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Putting PLN's Net Zero Ambition Into Context

The Numbers Will Need to Add Up

Executive Summary

Recent announcements by Indonesia's state-owned utility company Perusahaan Listrik Negara (PLN) and the Ministry of Energy and Mineral Resources (MEMR) referencing potential net zero emission (NZE) targets in the power sector have caught public attention both in Indonesia and abroad.

PLN hopes to achieve carbon neutrality by 2060, in addition to Indonesia's target of 23% renewables by 2025. In its announcement to the Parliament, PLN aims to start retiring its conventional steam power plants by 2030, subcritical coal plants by 2035, supercritical plants by 2040 and ultra-supercritical plants by 2056.

The willingness of high-profile Indonesian government officials to sketch out new commitments to long-term climate change mitigation targets suggest that the issues are getting more attention from senior policymakers and that they are facing more pressure from the public to keep pace with public expectations.

So far, policymakers leading this new climate-friendly initiative should be pleased with the media response as the headline commitments were greeted with positive coverage. Indeed, there has been some positive development within the plan. What often falls under the radar, however, is that the high-level statements and current and medium-term energy sector policy initiatives do not appear to line up. This is something that analysts and sector experts cannot overlook.

The net zero plan is not based on new initiatives that represent a reset of Indonesia's carbon emissions pathway.

To put the Net Zero and Green Power Sector Business Plan (RUPTL) ambition into a practical policy context, IEEFA has reviewed the announcements and compared the announced numbers with the existing data and planning documents that define actual project and budget commitments for Indonesia's power sector. Any effort to evaluate the NZE targets should be tested against the new 2021 power sector planning document, known as the RUPTL, but it has not yet been released. To fill the data gap, the Institute for Energy Economics and Financial Analysis (IEEFA) has referenced publicly available documents such as the 2019 RUPTL, PLN 2019 and 2020 Statistics, PLN 2020 Annual Reports, presentation slides of MEMR and PLN on the 27th of May 2021, and the MEMR press release on the 4th June 2021. IEEFA has also reviewed data from the Draft RUPTL 2021 (DRUPTL 2021) which was available in the market in mid-June 2021. Taken together, these documents create a

transparent record of the approved projects that are in the pipeline for development.

By comparing these documents, IEEFA has found that:

1. **The disclosed NZE plan is not based on new initiatives that represent a re-set of Indonesia's carbon emissions pathway**. Instead, the plan simply highlights existing plans for an orderly decommissioning of sub-scale and antiquated coal facilities, following the economic age of each plant. There is no early retirement in sight. A close examination also revealed the following:

    - **Approximately 16 GW of new coal capacity from the 35 GW program will still come online between 2021 and 2030**. MEMR has conveyed President Jokowi's instruction that no more coal plants should be considered with the exception of those that are under construction or have reached financial close. With such exception, it is expected that 100% of Independent Power Producers' (IPPs) coal pipelines in the 35 GW program will continue, despite the looming overcapacity in the Java-Bali and Sumatera grid.

    Ten out of the 12 'troubled' small coal plants that were targeted for cancellation were actually cancelled *two years ago*.

    - **Out of the 16 GW, IEEFA estimates that around 4.3 GW of coal plants were still in 'Financing Stage' at FY2020** with most of them owned by IPPs**.**

    - **The first phase of PLN's 1 GW steam power plants (PLTU) retirement planned for 2030 are *very old* plants, that will have been in service for 50-60 years, and have been operating on oil or gas.**

    - **10 out of the 12 'troubled' *small* coal plants that were targeted for cancellation were actually cancelled *two years ago* in 2019 RUPTL.**

2. Some new announcements that caught our attention include:

    - **6.8 GW of NEW coal power "modified" or "postponed" in the DRUPTL 2021.** Given the significant amount of coal power capacity that has either been shifted to renewable baseload or postponed in the plans, it raises questions about why PLN's and MEMR's announcements have not drawn more attention to this initiative. By contrast, they provided a detailed explanation covering 34 problematic power plants with total capacities of only about 627 MW.

- **The proportion of renewables is now higher and the electricity demand growth projection for the next 10 years is toned down.** The change in energy proportion has largely been due to the decline of planned new fossil fuel capacity additions - rather than a sharp increase for renewables. Nevertheless, this should be acknowledged as a step in the right direction. In addition, PLN has now toned down the demand growth projection from an overly ambitious 6.4% to 4.9%.

- **Biomass co-firing, large scale hydro and geothermal are the chosen shortcut to reach the Paris Agreement target in 2025**. Large scale hydro remained within PLN's fast track plan to reach the renewable energy target. Geothermal target development has been cut in half in the DRUPTL 2021 but remain significant. Meanwhile biomass co-firing which is planned to rapidly increase from **less than one percent to six percent by 2025**.

  Due to PLN's current financial constraints and the growing locked-in coal power capacity, PLN considers biomass co-firing to be a more plausible as it is less capital-intensive. Analysts are cautious of the multiple challenges to meet the existing biomass cofiring plan, particularly with the burden on biomass price setting pushed towards the supplier and the government.

- **MEMR's and PLN's Net Zero Emission (NZE) 2060 Scenarios are Based on Different Assumptions.** While both plans clearly showed alignment on coal capacity reduction, the pathways for meeting the targets diverged widely – in the use of solar/wind, nuclear, gas, and biomass. Variable renewable energy (VRE) such as solar and wind plays a much more prominent role in PLN's projection, albeit only after 2030. In contrast, MEMR's projection largely relies on other energy options, such as biomass and gas/gasified fuels with carbon capture, while planning for a significantly lower nuclear uptake than PLN.

Indonesia will need to build biomass capacity of more than 1.4 billion ton/year or roughly 200 times the capacity of the US to fulfill the ambition.

Meanwhile new novel technology such as Integrated Gasification Combined Cycle (IGCC) and Carbon Capture and Storage (CCS) have gained a lot more attention, despite its low possibility of reaching economic realization in the near future.

What needs to be brought to attention is the level of extreme biomass-reliant scenario. IEEFA has estimated that to fulfill the ambition, Indonesia will need to build **more than 1.4 billion ton/year of biomass capacity by**

2060, roughly *two hundred times* the biomass capacity of US – the world's largest exporter of wood pellet biomass. A scale that would highly put sustainability impact on the table.

3. **PLN's latest financial reports might put things into perspective.** PLN has been struggling with overcapacity and lower-than-forecast demand for years. A more detailed look into its financials reveal that:

   - **PLN's increased operating profit in FY2020 was mainly a result of a huge drop in fuel expenses, mostly from oil and gas.** PLN managed to save approximately IDR 30 trillion from the fuel costs alone in 2020. This might be due to a sharp drop in oil prices due to Covid-19, new government support to cap gas prices for PLN and a drop in volume purchased due to declining demand in 2020.

   - **PLN financial metrics would have looked different if they have implemented the new SFAS 73 accounting standard implementation.** The new internationally aligned SFAS 73 requires companies to recognize assets and liabilities for the rights and obligations created by leases. This approach is taken to provide greater transparency of a lessee's financial leverage and capital employed. However, PLN is exempted from the requirement through the issuance of POJK Regulation No 6/2017. Should PLN treat their Purchase Power Agreements (PPA) and Energy Sales Contracts (ESC) as finance leases, **PLN would have booked a significantly lower net profit in FY2020 from IDR 5.9 trillion to IDR 990 billion.** With this exemption, it is also worth noting **there is an estimate IDR 242.9 trillion of PLN's liabilities that are currently not recorded on its book (off-balance sheet).**

     PLN has claimed that the POJK regulation is valid until the end of the assignment on acceleration of electricity infrastructure. Credit Rating Agencies (CRAs) are certainly not oblivious to this exemption and has for the last three years adjusted their financial metrics on PLN. But the general stakeholders may not readily comprehend the potential implications. *Once this exemption expires, key stakeholders need to realize there will be a sudden change in PLN's financial position that could potentially affect financial metrics and PLN's leverage to access debt.*

   - **A reposition of subsidy and compensation income - from previously accounted below the operating margin to now considered at par with PLN's electricity sales revenue - means that ongoing central government support is viewed as recurring, rather than one-off items.** It also reinforces the impression that PLN lacks a

Around IDR 242.9 trillion of PLN's liabilities are currently not recorded on its book (off-balance sheet).

credible pathway to achieving any traditional form of full-cost recovery and will require material direct government subsidies if the government has the resources to provide support.

The gaps between the NZE announcements and MEMR and PLN's traditional planning process outputs raises the likelihood that the NZE plan is still a work in progress. As a result, further changes and adjustments should be expected as key stakeholders examine the practical implications of these plans and refinements emerge. **The following areas should be on the shortlist for review**:

- **Coherent and realistic targets.** The first step is to ensure alignment between PLN and MEMR plans, with full consideration which technologies are best positioned to deliver positive emissions outcomes.

- **Coal demand and pricing trends in the run-up 2030.** With the prominence of coal in the power system, rising consumption domestically is expected. Stakeholders should keep watch on the export quota which has been rising in recent years and any related pricing pressures.

- **Has the renewable energy (RE) potential been explored to the fullest?** Other RE sources such as wind (both onshore and offshore) and ocean energy need to be aggressively explored. Some of them may not be readily deployable, but PLN's willingness to take a risk on novel technologies such as ICGG + CCS suggests that a more balanced approach to innovations in technology would be merited.

- **Attention should be focused on the un-needed coal plants which remain in the plan but could potentially be scrapped – especially those that have NOT REACHED financial close.** There are three things that stakeholders need to watch on this subject. First, is to request clarity on deadlines - whether the deadline is for initiating construction, reaching financial close, or putting the unit into operation. Secondly, to ask for transparency on the current status for each unit in the pipeline, bearing in mind that 'under construction' can have a very liquid meaning. Third and the most important, is to critically examine the drawbacks for adding more plants in already-congested grids, especially on the backs of the government's increasing subsidy and compensation payment which basically uses taxpayers' monies.

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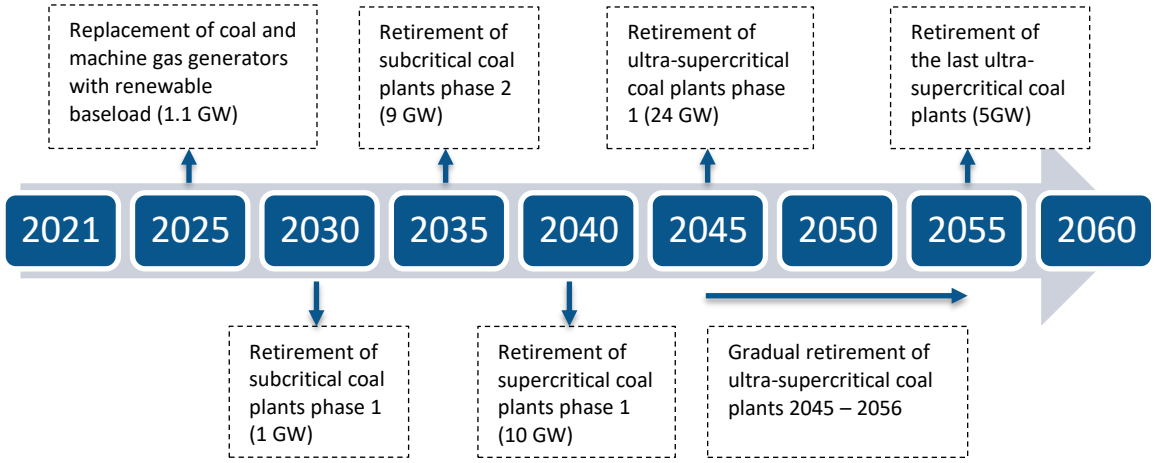
Mapping PLN's Net Zero and Green RUPTL Plan – What Drives the Numbers?

Out of the many issues announced during the Parliament hearing in May, it was the coal plant retirement plan that drew a lot of media attention, from both local and international media. Until now, the key energy and power policymakers have never acknowledged that there may be a positive case to be made for coal fleet retirement. This is despite a deep body of research from other markets demonstrating the merits of targeting the highest carbon emitting coal power plants for early retirement.

Figure 1: PLN's Proposed Coal Retirement Timeline



Source: *PLN presentation during a Parliament hearing on 27*th *May 2021.*

New Optics, Old Substance

From the outset, numerous announcements on the carbon neutrality targets made by PLN and the MEMR sounded very promising. After a full year of Covid-19 struggle and repeated delays on RUPTL issuance, it appeared that a real breakthrough on power sector strategy had finally emerged with the recent PLN and MEMR announcements. While there have been some positive developments, IEEFA's review of the statements indicate that they cannot be taken at face value given the scale of outstanding commitments to the existing pipeline of fossil fuel projects.

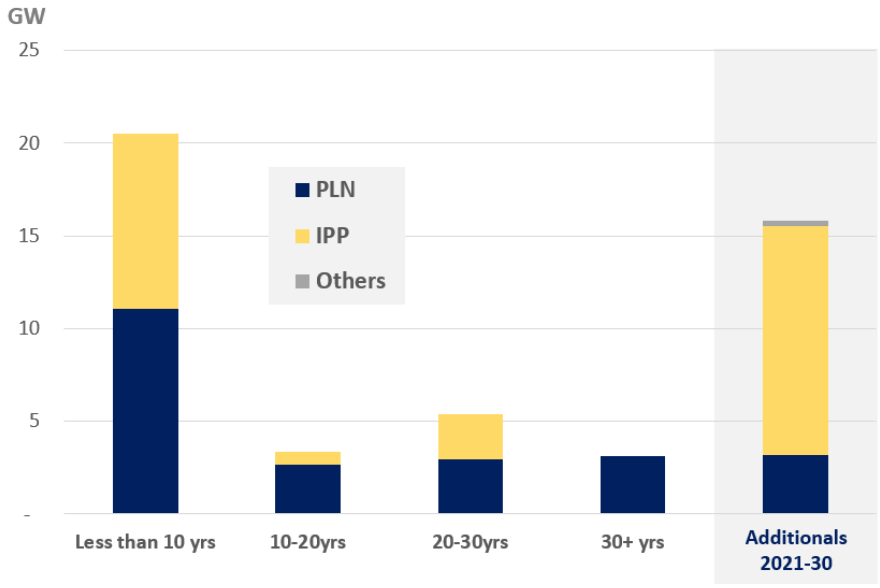
Moreover, IEEFA has found that the NZE policy narrative is simply putting a new face on old plans.

1. **This is not an early retirement plan for coal. All coal plants are still on track to operate for their forecast economic/contractual life.** In a Dewan Perwakilan Rakyat (DPR) parliamentary hearing with Commission VII, PLN deputy director stated that both existing plants and those within the pipeline will retain their 'natural economic life' which essentially means that for these

plants, it is business-as-usual.[1] In other words, there is no foreseeable plan for any early retirement for both PLN's own fleets and the IPP.

PPAs with the IPPs typically last between 25 to 30 years, with some extending to 40 years. The chart below shows that the majority of Indonesia's coal plants are still young and will continue to run until their economic life ends.

Figure 2: Existing Steam Power Plants (PLTU) Capacity Age and Additional Plans



Includes 1GW of legacy steam power plants running on oil or gas.
Source: RUPTL, MEMR, PLN.

2. **The 35 GW coal power programme has not been touched: The 35 GW pipeline will largely stay on track, despite looming over-capacity in the Java-Bali grid.** A recent statement from the MEMR Director General of Electricity conveyed the instruction from President Jokowi that no more coal plants should be considered except those which are under construction or have reached financial close.[2] This led some observers to believe that the government was finally re-evaluating the 35 GW program. IEEFA analysis suggests that nearly 16 GW of new coal capacity is still likely to come online between 2021 and 2030, although MEMR disclosed in a parliamentary hearing that 1.7 GW of these are still 'under further discussions.'[3]

   Out of the 16 GW, we estimate around 4.1 GW of coal plants were still in 'Financing Stage' as at FY2020.[4] This means that unless there has been progress in the first six months of 2021, these plants still have not reached financial close.

[1] DPR Parliamentary hearing. 27 May 2021.
[2] Jokowi Rejected New Coal Power Plants in RUPTL. CNBC Indonesia. 27 May 2021.
[3] MEMR Directorate of Electricity parliamentary hearing. 27 May 2021.
[4] 'Financing stage' status was derived from PLN 2020 Annual Report.

Most of them are owned by IPPs (some are majority owned by PLN subsidiaries but still considered as IPPs by PLN). To be consistent with President Jokowi's instruction, these plants should no longer be in the RUPTL new project pipeline. This is particularly true for those projects that have been on the RUPTL list for more than five years but have still failed to reach financial close. Affected projects include Jawa–3 Tanjung Jati A, and Indramayu CFPP which were included in Fast Track Programme 2 (FTP-2) program since 2010.

Table 1: Coal Power Plants Project Pipeline

Province	Construction	Procurement	PPA	Financing	Planning	Designated Name	Owner	Remarks	Capacity (MW)	COD year
Banten	■					Jawa-9 & Jawa-10	IPP	Indo Raya Tenaga (Indonesia Power, Barito Pacific)	2,000	2025/26
	■					Lontar Unit 4 aka Lontar Exp	PLN		315	2021
Jawa Barat	■					PLTU Jawa-1 (FTP2) aka Cirebon Unit 2	IPP	Cirebon Electric Power	1,000	2022
				■		Indramayu Unit 4 (FTP2)	PLN		1,000	2029
				■		PLTU Jawa-3 (FTP2) aka Tanjung Jati A	IPP	Tanjung Jati Power Co, Bakrie Power (B&Brothers Tbk, YTL Corp)	1,320	2025/26
Jawa Tengah	■					Jawa-4 (FTP2) aka Tanjung Jati B Unit 5-6	IPP	Bhumi Jati Power (Sumitomo, Kansai, United Tractors (Astra))	2,000	2021
	■					Jawa Tengah (PPP) aka Batang	IPP	Bhimasena Power Ind (J-Power, Adaro Power, Itochu)	1,900	2021
Aceh	■					Meulaboh aka Nagan Raya Unit 3-4	IPP	Meulaboh Power Gen (PP Energi, China Datang Ovs., Sumberdaya)	400	2023
Sumut	■					Sumut 1 Unit 1-2	K Wilus	Operating Areas Cooperation (Kerjasama Wilayah Usaha)	300	2023
Jambi				■		PLTU MT Jambi-1 Unit 1-2	IPP	Putra Indotenaga - PLN BB	600	2027
				■		PLTU MT Jambi-2 Unit 1-2	IPP	Pembangkitan Perkasa Daya	600	2026
Sumatera Selatan	■					MT Sumsel-I Unit 1-2	IPP	Shenhua Guohua Lion Power Ind (Shenhua, Lion Energy)	600	2023
	■					MT Sumsel-8 Unit 1-2	IPP	Huadian Bukit Asam Power (Bukit Asam, China Huadian)	1200	2022
				■		MT Sumbagsel 1 Unit 1-2	IPP	Sumbagsel Energi (Sakti) Perwali	300	2024
Kalimantan Barat	■					Parit Baru (FTP1) Unit 1-2	PLN		100	2022
	■					Bengkayang (FTP1) Unit 1-2 aka Pantai Kura2	PLN		55	2022
Kalimantan Timur	■					Tanah Grogot Unit 1-2	IPP	[?]	14	2023
Kalimantan Tengah				■		MT Kalselteng 3 Unit 1-2	IPP	PJBInvest - PLN BB	200	2024/25
	■					Sampit Unit 1-2	PLN		50	2023
Kalimantan Selatan	■					Kalselteng 2 Unit 1-2	PLN		200	2022
	■					Kotabaru Unit 1	PLN		14	2023
Kalimantan Utara	■					Malinau Unit 1	PLN		6	2021
	■					Tanjung Selor Unit 1	PLN		14	2021
Sulawesi Utara	■					Sulut 3 Unit 1	IPP	Minahasa Cahaya Lestari (Toba Bara S, Sinohydro Corp)	50	2021
	■					Talaud Unit 1	PLN		6	2022
	■					Sulut 1 Unit 1	PLN		100	2023/24
Gorontalo	■					Sulbagut 1 Unit 1-2	IPP	Gorontalo Listrik Perdana (TBS, Toba S, Shanghai Electric PC)	100	2021
Sulawesi Selatan	■					Barru 2 (1x100MW)	PLN		100	2021
Sulawesi Tengah	■					Palu 3 Unit 1 -2	PLN		100	2023
Sulawesi Tenggara					■	Sulbagsel Unit 1-2	PLN		400	2023/24
					■	Bau-Bau Unit 1-2	IPP	[?] - Note that this unit is different from Bau-Bau PLN units	30	2023/24
Nusa Tenggara Barat	■					Lombok Unit 1-2 (FTP 2)	PLN		100	2021/22
					■	Lombok 2 Unit 1-2	PLN		100	2023/24
	■					Bima Unit 1-2 (FTP 1)	PLN		20	2029
					■	Sumbawa 2 Unit 1-2	PLN	PLN (Previously unallocated in RUPTL2019)	100	2023/24
Nusa Tenggara Timur	■					Atambua Unit 1-4	PLN		24	2030
	■					Rote Ndao Unit 1-2	PLN		6	2022/23
		■				Timor 1 Unit 1-2	PLN		100	2022/23
	■					Alor Unit 1-2	PLN		6	2022/23
Maluku	■					Ambon-Waai (FTP1) Unit 1-2*	PLN		40	2023
Maluku Utara	■					Sofifi Unit 1-2	PLN		6	2021
					■	Feni Halmahera Timur (Haltim) Unit 1-4	PLN	PLN - potentially for PTBA/Antam	200	2024
Papua	■					Nabire - Kalibobo Unit 1-2	IPP	[?]	14	2022
Papua Barat					■	Sorong [Ex Timika]	PLN		28	2030
*) MEMR presented cancellation plan for PLTU Ambon/Waai (FTP1), but the unit is still on RUPTL2021 draft									**15,818**	

Source: DRUPTL2021, MEMR Press Release 4 June 2021, PLN Parliamentary hearing 27 May 2021.

Table 2: Coal Plants Still in Financing Stage Status According to PLN Annual Report 2020

Province	Plant Name	Plant Name	Ownership	Capacity (MW)	COD
Jambi	PLTU MT Jambi-1 Unit 1	IPP	PLN Subsidiary (PT Putra Indotenaga & PLN BB)	300	2027
	PLTU MT Jambi-1 Unit 2	IPP	PLN Subsidiary (PT Putra Indotenaga & PLN BB)	300	2027
	PLTU MT Jambi-2 Unit 1	IPP	PT Pembangkitan Perkasa Daya	300	2026
	PLTU MT Jambi-2 Unit 2	IPP	PT Pembangkitan Perkasa Daya	300	2026
South Sumatera	MT Sumbagsel 1 Unit 1	IPP	PT Sumbagsel Energi (Sakti) Perwali	150	2024
	MT Sumbagsel 1 Unit 2	IPP	PT Sumbagsel Energi (Sakti) Perwali	150	2024
West Java	Indramayu Unit 4 (FTP2)	PLN		1,000	2029
	PLTU Jawa-3 (FTP2) Unit 1 **aka Tanjung Jati A**	IPP	Bakrie Power (B&Brothers Tbk 20%, YTL Corporation 80%)	660	2025
	PLTU Jawa-3 (FTP2) Unit 2 **aka Tanjung Jati A**	IPP	Bakrie Power (B&Brothers Tbk 20%, YTL Corporation 80%)	660	2026
Central Kalimantan	MT Kalselteng 3 Unit 1	IPP	PLN Subsidiary (PT PJBInvest & PLN BB)	100	2024
	MT Kalselteng 3 Unit 2	IPP	PLN Subsidiary (PT PJBInvest & PLN BB)	100	2025
South Kalimantan	MT Kalselteng 5 Unit 1	IPP	PLN Subsidiary (PT PJBInvest & PLN BB)	100	2025
			TOTAL	**4,120**	

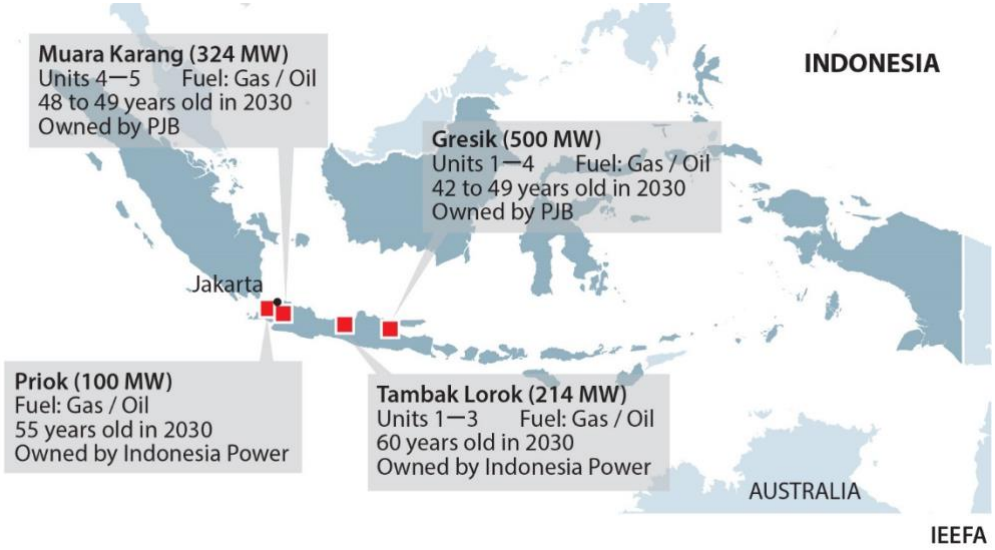
Source: PLN 2020 Financial Statements, DRUPTL 2021.

3. **The first phase of PLN's 1 GW PLTU retirement planned for 2030 are *very old* plants, that would have been in service for 50-60 years and running on oil or gas.** The first retirement phase involves 'Muarakarang, Priok, Tambak Lorok, and Gresik'. While details of the exact units to be retired is limited, IEEFA analysis on the likely units indicated that these plants would already be long overdue for retirement by 2030. The typical coal power plant lifetime of 25 to 35 years acknowledges the efficient working life of power generating units before operating efficiencies are known to deteriorate without significant retrofitting. Planning to retire 50- to 60-year-old units is far from being ambitious, even within a purely competitive electricity market.

   MEMR and PLN data also indicates that these steam plants have been running on oil or gas, using one of the least efficient methods of power generation. Globally, oil's share in power generation has declined from 11% of the total electricity mix in the 1990s to less than 3% in 2018.[5] One plant (Priok) has even been listed as inactive (i.e., generating zero electricity) since RUPTL 2016.

[5] IEA. World electricity generation mix by fuel, 1971-2018. 2020.

Figure 3: First Phase 2030 1GW Retirement Are Long Overdue



Source: RUPTL, Indonesia Power (IP) Statistics, PLN and IP Annual Reports.

Given the very old age of the plants, it is also important to ask whether PLN has taken steps to prepare decommissioning plans which could include environmental remediation. PLN has had limited decommissioning experience and it is unclear whether they have the technical or financial resources to decommission their power plants in line with international standards.

4. **Ten out of the 12 'troubled' *small* coal plants that were targeted for cancellation were actually cancelled two years ago in 2019 RUPTL.** Cancellation of sub-scale coal power plants is a smart move for most system operators because of their poor operating efficiencies and high emissions. What seems to have been ignored is the fact that 10 out of the 12 units highlighted for cancellation in the NZE announcement (127 out of 177 MW) were actually cancelled in the 2019 RUPTL. It should also be noted that these units are mostly small units with less than 30 MW capacity with a limited impact on overall carbon emissions targets.

Table 3: Small Coal Plants Cancellation List

Region	Name	Capacity (MW)		Owner	Status	IEEFA Remarks
Sumatera	PLTU Tembilahan	2x5.5	11	IPP	Cancelled	Already changed to Substation (GI) in RUPTL 2019
Sumatera	PLTU Kuala Tungkal	2x7	14	PLN	Cancelled	Already changed to Substation (GI) in RUPTL 2019
Sumatera	PLTU Ipuh Seblat	2x3	6	PLN	Cancelled	Already changed to Substation (GI) in RUPTL 2019
Sumatera	PLTU Bengkalis	2x10	20	PLN	Cancelled	Already changed to Substation (GI) in RUPTL 2019
Kalimantan	PLTU Tarakan	2x7	14	PLN	Cancelled	Already changed to Gas Engine Units (PLTMG) in RUPTL 2019
Kalimantan	PLTU Kuala Pambuang	2x3	6	PLN	Cancelled	Already changed to Substation (GI) in RUPTL 2019
Kalimantan	PLTU Bontok	2x7	14	PLN	Cancelled	Already changed to Substation (GI) in RUPTL 2019
Sulawesi	PLTU Raha	2x3	6	PLN	Cancelled	Already changed to Substation (GI) in RUPTL 2019
Sulawesi	PLTU Bau-Bau	2x10	20	PLN	Cancelled	New cancellation
Sulawesi	PLTU Wangi-Wangi	2x3	6	PLN	Cancelled	Already changed to Diesel Units(PLTD) in RUPTL 2019
Maluku & Papua	PLTU Ambon-FTP1	2x15	30	PLN	Cancelled	New cancellation
Maluku & Papua	PLTU Jayapura	2x15	30	PLN	Cancelled	Already changed to Mobile Power Plant (MPP) in RUPTL 2019

Source: RUPTL 2019.

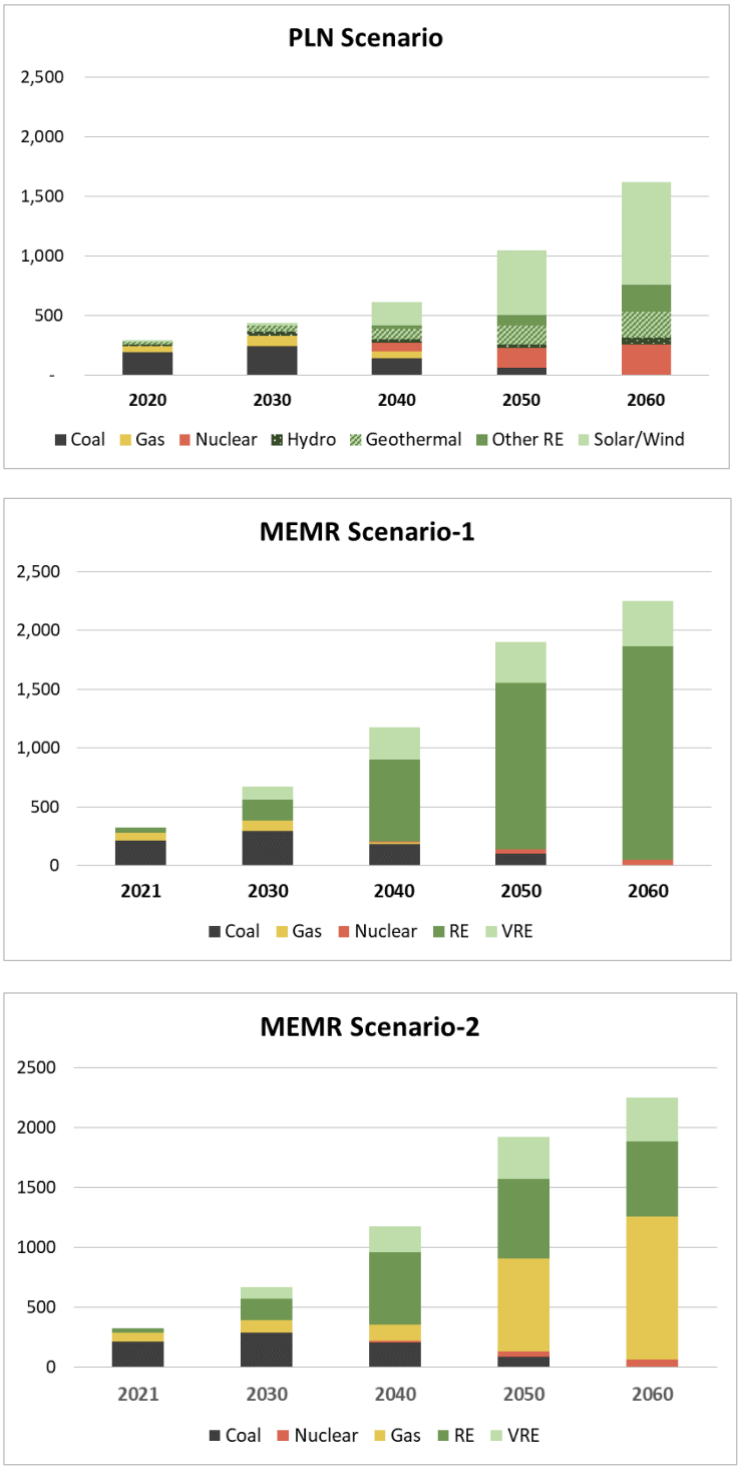
5. **MEMR's and PLN's Net Zero Emission (NZE) scenarios are based on different assumptions.** Despite the fact that PLN and MEMR presented their plans only days apart, the two plans are based on different assumptions of how the goals will be met.[6] While both plans clearly showed an alignment on coal capacity reduction, the pathways for meeting the targets diverged.

   First and foremost, the electricity growth projection is different. While MEMR sets a much higher growth target at more than 2,000 TWh by 2060, PLN remains modest at just above 1,500 TWh. Setting aside the different growth projections, a closer examination clearly indicates different approaches toward the objective – in the use of solar/wind, nuclear, gas, and biomass.

   For example, variable renewable energy (VRE) such as solar and wind play a much more prominent role in PLN's projection, albeit only after 2030. In contrast, MEMR's projection largely relies on other energy options, such as biomass and gas/gasified fuels[7] while planning for a significantly lower nuclear uptake than PLN.

[6] PLN, DPR Commission VII Parliamentary Hearing. 27 May 2021.
MEMR Press Release on Electricity Sector Development and Policies. 4 June 2021.
[7] Refer to Figure 4 for detailed composition of MEMR power generation capacity.

Figure 4: PLN and MEMR 2060 Net Zero Scenarios (TWh)



Source: PLN Parliamentary hearing 27 May 2021, MEMR Press Release 4 June 2021.

So, What Is New?

A number of new plans were disclosed by both PLN and the MEMR. IEEFA analysis on the issues show that both PLN and MEMR are still not on the same page with the forward planning, especially on how to reach net zero by 2060.

1. **Proportion of renewables is higher in DRUPTL 2021 as compared to the 2019 RUPTL.** If the higher installed capacity forecast for VRE in MEMR's presentation in their press conference on 4th June 2021 is achieved, then this will be an important break with over-reliance on high carbon generation options. Renewables are expected to reach 48% of the total installed capacity by 2030, as compared to 30% by 2028 in the 2019 RUPTL.

   Yet, it is worth noting that the higher share of VRE comes from the sharp decline of planned new fossil fuel capacity additions after the 35 GW programme peaks, rather than a sharp increase for the renewables itself. In another words, the renewables actually only receive an additional 3 GW in the new 'Green RUPTL'. Nevertheless, the sharp decline in the rate of growth of new coal units should be acknowledged as a step in the right direction.

Table 4: Proportion of Renewable vs Fossil Fuel in 2019 and 2021 DRUPTL

Generation	RUPTL 2019-2028		DRUPTL 2021-2030	
	(MW)	%	(MW)	%
New & Renewables	16,762	30%	19,899	48%
Fossil Fuel	39,633	70%	21,069	52%

Source: MEMR Press Release 4 June 2021.

2. **Electricity demand growth projection for the next 10 years is toned down.** With the key Java-Bali grid reserve margin currently expected to reach close to 60% in 2022, PLN has clearly put itself at risk by consistently over-estimating demand and committing to inflexible excess capacity additions.[8] Thankfully, recent electricity demand growth forecasts have finally been toned down from an overly ambitious 6.4% to 4.9% and are now better aligned with Indonesia's GDP growth potential and the associated power demand multiplier.

   While Covid-19 certainly has slowed electricity demand growth, the oversupply should come as no surprise to anyone given the rush of coal plants construction in the Java-Bali grid in recent years. Realistic forecasting of electricity demand growth has always been the persistent crux of the problem for PLN planning, a subject which IEEFA has repeatedly highlighted.

3. **There seems to be 6.8 GW of NEW coal power "modifications" or "postponed" in the DRUPTL 2021.** IEEFA analysed the detailed plan disclosed in the DRUPTL 2021 and compared the historical data with the announcements. We found that an estimated 6.8 GW of potential new coal power plants have

[8] PLN, DPR Commission VII Parliamentary Hearing. 27 May 2021.

either been modified and changed to renewable baseload[9] or shifted to other sources of generation or postponed until further notice.

We also note that almost all of the scrapped coal plants affect projects that are owned by PLN directly or indirectly via one of PLN's fully-owned subsidiaries (i.e., PT Indonesia Power, PT PJB Investasi, PT PLN Batu Bara, etc). None of the signed 35 GW program of coal IPPs were cancelled or modified. Only one IPP from the FTP-2 planning process was postponed—namely the troubled Banyuasin Mine Mouth Coal Power.[10] Meanwhile, two other unassigned coal IPPs-mine-mouth projects in South Sumatera—were also postponed.

Given the significant amount of coal power capacity that has either been shifted to renewable baseload or postponed in the plans, it raises questions about why PLN's and MEMR's announcements have not drawn more attention to this initiative. By contrast, they provide a detailed explanation of plans covering 34 problematic power plants with total capacities of only about 627 MW, 12 of which will be cancelled.

[9] There is no clear definition of renewable baseload from PLN nor MEMR. In the DRUPTL 2021, PLN stated them as a mix of hydro, geothermal, bioenergy as well as solar and wind with batteries as long as they can be operated continuously for 24 hours as baseload.
[10] Please see IEEFA Mine-Mouth Report for more explanation about Banyuasin mine mouth power plant. IEEFA. The Case for Power System Transformation. 2019

Table 5: Modified Coal Plants Proposed in DRUPTL 2021 (in MW)

Province	Plants Name	Capacity (MW)	DRUPTL 2021 Total Modified (MW)	Ownership	Notes
Banten	Jawa-5	1000	1,660	PLN Subsidiary (majority owned by PT Indonesia Power)	*unclear info. Jawa 5 was tendered in 2016, and annuled in 2017. PLN then decided Jawa-5 will be built by PT IP and its JV consortium. But the plan dissapeared in 2018 RUPTL, and reappear in 2019 RUPTL. The plan was for 2x1000 MW in 2016, and later on reduced to 1000 MW in 2019 RUPTL. In DRUPTL 2021 the plan is postponed according to system's needs
	Banten unallocated	660		Unallocated	Stated as postponed according to system's needs
North Sumatera	Sumut-2 Unit 1 &2	600	600	PLN Subsidiary (majority owned by PT PJB Investasi, minority PT Gamma Energi Negeri	Stated as postponed according to system's needs
Riau	Riau-1 Mine Mouth	600	600	PLN Subsidiary (51% PJB Investasi & PLN Batubara; 49% Samantaka batubara (BlackGold & China Huadian))	Stated as postponed according to system's needs
Riau Islandsi (Excl. Batam)	Bintan Unit 1 & 2	200	200	PLN	Changed to Baseload Power
Bangka Belitung	Bangka 1-A Unit 1 & 2	100	130	PLN	Changed to Baseload Power
	Belitung 2 Unit 1 & 2	30		PLN	Changed to Baseload Power
South Sumatera	Banyuasin Unit 1 & 2	240	890	IPP (*Oceanwide)	Stated as postponed according to system's needs
	Sumsel Mine Mouth (expansion)	350		IPP (not signed)	Stated as postponed according to system's needs
	Sumsel 6 Mine Mouth	300		IPP (not signed)	Stated as postponed according to system's needs
Lampung	Lampung extension	300	300	PLN	Stated as postponed according to system's needs
West Kalimantan	Kalbar 2	200	414	PLN	Changed to Baseload Renewables
	Kalbar 3	200		PLN	Changed to Gas or Steam Gas
	Ketapang (ex-Timika)	14		PLN	Shifted to Papua
East Kalimantan	Kaltim 3 Mine Mouth Unit 1 & 2	200	414	PLN subsidiary (Putra Indo Tenaga & PLN Batu Bara)	To be replaced with renewables
	Kaltim 5 Mine Mouth Unit 1 & 2	200		PLN subsidiary (Putra Indo Tenaga & PLN Batu Bara)	To be replaced with renewables
	Berau (ex-Timika) Unit 1 & 2	14		PLN	Shifted to Papua
Central Kalimantan	Kalselteng 4 Unit 1 & 2	200	200	PLN subsidiary (PT PJB Investasi - PLN Batu Bara)	To be replaced with renewables
South Kalimantan	Kalselteng 5	200	100	PLN subsidiary (PT PJB Investasi - PLN Batu Bara)	Capacity was 200 MW in R19, but then 100 MW was delisted from R21 and planned to be replaced with renewables
North Sulawesi	Sulbagut 3 Unit 1 & 2	100	300	PLN	Changed to Baseload Power
	Sulbagut 2 Unit 1 & 2	200		PLN	Stated as postponed according to system's needs
Central Sulawesi	Tolitoli Unit 1 & 2	50	50	PLN	Stated as postponed according to system's needs
Southeast Sulawesi	Sulbagsel 2 Unit 1 & 2	400	430	PLN	Stated as postponed according to system's needs
	Bau-bau 2 Unit 1 & 2	30		PLN	Changed to Baseload Renewables
West Nusa Tenggara	Lombok 3 Unit 1 & 2	100	200	PLN	To be replaced with renewables
	Lombok 4 Unit 1 & 2	100		PLN	To be replaced with renewables
East Nusa Tenggara	Timor 2	50	50	PLN	To be replaced with renewables
Maluku	Ambon	50		PLN	To be replaced with renewables
Papua	Jayapura 2	50	100	PLN	To be replaced with renewables
	Jayapura 3	50		PLN	Stated as postponed according to system's needs
Papua Barat	Sorong 3	50	50	PLN	To be replaced with renewables
TOTAL		**6,838**	**6,688**		

Source: DRUPTL 2021 and IEEFA estimates.

**Modified here means postponed or changed to renewable baseload or other kind of baseload generations.*

4. Rapid increase in biomass co-firing, large scale hydro and geothermal are the chosen shortcut to reach the Paris Agreement target in 2025.

Large scale hydro remains as PLN's fast track to reaching the renewable energy target. For years PLN has consistently depended on plans for large-scale hydro and geothermal power to boost its renewable energy mix. What is new this year is PLN's plan to boost the large-scale hydro through 'demand creation' for industrial estate. This will be done through the development of large-scale hydro especially through the Renewable Energy Based Industry Development (REBID) program in Kalimantan. The plan is to build 6000 - 9000 MW of cascading hydro in the Kayan river which runs through North and East Kalimantan.[11]

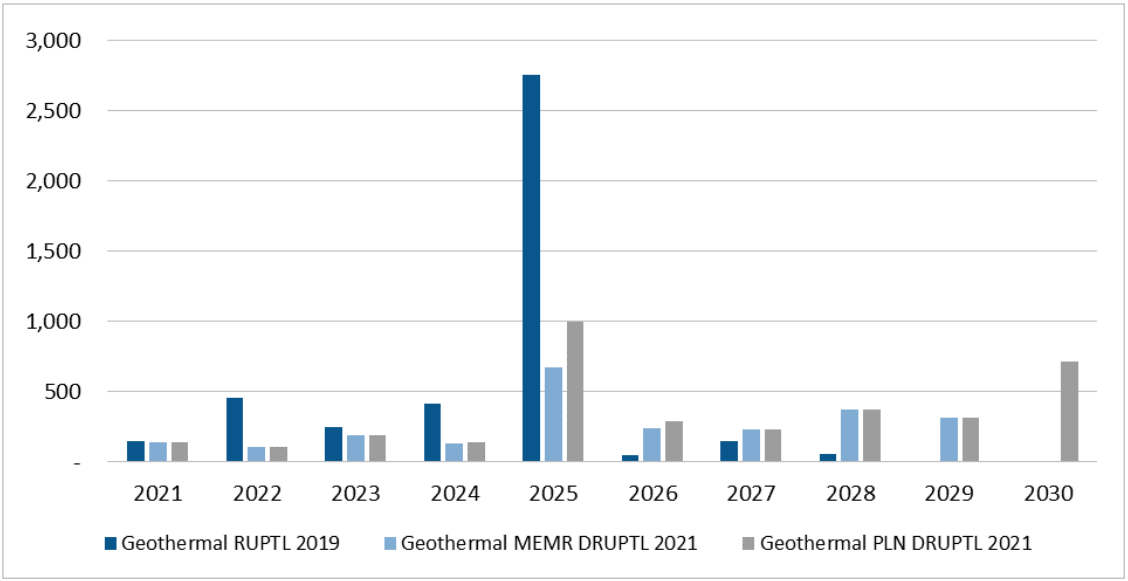
This plan will involve unstated risks, however. Implementation of the REBID program in Kalimantan will carry significant construction, environmental and operational risks, typical for large-scale hydro projects. The risks will be magnified if there is delay in the new capital city development plan, or a change of industrial planning site, or if economic growth in the region is slower than expected. Ironically, PLN has already acknowledged these risks and highlighted the challenges and difficulties in developing those resources in their RUPTL. Yet the plan remains central to the renewable capacity growth plan.

What is new this year is PLN's plan to boost the large-scale hydro through 'demand creation' for industrial estate.

Unrealistic geothermal development timeline - updated. In the previous 2019 RUPTL, PLN opted to include a huge planned addition of 2.7 GW geothermal in 2025 alone. This move has been seen as one of PLN's shortcuts to achieve the 23% Paris Agreement target. The new so-called Green RUPTL for 2021 cut the overly optimistic expectation by half, from 4.2 GW to 2.4 GW in 2030 in the MEMR version, or to 3.4 GW in the PLN's draft 2021 RUPTL. The 1-2 GW scale back reflects a realistic expectation by both entities, bearing in mind relevant experience of managing challenges in the exploration phase of geothermal development.

[11] MEMR Press Release. Renewable Power Plants for Large Scale Industries. 26 September 2020.

Figure 5: Geothermal Power Installed Capacity Planned (MW)

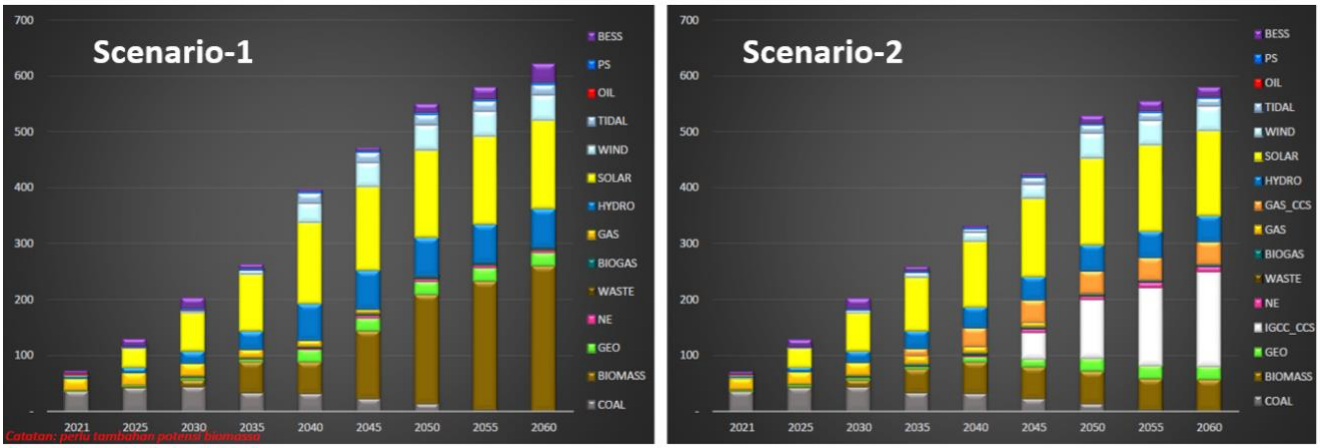


Source: 2019 RUPTL, MEMR Press Release 4 June 2021, DRUPTL 2021.

Biomass co-firing - With the reduced geothermal plan, the burden has now been shifted toward new plans for biomass co-firing. Due to its current financial constraints, PLN considers biomass co-firing to be a more plausible option as it is less capital intensive than other renewables. Meanwhile, the need for biomass price setting is pushed toward the supplier and the government. In the low carbon scenario presented by PLN, biomass cofiring is expected to multiply substantially from less than one percent to six percent in 2025, with a major jump taking place in 2025.

5. **Placing a big bet on novel technologies while downplaying proven options for the Net Zero target – Biomass, gasification and carbon capture instead of solar and wind.** The prominence of biomass and Integrated Gasification Combined Cycle (IGCC)+Carbon Capture and Storage (CCS) is very clear in the plan and raises tough questions about feasibility.

Figure 6: MEMR Power Generation Capacity Scenarios (Giga Watt)



Source: MEMR Press Release 4 June 2021.

a) **Biomass – a *huge* ambition with few details on sustainable implementation.** MEMR Scenario-1 presented massive biomass uptake reaching to nearly half Indonesia's total installed capacity by 2060, totalling more than 250 GW out of 600 GW. IEEFA has previously analysed the multiple challenges which the country needs to overcome in order to meet the existing PLN/MEMR biomass cofiring plan in PLN coal plants ('a mere' 1.7 GW cofiring capacity).[12] The latest PLN figures suggest the cofiring target has been raised to 2.7 GW requiring 8 to 16 million tonne/year of biomass for the next 10 years.[13]

To place things into context, a back-of-the-envelope calculation suggests that to reach the target, Indonesia needs to build more than **1.4 billion ton/year** of biomass capacity by 2060, **more than two hundred times the biomass capacity of US** – the world's largest exporter of wood pellet biomass.

External observers may not readily comprehend the scale of the ambition and one would only need to extend the question further to envision the probability of success -and the socio-environmental implications- for such novel ambition.

b) **IGCC+CCS – as a way to keep fossil fuel ambitions?** MEMR Scenario-2 also incorporates a massive gas consumption build up from 2031 onwards to be applied in conjunction with CCS. In contrast, PLN's scenario foresees a rapid gas decline post-2030. A key note is to understand that IGCC involves gasification of fuel -which could potentially be coal or biomass[14]- used in conjunction with CCS. Neither are yet proven technologies, and the outcome of this ambition will need to be re-calibrated frequently according

[12] IEEFA. Indonesia's Biomass Cofiring Bet – Beware of Implementation Risks. February 2021.
[13] PLN, DPR Commission VII Parliamentary Hearing. 27 May 2021.
[14] MEMR. Increasing Efficiency of Power Plant, MEMR Joined a Partnership with Japan. February 2020.

to the progress of R&D on CCS and should *only* be taken up if and when CCS has succeeded in reaching technical and commercial viability.

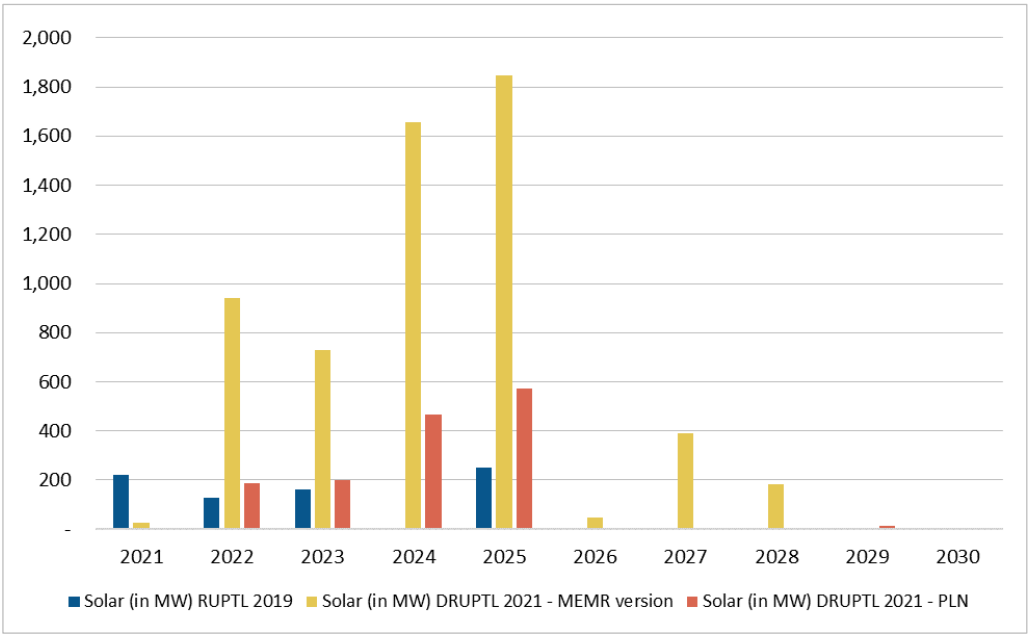
CCS has gained a lot of media coverage in recent years, nevertheless readers should be cautioned that such technology is still under development despite years of technological investments, and thus far is still hampered by its high cost. With the deflationary cost of renewable energy, it remains to be seen whether CCS could ever reach its way to economically operate in countries like Indonesia which hinges on low-cost electricity.

Carbon capture and storage technology is still under development despite years of technological investments.

c) **Solar and wind power – still being on the back burner.** Despite the rapid increase of solar and wind capacity additions globally, solar and wind power are still seen as second-class energy options in Indonesia. There is a small boost for solar adoption in the new plan yet we see stark differences between MEMR's ambition and PLN's approach in solar power deployment plan for the next 10 years.

PLN preferred a more modest increment of solar in the next 10 years, and a much higher number of solar generations after 2030. Meanwhile, MEMR looks pretty stern in its push for higher solar adoption, particularly in the next four years in order to reach the Paris Agreement target.

Figure 7: Solar Power Additions (MW)



Source: RUPTL 2019, MEMR Press Release 4 June 2021, DRUPTL 2021.

On numerous webinars and public events, PLN has been consistent in delivering a message that its method of choosing renewable generations will depend on the consideration of system balance, potential local resources, reliability, and the economics of the energy. It has also been consistent on pushing renewables into the eastern part of Indonesia, as the western part, especially Java-Bali and Sumatera grid are already oversupplied. In particular, PLN aims to use more renewables in locations where there are supply deficit or locations with high dependency in diesel power.

PLN's current plan to increase solar power is still far from ambitious:

a. 612 MW of floating solar on existing dams (to be combined with hydro power)

b. 435.5 MW on ex-mining sites

c. 112.5 MW of utility scale solar on PLN's existing site

d. Small hybrid solar power in micro-grids on isolated islands

e. 1000 MW of rooftop solar – a program endorsed by MEMR and Indonesian solar energy associations

6. **Converting 2 GW of diesel power plants into renewables in isolated places.** This is in line with PLN's target to reduce oil dependency while at the same time reaching the 23% renewable energy target. A total of 5200 units of diesel generators in 2130 locations will be replaced by renewables plus storage, with

the first stage conducted in 200 locations for 265 MW. The conversion is planned to be conducted in stages until 2025-2026.

Bringing the Ambition Into Reality – PLN Annual Report Says It All

To really put the released numbers into context, one must look at the financial reality on the ground. Either publicly admitted or not, PLN has been struggling with overcapacity and lower-than-forecast demand for years. Being the sole arm of the government to electrify 100% of Indonesia including its most isolated and far-out places, created a huge financial burden for PLN. PLN's CEO admitted at a Parliament hearing recently that PLN will need an additional IDR 31 trillion to achieve the 100% electrification target – a significant amount that is currently not provided by the government.[15] In addition to that is PLN's inability to set customer tariffs since 2017, which then worsened the already poor mismatch in its revenue model.

PLN's inability to set customer tariffs since 2017 has worsened its revenue model.

This unworkable revenue model basically paralyzed PLN's already crippled business model. It would come as no surprise to any analyst to see a utility company as big as PLN suffer and make a loss in a pandemic like today. But instead, PLN announced an increase profit of IDR 5.9 trillion in FY2020 as compared to IDR 4.3 trillion in FY2019. So, what has been done differently?

The changes we see in the PLN annual report:

1. **PLN's increased operating profit in FY2020 was mainly a result of a huge drop in fuel expenses, mostly from oil and gas.** PLN managed to save approximately IDR 30 trillion from the fuel costs alone in 2020. This might be due to several reasons including a sharp drop of oil prices due to Covid-19, new government support to cap gas prices for PLN as mandated by the MEMR Regulations no 10/2020, and a drop in volume purchased due to declining demand in 2020.

[15] Parliament hearing between PLN and the Commission 6 of the House of Parliament, 25th May 2021.

Table 6: PLN Fuel Expenditure (in IDR million)

Fuel Expenses	2020	2019	Cost Reduction (IDR)	%
Fuel oils				
High speed diesel	13,831,217	20,637,756	(6,806,539)	-33%
Fuel marine oil	797,241	2,378,592	(1,581,351)	-66%
Industrial diesel	584	2,313	(1,729)	-75%
Others	1,168,555	1,710,712	(542,157)	-32%
Subtotal	**15,797,597**	**24,729,373**	**(8,931,776)**	-36%
Non-oil fuels				
Coal	46,158,057	49,397,601	(3,239,544)	-7%
Natural gas	40,040,431	58,054,184	(18,013,753)	-31%
Geothermal	3,540,237	3,406,242	133,995	4%
Water	346,831	222,372	124,459	56%
Subtotal	**90,085,556**	**111,080,399**	**(20,994,843)**	-19%
Lubricants	121,132	274,710	(153,578)	-56%
TOTAL	**106,004,285**	**136,084,482**	**(30,080,197)**	-22%
Volume	**2020**	**2019**	**Vol Reduction**	**%**
Fuel oils (kilo liter)	2,669,946	3,118,762	(448,816)	-14%
Coal (tonnes)	66,683,392	67,008,829	(325,437)	-0.5%
Natural gas (MMSCF)	378,246	479,776	(101,531)	-21%
TOTAL				

Source: PLN Annual Reports 2020, PLN Statistic 2019 - 2020.

Meanwhile, the purchase of electricity increased by 18% in 2020, most of which came from an increase in purchases from PLN subsidiaries' Joint Venture with PT SSP (for the Jawa-8/Cilacap expansion 1,000 MW CFPP) and PT Shenhua Guohua (for the Jawa-7 2x1000 MW CFPP) both of which came online in late 2019 and 2020. It is expected that PLN will experience a higher increase in purchased electricity starting this year up to 2023 (both from IPPs that are related parties and third parties), although the timing cannot be confirmed until the new RUPTL is released.

Table 7: Increase in Purchase of Electricity (in IDR million)

	2020	2019	Cost Increment (IDR)	%
Related Parties				
PT Sumber Segara Primadaya	12,818,397	7,274,856	5,543,541	76%
PT Shenhua Guohua PJB	5,054,423	405,908	4,648,515	1145%
Others (each under 5% total)	6,960,390	6,334,594	625,796	10%
Subtotal	**24,833,210**	**14,015,358**	**10,817,852**	**77%**
Third Parties				
PT Paiton Energy	13,439,941	13,513,202	(73,261)	-1%
PT Jawa Power	7,723,929	8,066,142	(342,213)	-4%
Others (each under 5% total)	52,654,524	47,959,289	4,695,235	10%
Subtotal	**73,818,394**	**69,538,633**	**4,279,761**	**6%**
TOTAL	**98,651,604**	**83,553,991**	**15,097,613**	**18%**

Source: PLN Annual Report 2020.

2. **Implementing changes in the accounting standard of SFAS 73, would have created a different financial result**. Starting in January 2020, companies in Indonesia are required to implement the new accounting standard on leases, the SFAS 73, which requires companies to treat nearly all their lease contracts as a finance lease (on balance sheet). Only contracts with a lease period shorter than 12 months or contracts with an insignificant amount are allowed to be accounted for as an operational lease (off-balance sheet). The new approach is intended to provide greater transparency of a lessee's financial leverage and capital employed.

   The new standard could have a huge impact on PLN's financial statements. Firstly, the new accounting standard will affect the balance sheet and balance sheet ratios such as debt/equity ratio. Secondly, the implementation of SFAS 73 will also influence income statements, as the entity would now have to recognise interest expense (finance expense) on lease liabilities (obligations to make lease payments) and depreciation on 'right-of-use' assets.[16]

   PLN, however, has been exempted from this requirement with the issuance of POJK No 6/2017 which allows Power Purchase Agreement (PPA) and Energy Sales Contracts (ESC) to be treated as sale and purchase transactions, even though they may contain a substance other than the sale and purchase of electricity. By not implementing the new SFAS 73 on PPAs and ESC contracts, there is more to PLN's financials than meet the eyes. Lenders and regulators should be aware of these changes:

   1. If PPAs and ESCs were treated as finance leases, PLN's lease liabilities would increase by an estimate of 1,314% from IDR 18.5 trillion to IDR 261.4 trillion. Simultaneously, PLN's assets will increase by 12% and its equities will be much lower as unappropriated retained earnings drop by IDR 54.1 trillion.

[16] PWC. PSAK 73 – Leases: A new era for lease accounting.

2. **This means that there is approximately IDR 242.9 trillion of PLN's long-term liabilities that are currently not recorded on its books (off-balance sheet).**

3. The changes in treatment for leases would have created a much higher debt to equity ratio for PLN from 0.69 to 0.99, a level that might ring an alert to some lenders depending on its existing bank covenants.

4. If PPAs and ESCs are treated as finance leases, PLN's purchased electricity expense would have declined by 91.6%, but at the same time, PLN's finance cost (interest expense) would have increased by 170.8%, bringing the finance cost from IDR 27.4 trillion to IDR 74.2 trillion.

5. **The changes in accounting treatment would have lowered PLN's net profit significantly from IDR 5.9 trillion to IDR 990 billion in 2020**.

Table 8: PLN Consolidated Financial Statements of Profit or Loss and Other Comprehensive Income

in Millions IDR, unless otherwise stated

Year Currency	2019 IDR	2020 IDR	2020 with SFAS 73 IDR
Revenues			
Sale of electricity	276,061,925	274,898,464	274,898,464
Customer connection fees	6,934,597	312,725	312,725
Others	2,644,067	4,311,826	4,311,826
Total Revenues	**285,640,589**	**279,523,015**	**279,523,015**
Operating Expenses			
Fuel and lubricants	136,084,482	106,014,285	135,363,422
Purchased electricity	83,563,991	98,651,604	8,320,866
Lease	3,617,376	3,101,334	3,299,327
Maintenance	22,328,178	21,940,509	29,487,013
Personnel	25,908,771	24,965,707	24,965,707
Depreciation	35,318,071	36,662,917	44,856,604
Rights-of-use assets depreciation		2,479,663	2,479,663
Others	8,620,069	7,192,146	7,192,146
Total Operating Expenses	**315,440,938**	**301,008,165**	**255,964,748**
Operating Loss Before Subsidy	(29,800,349)	(21,485,150)	23,558,267
Government's electricity subsidy	51,711,774	47,988,114	47,988,114
Compensation Income	22,253,517	17,904,508	17,904,508
Operating Income After Subsidy	**44,164,942**	**44,407,472**	**89,450,889**
Other income -net	(3,667,666)	1,916,966	1,916,815
Gain (loss) on foreign exchange - net	9,486,326	(7,742,152)	(9,842,324)
Financial income	755,103	1,125,519	1,125,519
Financial cost	(24,619,495)	(27,415,886)	(74,231,203)
Income (Loss) Before Tax	**26,119,210**	**12,291,919**	**8,419,696**
Tax Benefit (Expenses)	(21,797,080)	(6,298,491)	(7,429,185)
Income for The Year	**4,322,130**	**5,993,428**	**990,511**

Consolidated Statements of Financial Position

in Millions IDR

Year Currency	2019 IDR	2020 IDR	2020 with PSAK 73 IDR
Assets			
Non-current Assets			
Property, Plant, and equipment	1,400,685,118	1,401,888,487	1,573,980,560
Right-of-use assets		31,193,985	31,193,985
Investment properties	5,283,708	5,408,572	5,408,572
Investments in associates	3,868,060	14,112,585	14,112,585
Investments in joint ventures	6,432,705		
Prepaid taxes		8,898,076	8,898,076
Deferred tax assets	2,215,963	195,290	195,290
Receivables from related parties	951,643	975,149	975,149
Restricted cash in banks and time deposits	5,980,703	5,882,934	5,882,934
Other receivables	824,545	1,295,416	1,295,416
Receivables from government		17,275,490	17,275,490
Other non-current assets	7,445,895	4,780,480	4,780,480
Total Non-current Assets	**1,433,688,340**	**1,491,906,464**	**1,663,998,537**
Current Assets			
Cash and cash equivalents	46,598,783	54,735,434	54,735,434
Short-terms investments	334,153	366,708	366,708
Trade receivables from:			
Related parties	819,836	731,817	731,817
Third parties	24,310,702	20,546,599	20,546,599
Receivables on electricity subsidy	-	819,067	819,067
Compensation Receivable			
Other receivables	47,451,084	1,746,344	1,746,344
Inventories	12,934,233	10,277,289	10,277,289
Prepaid taxes	17,634,137	7,287,693	7,287,693
Prepaid expenses and advances	1,206,785	640,881	640,881
Receivables from related parties	4,719	1,486	1,486
Other current assets	72,241		-
Total Current Assets	**151,366,673**	**97,153,318**	**97,153,318**
Total Assets	**1,585,055,013**	**1,589,059,782**	**1,761,151,855**

Year Currency	2019 IDR	2020 IDR	2020 with PSAK 73 IDR
Liabilities and Equity			
Equity			
Equity attributable to owners of the Parent			
Capital stock - par value of Rp 1 per share			
Authorized - 439,000,000 shares and 204,000,000 shares as of Dec 31, 2017 and 2016			
Subscribed and paid-up 109,826,526 shares and 109,826,526 shares as of 31st Dec 2018 and 2017, respectively	115,181,002	135,342,182	135,342,182
Additional paid-in capital	9,919,958	5,216,571	5,216,571
Stock subscription from Government in issuance process	10,528,230		
Retained earnings:			
Appropriated	60,334,896	64,657,026	64,657,026
Unappropriated	70,997,731	71,928,554	17,784,360
Other comprehensive income	661,509,952	661,734,097	661,734,097
Equity attributable to owners of the Parent	928,471,769	938,878,430	884,734,236
Non-controlling interests	908,644	934,162	934,162
Total Equity	929,380,413	939,812,592	885,668,398
Non-current Liabilities			
Deferred tax liabilities - net	28,121,540	31,746,600	16,235,838
Long-term liabilities - net of current portion			
Two-step loans	35,251,741	35,617,153	35,617,153
Government and non-bank government financial institution loans	4,359,569	3,649,146	3,649,146
Lease liabilities	11,569,377	14,035,913	249,387,044
Bank loans	184,023,820	154,489,751	154,489,751
Bonds payable and sukuk ijara	174,292,298	192,850,308	192,850,308
Electricity purchase payable	6,431,448	6,097,857	5,400,483
KIK-EBA loans	1,354,642	655,772	655,772
Payable to related parties	92	9,432	9,432
Employee benefits liabilities	50,838,258	54,609,453	54,609,453
Deferred revenues		5,644,472	5,644,472
Other payables	133,662	182,093	182,093
Total Non Current Liabilities	496,376,447	499,587,950	718,730,945
Current Liabilities			
Trade payables			
Related parties	11,814,735	8,505,191	8,002,261
Third parties	40,188,048	30,643,364	28,510,400
Taxes payable	2,383,288	1,747,279	1,747,279
Accrued expenses	16,754,640	7,449,309	9,590,411
Customers' security deposits	14,235,879	14,802,396	14,802,396
Project cost payable	150,664	153,983	153,983
Deferred revenue	1,049,231	1,617,725	1,617,725
Derivative liabilities		327,544	327,544
Current maturities of long-term liabilities			
Two-step loans	2,725,805	3,062,879	3,062,879
Gov and non-bank gov financial institution loans	1,998,476	2,416,967	2,416,967
Lease liabilities	2,540,107	4,450,390	12,059,933
Bank loans	21,693,338	18,816,957	18,816,957
Bonds payable and sukuk ijara	6,946,478	14,970,000	14,970,000
Electricity purchase payable	399,458	427,974	406,495
KIK - EBA loans	586,620	871,177	871,177
Employee benefits liabilities	5,232,467	8,500,782	8,500,782
Other payables	30,598,919	30,895,322	30,895,322
Total Current Liabilities	**159,298,153**	**149,659,239**	**156,752,511**
Total Liabilities	**655,674,600**	**649,247,189**	**875,483,456**
TOTAL EQUITY AND LIABILITIES	**1,585,055,013**	**1,589,059,781**	**1,761,151,854**
Debt to Equity Ratio	**0.71**	**0.69**	**0.99**

PLN has claimed that the POJK regulation is valid until the end of the assignment on acceleration of electricity infrastructure (as per Presidential Regulation No 14/2017), or in another words, this will apply until all the 35 GW projects are completed.

Once this exemption expires, key stakeholders need to realize there will be a sudden change in PLN's financial position that could potentially affect financial metrics and PLN's leverage to accessing debt.

It is worth noting that the Credit Rating Agencies (CRAs) such as Moody's are well-aware of PLN's financial condition. They have been adjusting PLN's financial metrics by accounting for its power purchase agreements (PPAs) as lease liabilities, yet it doesn't seem to be impacting its overall credit rating. PLN's stand-alone Baseline Credit Assessment (BCA) has consistently been in non-investment grade for the past four years (between from Ba2 – Ba3), but its final credit rating typically receives a 3-4 notch upgrade to investment grade due to very high support from the government.

3. **Repositioning of subsidy and compensation income - from previously accounted below the operating margin to now considered at par with PLN's revenue.** The first easily sighted alteration in PLN's 2021 Annual Report is the changes in its revenue line. Previously, PLN has always presented subsidies and compensation payment as non-operating revenue and put it below the operating margin line. This year, both accounts were moved up to the revenue line, creating an impression that PLN now has a positive operating margin.

   But international accounting standards specify that anything considered as core to a company's operation should be put above the line. By presenting the subsidy and compensation payments as a part of the operating revenue, this implies that PLN is publicly acknowledging that ongoing central government support should be viewed as recurring, rather than one-off items. It also reinforces the impression that PLN lacks a credible pathway to achieving any traditional form of full-cost recovery and will require material direct government subsidies as long as the government has the resources to provide support.

Bringing the Ambition into Reality – What to Look For

The gaps between the NZE announcements and MEMR and PLN's traditional planning process outputs raises the likelihood that the NZE plan is still work in progress. As a result, further changes and adjustments should be expected as key stakeholders examine the practical implications of these plans and refinements emerge. The following areas should be on the shortlist for review:

1. **Coherent and realistic targets.** The first step is to ensure alignment between PLN and MEMR plans, with full consideration which technologies are best positioned to deliver positive emissions outcomes. Placing high bets on future development of niche technology should not overlook the global trends. Betting

on technologies which attracts little attention globally reduces the likelihood of such technology reaching the maturity stage.

2. **Coal demand and pricing trends in the run-up to 2030.** With the prominence of coal in the power system, rising consumption domestically is expected. This begs questions about whether rising domestic demand requirements will be balanced against regional export trends. Stakeholders should keep watch on the export quota which has been rising in recent years and any related pricing pressures.

This is a window of opportunity for PLN to fully reconsider plants which have not secured financial backing.

3. **Has the renewable energy potential been explored to the fullest?** Have other RE sources such as wind (both onshore and offshore), ocean energy been explored? Some of them may not be readily deployable, but PLN's willingness to take risk on untested technologies such as CCS suggests that a more balanced approach to technology development would be merited.

4. **Attention should be focused on un-needed coal plants which remain in the plan but could potentially be scrapped.**

   There are three things that stakeholders need to watch on this subject. First, is to request clarity of deadline and whether the deadline is for starting construction, reaching financial close, or putting the unit into operation. Secondly, to ask for clarity on the current status for each unit in the pipeline, bearing in mind that 'under construction' can have a very liquid meaning. Third and the most important, is to scrutinize plans to add more plants in already-congested grids.

   In the 4th June MEMR press release, MEMR still retains statements that coal plants 'with contracts' are still allowed to continue. This is particularly important to pay attention to, considering that 100% of Independent Power Producers (IPP) PPAs have been signed.[17] PLN is certainly well aware of the challenges in exiting contractual agreement for plants which are already in the later stages of development. Prolonged inability to reach financial closure certainly raises a question on business viability. With PLN already struggling to manage excess capacity, it is a window of opportunity for PLN -with the government support- to fully reconsider plants which have not secured financial backing.

[17] MEMR Press Release on Electricity Sector Development and Policies. 4 June 2021.

About IEEFA

The Institute for Energy Economics and Financial Analysis (IEEFA) examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

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