2025 is set to be most pronounced in regions that will experience the largest advances in electrification
  - Java-Bali

    65.4 TWh rising to 324.4 TWh (+7.8% pa.)
  - East Indonesia

    22.6 TWh rising to 57.1 TWh (+11.1% pa.)
  - Sumatra

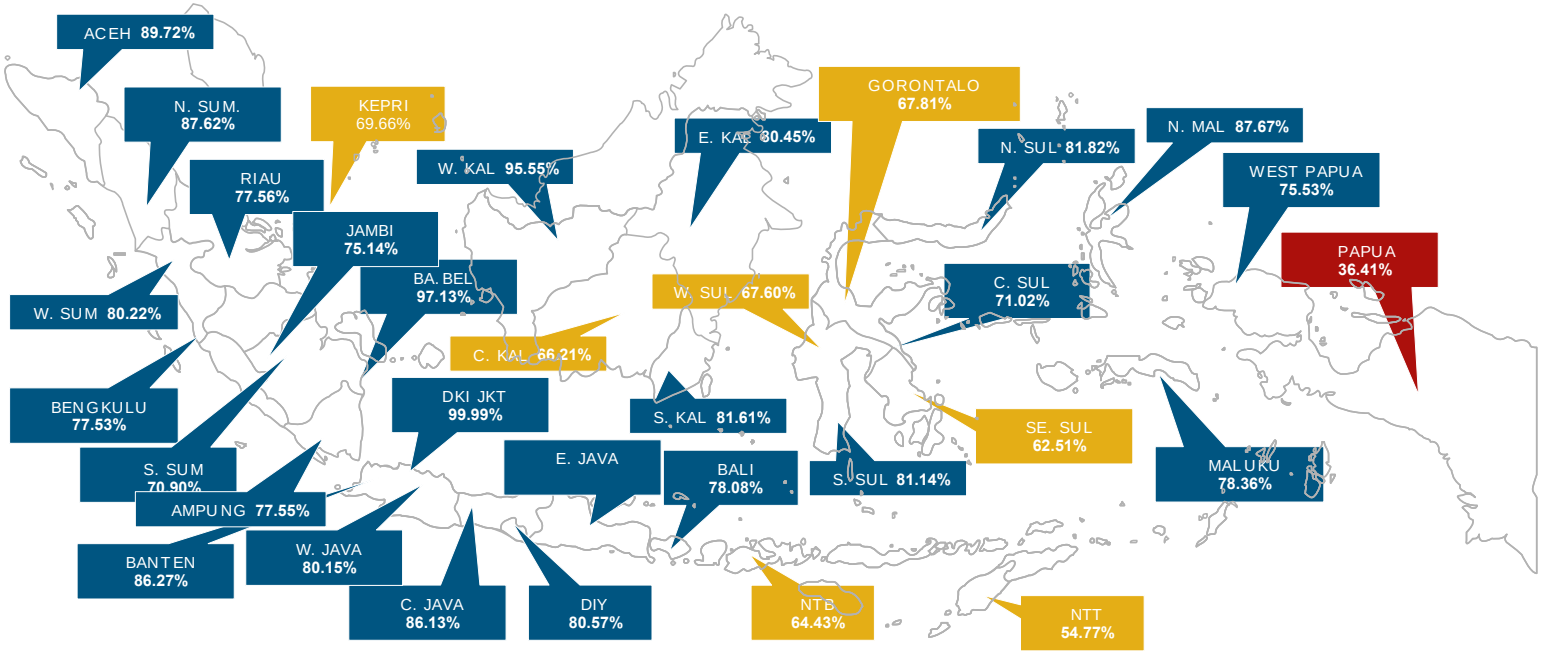
    31.2 TWh rising to 82.8 TWh (+11.6% pa.)



Source: PLN RUPTL 2015-2024

Yet many regions within **Indonesia** are still without electricity supply

- Indonesia's overall electrification is currently between 81-85%, but falls to 32% in rural areas. The government has set out to achieve 100% electrification by 2025
- Indonesia has a lack of installed capacity per capita MW and low electrification rates, particularly in rural areas where over 50 million are without public electricity. System reliability is also poor
- Indonesia's geography, with over 7,000 islands of which ~ 1,000 are inhabited, makes it difficult to supply electricity effectively. Only Java-Bali, Sumatra and Kalimantan are sufficiently large for a 'normal' grid-based approach

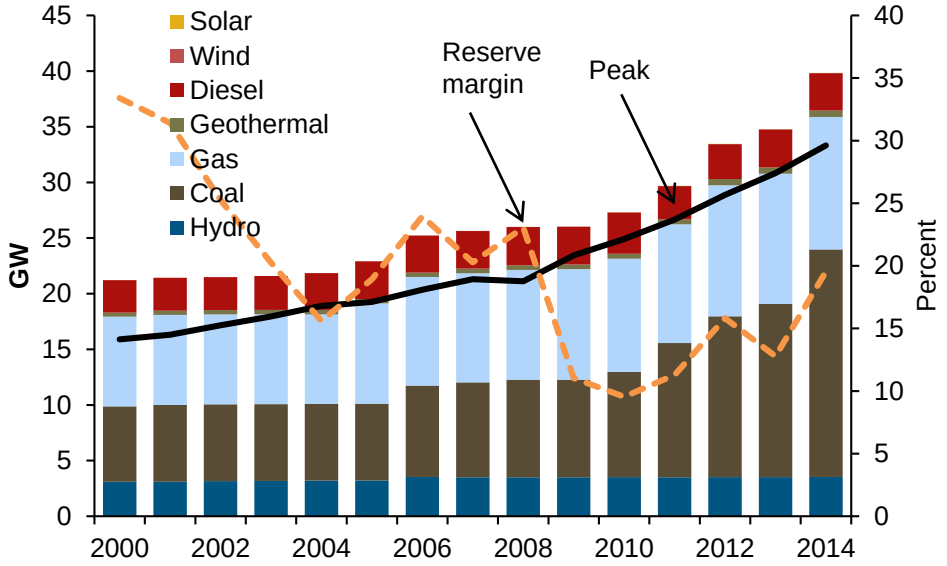


Source: Energy White Paper (2015)

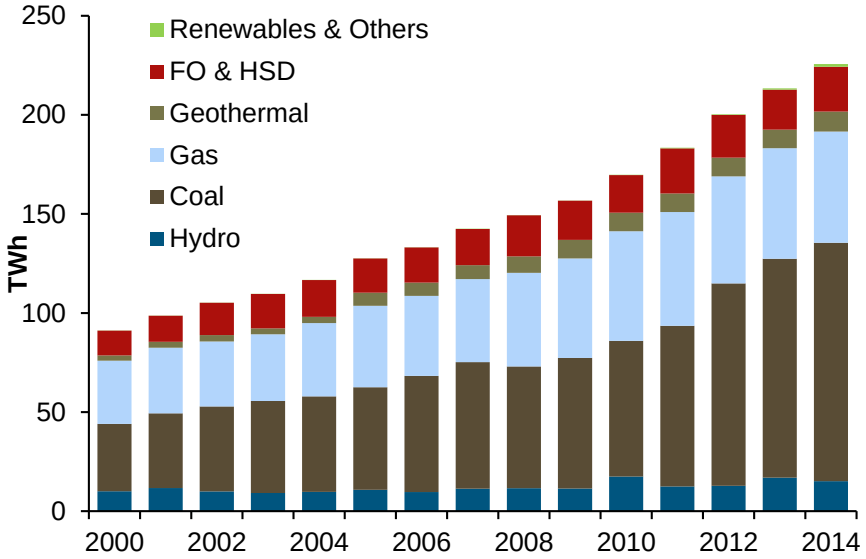
Historic capacity, peak, reserve margin and generation

- The share of coal-fired and gas-fired plant has grown significantly, accounting for around 80% of total installed capacity as of 2014
- Fuel oil and diesel generation is largely used in smaller plants that serve remote locations on islands outside of the Java-Bali and Sumatra-Batam regions
- Very little hydro has been added over the past 15 years, and despite the large potential for geothermal there have been negligible capacity additions

Historic capacity, peak, and reserve margin



Historic generation by fuel type



Severe under-capacity is leading to power outages in numerous locations

Power outages are commonplace

- Java-Bali are the only provinces with any reserve margin, yet in recent years there have still been problems with the operation of coal-fired plant, including serious over-loading of transformers and voltage drops
- The electricity system in Sumatra operates without backup for most of the year, experiencing frequent shortfalls in supply, leading to extensive use of diesel fuel plants
- Severe shortages (and the use of diesel generation) also occur in West Kalimantan, East Kalimantan, South Kalimantan, Southeast Sulawesi, Minahasa-Gorontalo, Palu, Lombok, Ambon, Ternate and Jayapura

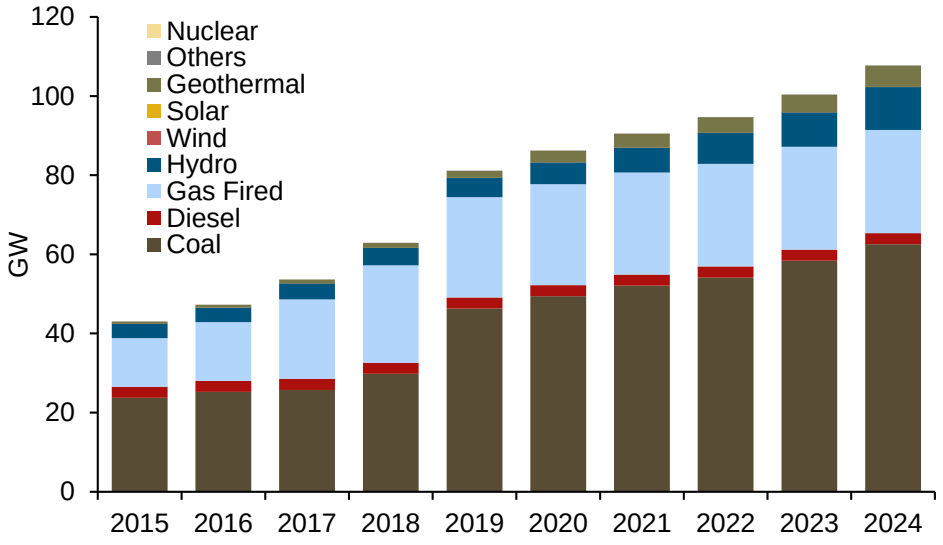
Recent policy responses have included

- RUPTL (PLN's plan) requires LOLP of less than 0.274%. Required reserve margin 35% (installed capacity) for Java-Bali, 40% elsewhere. Hence large additional capacity is required
- Rental of generation capacity, purchasing the electricity from small-scale IPPs, purchasing excess power from private companies
- Short-term fixes to transmission system for Java-Bali:
  - Acceleration of the procurement of 150/20 kV transformer and 500/150 kV interbus, an addition of generating capacity in Bali, an acceleration of the commissioning of submarine cables in Java-Bali 150 kV circuits 3 and 4 and an installation of shunt capacitors in the Jakarta system to improve voltage levels

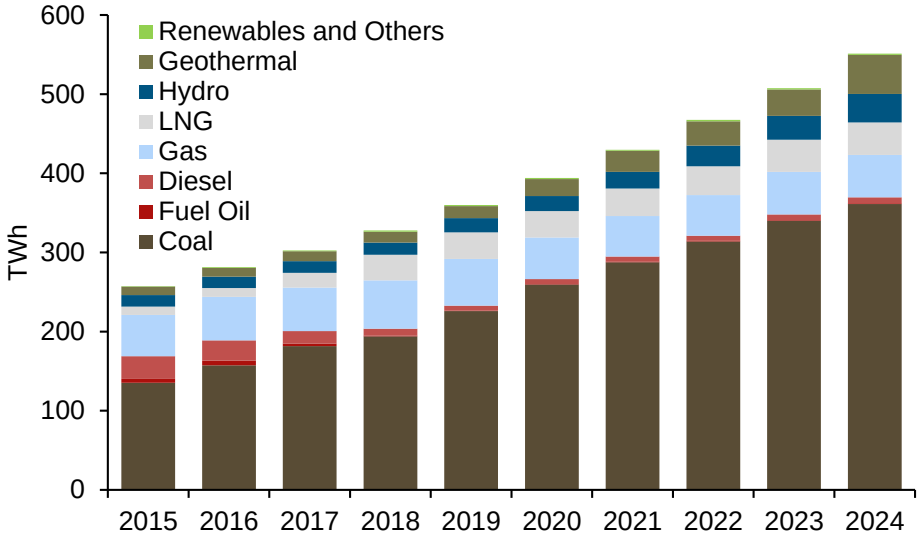
Planned capacity additions equate to around 7 GW per annum, with coal playing an ever-increasing role in the generation mix

- Coal is set to dominate the generation mix going forward, although previous delays to coal capacity additions have sometimes required the fast development of CCGTs to fill in shortfalls
- Java-Bali will is forecast to experience the largest growth in capacity at 38.5 GW, followed by West Indonesia (17.7 GW) and East Indonesia (14.2 GW)
- Gas-fired generation will remain relatively flat, although an increase in LNG-fired plant is seen. Diesel generation that is used on smaller islands will transition towards gas-fired plant
- Geothermal capacity is set to rise, although the rate of build is hindered by resistance from the PLN to pay high feed in tariffs, as well as issues with permitting. Other renewables do not feature significantly, due to low fee in tariffs, and project sizes being typically small

Installed capacity

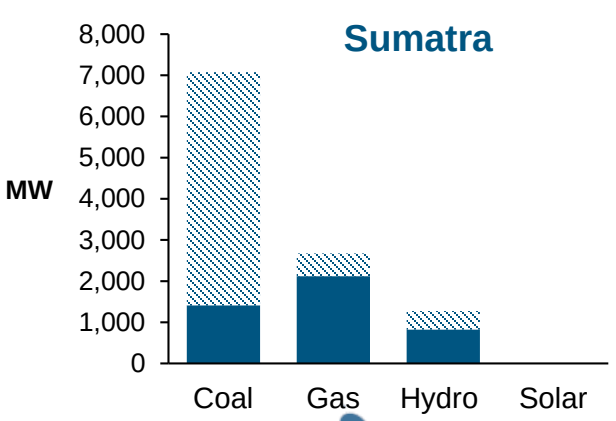


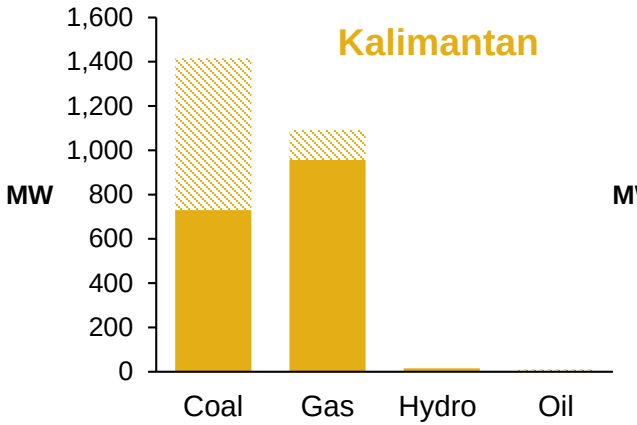
Generation mix

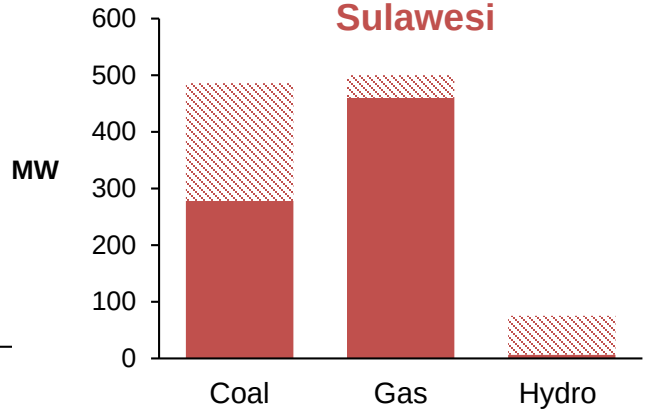


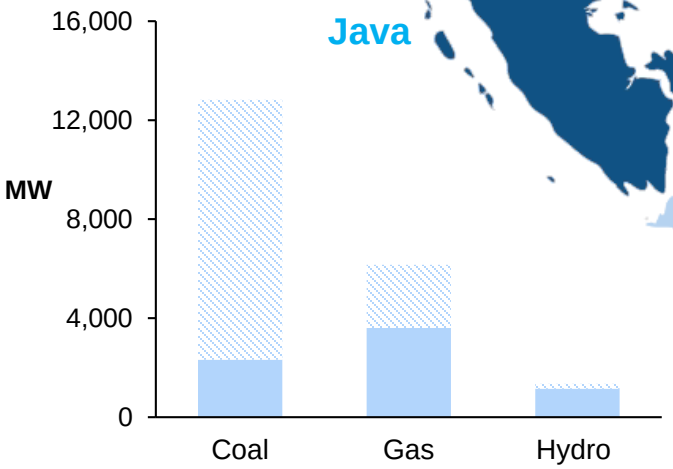
Source: PLN RUPTL 2015-2024

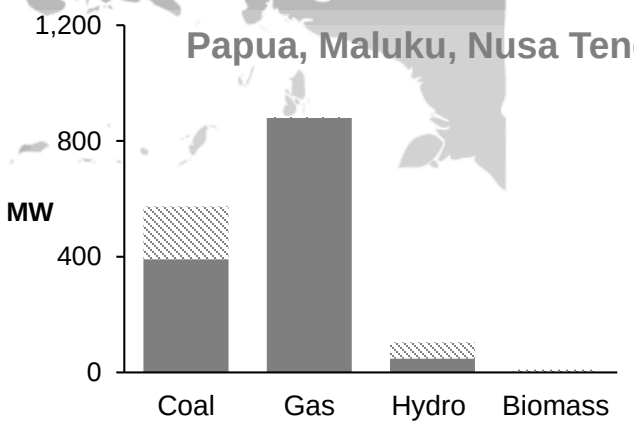
Java-Bali and Sumatra remain the focus of 35 GW of planned capacity additions





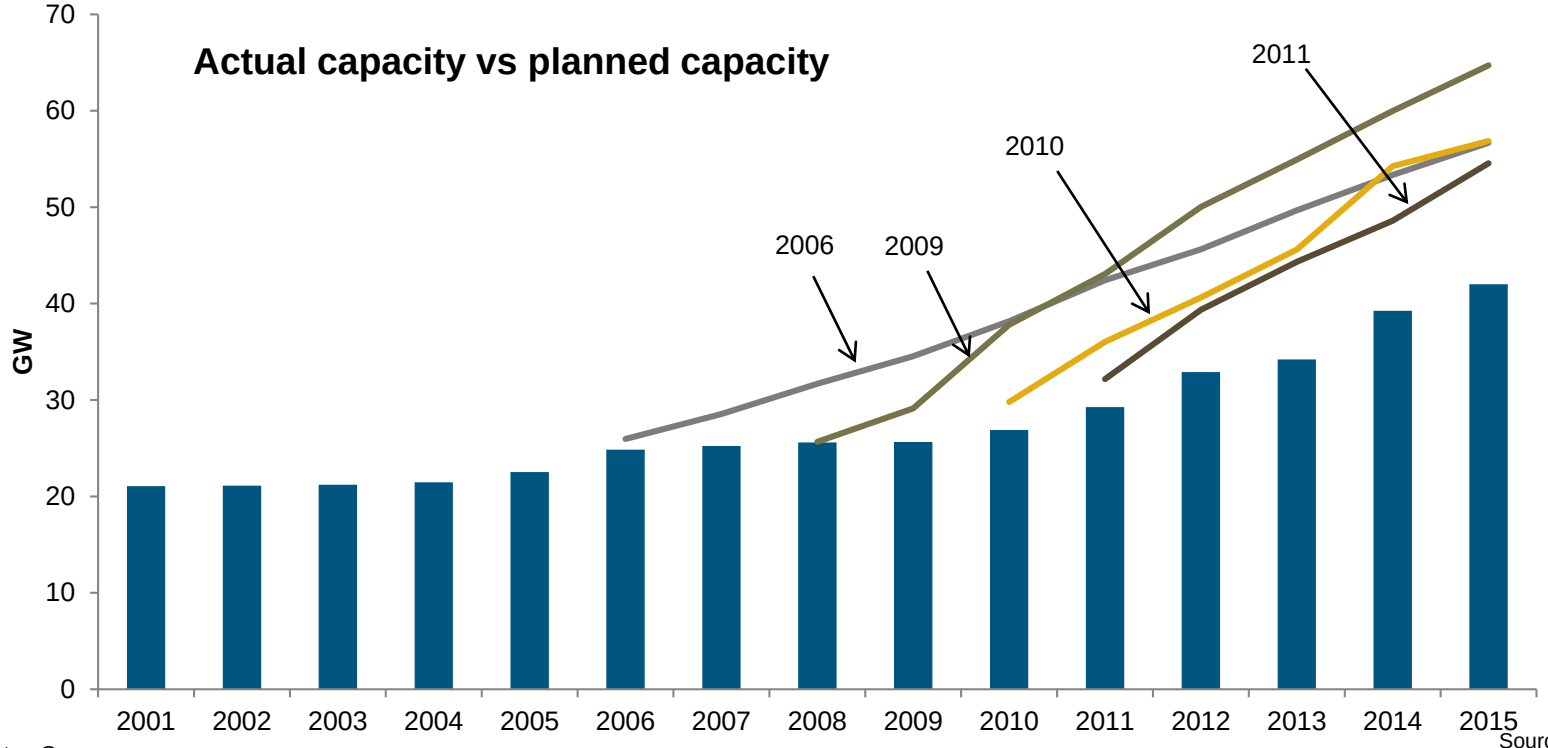






However, Indonesia has a track record of setting ambitious targets for new build… but failing to meet them

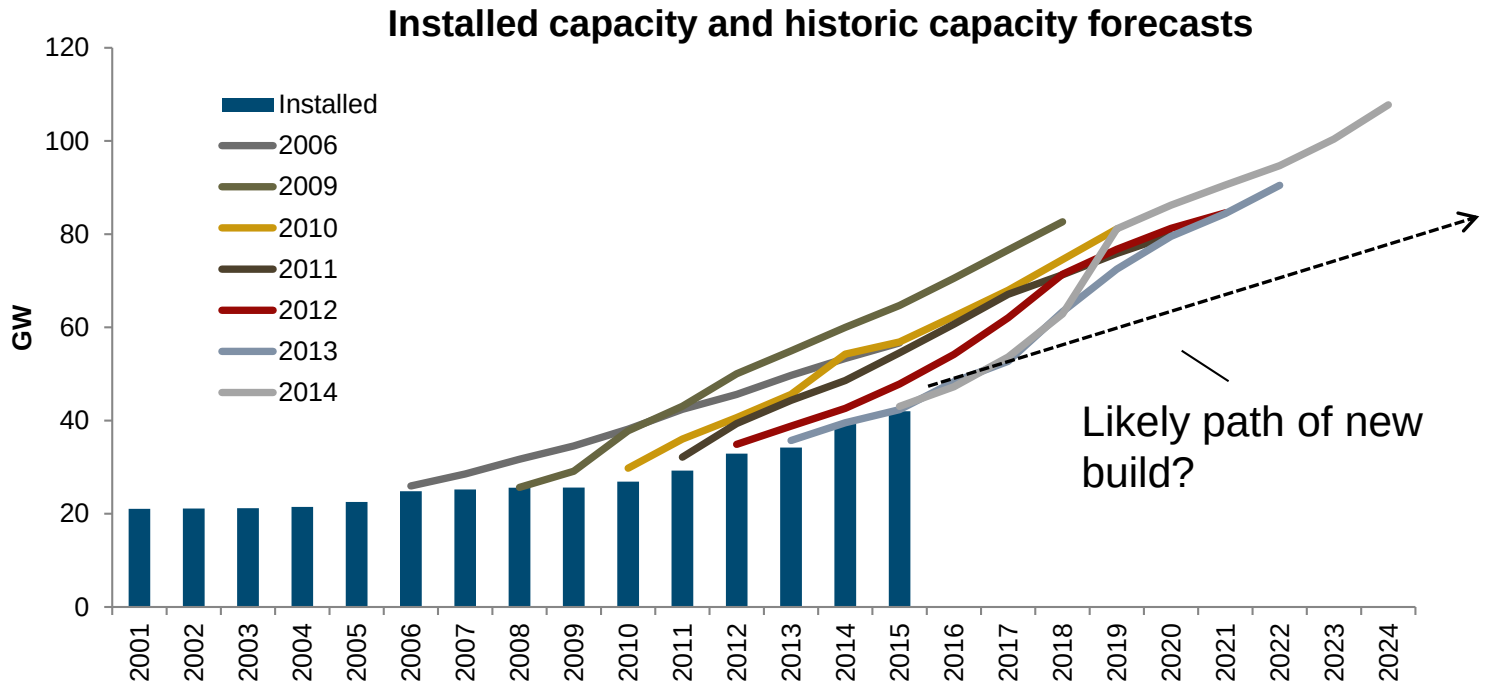
- The effects of delays to capacity additions has been two-fold; unserved load has remained unserved, whilst new CCGT plant has been built on the PLN's existing sites in a rush to meet demand growth – particularly on Java
- Indonesia's 'Fast Track 1' program had intended to add nearly 10,000 MW in coal-fired plant by 2010, of which nearly 7,000 MW was targeted for Java-Bali, however much of this generation ended up being four to five years behind schedule



Source: RUPTLs, TLG analysis

Future plans for capacity additions appear to be equally ambitious, and private investors into the Indonesian power sector should be braced for delays

- Delays have stemmed from large amounts of ‘red tape’ and the fact that PLN is not seen as a creditworthy off-taker – as such, Letters of Guarantee are required from the Ministry of Finance, which have to be changed each time there is a change in the PPA
- Of the 35 GW of planned capacity additions targeted by 2019, some 16 GW of tenders have been delayed and so far in 2016 no PPAs have yet to be signed



Source: RUPTLs, TLG analysis

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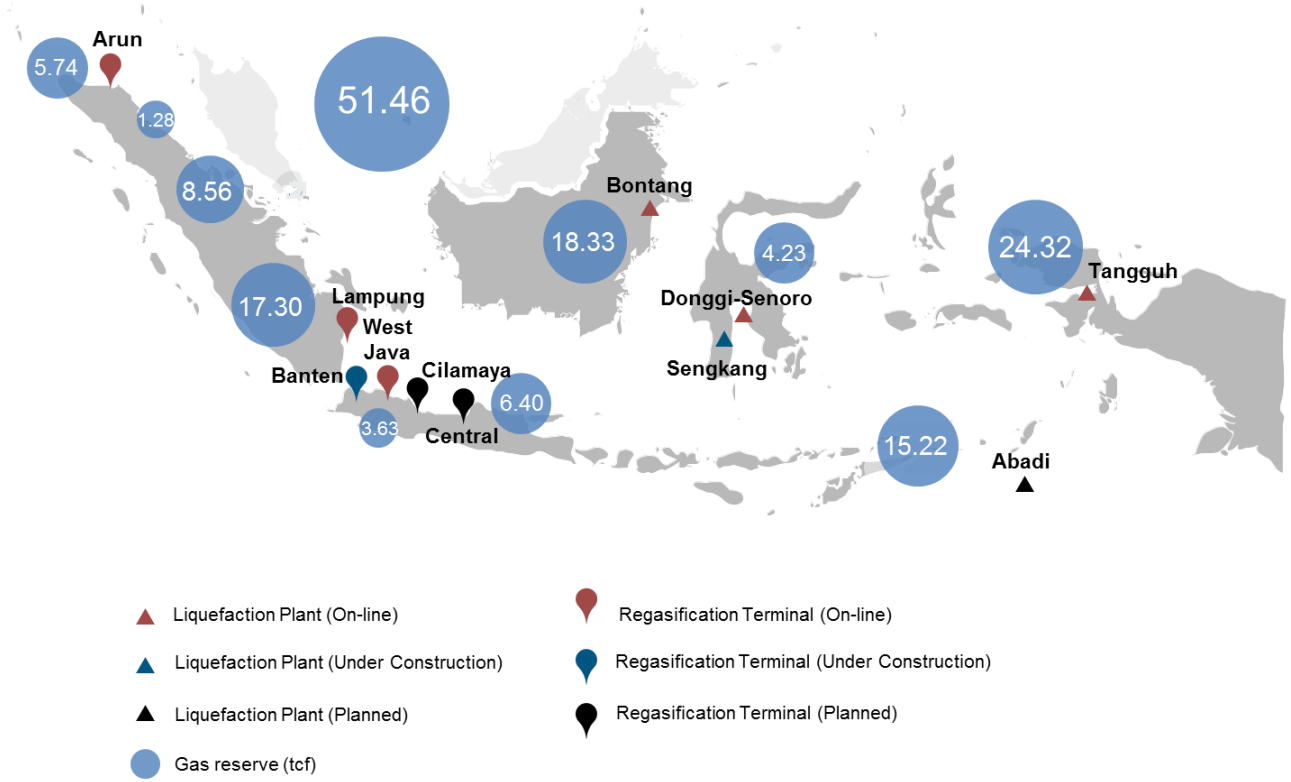
Despite Indonesia's significant reserves of conventional gas, these are under-utilised and located far from end-user demand

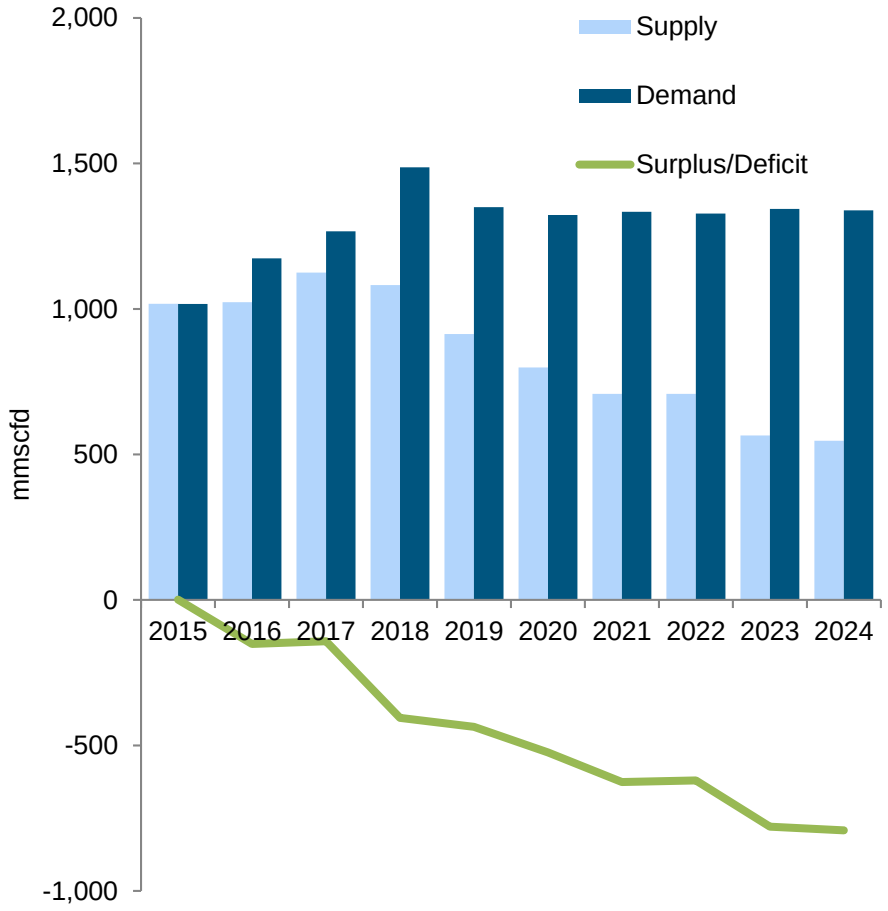
- Most of Indonesia's gas are located far away from the main domestic demand centre of Java-Bali, in many cases requiring transportation as LNG. In addition, long-term export contracts have limited domestic supply
- Many gas pipelines are not being developed due to a lack of supply guarantees, whilst institutional and regulatory bottlenecks are hampering domestic gas making it to market
- Further construction of LNG plants and more feed-gas into existing LNG plants (in addition to new receiving terminals) is needed to cope with expected increases in gas demand

Proven reserves (Tcf)	Potential reserves (Tcf)	Total reserves (Tcf)
103.35	47.35	150.7



Java-Bali is set for a significant supply gap between contracted gas and demand

Java-Bali Gas Demand vs. Contracted Supply



- Some of the supply gap is likely to be filled by as yet uncontracted proven gas in West Java and South Sumatra. Imported or domestic LNG is also likely to play a key role
- More expensive gas may shift gas-fired CCGTs higher up the merit order and lowering capacity factors as a result
- That said, power transmission constraints in West Java have tended to require that gas fired plant run at capacity factors higher than would be the case were transmission not a barrier to the flow of power

The full potential of Indonesia's domestic gas supplies has not been fully realised, leading to a greater use of more expensive imported LNG

Supply	• Despite having very large reserves and resources of conventional and unconventional gas, Indonesia is very slow in getting this gas proven up and delivery to end users. Much of this is blamed on 'red tape' in the upstream business and constant regulatory changes. The proof of this was Pertamina contracting for 1.42 mmtpa of LNG from Corpus Christi in the USA with deliveries starting in 2019. Moreover Pertamina has contracted with TOTAL for up to 1 mmtpa starting in 2020. What this means is that the average and marginal gas prices are higher than would be the case if domestic supplies were properly brought to market.
Piped gas	• Pipeline gas supply tends to be at a starting price plus a escalation for inflation. It is likely that an IPP would have to purchase the gas via an intermediary of aggregator such as Pertagas, PGN. Due to institutional failure the official view is that supplies of piped gas are on a general decline.
LNG	• Domestic market obligation on gas in remote LNG plants without much of a local market has resulted in LNG arriving at the main load centre of Java. Two FSRUs have been completed so far for Java and Arun on Sumatra was re-engineered into an onshore terminal. The development of FSRUs is the one part of infrastructure that appears to be built relatively fast and on time. Several large existing and new LNG sources of supply are being held up by a lack of an extension to their PSCs, or changes to their plan of development by the government.
CBM	• The initiative to monetize the nation's large resources of CBM has been a large disappointment. This offered the chance for Indonesia's CBM revolution (mirroring the US's shale gas experience). Unfortunately rules and regulations substantially hindered exploration and development.

Several large domestic gas and LNG projects have experienced delays

TOTAL - Offshore Mahakam

- TOTAL's Offshore Mahakam PSC near Kalimantan expires in 2017. The upstream regulator has finally, after close to ten years of petitioning by TOTAL for an extension, awarded a new PSC covering the same acreage to Pertamina. The uncertainty has hampering investment decisions that would have sustained or lifted gas production. Given its substantial proven reserves, the Offshore Mahakam PSC could provide significant volumes in future. At its peak, this PSC produced close to 2,600 mmcfd or 20 mmtpa but has now declined to 9 mmpta.

Chevron - Indonesia Deepwater Development

- Chevron's Indonesia Deepwater Development (IDD) involves four blocks: Ganal, Rapak, Makassar Strait, and East Kalimantan. The first one expires in 2018, the next in 2020, the two expire in 2027/2028. Chevron is seeking an extension on the first two PSCs. The plan of development for the IDD was approved as far back as 2008, but the budget has not been approved.

Inpex - Maesela

- The Abadi FLNG project might have questions over its currently projected 2021 start up. The Masela block PSC is due to expire in 2028, and, combined with the high 40 percent DMO, raises doubts over the economics of such a large scale project. Seven years is a very short time scale for an expensive project to make a return. Just recently the President ordered that the project should be onshore rather than offshore, raising further concerns on timing and viability of the project.

DMO LNG

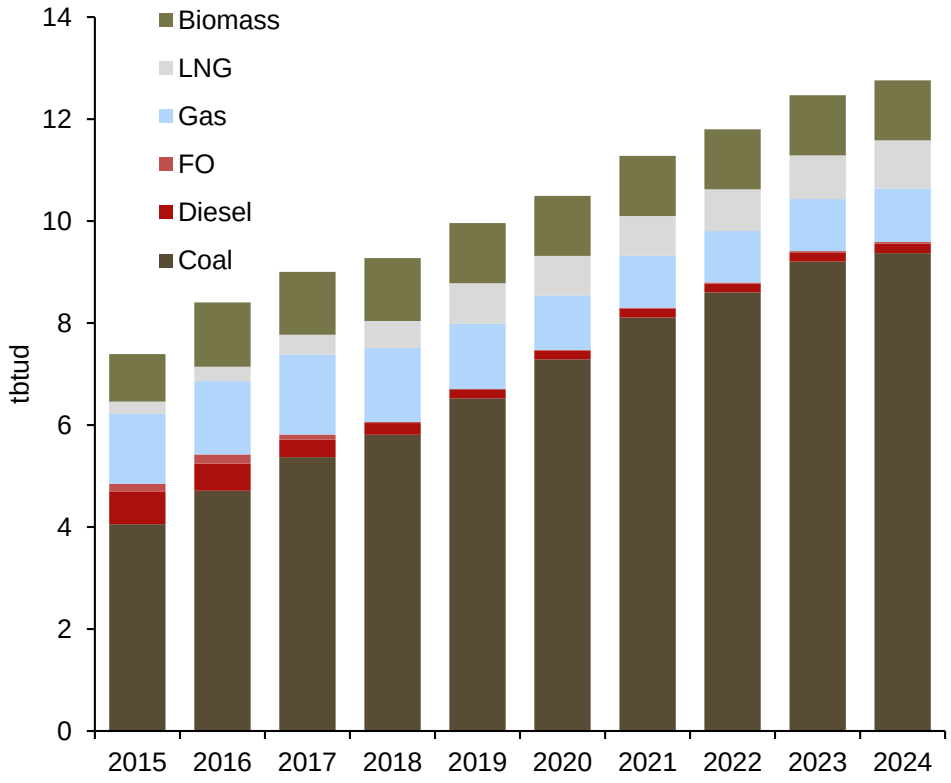
- The above three project have the potential to supply close to 3,250 mmscfd of sales gas, and assuming that 35 percent was allocated as DMO, then this equals 1,130 mmscfd of gas or 8.5 mmtpa of LNG. But all of that supply is subject to substantial delays. This probably means Indonesia will need to make a call on global LNG supplies at a higher cost than domestic gas.

Indonesia has abundant domestic coal reserves, however the poor ability of the domestic market to absorb supply has led to around 77% being exported

Plentiful domestic coal	• There is no shortage of coal on Kalimantan and Sumatra (coal mining is banned on Java). The nation has proven reserves of 28 billion tonnes and potential resources of 120 billion tonnes, and produced 362 million tonnes of which 67 were used domestically
Domestic market obligation on coal	• The government has always had a right to physically take part of the coal production for domestic use, but in the past, it simply took cash payments in lieu. That is starting to change with the stricter implementation of a higher DMO for coal in order to conform to National Energy Plan.
DMO coal price set by benchmark	• Domestic Market Obligation (DMO) coal is negotiated mine by mine and is paid according to the Indonesian Coal Reference Price. This reference price is below the export price, however, and thus disincentivises coal production to an extent
Supply interruptions	• Occasionally supplies from Kalimantan to Java are interrupted by rough seas and so enough storage capacity should be designed into any coal fired IPP project
Sumatra-Java HVDC and mine mouth coal	• PLN has a plan to import electricity generated by mine-mouth coal plant by cable from South Sumatra to Java in 2016, which given a few years slippage, might happen by 2018. This would further entrench coal as the base load fuel on Java-Bali

Utilising domestic coal resources in future planned additions to generation capacity is a key means by which Indonesia is reducing the exposure of its coal mining industry to export markets

Indonesia's generation is projected to see substantial increases in coal, gas, and LNG, alongside a steep fall in use of diesel and fuel oil



- The increase in coal generation will tap into Indonesia's large coal reserves
- LNG taking an increasing share of the natural gas supply. Some domestic LNG and some imported
- Fuel oil and diesel gradually phased out (in steam units) as gas supplies increase and infrastructure is built-out
- Biomass is likely to suffer due to lack of long term supplies

Source: PLN RUPTL 2015-2024, Table 1, converted by TLG

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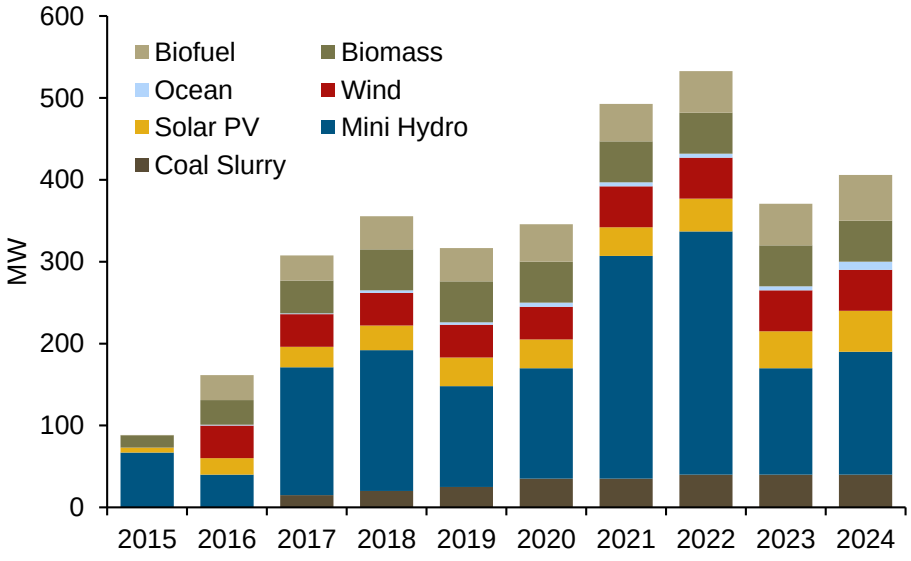
Indonesia's vast potential for renewables has yet to be fully realised, and if optimally utilised could displace significant amounts of fossil fuel generation

- Non-hydropower renewables currently provide about 12.9 TWh out of 240 TWh total (5.4%), most of which is geothermal
- Despite significant resource potential, RE capacity from other technologies capacity stands at a meagre 88 MW, and is projected to expand to 3.4 GW by 2024 under plans drawn up by PLN*.
- There is a large potential for geothermal and new projects are underway, notably the 240 MW Rantau Dedap Geothermal Project in South Sumatra developed by Supreme Energy, GDF SUEZ and Marubeni Corporation. Most of the other projects in the pipeline are small and typically 30 MW to 40 MW in scale.
- Solar may be a viable solution for local electrification and distributed generation in less developed regions, however it is still in its infancy.
- Wind is similarly under-developed despite favourable conditions in the south of Sulawesi.

Renewable source	Estimated potential
Hydro	75.0 GW
Geothermal	28.8 GW
Solar	58.1 GW
Biomass	49.8 GW
Wind	9.3 GW

Projected renewable capacity additions (excl. hydro and geothermal)



Source: BMI
* PLN RUPTL 2015-2024

Thus far RE development has been hindered by institutional, policy, and regulatory issues, although PLN's latest plans are set to target ambitious growth

Impediments to renewables developments

- Implementation dependent on PLN, which has limited or capability incentives to develop renewables fast
- Indonesia's geography and lack of development of transmission system makes integration difficult
- Corruption, bureaucracy, and difficulties with permits and land acquisition all make projects difficult
- Main load is on Java, which has limited hydro and insufficient space for major solar

Recent positive developments

- Electricity prices being raised towards cost-reflective levels
- There is increased focus on decentralised off-grid projects as solution to improving electrification
- Auction mechanism has been introduced, with new FIT for solar
- UK has expressed an interest in investing $4 billion in Indonesian renewables (mostly solar and tidal)
- Focus on PLN performance, with increased pressure from government

PLN's plans for 2016-2025 *(currently under review by the Government)*

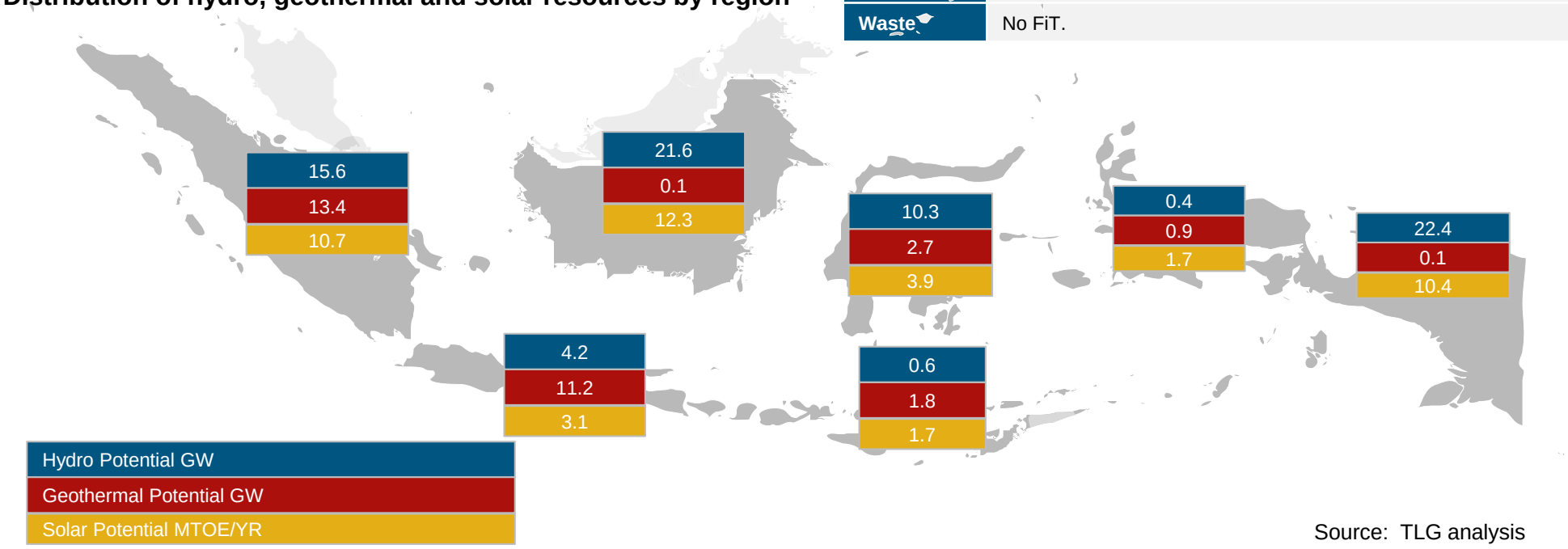
- Strong lobbying from environmental groups is likely to see an increased emphasis on RE
- Reported to target renewables achieving an ambitious 25% share of the national energy mix by 2025
- Yet it is unclear how binding this target will be, as PLN will look to make up any shortfall with natural gas
- Clean coal technology is also planned for Sumatra

The introduction of Feed-In Tariffs is beginning to unlock Indonesia's vast renewable energy potential

- Quotas for feed-in tariffs generally range from 100MW - 200MW at present, with the exception of geothermal which has no quota

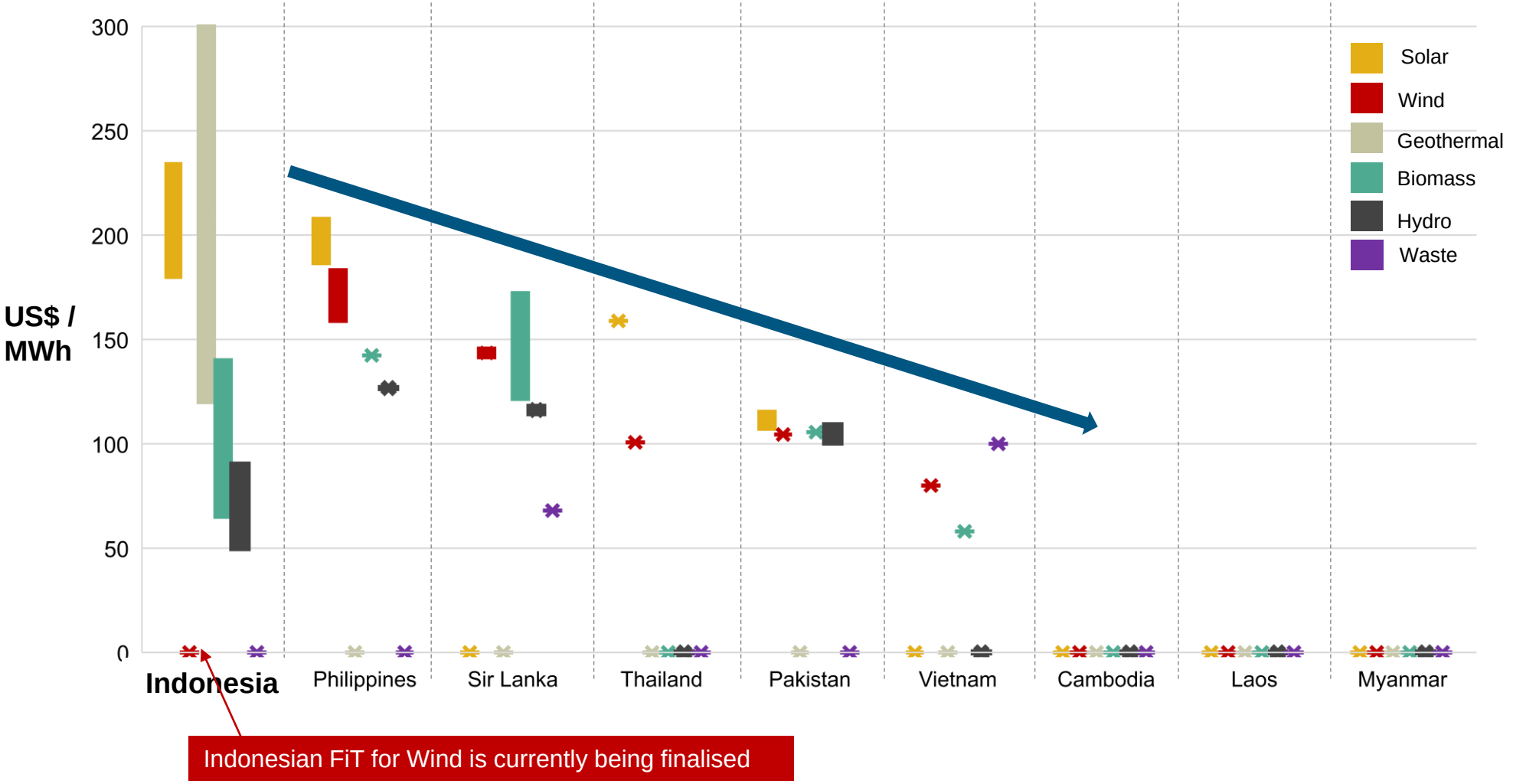
	Detailed summary of Indonesian Feed-In Tariffs
Solar	$180 to $234 / MWh for several hundred MWs, depending on location and local content. Lowest prices were $180 / MWh for entirely imported modules.
Wind	*Being finalised by Govt.*
Geothermal	$120 to $300 / MWh, depending on location and the vintage of work license.
Biomass	$65 to $140 / MWh for projects < 10 MW and depending on location.
Hydro	$50 to $90 / MWh for mini-hydro depending on location and voltage of grid connection.
Waste	No FiT.

Distribution of hydro, geothermal and solar resources by region



Source: TLG analysis

Despite being at an early stage of evolution, Feed-In Tariffs in South East Asia are amongst the most attractive in the region



* Philippine's FiT for Solar over-subscribed but expected to be renewed

** FiTs quoted in USD equivalent

*** FiTs vary according to size, location, and local content, amongst other factors

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Introduction to The Lantau Group

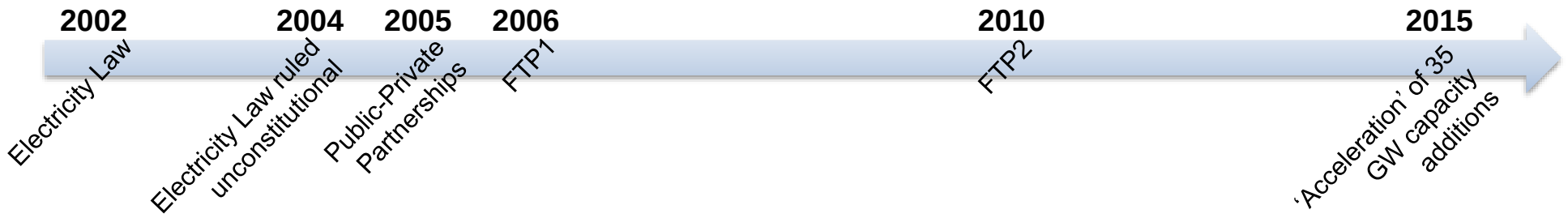
Regional context within ASEAN

Indonesian power sector

- Overview
- Supply and demand fundamentals
- The role of fuels
- Renewable energy
- Regulation and policy
- Financing and competition

Summary

Indonesia has a varied history of policy initiatives



- In 2002 the Electricity Law was enacted, enabling
  - Division into competitive and non-competitive areas, allowing private participation in generation and retailing
  - Electricity tariffs to be determined by the market
  - Independent regulation through the establishment of the Electricity Market Supervisory Agency
- However in 2004 this Electricity Law was ruled to be unconstitutional
  - This occurred due to electricity being viewed as a social necessity, and the constitutional requirement for its delivery needing to remain exclusively with a State-owned agency
- In 2005 there were renewed efforts to attract private investment back into the power sector
  - New 'Public-Private Partnership' legislation was enacted and a list of IPP projects open for private tender was also made available
- 2006 saw the first stage of a 'fast track' program (FTP1) followed by a second program (FTP2) in early 2010. Each of these programs aimed to accelerate the development of 10,000 MW of generating capacity, with FTP II geared towards IPPs and renewable energy
- In 2015, the new Joko Widodo Government announced plans to accelerate the development of 35 GW of generating capacity, however institutional complexity makes this a challenging task

A background to electricity pricing and subsidies

A key issue with the Indonesian ESI is that PLN sells electricity at a lower price than it costs

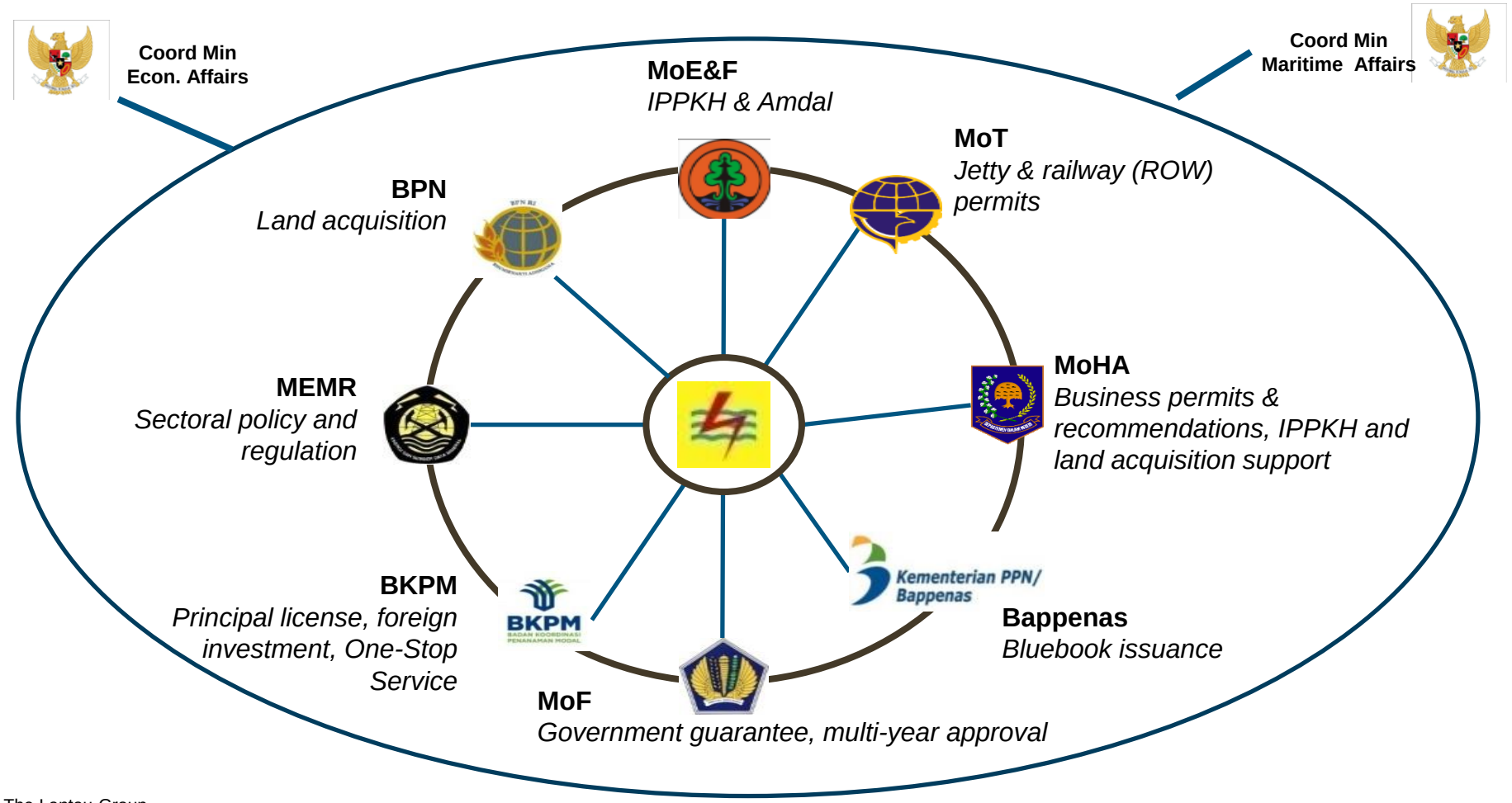
- PLN's selling price in 2014 was IDR922 per kWh while the cost of production was IDR1,424
- The shortfall is funded through a Government subsidy estimated at around US$5.6 billion pa.

Electricity prices are regulated by the Indonesian government and they are trying to phase out the subsidies

- There are four basic tariff categories based on consumer type: residential; industrial; business; and public (such as government agencies and hospitals)
- The Government increased electricity prices by an average of 15% in 2013 under (MEMR Regulation No.30/2012)
- Electricity prices were raised further during 2014 (MEMR Regulations Nos. 9/2014, 19/2014 and 31/2014), with total increases of over 30% for a number of industry and household sub-categories
- There are automatic price adjustments for some consumers based on the exchange rate, inflation and the Indonesian Crude Price (ICP)

Achieving an additional 35 GW of generation capacity is a key government target, yet institutional arrangements will likely continue to be a barrier

- A range of cross-sectorial arrangements are required to help PLN (and IPPs) to achieve targets



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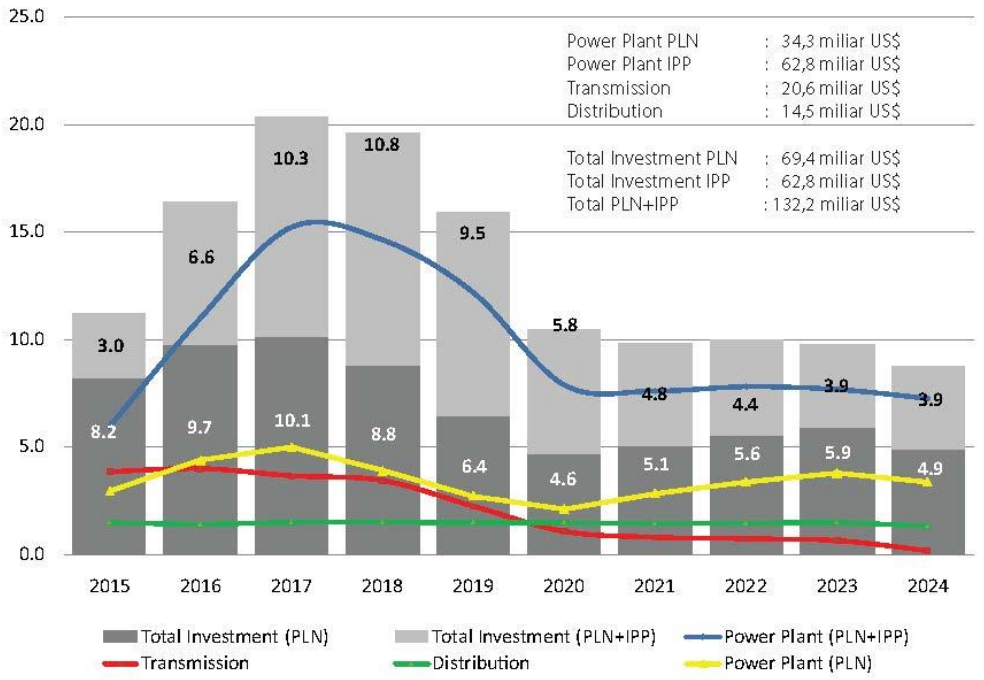
Summary

Substantial investment is required across generation, transmission, and distribution infrastructure, peaking at over US $20 billion per annum

- Indonesia undoubtedly needs a large amount of new capacity to extend electrification and to reduce the risk of brown-outs
- PLN projects are set to require US $69.4 billion between 2015 - 2024
- IPP and private sector projects are set to require US $62.8 billion
- The ‘Fast Track 1’ (FTP1) project for 10,000 MW of new capacity was fully financed by loans to PLN (with government guarantee), however this is not planned for future phases
- Recently PLN has been seeking further loans from multilateral and bilateral institutions for specific projects

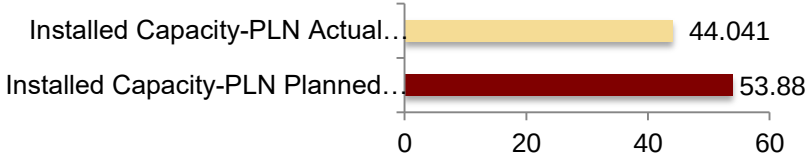


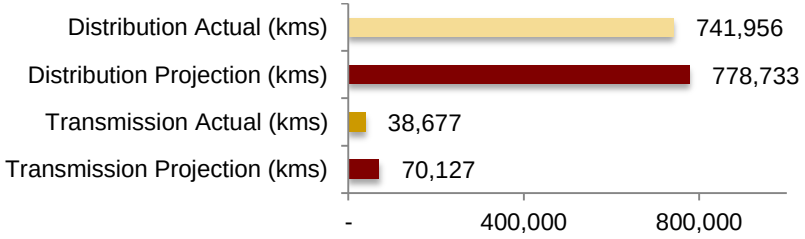
Source: PLN RUPTL 2015-2024

PLN expects a substantial contribution of new build to be made by IPPs

- 2.8 GW IPP under construction
- 11.4 GW IPP committed
- 10.7 GW IPP planned, but not yet committed
- Achieving this contribution from IPPs is problematic, however. So far, Indonesia has struggled with PPP arrangements

Developer	2015	2016	2017	2018	2019	Total
Construction						
PLN	2,308	784	339	562	200	4,193
IPP	1,471	971	286	41	55	2,824
Sub-Total	**3,779**	**1,755**	**625**	**603**	**255**	**7,017**
Committed						
PLN	-	454	2,090	575	2,539	5,658
IPP	3	78	563	5,048	5,737	11,429
Sub-Total	**3**	**532**	**2,653**	**5,623**	**8,276**	**17,087**
Plan						
PLN	-	1,610	2,251	2,640	1,675	8,175
IPP	-	315	861	372	9,113	10,661
Sub-Total	**-**	**1,925**	**3,112**	**3,011**	**10,788**	**18,836**
TOTAL	**3,782**	**4,212**	**6,389**	**9,237**	**19,319**	**42,940**





- In the past, there has been a considerable difference between plans and outcomes
- For example, by 2013 only 44 GW of the planned 54 GW had been commissioned
- There are similar shortfalls in transmission and distribution infrastructure

Bidding process for IPPs

Mostly competitive tender, although GR No.14/2012 allows direct selection and direct appointment of an IPP for projects under PLN's regular program in the following circumstances:

- Direct selection is permitted if the project uses non-fuel energy for power generation
- Direct appointment is permitted for:
  - Renewable energy, marginal gas and mine-mouth power plants
  - Purchase of excess power supply
  - Critical or emergency supply conditions
  - Purchase of additional capacity from an established power plant

Competitive tendering for a project follows a process as set out in MEMR Regulation No.1/2006 and its revisions under MEMR Regulation No.4/2007. PPP projects have specific regulations (PR No.67/2005 as amended by PR No.13/2010 and PR No.56/2011) which state that:

- Tenders are to be based on the RUPTL
- Evaluation and pre-qualification phase is to be based on financial and technical capabilities
- Requests for proposals are to include a model PPA and a performance bond callable on failure to achieve financial close
- The selection process should identify the best bid based upon technical parameters, electricity price proposal and the development/construction schedule

Hot Off the Press - Update

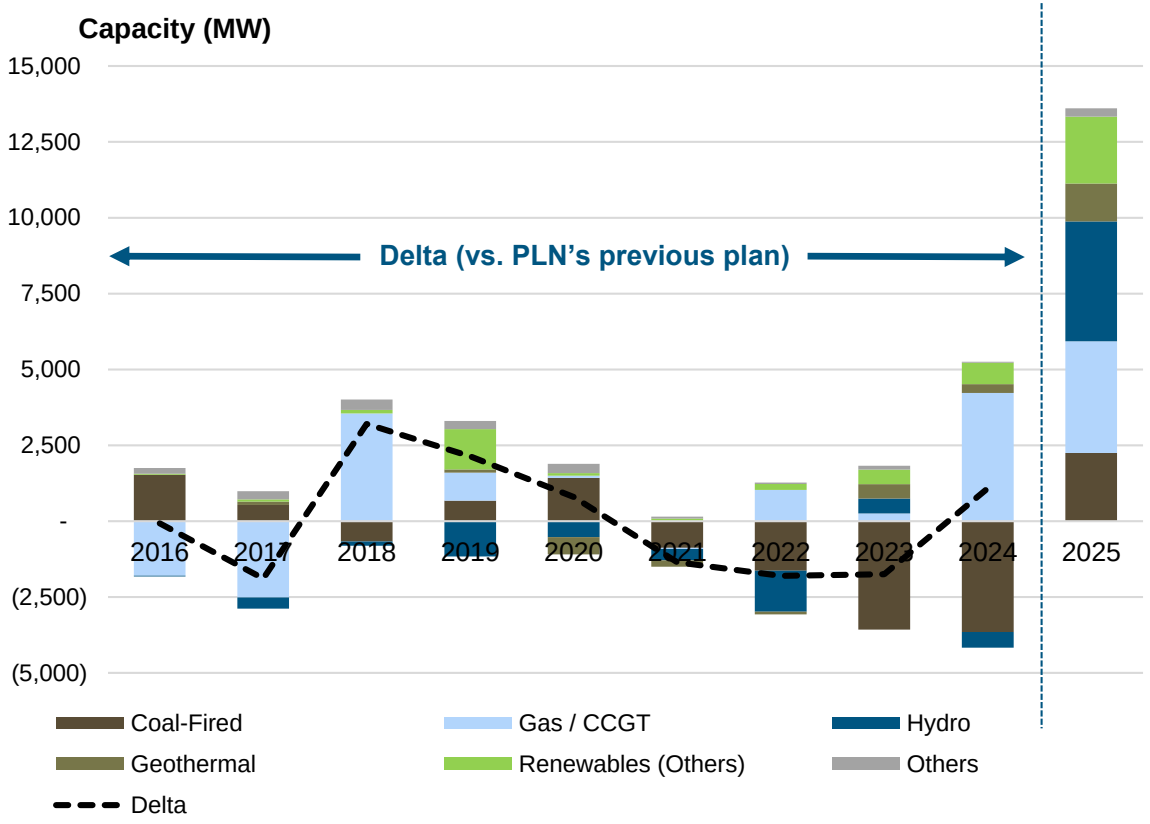
- PLN's updated plan for 2016-2025 was announced earlier this week:
  - Negligible overall new capacity between 2016-2024, some transitioning from coal to gas / RE
  - Planned capacity additions now total 80.5 GW, of which 13.6 GW is earmarked for 2025

2016-2024:

- Coal still represents 49% of planned new capacity
- Reduced emphasis on coal (-7.2 GW) and an increase in gas-fired plant (+4.5 GW)
- Renewables (incl. geothermal) rise by 2 GW

2025 *(newly published)*

- Hydro, geothermal, and other forms of renewables account for over half (55%) of new build
- Such a late addition of 7.5 GW of clean tech to the tail-end of the forecast is likely a result of environmental lobbyists, but is it achievable?

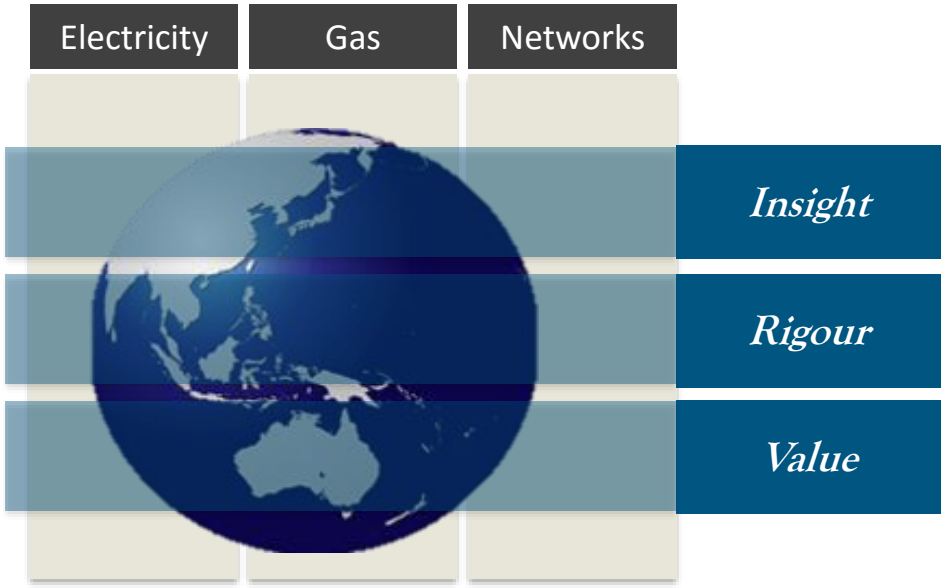


Source: RUPTL 2016-2025; TLG analysis

In Summary

- Indonesia is a major growth market in Asia
- It needs all kinds of capacity using various fuels in many places
- However, it remains a difficult place to do business and policy and regulatory hurdles remain

The end



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