

# **Perusahaan Listrik Negara (PLN): A Power Company Out of Step With Global Trends**

**Can Indonesia's National Electricity  
Provider Adjust to New Market Realities as  
It Seeks \$1 Billion in International Bond  
Support?**



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# Executive Summary

Indonesia's monopoly coal-dependent state-owned power company, Perusahaan Listrik Negara (PLN), is sinking under the weight of a flawed planning process that lacks crucial insight into the clean energy trends reshaping global power.

In years past, international capital markets might have overlooked the company's coal dependency and its shaky finances. But not anymore, and that spells trouble for PLN, which is planning to seek more than \$1 billion from a bond sale this quarter to fund its growth plans. Increasingly, global bond investors understand the risks associated with coal lock-in for high-growth countries like Indonesia.

To make its issuance a success, PLN will need to answer a number of crucial questions:

**Can PLN reduce its reliance on Ministry of Finance subsidies?** PLN's coal-intensive growth plan exposes it to long-term financial risks that can be solved only by higher tariffs or long-term, and large, subsidies from the Indonesian government. PLN's current tariffs fail to cover its costs, which has led to operating losses averaging US\$2.1 billion annually over the past four years—a shortfall that the Ministry of Finance (MoF) has covered. PLN's tariffs are frozen for 2018 and 2019 and payments to independent power producers (IPPs) are set to rise, meaning the utility stands to be an even bigger drain on Indonesia's treasury over the medium term. While Indonesia's sovereign credit profile has improved recently, PLN's debt service metrics compare unfavorably to other Asian issuers. We see more risk, not less, ahead.

**Can PLN adopt a more credible planning process?** PLN's planning process is in disarray. The 2018 RUPTL, which dictates PLN's capital spending and operations is a black box with multi-year forecasts that are disconnected from actual outcomes and relevant regional and global trends. The RUPTL has front-loaded cuts in new capacity needs, necessitated by an over-optimistic plan. These revisions appear to be haphazard, suggesting that PLN's planning horizon may not be much longer than 12 to 24 months—a timeframe that is a bad fit for power system planning. Power sales forecasts have been cut in each of the past three years, with the forecast 2026 level now 31.6% lower than the earlier prediction. Nevertheless, underlying growth forecasts continue to have an upside bias. In addition, the forecast generation mix is at odds with global market trends, which reflect dramatic changes thanks to new industrial-scale renewable solutions. If PLN hopes to be in good standing with global bond investors, it will need to find a way to address flaws in its high-cost IPP-dependent planning process, which sees a bigger future for diesel-fired capacity than for cost-effective utility-scale solar.

**How can PLN lower the risk of its capex program and manage major technology and market changes?** PLN would benefit from a crash course on the type of dynamic scenario analysis that experts use to analyze the type of risks that come with over-reliance on legacy coal technologies and weak planning disciplines. North Asian bankers and equipment suppliers will not do this work for PLN because it's not in their interest. By contrast, consultants like McKinsey and leading bond rating firms like Standard & Poor's have a wealth of research that highlights the importance of greater technology flexibility and modular grid management strategies that would put PLN in

better control of its economic destiny. As S&P notes, “if the forces of change...are here to stay, then it makes sense to make smaller capital bets to plan for a more dynamic future.” Otherwise, it's the Indonesian public that will be left to pay for PLN's large and growing IPP obligations in the face of a rapidly changing market, one that is dramatically re-pricing power assets, resources, and grid services.

**Does PLN recognize that long-term investors place a value on environmental performance?** The Government of Indonesia (GoI) scored a victory in the global bond markets in February with an attractively priced five-year US\$1.25 billion green sukuk, which will fund projects in a range of green” areas including renewables, energy efficiency, climate change adaptation, sustainable transport, and green buildings. Capital markets now favor these trends, as opposed to fossil-fuel-heavy development plans like PLN's. The utility may say it aims to “suppress future CO2 emissions,” but that stated intention stands in stark contrast to the realities in the Ministry of Energy and Mineral Resources' 2018 Electricity Supply Business Plan (RUPTL). That plan rests on a 26.8-GW increase of installed coal-fired capacity. Assuming PLN moves ahead with a conventional global bond offering with unrestricted use of proceeds, most influential global investors will be expecting disclosure to clarify PLN's climate risk profile, a proposition that would lay bare unacceptable risks.

## Introduction and Background: A Power Company Out of Step with Global Trends

Perusahaan Listrik Negara (PLN), Indonesia's state-owned, vertically integrated utility company, is struggling with cost under-recovery issues, regulatory risk, and flawed development plans loaded with potential stranded assets. These problems are so severe that even the strong support of the government's Ministry of Finance may not be enough to prevent a credit meltdown.

All of these problems were highlighted in a recent S&P investor call. The pluses: healthy demand growth by Asian standards and improved sovereign fiscal capacity, both of which are required to help PLN plug holes in a balance sheet that is still well below the standards of its Asian peers. The minuses: “stagnant” tariffs and regulatory risk as conflicting policy initiatives threaten PLN's financial health. PLN's leverage, measured by debt to EBITDA, is forecast to rise sharply to an unhealthy 5.5 times. This is expected to happen just as Indonesia's “ad hoc” tariff regime struggles to cope with new capacity delivered via high cost IPPs with long-term power purchase agreements (PPAs) that will lock in rising costs. In theory, some of this risk can be managed, but only if the government increases its financial support for PLN at a time when its policy goal is to wean PLN off poorly-targeted tariff subsidies.

These issues have taken on added urgency because of the company's (see Table 1 below for a corporate overview) need to tap into the international finance market to fund its new generation capacity needs. Where previously the Ministry of Finance has tried to fund these efforts, it lacks the domestic debt capacity to continue doing so. This point was underscored by the International Monetary Fund (IMF) following recent talks

with the Gol:<sup>1</sup>

“The increase in infrastructure spending should be paced in line with available financing and the economy’s absorptive capacity. Given shallow domestic financial markets and constrained fiscal space, the level of infrastructure investment planned would require a significant rise in corporate external debt, including by SOEs, with potential spillovers to the financial system. A more measured pace of infrastructure development would help preserve stability, while sound risk management would help mitigate fiscal risks from contingent liabilities.”

**Table 1**

<b>PLN Profile</b>	
Installed Capacity	54.6 GW
Asset Value 2017	97.0 USD bn
Capex 2017	6.2 USD bn
Indonesian Electrification Rate	95.4%
Average Annual Demand Growth 2018 RUPTL	6.9%

Sources: 2018 RUPTL, PLN Annual Report 2017

Interestingly, there is a base to build on. Electricity demand growth has been strong, and the country should benefit from continued population growth. In addition, the government’s fiscal capacity is rising, and Indonesia is expected to see sustained economic growth in the years ahead. It also has the opportunity to benefit from a host of new electricity-generation options.

Much-needed foreign direct investment (FDI) requires “transparent, competitive bidding processes, expediting concessions for brownfield projects, and regulatory certainty.” In addition, “Government guarantees for infrastructure development (credit, business viability, and PPP guarantees), which remained small at 2.8 percent of GDP in March 2017, need to be carefully designed and monitored to avoid a potential increase in future contingent liabilities.”

The pressure points cited by the IMF deserve attention because PLN is hoping to raise as much as US\$1 billion from the international bond market this year and has just announced plans to launch a new US\$5 billion medium-term note program. The timing is a clear sign that PLN is rushing to benefit from the positive reception to both Indonesia’s newly upgraded sovereign bond rating and the its inaugural US\$1.25 billion sovereign green sukuk bond.<sup>2</sup> PLN will struggle, however, to present a coherent growth plan that won’t draw more attention to its financial woes, especially with local and national elections holding tariff increases in check.

<sup>1</sup> <https://www.imf.org/en/Publications/CR/Issues/2018/02/06/Indonesia-2017-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-by-the-45614>

<sup>2</sup> <http://www.straitstimes.com/asia/se-asia/indonesia-raises-165bln-in-first-asian-sovereign-green-bond-sale>

A second issue facing PLN and its aggressive funding plans is the growing global financial market aversion to taking on increased thermal coal financing exposure.<sup>3</sup> Indonesia's rich coal resources are a double-edged sword for PLN. Plentiful domestic coal resources mean the company is partially insulated from international coal price volatility and foreign currency exposure. At the same time, those plentiful resources, which have strong domestic backers, have robbed PLN of strategic flexibility just as technology breakthroughs are accelerating the promise of renewables. The company's current, coal-dependent development plan raises serious financial implications for PLN. On the one hand, plentiful domestic coal resources mean that PLN is partially insulated from international coal price volatility and foreign currency exposure. On the other hand, the country's reliance on coal has robbed PLN of strategic flexibility just as technology breakthroughs are accelerating the promise of renewables.

Its bias toward coal increases PLN's exposure to domestic political and regulatory risk. The company's most recent round of coal price negotiations just concluded with a two-year agreement that caps PLN's domestic coal prices at US\$70 per ton through 2019. Although the agreement was trumpeted as a short-term victory for consumers, commentators agree that the associated tariff risk simply has been delayed until 2020. As a result, the good news for the coal and IPP interests may not be good news for international bond investors—and that could be a big problem for PLN.

Institutional investors are largely driven by one question: Will they get their money back? Given this reality, PLN would do well to acknowledge that its current business-as-usual policy is increasingly risky, given the changes occurring around the globe in the power sector. These changes are beginning to disrupt legacy asset values and transform new capacity options, and investors will want good answers to some key questions. For example, how will PLN and Indonesia mitigate the risk of coal lock-in due to inflexible and high cost generating capacity as the economics of renewables are improving rapidly, disrupting other markets, and improving the economic potential of Indonesia's regional competitors.<sup>4</sup> Because of PLN's external capital needs, bond investors will inevitably play an important role in how PLN and Indonesian policy leaders manage this process. Analyzing Indonesia's power sector is not easy (an overview of the issues is in Table 2 below), but investors should focus on the following questions.

**Table 2**

Handicapping PLN's Financial Strategy Options			
Priority Steps	Financial Rationale	Political Risk	Feasibility
Raise tariffs	Addresses PLN's operating income and solvency challenges	High	Limited
Cut demand growth	Demand side management strategies are cost efficient	Medium	Medium
Control capex	Reduces leverage and cash flow drain	Medium	High
Control fuel costs	Critical to find ways to manage PLN's fuel cost exposure	High	Medium
Cut coal IPP costs	Rising IPP costs are hard to pass on without tariff reform	Medium	High
Develop new renewables options	Flexible grid structures increase technology options	Low	High

<sup>3</sup> <https://www.ft.com/content/0fe92a82-1ca4-11e8-956a-43db76e69936>

<sup>4</sup> <http://ieefa.org/ieefa-update-cheap-renewables-transforming-global-electricity-business/>

## Can PLN Shake Its Reliance on Ministry of Finance Subsidies?

The starting point for any financial analysis of PLN is that absent government support, the company would be thoroughly un-investible for traditional bond investors. Just from 2014 to 2017, the Ministry of Finance pumped US\$22.9 billion of fresh cash into PLN to plug the holes in PLN's financials created by rapidly escalating fuel and purchased power costs. It's expected that PLN will remain a massive drain on the national treasury without a radical restructuring of the company's business model.

The crux of the problem is that PLN's tariff regime fails to recover generating, transmission and distribution costs, resulting in operating losses that have averaged US\$2.1 billion annually over the past four years. To cover this shortfall, enable the company to service its debt, and record a cosmetic profit, the government has given PLN an average of US\$4.7 billion annually during this period. Reducing this subsidy is a government priority, and steps have been taken to improve the targeting of the subsidy to identified low-income groups along the lines of the direct benefit transfer policy being developed in India. The effectiveness of this strategy, as well as the political will to implement the new tariff targeting, has fallen well short of what is needed to stop the bleeding, however.

But tariffs are not PLN's only problem. PLN also is investing heavily in new capacity and is facing higher payments to IPPs that must be paid (to cover guaranteed capacity payments) regardless of dispatch levels. This has forced the Ministry of Finance to backstop PLN's financing capacity using a mix of both direct and indirect tools.

Over the past four years, the Gol has made direct annual subsidy payments totaling US\$20.8 billion (see Table 3). The government also injected US\$2.1 billion into PLN in the form of new equity in 2015 and 2016. This came after a 2015 asset revaluation that resulted in a flattering increase in balance sheet asset valuations of US\$46 billion, an embellishment that will attract attention from international investors who are paid to look beyond window dressing and, instead, ask why operating losses were so high. The effect of the non-cash revaluation, which was accompanied by a switch from a Big Four auditor, was to dramatically improve balance sheet debt ratios, artificially reducing the debt-equity ratio from 100% to 44.7% in 2016. Unfortunately, the move also highlighted PLN's operating challenge as its return on assets (ROA) has now shrunk to less than 0.5%.

**Table 3**

PLN Financials Adjusted for Subsidies	2014	2015	2016	2017	2014	2015	2016	2017
	Rupiah Trillions				USD Billions			
Income for the Year	11.07	6.03	8.15	4.43	0.80	0.44	0.59	0.32
Direct Gov Payments -- Annual Subsidy	101.82	60.33	73.13	50.60	7.40	4.38	5.31	3.68
Income (Loss) Before Tax (Without Subsidy)	(84.30)	(72.47)	(44.47)	(41.31)	(6.13)	(5.27)	(3.23)	(3.00)
Yearend Cash and Equivalents	27.11	23.60	41.91	42.29	1.97	1.71	3.05	3.07
Direct Gov Payments -- Equity Injection		5.00	23.56			0.36	1.71	
Yearend Cash -- Ex-Annual Subsidy & Equity	(74.70)	(36.74)	(31.22)	(8.30)	(5.43)	(2.67)	(2.27)	(0.60)

PLN Summary Balance Sheet	2014	2015	2016	2017	2014	2015	2016	2017
	Rupiah Trillions				USD Billions			
Total Assets	607.45	1,314.37	1,272.18	1,334.96	44.15	95.52	92.45	97.02
Property, Plant, and Equipment	501.71	1,187.88	1,145.53	1,204.57	36.46	86.33	83.25	87.54
Total Equity	153.30	804.79	878.40	869.42	11.14	58.49	63.84	63.18
Total Liabilities	454.14	509.58	393.78	465.54	33.00	37.03	28.62	33.83
Asset Revaluation	(11.49)	631.24	629.16	618.46	(0.84)	45.88	45.72	44.95

Considering these financial challenges, what should investors expect in terms of PLN's financial performance in 2018 and 2019? Most of the script already has been written. Local elections are pending in 2018 and a presidential election is set for 2019—meaning tariff increases are off the table. At the same time, PLN will face higher costs for its IPP power purchases and for coal-fired generation, thanks to increased capacity and higher fuel prices. PLN has taken steps to cap coal costs in the face of higher prices for the next 20 months, but the US\$70 per ton cap is due to expire at the end of 2019, and PLN then will again be at the mercy of shifting geopolitical winds and a volatile Asian coal market. Given China's outsize coal consumption, its national energy policies drive prices. If China continues its explosive push into wind and solar, it could drive coal prices down; conversely, any increase in Chinese coal demand likely would drive prices up.

PLN has sought to relieve some of its cost pressures in the short term by pushing major planned capacity additions into 2020 and 2021 and putting various projects on hold. Based on PLN's reported electricity purchase costs for 2017, which are highlighted in Table 4, and our estimate of average installed IPP capacity from 2018 to 2021, moderate IPP cost increases in 2018 and 2019 will be followed by aggressive increases in purchased electricity costs that will drive a four-year increase of 134.4% to US\$12.3 billion.

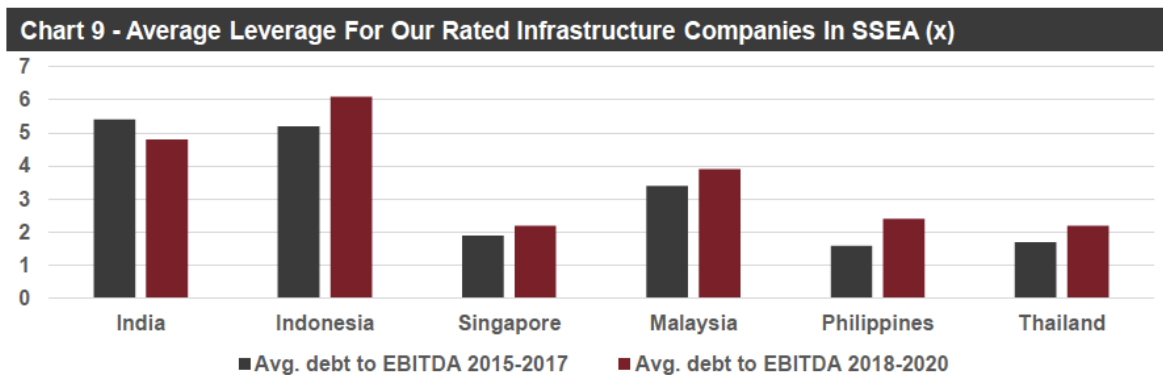


Table 4

PLN Summary Income Statement	2014	2015	2016	2017	2014	2015	2016	2017
	Rupiah Trillions				USD Billions			
Operating Revenues	193.42	217.35	222.82	255.30	14.06	15.80	16.19	18.55
Total Operating Expenses	247.81	225.57	254.45	275.47	18.01	16.39	18.49	20.02
Purchased Electricity	3.49	4.42	59.73	72.43	0.25	0.32	4.34	5.26
Operating Income/Loss	(54.39)	(8.23)	(31.63)	(20.18)	(3.95)	(0.60)	(2.30)	(1.47)
Government's Electricity Subsidy	99.30	56.55	58.04	45.74	7.22	4.11	4.22	3.32
Operating Income After Subsidy	44.91	48.33	26.42	25.56	3.26	3.51	1.92	1.86
Income for the Year	11.07	6.03	8.15	4.43	0.80	0.44	0.59	0.32

This surge in IPP costs inevitably will require a more government funding, and that is a problem both for PLN and the Indonesian government. The risk for PLN, made clear in the S&P chart below, is that stretched financials and limited debt capacity compare unfavorably to regional peers, which may inhibit access to low-cost funding options. PLN's average debt to EBITDA—a standard measure of leverage—is forecast to be the higher than its Southeast Asian peers (see Chart 1 below). Rather than improving from 2018 to 2020, S&P sees PLN's leverage ratio worsening, rising from just above 5x to almost 6x. This is a problem that Indonesia's Ministry of Energy and Mineral Resources acknowledged quite candidly in the 2017 RUPTL, noting that a key threat to PLN's growth plan is the need to “immediately strengthen its capitalization structure to maintain sound financial ratios currently including DSCR <sup>5</sup> of 1.35, which is lower than the required 1.5).”

Figure 1



Source: S&P Global Ratings.

Unfortunately for Indonesian taxpayers and the government, efforts to postpone capital expenditures (capex) in the 2018 RUPTL are necessary to preserve appearances, but

<sup>5</sup> DSCR = debt servicing coverage ratio

that won't solve PLN's problems. IEEFA estimates that PLN's debt service coverage ratio (DSCR) at yearend 2017 was stuck at 1.4 despite the government's subsidies. At the same time, PLN representatives mistakenly cite low debt-to-equity ratio as a point in their favor,<sup>6</sup> forgetting that investors are not fooled by dismal cash dynamics. The company managed to burn through a cash subsidy of US\$3.7 billion to deliver a very modest US\$30 million in net cash in 2017. How PLN's financial situation can be materially improved without undercutting the government's financial position will be an important question for bond investors who will be naturally cautious about a financial scenario that can only be repaired by dramatic increases in tariffs.

## Can PLN Make Its Planning Process More Credible?

Since 2015, Indonesia's power planning goal has been framed simply: 35 gigawatts of new capacity by 2019. The closely followed target underscores the importance of addressing critical long-term infrastructure needs, particularly since Indonesia's economy has been growing at a solid 5-6% a year for the past five years and reliable supplies of electricity are an essential component of long-term growth.

Nevertheless, power sector bankers, analysts, and investors are aware that the capacity goal in itself has little bearing on what PLN is actually doing. The Ministry of Energy and Mineral Resource's RUPTL planning framework, which sets the terms for PLN's financial outlook and the level of subsidy it gets, is clearly part of the problem. This annual document is essentially a black box (see Table 5 for details) with an array of bottom-up data and multi-year forecasts that are curiously disconnected from strategic insight into actual outcomes and relevant regional and global trends.

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<sup>6</sup> <http://www.thejakartapost.com/news/2018/03/29/pln-rely-more-loans-finance-power-infrastructure.html>

Table 5

Description	Unit	Indonesia		
		RUPTL 2016 - 2025	RUPTL 2017 - 2026	RUPTL 2018-2027
Economic Growth	%	6.7	6.2	6.3
Electricity Growth	%	8.3	8.3	6.9
Electrification Ratio	%	99.7 (2025)	100.0	100.0
Installed Generation Capacity	MW	80,538	77,873	56,024
Transmission	kms	67,665	67,465	63,897
Sub-station	MVA	171,416	165,231	151,424
Customer additions	millions	21.6	18.9	25.5
<b>% Change 2018 vs. 2016</b>				
Installed Generation				-30.4%
Transmission				-5.6%
Sub-station				-11.7%
Customer additions				18.1%

The 2018 RUPTL is a case in point. With dramatic front-loaded cuts in expected new capacity needs and evident confusion about longer-term plans, the document fails to give any indication that PLN's planning horizon is longer than 12 to 24 months—a timeframe that is a bad fit for power-system planning and the needs of long-term international bondholders.

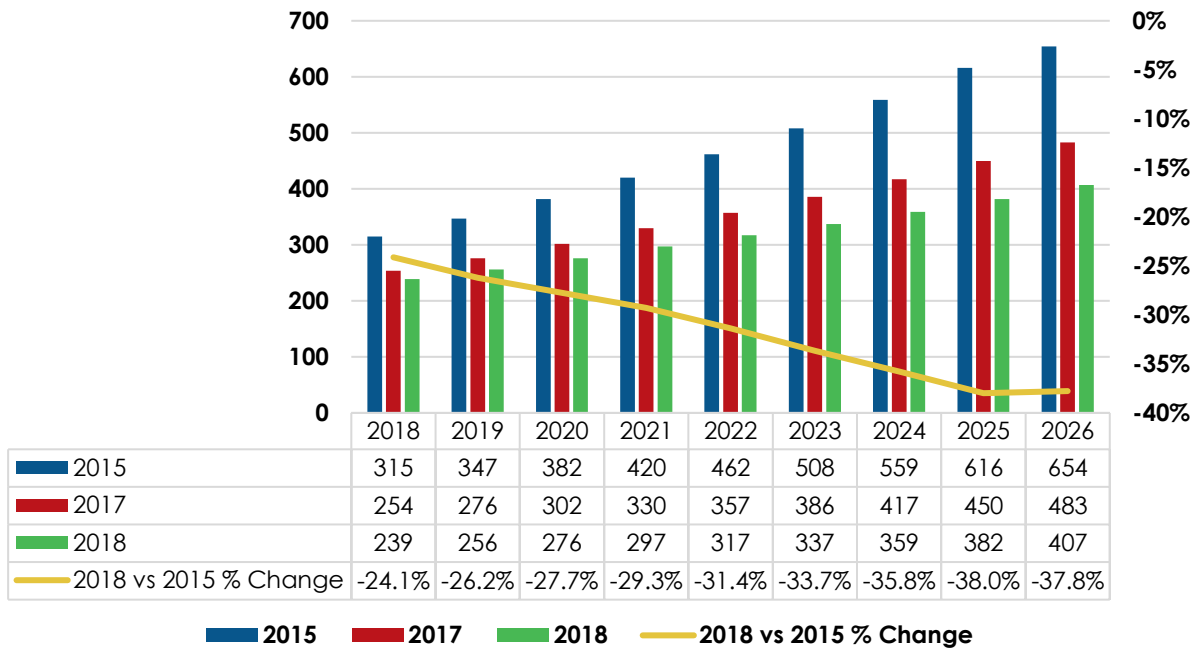
This year's RUPTL is notable for several changes creating confusion around PLN's core planning discipline (see Table 5 above):

**Demand Growth:** The just-announced 30% cut in PLN's installed capacity growth plans over the past two years is best seen as a late but much-needed concession to reality. Over the past decade, PLN has systematically over-estimated demand, resolutely building its forecast from over-optimistic GDP growth forecasts while using an excessive electricity growth multiplier based on outdated assumptions concerning the electricity intensity of growth.

As a result, every recent RUPTL has included significant downward revisions of forecast sales (see Chart 3). And the growth bias remains a concern. It's noteworthy that in the new RUPTL, PLN is still using a GDP growth forecast that remains well above the IMF's forecast of average GDP growth through 2022 of 5.5%. Overestimating growth results in excessive capital deployment and subsequent underutilization of assets, which in turn results in a failure to deliver on expected rates of return.

Figure 2

RUPTL Sales Forecast Changes (TWh)



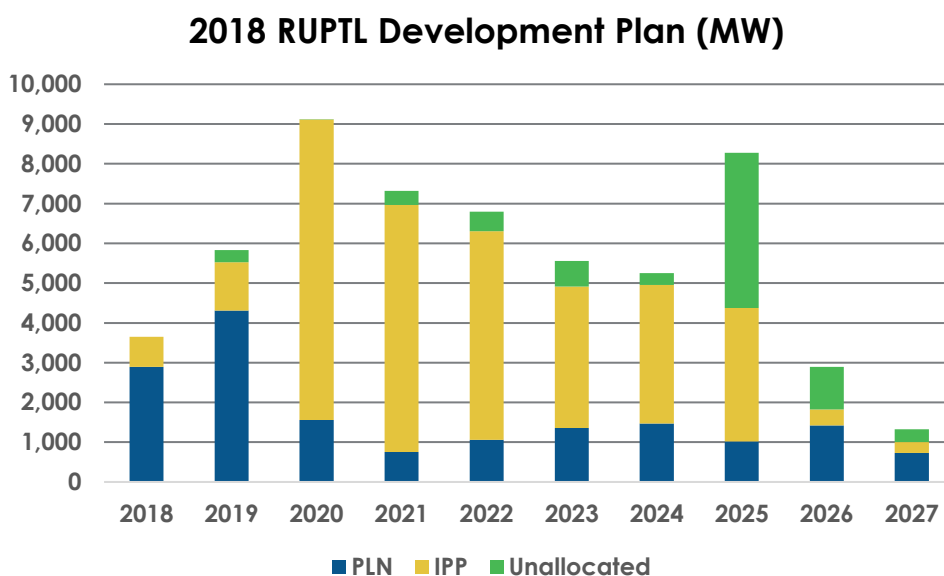
**Capacity Planning:** By carrying an over-optimistic sales forecast and an associated program of aggressive capex, PLN has become mired in a stop-start cycle, alternately negotiating new high-cost IPP capacity and renegotiating terms on old contracts to cut costs. PLN's grid infrastructure and generating capacity have grown at a healthy rate, displaying a positive relationship to underlying GDP growth that is common in emerging markets. However, systematic over-estimation errors in demand result in a growth bias that distorts PLN's capacity planning process and encourages IPP developers to raise the political pressure and their target returns whenever it looks like PLN has the running room to lock in new capacity.

The damaging impact of this politicized process is on full view in the new RUPTL, which has PLN cutting more than 15 GW of unneeded capacity expansion in just the next two years, 95% of which is related to planned IPP capacity. IEEFA's July 2017 report, "Overpaid and Underutilized: How Capacity Payments Could Lock Indonesia into a High Cost Electricity Future"<sup>7</sup> validates the logic of this decision. The report demonstrates how the 2017 RUPTL had the potential to force PLN into paying US\$16.2 billion for idle capacity.

<sup>7</sup> [ieefa.org/wp-content/uploads/2017/08/Overpaid-and-Underutilized\\_How-Capacity-Payments-to-Coal-Fired-Power-Plants-Could-Lock-Indonesia-into-a-High-Cost-Electricity-Future-\\_August2017.pdf](http://ieefa.org/wp-content/uploads/2017/08/Overpaid-and-Underutilized_How-Capacity-Payments-to-Coal-Fired-Power-Plants-Could-Lock-Indonesia-into-a-High-Cost-Electricity-Future-_August2017.pdf)

PLN's belated move to cut planned capacity is a plus for its financials in 2018 and 2019, but the erratic profile of its planned future capacity additions (see Chart 4 below) suggests that these were not carefully considered strategic decisions. This is evident from the new development plan, with its surge in new capacity in 2020, followed by a lull and then another surge in forecast new capacity in 2025. Risks to this forecast are evident in the fact that almost 50% of the new capacity planned for 2025 is unallocated despite the aggressive cut that already has been made to the 2025 forecast.

Figure 3



Another flaw in PLN's planning process, particularly evident in the 2018 RUPTL, is the apparent neglect of any meaningful strategy to incorporate increasingly cost-effective renewable energy options. Solar is reshaping the generation mix in dynamic power markets such as China and India, but it is all but ignored by PLN. Consequently, PLN faces a serious risk of coal lock-in due to its growing exposure to coal IPPs. Beyond that, its focus on large-scale hydro and geothermal (see Table 6 below), as opposed to more innovative and distributed technologies, robs PLN of the incentives it needs to gain experience with the new technologies dominating most countries' electricity-generation plans. Indeed, it's hard to imagine how diesel should play a larger role in a well-managed system than solar given the well-documented pricing and functionality advantages of integrated solar solutions.

**Table 6**

Forecast 2027 Installed Capacity Mix		
	MW	% Total
Coal	45,375	41.0%
Mine-Mouth Coal	6,045	5.5%
Geothermal	6,301	5.7%
Gas & Steam	23,544	21.3%
Well-Head Gas	8,971	8.1%
Diesel	5,497	5.0%
Mini Hydro	812	0.7%
Hydro	8,432	7.6%
Solar	3,451	3.1%
Others	2,177	2.0%
Total	110,605	
Renewables		
With Large Hydro	18,996	17.2%
Ex-Large Hydro	10,564	9.6%

Can this cycle of bad forecasting be fixed?

Unfortunately, state-owned power companies are often slow to shed simple targets even when they are not suitable. That said, South Korea has demonstrated the merits of hitting the reset button with a new power-development plan, released in December 2017, that builds credibility by acknowledging slower peak demand growth and the changing realities in global power markets.

Like Indonesia, South Korea has a state-controlled power company that supplies power nationwide and that utilizes a coordinated power development plan. What's particularly striking about South Korea is that planners intend to pair a smaller number of traditional thermal baseload capacity additions with the grid investments needed to accommodate more flexible renewable and battery storage options.

Clearly, change is possible. But if the current RUPTL is any indication, policymakers, investors, and companies with renewables expertise will have to be persistent in pressing PLN to improve its poor planning track record.

# Can PLN Lower the Risk of Its Capex Program and Manage Major Technology and Market Changes?

PLN is in an unenviable position: It serves a resource-rich country locked into habits that are a poor fit for the new economics of the increasingly technology-driven power sector.

While PLN restricts itself to a menu of outdated fuel and financing options, many other state-run utilities, by contrast, are taking tangible steps to make a transition toward more distributed models and are moving away from opaque IPP arrangements by using reverse auctions to capture rapidly improving prices for renewables. Given Indonesia's demand-growth profile for new capacity, PLN could use that profile to strike innovative deals with new technology providers. PLN is not asleep to the possibilities, but it has provided little analysis of the growing range of competitively priced alternatives to justify choices to policymakers or investors. What's missing in PLN's business plan is the type of dynamic scenario analysis and strategic planning that drives high-level decisions in other high-growth power markets.

To get a sense of how PLN might stress-test its approach to system design, some takeaways from *McKinsey's Global Energy Perspective: Reference Case 2018* are instructive.<sup>8</sup>

**Global energy demand growth is slowing as global economies mature and energy intensity declines.** Indonesia is unusual because it has unmet demand growth in remote areas, but a lower and more realistic electricity demand multiplier should be factored into PLN's demand forecasts to reflect the more mature growth patterns seen in the established load centers.

**There is new demand for more energy-efficient building, transport, and industry technologies** that displace primary energy uses. Aggressively embracing new energy management options could provide PLN with new service revenue options in the medium term that would moderate long-term demand growth.

**Solar and wind are forecast to be “the most economic new-build” options in 2020 in a range of markets** including China, India, Australia, Mexico, the U.K., Chile, and Brazil. Solar is the most affordable option in high-growth markets like China and India, with Mexico forecast to have the lowest solar cost at US\$36/MWh for industrial-scale installations. These trends have clear implications for a market like Indonesia.

**Increasingly affordable energy storage is restructuring power markets** in many countries, and McKinsey's baseline forecast calls for storage costs to halve from 2020 to 2030. Energy storage could be a game-changer across the many islands of the Indonesian archipelago and could undermine the economics of large-scale, mine-mouth coal IPPs with high associated grid costs. It could also help reduce the costs of electrification in remote areas.

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<sup>8</sup> <https://www.mckinseyenergyinsights.com/services/market-intelligence/reports/global-energy-perspective/>

**If renewable costs continue to decline, demand for coal-fired power could fall 50% in China and India.** What does this imply for the pricing of domestic coal and associated commodity-price volatility? Also, it would be useful if PLN began to account for air pollution and longer-term carbon costs in its planning process.

While many of its peers are embracing the new power-industry paradigm unfolding globally, Indonesia is an outlier, on the brink of committing to a coal power lock-in without having demonstrated that its policymakers have a good understanding of the trends discussed by McKinsey.

A February IEEFA report “Cheap Renewables Are Transforming Global Electricity Business: Record Uptake and Record Low Bid for Solar and Wind” highlights how powerful economic and policy trends are driving market-share gains for renewables globally.<sup>9</sup> S&P analyzed these trends in a November 2017 report focused on the United States, commenting that “if the forces of change (demand-side responses, technology advances such as storage, distributed generation, and efficiency gains for alternative generation sources) are here to stay, then it makes sense to make smaller capital bets to plan for a more dynamic future. It is increasingly possible that laggards in this regard—those with a higher-than-average proportion of generation in less-efficient coal plants or with relatively unattractive emissions profiles—could be in a more vulnerable position than their forward-looking peers in the future.”<sup>10</sup>

These trends raise the question of whether PLN has been given a proper mandate to evaluate how these resources, and the associated fixed assets, should be priced in the context of a rapid technology transition. It’s notable that the eight-page “Risk Analysis” buried at the end of the 2018 RUPTL acknowledges some of the risks of PLN’s business-as-usual approach. However, except for a few numbers, the 2018 text is identical to the 2017 text.

Given the dramatic changes reshaping global power markets, PLN may need to take more urgent steps to demonstrate that its new capacity choices won’t aggravate risks to PLN’s long-term solvency. Investors will certainly be alert to the question of whether PLN’s current capex increases or decreases the type of system flexibility that will be needed to optimize future capex decisions as renewables and battery storage continue to reshape power markets.

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<sup>9</sup> <http://ieefa.org/wp-content/uploads/2018/02/Cheap-Renewables-Transforming-Global-Electricity-2018.pdf>

<sup>10</sup> <https://www.spratings.com/documents/20184/1634005/How+Quickly+Utilities+Adapt+To+Disruptive+Factors+Will+Have+An+Increasing+Impact+On+Their+Credit+Quality/f8b39dfe-bf38-45c2-aed8-a5ca00913afa>



## Does PLN Recognize That Long-Term Investors Place a Value on Environmental Performance?

By successfully tapping the global bond markets in February with an attractively priced five-year US\$1.25 billion green sukuk, Indonesia drew attention to its potential as a green bond issuer.

Not only was the offering up-sized to accommodate strong demand, but the 3.75% yield also resulted in pricing that was only 109.5 basis points above that of U.S. Treasuries. The green aspects of the offering are noteworthy because the Ministry of Finance will play a lead role in coordinating, monitoring, and reporting on projects funded by the sukuk. The plan calls for eligible projects to be identified in a range of areas that includes renewables, energy efficiency, climate change adaptation, sustainable transport, and green buildings.

Indonesia's green sukuk debut includes several striking aspects.

The first is how the Ministry of Finance's presentation of a credible green bond implementation plan was rewarded by capital markets. This signals that Indonesia's improved credit story, when paired with well-designed green project initiatives, can efficiently and rapidly mobilize offshore capital.

The second is that Indonesia's marketing efforts stressed full alignment with international standards such as the green bond principles and investor expectations concerning the types of projects that would be developed and tagged for allocation of the sukuk proceeds. The Ministry of Finance's commitments were reinforced by a second opinion from the Center for International Climate Research (CICERO), which confirmed that the framework "explicitly excludes new fossil fuel based electric power generation capacity and expenditure related to the improvement in the efficiency of fossil fuel based electric power generation, as well as large-scale hydropower plants and nuclear-related assets."

This exclusion—and the fact that the Ministry of Finance, not PLN, will oversee the projects—is meaningful. If PLN enters the capital markets with its fossil-fuel-heavy development plan, most influential global investors will be expecting disclosures to clarify PLN's climate-risk profile.

In recent commentary, IEEFA has outlined the way that Asian bond investors are increasingly testing climate-change themes. Investors want more assurance that climate risks are being managed at the portfolio level. Table 7 below illustrates how most of the leading global bond investors that PLN might hope to tap for funding are committing to sustainability and responsible investment disciplines. United Nations Principles for Responsible Investment (UN PRI) signatory status is a useful proxy for estimating how much potential demand for a large PLN bond issue might be influenced by PLN's ability to respond to questions about climate risk; 18 of 25 of the largest global asset managers with nearly 70% of related assets under management are now UN PRI signatories and it is reasonable to assume that if PLN hopes to attract premium pricing these investors will need to do due diligence on PLN's carbon-emissions outlook.

**Table 7**

IPE Top 25 Asset Managers 2017					
Company	Country	Total AUM 2017	Total AUM 2016	UN PRI Signatory	2017 PRI AUM
		31/12/16 (€m)	31/12/15 (€m)		
BlackRock	US/UK	4,884,550	4,398,439	✓	4,884,550
Vanguard Asset Management	US/UK	3,727,455	3,091,979		
State Street Global Advisors	US/UK	2,340,323	2,066,479	✓	2,340,323
Fidelity Investments	US	2,129,650	1,830,330	✓	2,129,650
BNY Mellon Investment Management	US/UK	1,518,420	1,492,895		
J.P. Morgan Asset Management	US/UK	1,479,125	1,361,178		
PIMCO	US/Ger/UK	1,406,350	1,321,158	✓	1,406,350
Capital Group	US	1,401,780	1,272,080	✓	1,401,780
Prudential Financial	US	1,201,082	1,089,737		
Goldman Sachs Asset Management In	US/UK	1,116,606	996,651	✓	1,116,606
Amundi	France	1,082,700	985,028	✓	1,082,700
Legal & General Investment Mngt.	UK	1,047,470	1,012,389	✓	1,047,470
Wellington Management International	US	928,380	853,274	✓	928,380
Northern Trust Asset Management	US/UK	893,575	805,763	✓	893,575
Nuveen	US/UK	838,437	-		
Natixis Global Asset Management	France/US	831,501	801,128	✓	831,501
Invesco	US/UK	771,233	714,070	✓	771,233
T. Rowe Price	US/UK	768,711	702,479	✓	768,711
Deutsche Asset Management	Germany	705,867	777,091	✓	705,867
AXA Investment Managers	France	699,628	669,436	✓	699,628
Affiliated Managers Group	US	689,000	578,310		
Legg Mason	US	685,993	618,397		
Franklin Templeton Investments	US/UK	684,270	703,220	✓	684,270
Sumitomo Mitsui Trust Holdings (SuMi TR)	Japan	659,180	614,762	✓	659,180
UBS Asset Management	Switzerland/UK	612,754	597,234	✓	612,754
<b>Total</b>		<b>33,104,040</b>		<b>18</b>	<b>22,964,528</b>

Source: UN PRI

PLN is not unfamiliar with environmental, social and governance (ESG) disclosure disciplines. The company has released an annual sustainability report since 2008 and now reports in accordance with the Global Reporting Initiative G4 standard. In 2016, PLN reported a 56% year-over-year increase in carbon emissions totaling 226,466,072 metric tons of CO<sub>2</sub>-equivalent emissions; the data does not clarify whether it includes IPP-related emissions or just those from PLN's own generation. In addition, PLN's statements concerning efforts to "suppress future CO<sub>2</sub> emissions" sit in awkward contrast with the realities described in the 2018 RUPTL, which clearly state that PLN's development plan rests on a 26.8 GW increase in installed coal capacity. By 2027, coal-fired units are expected to account for 46.5% of total installed capacity versus less than 3.1% for solar.

In researching analytical tools used by climate-aware investors, PLN should note CICERO's goal "to avoid locking-in of emissions through careful infrastructure investments and moving toward low- or zero-emitting infrastructure in the long run."

Indeed, PLN would be wise to note that CICERO reserves a "brown" rating for "projects that are irrelevant or in opposition to the long-term vision of a low-carbon and climate-resilient future."

### Appendix I

PLN Summary Financials	2014	2015	2016	2017	2014	2015	2016	2017
	Rupiah Trillions				USD Billions			
<b>PLN Summary Income Statement</b>								
Operating Revenues	193.42	217.35	222.82	255.30	14.06	15.80	16.19	18.55
Total Operating Expenses	247.81	225.57	254.45	275.47	18.01	16.39	18.49	20.02
Purchased Electricity	3.49	4.42	59.73	72.43	0.25	0.32	4.34	5.26
Operating Income/Loss	(54.39)	(8.23)	(31.63)	(20.18)	(3.95)	(0.60)	(2.30)	(1.47)
Government's Electricity Subsidy *	99.30	56.55	58.04	45.74	7.22	4.11	4.22	3.32
Operating Income After Subsidy	44.91	48.33	26.42	25.56	3.26	3.51	1.92	1.86
Income for the Year	11.07	6.03	8.15	4.43	0.80	0.44	0.59	0.32
<b>PLN Summary Balance Sheet</b>								
Total Assets	607.45	1,314.37	1,272.18	1,334.96	44.15	95.52	92.45	97.02
Property, Plant, and Equipment	501.71	1,187.88	1,145.53	1,204.57	36.46	86.33	83.25	87.54
Total Equity	153.30	804.79	878.40	869.42	11.14	58.49	63.84	63.18
Total Liabilities	454.14	509.58	393.78	465.54	33.00	37.03	28.62	33.83
<b>PLN Cash Flow Summary</b>								
Cash From (Used in) Operations	(26.06)	23.88	(0.34)	28.57	(1.89)	1.74	(0.02)	2.08
Government Subsidy Received	101.82	55.33	49.57	50.60	7.40	4.02	3.60	3.68
Interest Expense Paid	(35.38)	(37.71)	(18.29)	(17.89)	(2.57)	(2.74)	(1.33)	(1.30)
Net Cash From Operations	39.25	37.29	29.59	56.84	2.85	2.71	2.15	4.13
Acquisition of PPE	(30.13)	(36.37)	(55.80)	(85.21)	(2.19)	(2.64)	(4.06)	(6.19)
Net cash From Investing Activities	(30.40)	(38.30)	(54.80)	(87.11)	(2.21)	(2.78)	(3.98)	(6.33)
Government Stock Subscription	-	5.00	23.56	-	-	0.36	1.71	-
Bank Loans -- Net	4.30	5.49	38.21	15.27	0.31	0.40	2.78	1.11
Net Cash From (Used in) Financing	(7.25)	(2.87)	43.60	30.61	(0.53)	(0.21)	3.17	2.22
Increase/Decrease in Cash	1.60	(3.88)	18.38	0.35	0.12	(0.28)	1.34	0.03
Yearend Cash and Equivalents	27.11	23.60	41.91	42.29	1.97	1.71	3.05	3.07
<b>Income, CF, and B/S Adjustments</b>								
Income for the Year	11.07	6.03	8.15	4.43	0.80	0.44	0.59	0.32
Direct Gov Payments -- Annual Subsidy	101.82	60.33	73.13	50.60	7.40	4.38	5.31	3.68
Income (Loss) Before Tax (Without	(84.30)	(72.47)	(44.47)	(41.31)	(6.13)	(5.27)	(3.23)	(3.00)
Yearend Cash and Equivalents	27.11	23.60	41.91	42.29	1.97	1.71	3.05	3.07
Direct Gov Payments -- Equity Injection		5.00	23.56			0.36	1.71	
Yearend Cash -- Ex-Annual Subsidy &	(74.70)	(36.74)	(31.22)	(8.30)	(5.43)	(2.67)	(2.27)	(0.60)
<b>PLN Select Financial Ratios</b>								
Debt to Equity (%)	296.24	63.32	44.83	53.55				
ROE (%)	7.48	1.26	0.97	0.51				
ROA (%)	2.60	0.63	0.63	0.34				
DSCR (after subsidy)	1.25	1.21	1.41	1.38				
Average Debt to EBITDA	6.63	6.54	8.38	7.85				

Source: PLN 2017 financials, IEEFA financial ratio calculations and adjustments. The RP:USD exchange rate of 13,760 for 30 March 2018 has been used above.

## About IEEFA

The Institute for Energy Economics and Financial Analysis conducts research and analyses on financial and economic issues related to energy and the environment. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy. <http://ieefa.org>

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