



Market Assessment Report for 3rd Quarter of 2023

26 July to 25 September 2023

DECEMBER 2023

This Report is prepared by the
Philippine Electricity Market Corporation –
Market Assessment Group
and approved by the
Market Surveillance Committee

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QUARTERLY MARKET ASSESSMENT REPORT

This quarterly report assesses the results of the WESM operation for the Third Billing Quarter of 2023 (26 June to 25 September 2023) and how the market performed compared with the previous quarter of the year.

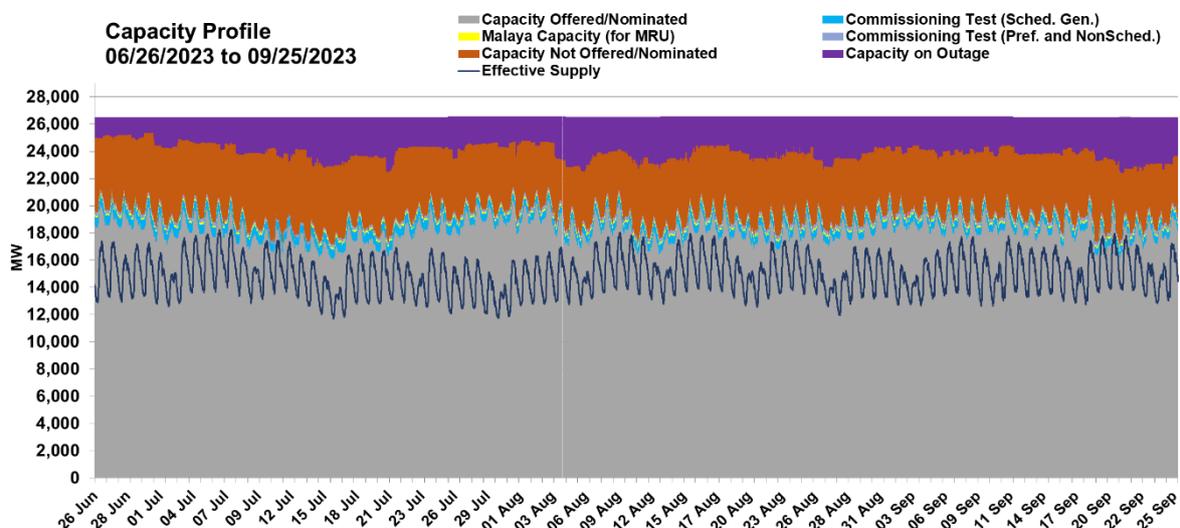
I. Capacity Profile

The total WESM registered capacity stood at 26,503.2 MW by the end of the third billing quarter of 2023, recording a 3.7 MW increase from 26,499.5 MW on 25 June 2023. The increase was attributed to the entry of two (2) hydro facilities during the quarter, namely i. Hydrocore Corp. (6 MW), ii. Matuno River Development Corporation (8.7 MW). In addition, Trustpower Corporation (15.4 MW), a solar facility, was also registered in the market. Furthermore, two (2) Battery, two (2) Coal, two (2) Hydro, 1 Geothermal, five (5) Solar, and 16 Oil-based power plants posted changes in their registered capacity, which contributed to the total registered capacity this quarter.

Of the total registered capacity, only 69 percent was offered/nominated in the market, averaging at 18,187 MW during the quarter. On top of which, about 0.5 percent or an average of 130 MW was the capacity designation of Malaya TPP as Must Run Unit (MRU)¹ while 3 percent or an average of 848 MW were accounted to the registered capacities of plants which were still undergoing testing and commissioning.

The remaining registered capacity was either unavailable due to outage, comprising 2,614 MW or 10 percent, or was not offered/nominated in the market², amounting to 4,746 MW or 18 percent of the total registered capacity due to derating level of plants, among others.

Figure 1. Capacity Profile, 3rd Quarter 2023



¹ Per DOE Department Circular 2014-01-0003, designating the 650-MW Malaya Thermal Plant as a Must-Run Unit in the Wholesale Electricity Spot Market in cases of supply shortfall and to address system security.

² Subject to compliance monitoring or investigation for possible non-compliance with the submission of offers under the WESM Rules

Table 1. Capacity Profile, 2nd Quarter, and 3rd Quarter 2023

	2nd Quarter 2023 (26 Mar to 25 Jun 2023)		3rd Quarter 2023 (26 Jun to 25 Sep 2023)		% Average Change
	Average (in MW)	% of RegCap	Average (in MW)	% of RegCap	
Capacity on Outage	2,650	10%	2,614	10%	1%
Capacity Not Offered/Nominated	4,537	17%	4,746	18%	5%
Capacity of Plants on Commissioning	971	4%	848	3%	13%
Malaya Capacity (for MRU)	130	0%	130	0%	0%
Capacity Offered/Nominated	17,095	65%	18,187	69%	6%

Table 2. Capacity Monthly Capacity Profile, 3rd Quarter 2023

	July 2023 (26 Jun to 25 Jul 2023)		August 2023 (26 Jul to 25 Aug 2023)		September 2023 (26 Aug to 25 Sep 2023)	
	Average (in MW)	% of RegCap	Average (in MW)	% of RegCap	Average (in MW)	% of RegCap
Capacity on Outage	2,348	9%	2,663	10%	2,825	11%
Capacity Not Offered/Nominated	5,135	19%	4,592	17%	4,522	17%
Capacity of Plants on Commissioning	907	3%	829	3%	811	3%
Malaya Capacity (for MRU)	113	0%	130	0%	130	0%
Capacity Offered/Nominated	17,996	68%	18,316	69%	18,244	69%
Registered Capacity (by the end of the billing month)	26,500	100%	26,558	100%	26,503	100%

II. Power Plant Outages

a. Capacity on Outage by Plant Type

Capacities on Outage dipped by an average of 1 percent in the third quarter of 2023 or at an average of 2,614 MW. The coal and oil-based plants demonstrated an increase on their capacity on outage contrary to the noted improvement from natural gas, geothermal and hydro plants. The coal plants capacity on outage during this quarter was attributable to the planned outages of Calaca CFTPP unit 2 (300 MW) from 17 October until the end of the quarter, Pagbilao CFTPP units 1 and 2 (382 MW each) from 01 July to 27 July 2023 and 05 August to 30 August 2023, respectively, SMC Limay CFTPP unit 1 (150 MW) from 10 August to 22 September, Masinloc CFTPP unit 2 (344 MW) from 07 July to 31 July, SLTEC CFTPP unit 1 (122 MW) from 26 July until the 31 August, and KSPC CFTPP (103 MW) 02 August to 06 September.

Oil-based plants' capacities on outage averaged at 419 MW due to the maintenance outage of Navotas DPP unit 2 (51.5 MW) from 11 to 23 September 2023 and planned outage of Limay CCGT (60 MW) from 07 August to 21 September 2023.

On the other hand, natural gas plants' capacities on outage averaged at 530 MW which was mostly attributable to the forced outages of Ilijan NGPP Block A2 (190 MW) from 08 June to 17 July 2023, Ilijan NGPP Blocks B2 and B3 (190 and 220 MW, respectively).

The outage level was also observed to have generally increased towards the end of the quarter. The September billing month had the highest monthly average values during the quarter at 2,781 MW.

Provided in Appendix A is the list of major plant outages.

Figure 2. Plant Outage Capacity (by Plant Type), 3rd Quarter 2023

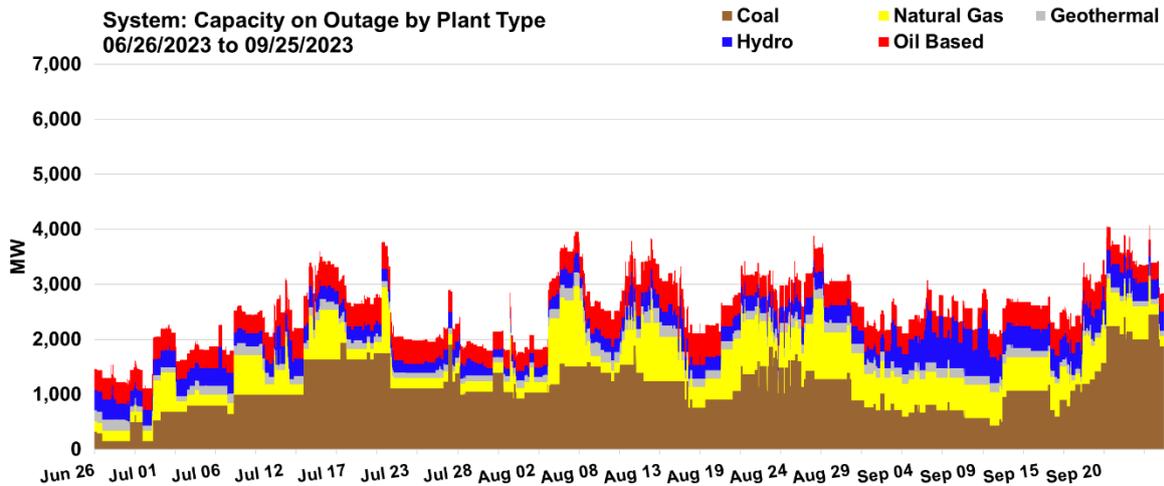


Table 3. Outage Summary, 3rd Quarter 2023, and 2nd Quarter 2023

	2nd Quarter 2023 (26 Mar to 25 Jun 2023) in MW			3rd Quarter 2023 (26 Jun to 25 Sep 2023) in MW			% Average Change
	Max	Min	Avg	Max	Min	Avg	
Coal	1,979	150	803	2,452	150	1,128	40%
Natural Gas	1,465	190	708	1,467	190	530	25.2%
Geothermal	436	90	201	323	90	150	25.5%
Hydro	1,143	191	542	1,201	139	332	38.8%
Oil-based	511	300	329	709	310	419	27%

Table 4. Monthly Outage Summary, 3rd Quarter 2023

	July 2023 (26 Jun to 25 Jul 2023) in MW			August 2023 (26 Jul to 25 Aug 2023) in MW			September 2023 (26 Aug to 25 Sep 2023) in MW		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Coal	1,939	150	995	1,898	757	1,259	2,452	437	1,126
Natural Gas	1,200	190	373	1,467	190	566	1,456	190	645
Geothermal	263	90	140	323	95	161	281	90	147
Hydro	711	163	288	633	139	253	1,201	235	452
Oil-based	630	328	418	709	321	429	506	310	411

b. Outage Capacity by Category

Consistent with the discussion above, high level of capacities on outage this quarter were mostly attributable to planned outages which recorded an average of 950 MW. This posted a 129.2 percent increase compared to the previous quarter's 415 MW. It was observed that planned outages were scheduled during the onset of the rainy season to maximize the anticipated low level of demand during the period.

Meanwhile, forced outages were still prevalent during the third quarter of the year at 1,212 MW on average, although it was observed to be lower than the previous quarter's 1,855 MW.

Figure 3. Plant Outage Capacity (by Outage Category), 3rd Quarter 2023

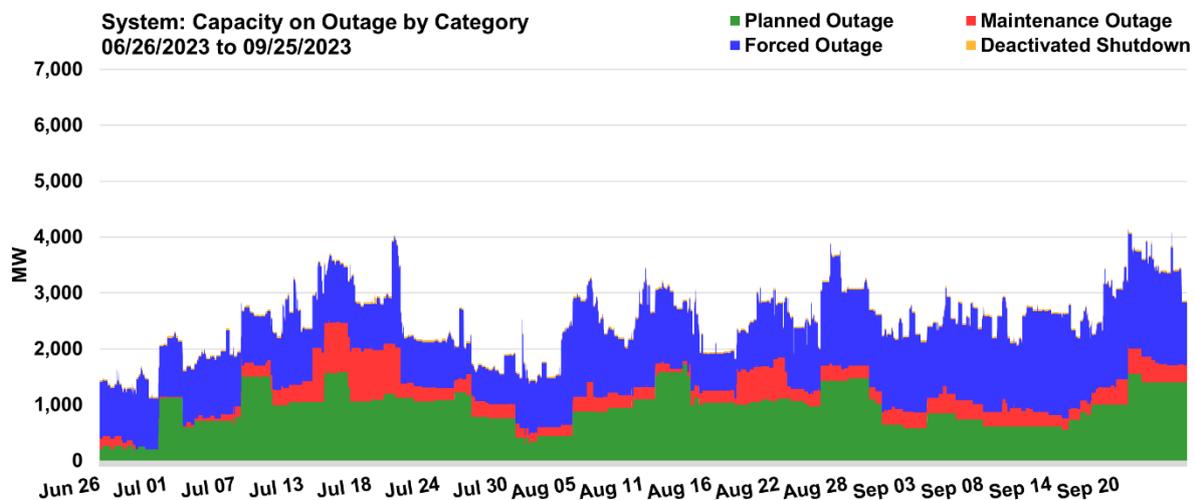


Table 5. Outage Summary, by Outage Category, 3rd Quarter 2023, and 2nd Quarter 2023

	2nd Quarter 2023 (26 Mar to 25 Jun 2023) in MW			3rd Quarter 2023 (26 Jun to 25 Sep 2023) in MW			% Average Change
	Max	Min	Avg	Max	Min	Avg	
Planned	779	56	415	1,720	35	950	129.2%
Maintenance	960	75	342	1,018	3	308	10%
Forced	3,562	898	1,855	2,117	65	1,212	35%
Deactivated/Shutdown	30	30	30	255	30	30	0%

Table 6. Monthly Outage Summary, by Outage Category, 3rd Quarter 2023

	July 2023 (26 Jun to 25 Jul 2023) in MW			August 2023 (26 Jul to 25 Aug 2023) in MW			September 2023 (26 Aug to 25 Sep 2023) in MW		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Planned	1,648	201	947	1,720	302	955	321	35	216
Maintenance	1,018	3	352	745	65	278	430	150	228
Forced	1,912	798	1,017	2,117	478	1,062	460	65	268
Deactivated/Shutdown	255	30	31	30	30	30	30	30	30

III. Demand and Supply Situation

System demand increased during the third quarter from 12,430 MW in June to 13,325 MW in September, even with the noted cooler temperatures and the observance of national holidays noted during the period. For the whole quarter, system demand averaged at 13,325 MW, resulting in a growth of 7.2 percent from an average of 12,430 MW on second quarter.

Meanwhile, the scheduled reserve capacities averaged at 644 MW this quarter which resulted in the demand plus reserve schedule capacities to average at 13,969 MW.

On the other hand, effective supply³ was lower by 1.7 percent at an average of 14,948 MW coming from 15,204 MW in the second quarter, mainly attributed to the derations and ramp limited capacities. On the other hand, monthly average effective supply increased, from 14,901 MW in June to 14,986 MW in September, consistent with the above discussed increase in capacities on outage towards the end of the quarter.

Even with the dip in supply, quarterly supply margin⁴ improved by 8.3 percent to an average of 977 MW this third quarter from 902 MW during the second quarter.

Figure 4. Demand, Supply, Demand plus Reserve Schedule and Supply Margin, 3rd Quarter 2023

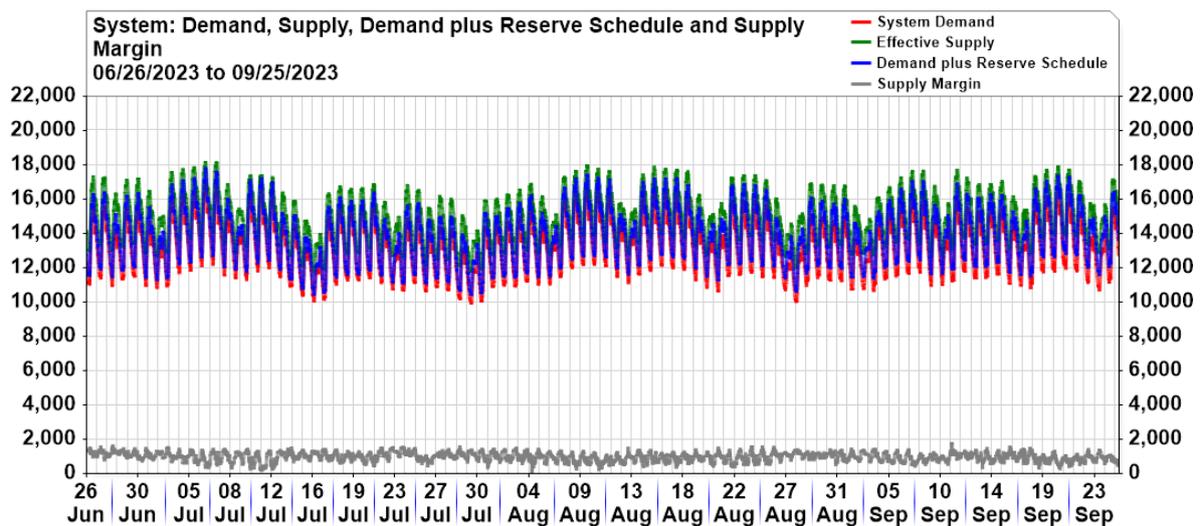


Table 7. Demand and Supply Summary, 2nd Quarter 3rd Quarter 2023

	2nd Quarter 2023 (26 Mar to 25 Jun 2023)			3rd Quarter 2023 (26 Jun to 25 Sep 2023)			% Average Change	% Change
	Max	Min	Avg	Max	Min	Avg		
System Demand	17,244	7,262	12,430	17,141	9,877	13,325	7%	7.2%
Reserve Schedule	1,157	166	685	1,046	227	644	6%	-6.0%
Demand plus Reserve Schedule	17,837	9,126	14,302	17,879	10,373	13,969	2%	-2.3%
Effective Supply	18,455	10,491	15,204	18,218	11,707	14,948	2%	-1.7%
Supply Margin	1,773	-467	902	1,836	-458	977	8%	8.3%

Note: The derived values were non-coincidental.

³The system effective supply is equal to the offered capacity of all scheduled generator resources, nominated loading level of non-scheduled generating units and projected output of preferential dispatch generating units adjusted for any security limit and ramp rates. Scheduled output of plants on testing and commissioning, through the imposition of security limit by SO, are accounted for in the effected supply. Likewise included is the scheduled output of Malaya plant when it is called to run as Must Run Unit (MRU).

⁴The supply margin is equal to the effective supply less system demand requirement plus reserve schedule.

Table 8. Monthly Demand and Supply Summary, 3rd Quarter 2023

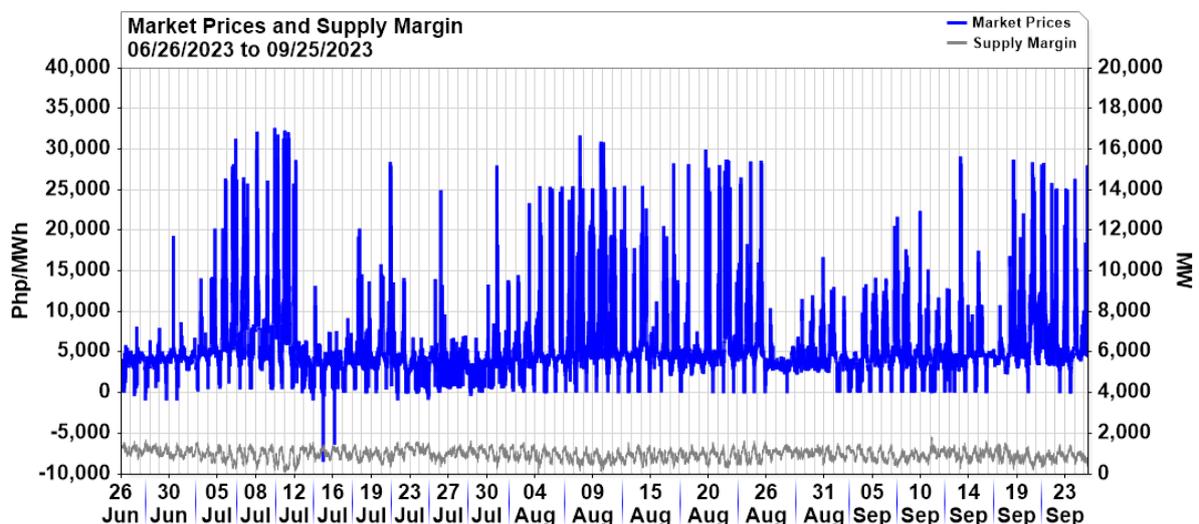
	July 2023 (26 Jun to 25 Jul 2023)			August 2023 (26 Jul to 25 Aug 2023)			September 2023 (26 Aug to 25 Sep 2023)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
System Demand	17,141	9,985	13,345	16,756	9,877	13,391	16,487	9,954	13,241
Reserve Schedule	864	227	531	1,003	353	624	1,046	460	777
Demand plus Reserve Schedule	17,879	10,373	13,875	17,484	10,381	14,015	17,426	10,562	14,017
Effective Supply	18,218	11,707	14,901	18,037	11,743	14,958	17,959	11,943	14,986
Supply Margin	1,705	136	1,026	1,660	(458)	933	1,836	211	970

IV. Market Price Outcome

a. Market Prices

There were noted instances of decreases in the market prices as supply margin improved during the third quarter as compared to the average supply margin during the second quarter of the year. An average of PhP5,395/MWh was recorded during the third quarter, demonstrating a 36.5 percent decrease from PhP7,363/MWh during the second quarter of 2023.

The monthly average prices were also observed to have decreased from PhP5,665/MWh in July, to PhP5,550/MWh in August, and to PhP5,216/MWh in September. This was mainly driven by the interplay between supply and demand.

Figure 5. Market Price Trend vs. Supply Margin, 3rd Quarter 2023

Table 9. Market Price Summary, 3rd Quarter 2023, and 2nd Quarter 2023

	2nd Quarter 2023 (26 Mar to 25 Jun 2023) in Php/ MWh			3rd Quarter 2023 (26 Jun to 25 Sep 2023) in Php/ MWh			% Change		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
System	35,488	-8,833	7,363	32,674	-8,460	5,395	8.6%	4.4%	36.5%

Table 10. Monthly Market Price Summary, 3rd Quarter 2023

	July 2023 (26 Jun to 25 Jul 2023) in Php/ MWh			August 2023 (26 Jul to 25 Aug 2023) in Php/ MWh			September 2023 (26 Aug to 25 Sep 2023)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
System	36,304	-9,809	5,665	31,727	-346	5,550	29,150	0	5,216

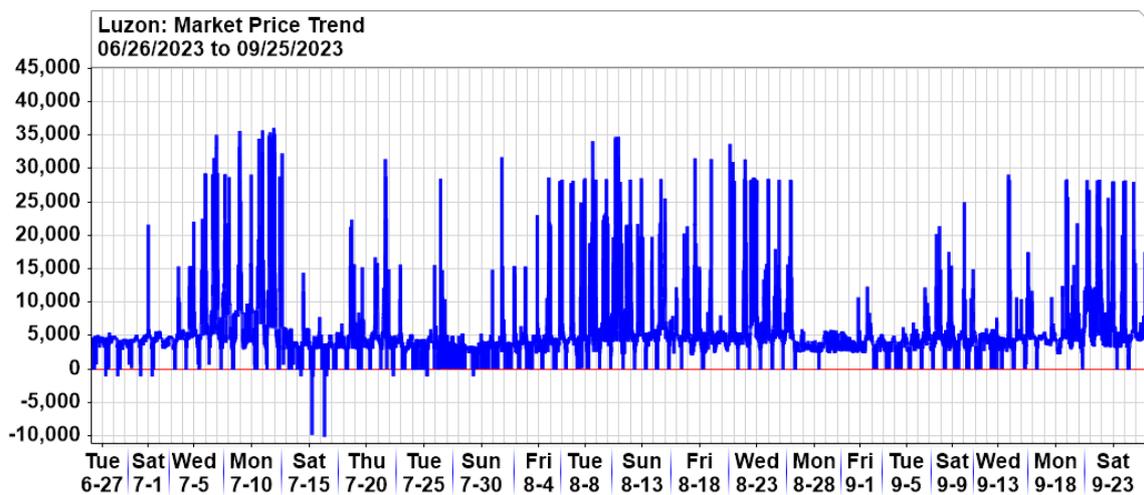
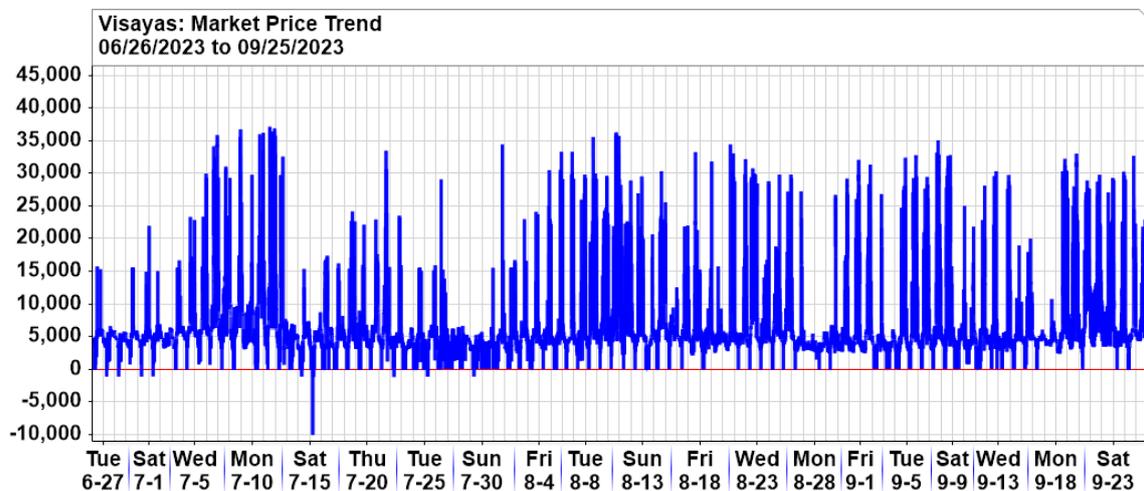
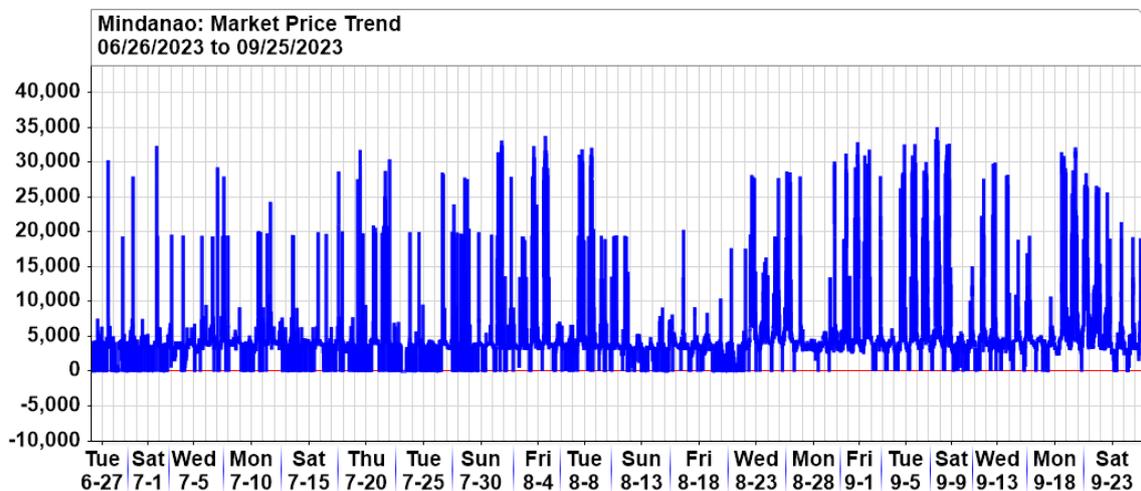
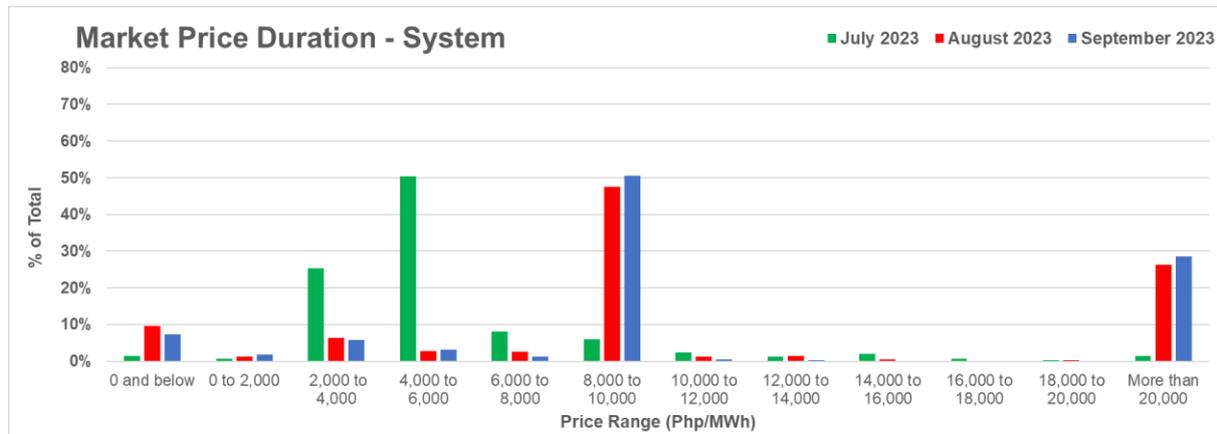
Figure 6. Market Price Trend - Luzon, 3rd Quarter 2023

Figure 7. Market Price Trend - Visayas, 3rd Quarter 2023


Figure 8. Market Price Trend - Mindanao, 3rd Quarter 2023

Table 11. Monthly Regional Price Summary, 3rd Quarter 2023

	Luzon in Php/ MWh			Visayas in Php/ MWh			Mindanao in Php/ MWh		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
July 2023	36,177	-10,079	5,551	37,262	-9,993	6,254	32,461	0	3,791
August 2023	34,853	-1,012	5,530	36,393	-1,083	6,189	33,893	0	4,825
September 2023	31,604	0	4,868	35,166	-0	6,359	35,149	0	5,713

b. Price Distribution

As seen in Figure 9, a noticeable decline was observed in the frequency of prices falling within the PhP2,000/MWh to PhP6,000/MWh range from July to September billing months. On the other hand, prices in the range of PhP8,000/MWh and above grew from only 5.9 percent in July to 47.5 percent in August, up to 50.6 percent in September 2023. Additionally, there was also an observed increase in the price range of PhP0/MWh and below come the month of August and September 2023, which somehow minimizes the impact of higher price range.

Figure 9. Price Distribution, 3rd Quarter 2023

Table 12. Monthly Price Distribution, 3rd Quarter 2023

Price Range (Php/MWh)	% Distribution		
	July 2023	August 2023	September 2023
0 and below	1%	10%	7%
0 to 2,000	1%	1%	2%
2,000 to 4,000	25%	6%	6%
4,000 to 6,000	50%	3%	3%
6,000 to 8,000	8%	3%	1%
8,000 to 10,000	6%	47%	51%
10,000 to 12,000	2%	1%	0%
12,000 to 14,000	1%	1%	0%
14,000 to 16,000	2%	0%	0%
16,000 to 18,000	1%	0%	0%
18,000 to 20,000	0%	0%	0%
More than 20,000	1%	26%	29%

V. Market Pricing Conditions

System-wide and regional pricing error notices were issued during the third quarter which were related to inappropriate input data that subsequently affected the generation of prices and schedules. The pricing errors during the third quarter affected 882 trading intervals in Luzon, 890 trading intervals in Visayas and 828 trading intervals in Mindanao.

Meanwhile, due to network constraints, system-wide Price Substitution Methodology (PSM) was applied attributable to the congestion of Mexico-Hermosa Line 2, Hermosa-Duhat line 1, Bauang-La Trinidad Line 1, Bauang-BPPC line 1, and the San Jose HV transformer equipment.

System-wide market intervention was declared by the Market Operator on 04 August from 1605h to 1645h due to database publication failure. In addition, System Operator-

initiated system-wide market interventions on 12 September from 1940h to 2005h, 17 September from 1115h to 1610h, and 18 September from 1255h to 1305h due to un-implementable RTD schedule. In addition, regional declaration of administered prices were declared in Visayas and Mindanao on 23 September from 1310h to 1345h due to un-implementable RTD schedules. Finally, secondary cap was not imposed during the August 2023 billing period, while there were regional issuances of SPC in July and September 2023.

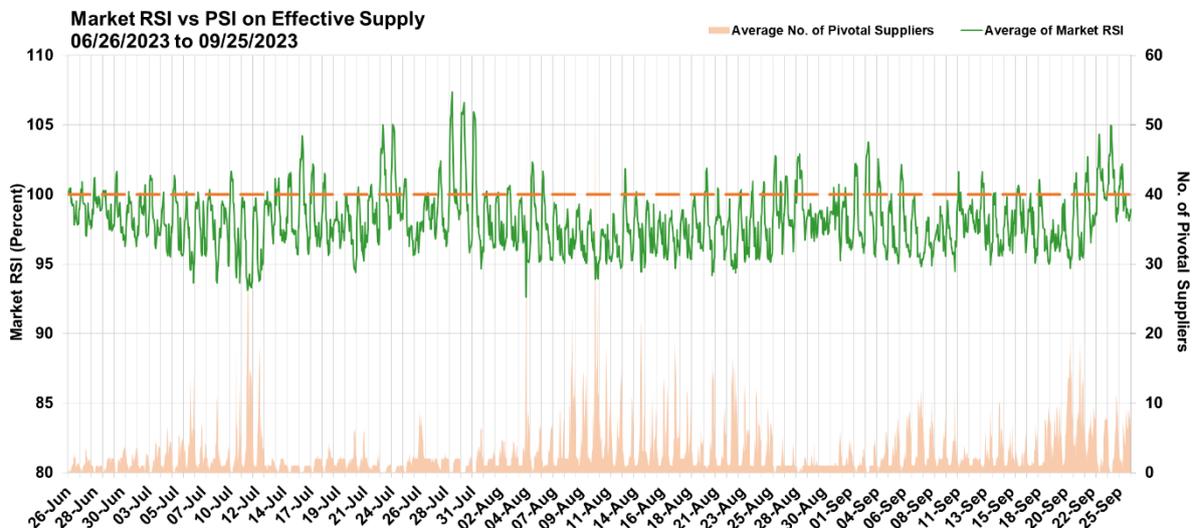
Table 13. PEN, PSM, MI and Sec Cap Summary, 3rd Quarter 2023

	Luzon						Visayas						Mindanao					
	July 2023		August 2023		September 2023		July 2023		August 2023		September 2023		July 2023		August 2023		September 2023	
	Freq.	% of Time	Freq.	% of Time	Freq.	% of Time	Freq.	% of Time	Freq.	% of Time	Freq.	% of Time	Freq.	% of Time	Freq.	% of Time	Freq.	% of Time
PEN	183	2%	588	7%	111	1%	182	2%	606	7%	102	1%	41	0%	685	8%	102	1%
PSM	258	3%	9	0%	9	0%	258	3%	9	0%	9	0%	36	0%	6	0%	9	0%
SEC	208	2%	0	0%	0	0%	211	2%	0	0%	9	0%	0	0%	0	0%	9	0%
AP	0	0%	9	0%	36	0%	0	0%	9	0%	44	0%	0	0%	9	0%	44	0%

VI. Residual Supply

The figure below shows the hourly trend of the Market Residual Supply Index (Market RSI)⁵ plotted against the number of pivotal supplier/s.

During the period, the market resulted in RSIs ranging from 92.6% to 107.4% and averaging 98%. The average market prices for intervals with RSI below 100% was PHP5,748/MWh, while those with RSIs above 100 was at PHP2,884/MWh indicating ample supply during intervals with high RSI values.

Figure 10. Market RSI vs. Pivotal Suppliers, 3rd Quarter 2023


⁵ For a generator, the Residual Supply Index (RSI) is a dynamic continuous index measured as ratio of the available generation without that generator to the total generation required to supply the demand. The Market RSI is measured as the lowest RSI among all generators in the market. A Market RSI less 100% indicates the presence of pivotal generator/s or supplier/s.

VII. Pivotal Suppliers⁶

Provided in Table 14 are the top 20 pivotal suppliers in the market during the billing quarter, which was led by GNP Dinginin CFTPP, Sual CFTPP, Sta. Rita NGPP, Masinloc CFTPP, Mariveles CFTPP, and SMC Limay CFTPP. In line with the RSI discussion above, presence of pivotal suppliers was observed this quarter totaling to 54,714 generator-trading intervals.

Table 14. Pivotal Supplier Frequency Index, 3rd Quarter 2023

Top Pivotal Suppliers	Frequency (Number of trading intervals)		
	July	August	September
GNP DINGININ CFTPP	7,162	7,666	6,736
SUAL CFTPP	2,700	2,527	1,312
STA RITA NGPP	2,655	4,049	3,145
MASINLOC CFTPP	1,364	1,440	1,737
MARIVELES CFTPP	752	1,117	610
SMC LIMAY CFTPP	626	140	40
KALAYAAN PSPP	442	742	106
QPPL CFTPP	322	109	44
SBPLC CFTPP	312	151	43
SAN GABRIEL NGPP	265	70	
CALACA CFTPP	263	71	11
PAGBILAO 3 CFTPP	251	98	31
SAN LORENZO NGPP	212	349	84
PAGBILAO CFTPP	204	74	928
TVI CFTPP	138	38	5
PEDC CFTPP	112	29	7
LEYTE A GPP	109	43	7
GN POWER KAUSWAGAN C	91	25	
ILUAN NGPP		352	1,073
SAN ROQUE HEP		81	4

VIII. Generator Offer Pattern

Coal plants offered more than half of their entire capacity (55.4 percent) at PhP0/MWh and below during the billing quarter. About 47.4 percent was priced at PhP-7,500/MWh to PhP-10,000/MWh while the remaining 8 percent was priced at PhP0/MWh to PhP-7,500/MWh as seen in Figure 11. The remaining 44.6 percent were offered at PhP0/MWh to PhP32,000/MWh.

Accordingly, Coal submitted capacity offers, at 62.2 percent, were scheduled for dispatch in the market.

⁶ The Pivotal Supply Index (PSI) measures how critical a particular generator is in meeting the total demand at a particular time. It is a binary variable (1 for pivotal and 0 for not pivotal) which measures the frequency that a generating is pivotal for a particular period.

It may be noted that geothermal plants had the highest level of capacities offered among others, noting that most of the geothermal power plants are now categorized as preferential power plants – this only means that nominated capacities from these plants would be assured of dispatch and would not need to participate in the competitive side of the market.

On another note, Natural gas power plants had lower-priced offers despite offering their capacities from 58 to 66 percent of the time this quarter compared to the 2nd Quarter due to the availability of the 2 units of Ilijan. About 77.5 percent of Natural gas offered capacity were offered at Php0/MWh and below while the remaining 22.5 percent were priced at Php0/MWh to Php32,000/MWh, as seen in Figure 12.

For the hydro power plants, there were no notable changes in the offer behavior of these plants during the quarter in review. While oil-based plants consistently offered their available capacities at the higher spectrum of offered prices.

Figure 11. Coal Plants Offer Pattern – 3rd Quarter 2023

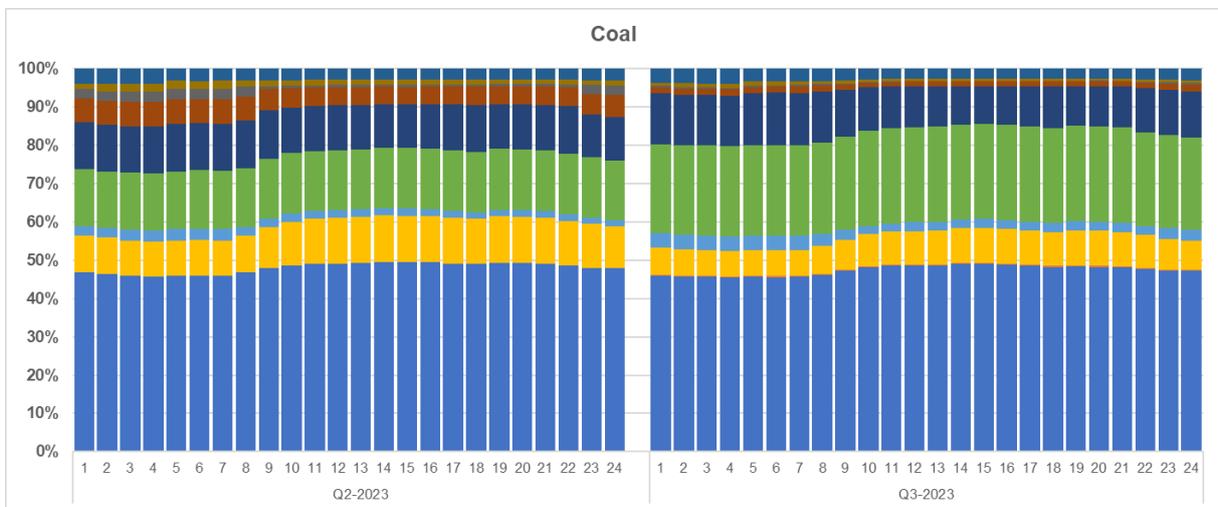


Figure 12. Natural Gas Plants Offer Pattern – 3rd Quarter 2023

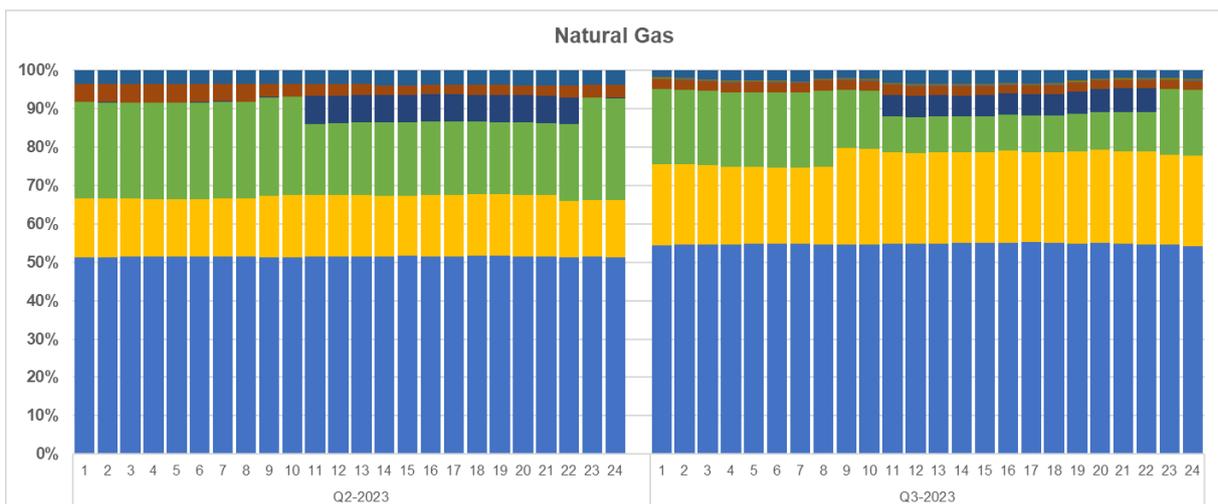


Figure 13. Geothermal Plants Offer Pattern – 3rd Quarter 2023

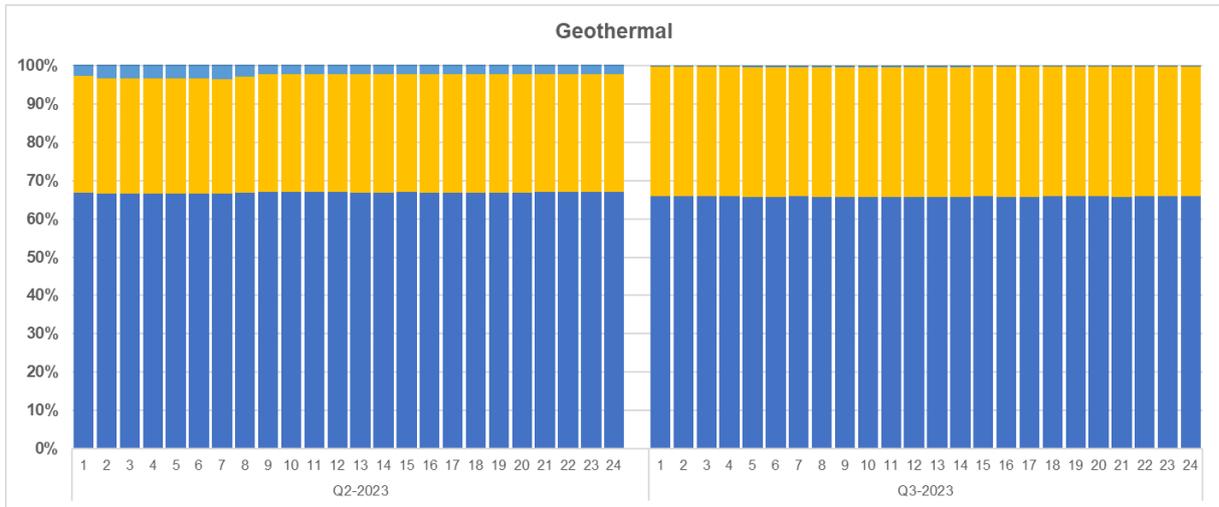


Figure 14. Hydro Plants Offer Pattern – 3rd Quarter 2023

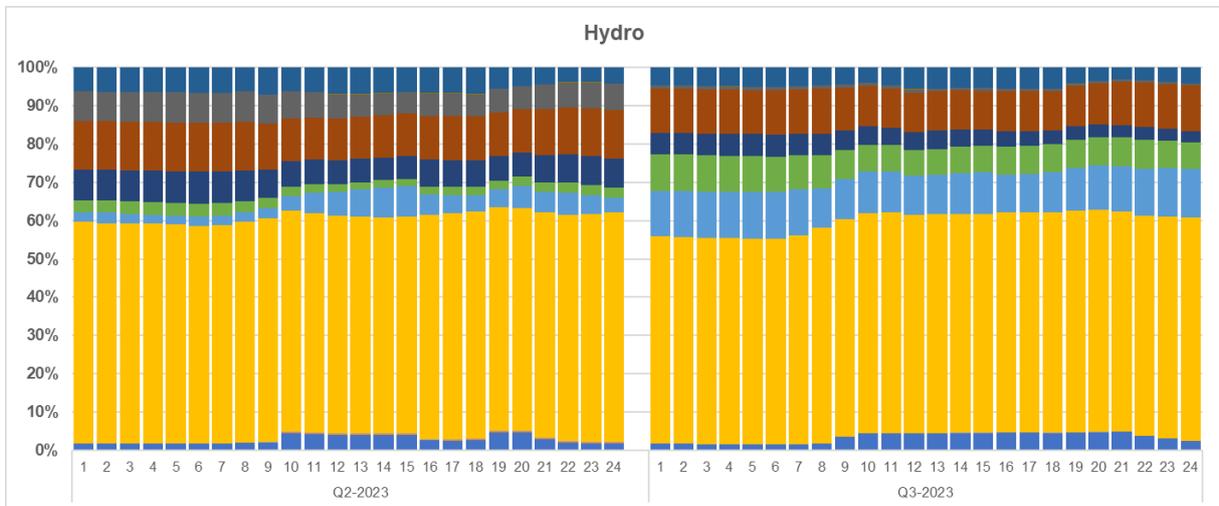
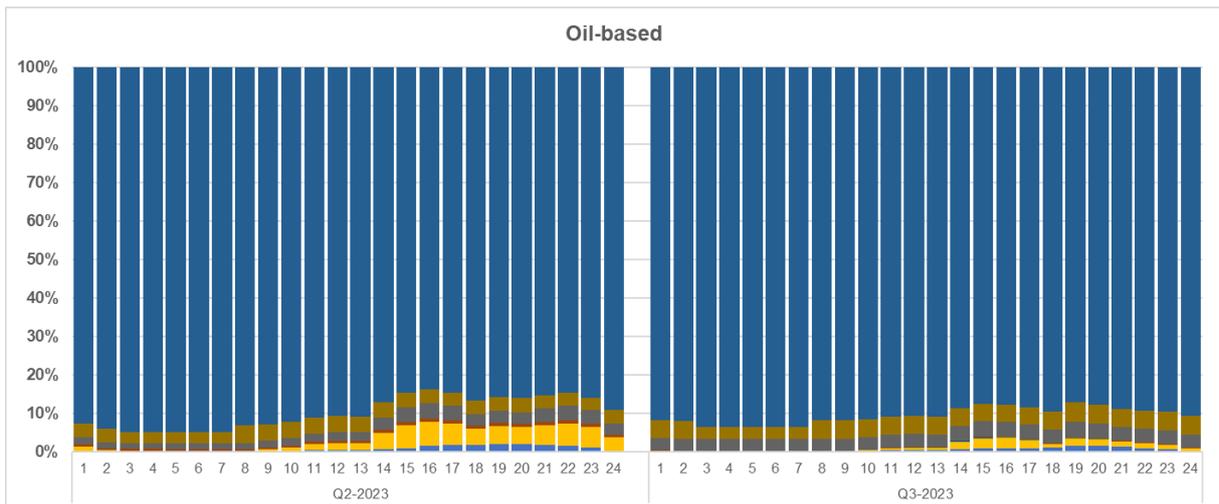


Figure 15. Oil-based Plants Offer Pattern – 3rd Quarter 2023



IX. Capacity Factor

Geothermal power plants were observed with the highest utilization during the quarter when measured in terms of registered capacity, among resource types with capacity factor reaching 70 percent in July. Coal and Natural gas plants followed with capacity factors ranging from 60 to 66 percent and 58 to 66 percent, respectively. Hydro power plants came next reaching 43 percent in August while Oil-based plants had the lowest utilization ranging from 3 to 5 percent due to its consistent high-priced offers. Additionally, Hydro and Oil-based power plants were mostly scheduled as reserve, and taking into account also the pumping operations of Kalayaan during off-peak hours.

Meanwhile, biomass plants' capacity factors were recorded at 15 to 20 percent range when measured based on registered capacity, wind plants' capacity factors were recorded from 8 to 22 percent, and solar plants with their capacity factors ranging from 17 to 18 percent.

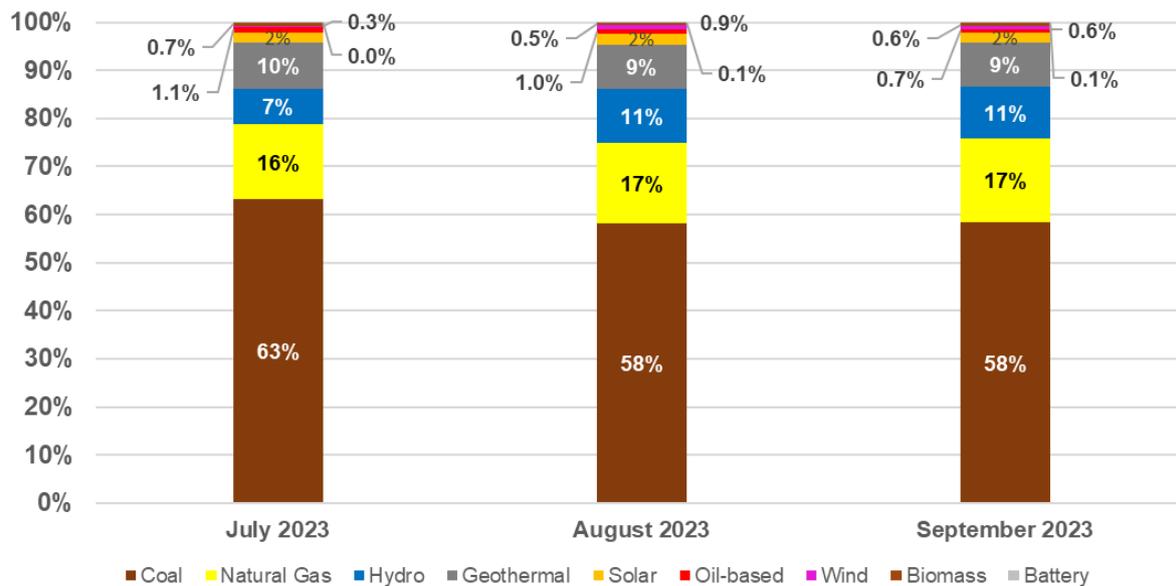
On the other hand, battery energy storage facility in the WESM, posted a lower capacity factor ranging from 0 to 3 percent related to its charging characteristics as part of its normal operation.

Table 15. Capacity Factor, 3rd Quarter 2023

	Capacity Factor (GESQ vs Registered Capacity)		
	July	August	September
Coal	66%	60%	60%
Natural Gas	58%	64%	66%
Geothermal	70%	69%	67%
Hydro	31%	43%	42%
Oil-based	5%	4%	3%
Wind	8%	22%	15%
Solar	18%	18%	17%
Biomass	20%	15%	19%
Battery	0%	2%	3%

X. Generation Mix

Coal plants consistently contributed the largest chunk of the generation in all billing months ranging from 58.1 percent to 63.1 percent. Natural gas plants followed comprising about 15.6 to 17.4 percent of the generation mix. Hydro plants and geothermal plants came next accounting for 7.5 percent to 11.3 percent and 9.2 percent to 9.5 percent, respectively. Oil-based plants' contribution was the lowest at 0.7 percent to 1.1 percent. Meanwhile, the contribution of preferential and must-dispatch generating units ranged from 0.3 to 2.2 percent.

Figure 16. Generation Mix (Based on Metered Quantity) – 3rd Quarter 2023


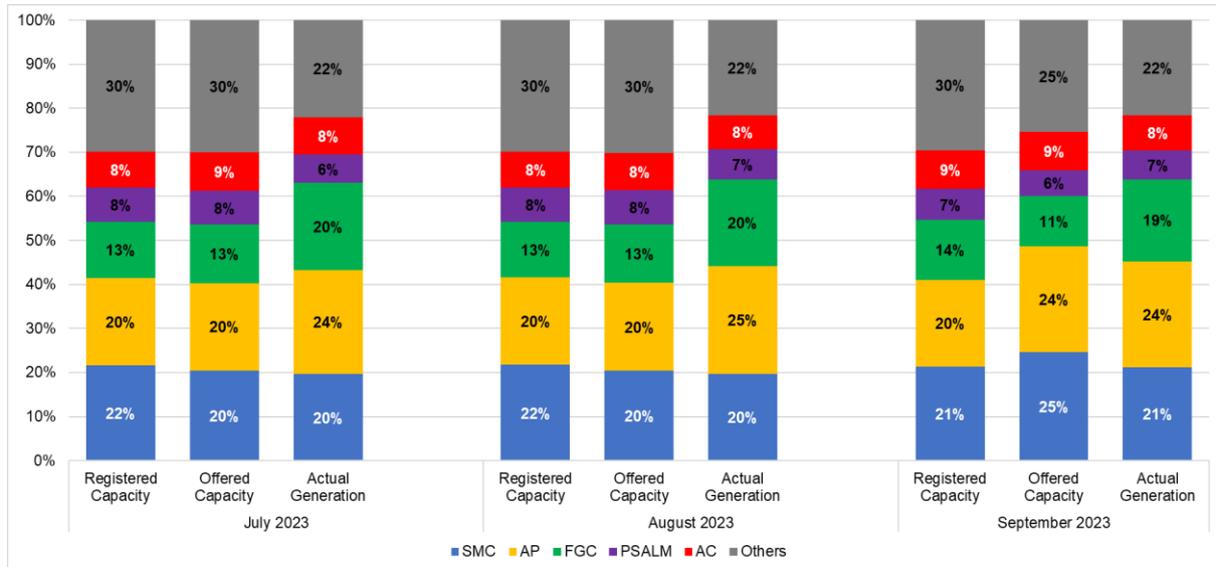
XI. Market Concentration

a. Market Share

The integrated Luzon, Visayas, and Mindanao market remained to be dominated by five (5) major participant groups based on registered capacity led by San Miguel Corporation (SMC) with a market share of 21 percent by the end of the billing quarter. Aboitiz Power Corporation (AP) came in next with market share of about 20 percent followed by First Gen Corporation (FGC), Ayala Corporation (AC) and Power Sector Assets and Liabilities Management (PSALM) at 14 percent, 9 percent, and 7 percent, respectively.

It may be noted that higher market shares were recorded for SMC at 25 percent when based on offered capacity while it was only 21 percent when based on actual generation. The same observations were noted for AP at 24 percent on both offered capacity and actual generation, compared to its shares based on registered capacities.

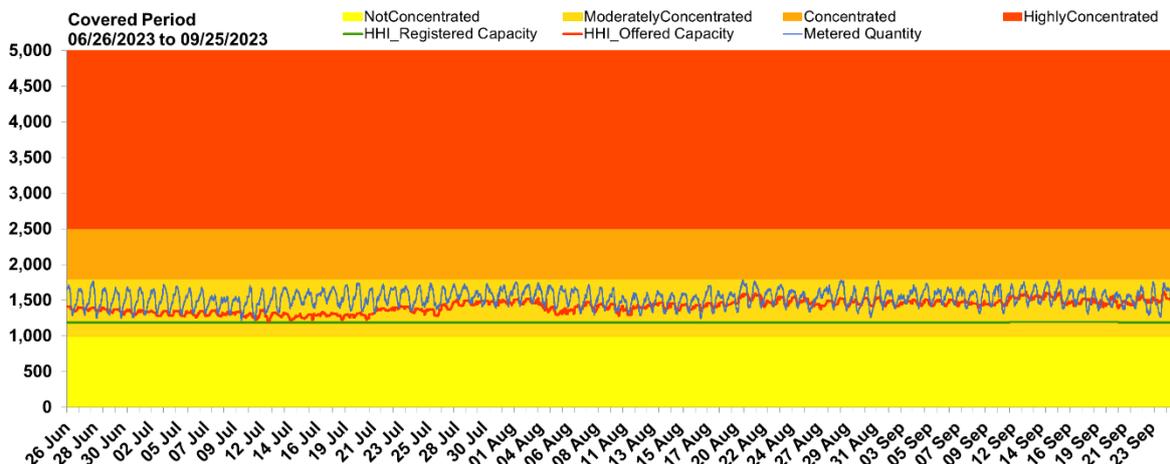
Figure 17. Market Share by Major Participant Group based on Registered Capacity, Offered Capacity, Actual Generation, 3rd Quarter of 2023



b. Herfindahl-Hirschman Index (HHI)

The Herfindahl-Hirschman Index (HHI)⁷ by major participant grouping indicated a moderately concentrated market during the third quarter of 2023 across all calculations – based on registered capacity, offered capacity, and actual generation.

Figure 18. Hourly HHI based by Major Participant Grouping, 3rd Quarter 2023



⁷ The HHI measures the degree of market concentration, taking into account the relative size and distribution of participants in the monitored market. It is calculated as the sum of squares of the participant’s market share. The following are the widely-used HHI screening numbers: the HHI approaches zero when the market has very large number of participants with each having a relatively small market share. In contrary, the HHI increases as the number of participants in the market decreases, and the disparity in the market shares among the participants increases. The following are the widely-used HHI screening numbers: (1) when HHI is less than 1,000 the market is not concentrated; (2) in the range of 1,000 to 1,800 the market is moderately concentrated; (3) greater than 1,800 to 2,500 the market is concentrated; and (4) greater than 2,500 the market is highly concentrated and signals lack of competition in the market.

XII. Spot Exposure

Spot market transaction of generator-trading participants during the quarter ranged from approximately 19.9 percent to 22.4 percent in September of the total energy transaction in the WESM, from only 10-15 percent of spot quantities prior to the commercial operation of 5-minute market. Still, the majority of the total energy injected into the grid was covered by bilateral contracts.

Figure 19. Spot Market Exposure, 3rd Quarter 2023

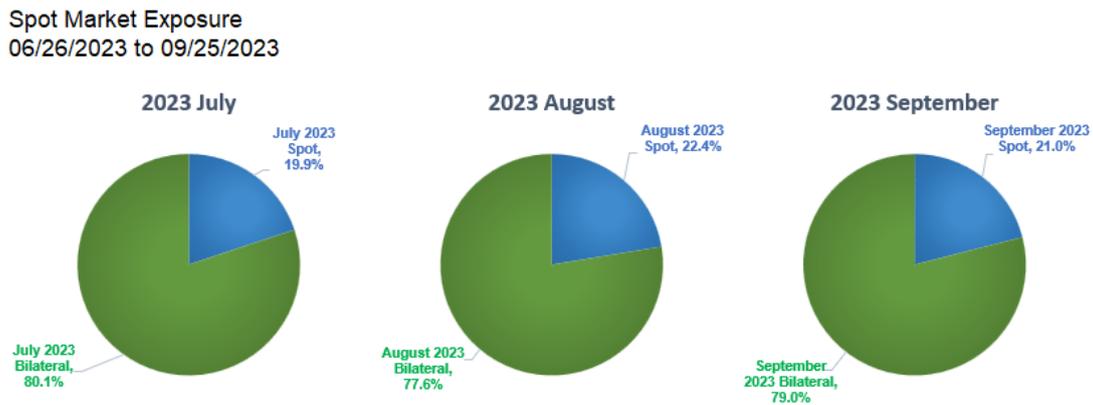
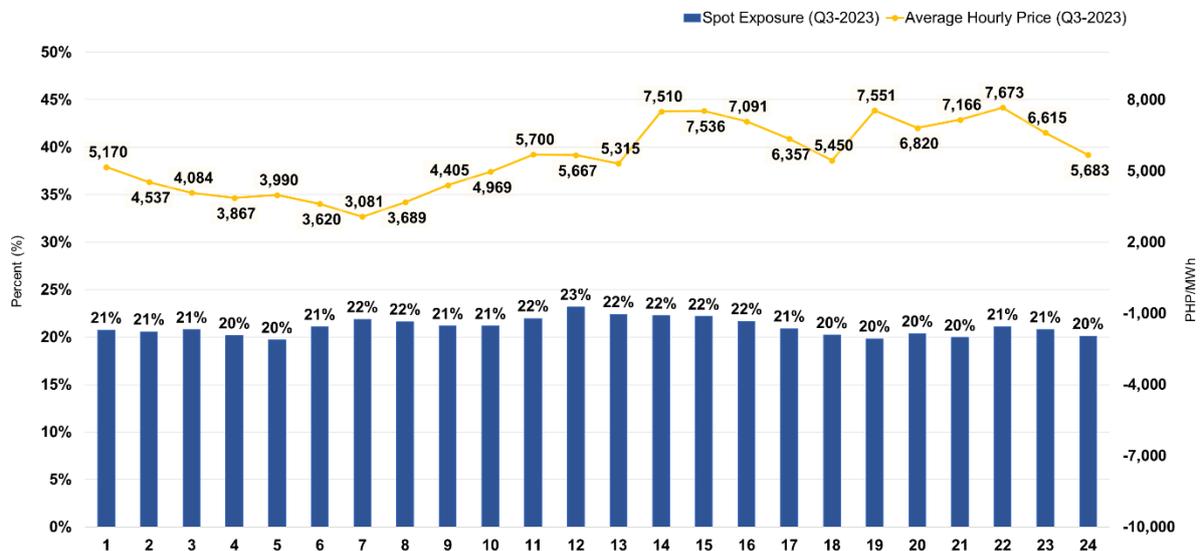


Figure 20 shows the hourly profile of the spot exposure plotted against average hourly price. Relatively higher average spot exposure was noted during the peak hours, particularly from 1100h-1600h and 0700h-0800h, both belong to the peak hours.

Figure 20. Hourly Profile of Spot Market Exposure, 3rd Quarter 2023



Appendix A. Major Plant Outages

Plant Type	Plant/ Unit Name	Capacity (MW)	Date Out	Date In	Duration (Days)	Outage Type	Remarks
Luzon							
BIOF	IPower 2	10.8	07/05/2023 19:31			Forced Outage	Unplanned shutdown due to ash system problem.
BIOF	IPower 2	10.8	06/25/2023 16:01	07/04/2023 8:27	9	Forced Outage	To repair main de-ashing screw conveyor.
BIOF	IPower 1	10.8	06/25/2023 16:01	07/04/2023 8:27	9	Forced Outage	To repair main de-ashing screw conveyor
COAL	Sual 1	647	07/13/2023 23:33	07/21/2023 10:54	7	Maintenance Outage	On maintenance outage until July 22, 2023.
COAL	Masinloc 2	344	07/07/2023 23:24			Planned Outage	Planned Outage until July 28, 2023.
COAL	Pagbilao 1	382	07/01/2023 0:42			Planned Outage	On Planned Outage until July 30, 2023.
COAL	SLPGC 1	150	06/17/2023 12:03			Forced Outage	Tripped from 90MW load. Turbine trip due to axial displacement high.
GEO	Bacman 3	19.2	07/25/2023 15:16			Forced Outage	Affected by the outage of Bacman 230kV Bus 2.
GEO	Tiwi 1	60	11/30/2021 18:32			Forced Outage	Steam supply diverted to Unit 2.
GEO	MGPP 2	12	06/23/2023 8:01	06/28/2023 16:18	5	Maintenance Outage	Relocation of MGI's TL and stub poles affected by SLEX-TR4 construction.
GEO	MGPP 1	20	06/23/2023 8:01	06/28/2023 20:45	6	Maintenance Outage	Relocation of MGI's TL and stub poles affected by SLEX-TR4 construction.
GEO	Makban 6	30	04/11/2013 22:44			Deactivated Shutdown	Conducted Gas compressor test.
HYD	Caliraya 2	14	07/24/2023 8:00			Planned Outage	Planned outage until July 28, 2023.
HYD	Caliraya 1	14	07/24/2023 8:00			Planned Outage	Planned outage until July 28, 2023.
HYD	San Roque 2	145	06/26/2023 0:41	07/08/2023 0:01	12	Planned Outage	Planned Outage until July 26, 2023.
HYD	Angat M 4	50	02/14/2022 0:00			Planned Outage	Planned outage.
HYD	Angat M 3	50	11/02/2021 8:15			Forced Outage	Draw-out of Main Unit 3 generator breaker.
NATG	Ilijan B1	190	07/15/2023 9:26			Forced Outage	Tripped by Generator earth fault protection
NATG	Sta. Rita 1	257.3	07/14/2023 23:15	07/17/2023 3:44	2	Planned Outage	Planned outage until July 16, 2023.
NATG	Sta. Rita 4	264	07/07/2023 23:48	07/10/2023 15:28	3	Planned Outage	Planned Outage until July 9, 2023.
NATG	Sta. Rita 3	265.5	07/07/2023 23:26	07/10/2023 11:03	2	Planned Outage	Planned Outage until July 9, 2023.
NATG	San Lorenzo 2	265	06/30/2023 23:51	07/03/2023 0:11	2	Planned Outage	On Planned Outage until July 2, 2023.
NATG	San Lorenzo 1	265	06/30/2023 22:45	07/03/2023 1:02	2	Planned Outage	Planned outage until July 2, 2023.
NATG	Ilijan A2	190	06/08/2023 14:40	07/17/2023 11:26	39	Forced Outage	Emergency shutdown due to Blade Path Temperature auto stop.
OIL	TMO Unit 2	51.5	07/19/2023 0:01			Planned Outage	Annual Switchyard PMS until July 26, 2023.
OIL	TMO Unit 1	63.8	07/12/2023 0:01	07/21/2023 0:00	9	Planned Outage	Planned outage until 2359H of July 20, 2023.
OIL	Malaya 2	130	07/10/2023 11:32	07/14/2023 8:11	4	Forced Outage	The unit tripped from 307MW load.
OIL	SLPGC 4	25	02/10/2022 18:07			Forced Outage	Due to low turbine lube oil supply. IEMOP deregistration effective on August 25, 2022.
OIL	SLPGC 3	25	01/22/2022 21:39			Forced Outage	Declared unavailable due to turbine lube oil sump metal chips detected. IEMOP deregistration effective on August 25, 2022.
OIL	Malaya 1	300	05/03/2019 18:21			Forced Outage	Declared unavailable due to motorization of unit generator caused by the non-opening of phase B of PCB 8-05CB08MAL.
WIND	Caparispisan 1	81	07/07/2023 6:17			Maintenance Outage	Affected by the planned outage of Laoag-Pagudpud(NLREC) Wind Farm 115kV line.
WIND	BWPC	80	07/06/2023 6:04			Maintenance Outage	Maintenance until July 30, 2023
WIND	AWOC 1	53.6	06/26/2023 5:42	06/30/2023 9:33	4	Planned Outage	APMT.
BIOF	G2REC	10.8	08/18/2023 10:30	08/22/2023 11:19	4	Forced Outage	Emergency shutdown due to feeding system problem.
BIOF	IPower 2	10.8	07/05/2023 19:31			Forced Outage	Unplanned shutdown due to ash system problem.
BIOF	CBEC	13.5	07/24/2023 0:01	08/18/2023 10:44	25	Planned Outage	Planned outage until August 7, 2023.
COAL	SMC 1	150	08/10/2023 4:01			Planned Outage	Planned Outage until September 24, 2023.
COAL	Pagbilao 2	382	08/05/2023 0:56			Planned Outage	On planned outage until September 03, 2023.
COAL	SMC 3	150	08/04/2023 4:58	08/09/2023 9:43	5	Forced Outage	Unplanned outage due to main steam line excessive leak.
COAL	Masinloc 3	335	07/30/2023 5:22	08/15/2023 18:17	17	Forced Outage	Emergency shutdown due to coal reclaiming constraints brought by strong winds and heavy rains that poses safety issues.
COAL	MPGC U1	150	07/26/2023 23:57	08/12/2023 5:18	16	Maintenance Outage	Testing and commissioning until July 31, 2023.
COAL	SLTEC 1	122	07/26/2023 0:30			Planned Outage	Planned outage until September 4, 2023.
COAL	SLPGC 1	150	06/17/2023 12:03	08/16/2023 0:45	60	Forced Outage	Tripped from 90MW load. Turbine trip due to axial displacement high.
COAL	Pagbilao 1	382	07/01/2023 0:42	07/27/2023 10:24	26	Planned Outage	On Planned Outage until July 30, 2023.
COAL	Masinloc 2	344	07/07/2023 23:24	07/31/2023 4:03	23	Planned Outage	Planned Outage until July 28, 2023. Extended Outage until July 30, 2023.
GEO	Makban 7	20	08/22/2023 17:57			Forced Outage	MAKBAN D UNIT 7 SHUTDOWN DUE TO HIGH TURBINE VIBRATION
GEO	Bacman 1	60	08/10/2023 6:10	08/14/2023 17:00	4	Planned Outage	On planned outage until August 15, 2023.
GEO	Makban 1	57	08/05/2023 1:50			Maintenance Outage	Generator unit overhaul.
GEO	Tiwi 1	60	11/30/2021 18:32			Forced Outage	Steam supply diverted to Unit 2.
GEO	Makban 6	30	04/11/2013 22:44			Deactivated Shutdown	Conducted Gas compressor test.
HYD	Caliraya 2	14	07/24/2023 8:00	07/28/2023 21:06	5	Planned Outage	Planned outage until July 28, 2023.
HYD	Caliraya 1	14	07/24/2023 8:00	07/28/2023 21:06	5	Planned Outage	Planned outage until July 28, 2023.
HYD	Angat M 4	50	02/14/2022 0:00			Planned Outage	Planned outage.
HYD	Angat M 3	50	11/02/2021 8:15			Forced Outage	Draw-out of Main Unit 3 generator breaker.
NATG	Sta. Rita 2	255.7	08/25/2023 23:42			Planned Outage	On planned outage until August 30, 2023.
NATG	Ilijan B2	190	08/23/2023 21:37			Forced Outage	Shutdown due to gas optimization.
NATG	Ilijan B3	220	08/23/2023 21:15			Forced Outage	Shutdown due to gas optimization.
NATG	Avion 1	47.2	08/21/2023 0:00	08/24/2023 22:37	4	Planned Outage	Planned outage until August 25, 2023.
NATG	Avion 2	45.8	08/20/2023 0:01	08/23/2023 11:18	3	Planned Outage	Planned outage until August 30, 2023.
NATG	Sta. Rita 4	264	08/18/2023 21:43	08/22/2023 23:43	4	Maintenance Outage	On maintenance outage until August 23, 2023 to conduct inspection of cooling water intake pipe from seawater to check possible blockage of debris inside the pipe.
NATG	Sta. Rita 3	265.5	08/18/2023 20:42	08/23/2023 3:39	4	Maintenance Outage	On maintenance outage until August 23, 2023 to conduct inspection of cooling water intake pipe from seawater to check possible blockage of debris inside the pipe.
NATG	San Gabriel	420	08/11/2023 23:37	08/15/2023 0:01	3	Planned Outage	Planned Outage until August 14, 2023.
NATG	Ilijan A1	190	08/10/2023 15:20	08/22/2023 4:17	12	Forced Outage	Tripped due to gas supply pressure problem.
NATG	Sta. Rita 1	257.3	08/10/2023 7:12	08/13/2023 13:25	3	Forced Outage	Tripped due to GT protection activation while ongoing changeover.
NATG	Ilijan B3	220	08/04/2023 0:31	08/07/2023 0:56	3	Forced Outage	Tripped due to loss of gas supply.
NATG	Ilijan B2	190	08/04/2023 0:32	08/06/2023 23:24	3	Forced Outage	Tripped due to loss of gas supply.
NATG	Ilijan A3	220	08/04/2023 0:32	08/07/2023 5:41	3	Forced Outage	Tripped due to loss of gas supply.
NATG	Ilijan A2	190	08/04/2023 0:32	08/07/2023 3:43	3	Forced Outage	Tripped due to loss of gas supply.
NATG	Ilijan A1	190	08/04/2023 0:32	08/07/2023 15:00	4	Forced Outage	Tripped due to loss of gas supply.
NATG	Ilijan B1	190	07/15/2023 9:26			Forced Outage	Tripped by Generator earth fault protection
OIL	Ingrid 6	28	08/14/2023 21:05	08/18/2023 16:37	4	Maintenance Outage	Affected by the planned outage of Malaya-Ingrid 230kV line 2 until 2359H of August 20, 2023.
OIL	Ingrid 5	22	08/14/2023 21:05	08/18/2023 16:37	4	Maintenance Outage	Affected by the planned outage of Malaya-Ingrid 230kV line 2 until 2359H of August 20, 2023.
OIL	Ingrid 4	28	08/14/2023 21:05	08/18/2023 16:37	4	Maintenance Outage	Affected by the planned outage of Malaya-Ingrid 230kV line 2 until 2359H of August 20, 2023.
OIL	Ingrid 3	22	08/14/2023 21:05	08/18/2023 16:37	4	Maintenance Outage	Affected by the planned outage of Malaya-Ingrid 230kV line 2 until 2359H of August 20, 2023.
OIL	Ingrid 2	22	08/14/2023 21:05	08/18/2023 16:37	4	Maintenance Outage	Affected by the planned outage of Malaya-Ingrid 230kV line 2 until 2359H of August 20, 2023.
OIL	Ingrid 1	28	08/14/2023 21:05	08/18/2023 16:37	4	Maintenance Outage	Affected by the planned outage of Malaya-Ingrid 230kV line 2 until 2359H of August 20, 2023.(RECLASSIFIED FROM FORCE / OMC OUTAGE)
OIL	Limay 6	60	08/10/2023 15:32	08/14/2023 23:30	4	Forced Outage	Declared unavailable due to rotor bearing failure
OIL	Limay 3	60	08/07/2023 0:01			Planned Outage	To conduct C-inspection (Major Overhauling) until September 20, 2023.
OIL	Limay 5	60	08/05/2023 0:01	08/11/2023 21:08	7	Planned Outage	On planned outage until August 14, 2023.
OIL	TMO Unit 2	51.5	07/19/2023 0:01	07/27/2023 0:00	8	Planned Outage	Annual Switchyard PMS until July 26, 2023.
OIL	SLPGC 4	25	02/10/2022 18:07			Forced Outage	Due to low turbine lube oil supply. IEMOP deregistration effective on August 25, 2022.
OIL	SLPGC 3	25	01/22/2022 21:39			Forced Outage	Declared unavailable due to turbine lube oil sump metal chips detected. IEMOP deregistration effective on August 25, 2022.
OIL	Malaya 1	300	05/03/2019 18:21			Forced Outage	Declared unavailable due to motorization of unit generator caused by the non-opening of phase B of PCB 8-05CB08MAL.
WIND	Caparispisan 1	81	07/07/2023 6:17	07/27/2023 17:55	20	Maintenance Outage	Affected by the planned outage of Laoag-Pagudpud(NLREC) Wind Farm 115kV line.
WIND	BWPC	80	07/06/2023 6:04	07/31/2023 12:02	25	Maintenance Outage	Maintenance until July 30, 2023
BIOF	G2REC	10.8	09/07/2023 16:45	09/20/2023 7:00	13	Forced Outage	IDF Problem.
BIOF	IPower 1	10.8	09/02/2023 0:01	09/09/2023 8:01	7	Forced Outage	Fuel System problem
BIOF	GIFT	12	08/28/2023 0:06	09/02/2023 18:00	6	Maintenance Outage	Maintenance Outage
BIOF	IPower 2	10.8	07/05/2023 19:31			Forced Outage	Unplanned shutdown due to ash system problem.
COAL	GNP Dinginin 1	668	09/21/2023 0:12			Planned Outage	Planned outage until October 14, 2023.
COAL	SLPGC 1	150	09/20/2023 13:09			Forced Outage	Emergency shutdown due to coal coking at boiler.
COAL	SLPGC 2	149.6	09/16/2023 23:47			Forced Outage	Unplanned outage due to coal coking.
COAL	QPPL	460	09/12/2023 2:02	09/16/2023 4:32	4	Forced Outage	Unplanned outage due to economizer tube leak.
COAL	SMC 1	150	08/10/2023 4:01	09/22/2023 3:25	43	Planned Outage	Planned Outage until September 24, 2023.
COAL	SLTEC 1	122	07/26/2023 0:30	08/31/2023 3:59	36	Planned Outage	Planned outage until September 4, 2023.
COAL	Pagbilao 2	382	08/05/2023 0:56	08/30/2023 2:22	25	Planned Outage	On planned outage until September 03, 2023.
GEO	Tiwi 1	60	11/30/2021 18:32			Forced Outage	Steam supply diverted to Unit 2.
GEO	Makban 7	20	08/22/2023 17:57	09/16/2023 18:44	25	Forced Outage	MAKBAN D UNIT 7 SHUTDOWN DUE TO HIGH TURBINE VIBRATION
GEO	Makban 6	30	04/11/2013 22:44			Deactivated Shutdown	Conducted Gas compressor test.

Appendix A. Major Plant Outages

Plant Type	Plant/ Unit Name	Capacity (MW)	Date Out	Date In	Duration (Days)	Outage Type	Remarks
Luzon							
GEO	Makban 1	57	08/05/2023 1:50	09/14/2023 6:38	40	Maintenance Outage	Generator unit overhaul.
HYD	Kalayaan 4	180	09/04/2023 0:01			Planned Outage	Planned outage until November 24 2023.
HYD	Masway	12	08/27/2023 19:30	09/10/2023 15:17	14	Forced Outage	Cut-off of NIA IDR due to heavy rain in down stream area.
HYD	Angat M 4	50	02/14/2022 0:00			Planned Outage	Planned outage.
HYD	Angat M 3	50	11/02/2021 8:15			Forced Outage	Draw-out of Main Unit 3 generator breaker.
NATG	San Gabriel	420	09/18/2023 20:54	09/24/2023 20:09	6	Forced Outage	Gas restriction
NATG	Ilijan B2	190	09/08/2023 17:10	09/17/2023 19:52	9	Forced Outage	Emergency shutdown due to fuel gas supply restriction.
NATG	Sia Rita 2	255.7	08/25/2023 23:42	08/31/2023 4:21	5	Planned Outage	On planned outage until August 30 2023.
NATG	Ilijan B3	220	08/23/2023 21:15	09/17/2023 23:13	25	Forced Outage	Shutdown due to gas optimization.
NATG	Ilijan B2	190	08/23/2023 21:37	09/08/2023 16:22	16	Forced Outage	Shutdown due to gas optimization.
NATG	Ilijan B1	190	07/15/2023 9:26			Forced Outage	Tripped by Generator earth fault protection
OL	Limay 7	60	09/16/2023 0:01	09/19/2023 17:00	4	Planned Outage	To conduct Hot Gas Path Inspection and other pending works on unit.
OL	TMO Unit 2	51.5	09/11/2023 0:00	09/23/2023 0:00	12	Maintenance Outage	Maintenance outage.
OL	SLPGC 4	25	02/10/2022 18:07			Forced Outage	Due to low turbine lube oil supply. IEMOP deregistration effective on August 25 2022.
OL	SLPGC 3	25	01/22/2022 21:39			Forced Outage	
OL	Malaya 1	300	05/03/2019 18:21			Forced Outage	Declared unavailable due to turbine lube oil sump metal chips detected. IEMOP deregistration effective on August 25 2022.
OL	Limay 3	60	08/07/2023 0:01	09/21/2023 0:00	45	Planned Outage	To conduct C-inspection (Major Overhauling) until September 20 2023.
OL	Limay 1	60	08/26/2023 0:01	09/01/2023 19:58	7	Planned Outage	Planned Outage Hot Gas Path Inspection
Visayas							
BAT	Kabankalan Bat	20	04/19/2023 15:26	07/07/2023 8:15	79	Forced Outage	Auto-tripped due to Damaged 13.8kV PCB
COAL	TPC-Sangi 1	82	06/24/2023 0:03	06/26/2023 16:09	3	Forced Outage	Cut-out to facilitate boiler tube leak problem
GEO	Mahanagdong A1	5	07/16/2023 1:29	07/21/2023 1:23	5	Planned Outage	Annual PMS ETC July 18 2023
GEO	Mahanagdong B1	5	07/16/2023 0:18	07/22/2023 16:46	7	Planned Outage	Annual PMS ETC July 18 2023
GEO	Mahanagdong A2	5	07/13/2023 2:04			Maintenance Outage	PMS
GEO	Malibog 1	72	07/04/2023 5:03	07/10/2023 23:48	7	Forced Outage	Control Valve Deviation Problem
GEO	Malibog 2	72	01/21/2023 0:13	06/29/2023 1:09	159	Maintenance Outage	CUT OUT
GEO	Mahanagdong A1	5	05/05/2023 12:34	07/08/2023 5:59	64	Forced Outage	Due to over frequency
HYD	THC	15.9	07/16/2023 15:15	07/19/2023 8:20	3	Forced Outage	Auto-shutdown due to temperature winding very high.
HYD	THC	15.9	07/11/2023 4:34	07/13/2023 7:47	2	Forced Outage	Auto-shutdown due to very high temperature winding. Change over to Unit 3.
OL	PB104 Unit 1	7	07/07/2023 0:05	07/11/2023 0:00	4	Maintenance Outage	6000 RH PMS
WIND	SLWind	54	07/05/2023 8:18			Maintenance Outage	Conducted preventive maintenance
COAL	Keppo Salcon 1	103	08/02/2023 0:01			Planned Outage	APMS
GEO	PGPP1 Unit 1	37.5	08/11/2023 0:01			Maintenance Outage	Shutdown due to PMS.
GEO	Leyte 3	40.2	08/04/2023 0:30	08/08/2023 20:30	5	Maintenance Outage	5-day scheduled PMS
GEO	PGPP1 Unit 3	33.5	08/03/2023 13:08	08/10/2023 7:18	7	Forced Outage	Emergency shutdown to conduct turbine rotor replacement/inspection due to increasing bearing vibration.
GEO	Mahanagdong A2	5	07/13/2023 2:04	08/17/2023 21:15	36	Maintenance Outage	PMS
HYD	THC	15.2	08/22/2023 14:08			Forced Outage	Affected by the tripping of 69kV Taft feeder
HYD	THC	15.2	07/27/2023 7:07	07/29/2023 11:17	2	Forced Outage	Tripped due to undervoltage activation.
BIOF	HPCO	9.5	09/25/2023 7:00			Maintenance Outage	Offline weekly maintenance.
COAL	PALM 1	135	09/22/2023 17:44			Forced Outage	transformer tripped
COAL	CEDC 1	82	09/19/2023 14:33	09/22/2023 16:02	3	Forced Outage	EMERGENCY CUT-OUT DUE TO POSSIBLE BOILER TUBE LEAK
COAL	Keppo Salcon 2	103	09/16/2023 0:01			Planned Outage	Manually shutdown for scheduled APMS Duration 40 Days
COAL	CEDC 2	82	09/04/2023 0:21			Planned Outage	AMPS - Conduct of Major Turbine Overhaul(MOH) in accordance with the Approved 2023 GOMP Harmonization
COAL	Keppo Salcon 1	103	08/02/2023 0:01	09/06/2023 9:22	35	Planned Outage	APMS
GEO	PGPP1 Unit 2	37.47	09/14/2023 0:01			Maintenance Outage	Planned maintenance
GEO	PGPP1 Unit 1	37.5	08/11/2023 0:01	09/07/2023 6:12	27	Maintenance Outage	Shutdown due to PMS.
HYD	THC	15.2	09/09/2023 13:55	09/16/2023 12:01	7	Forced Outage	Tripped due to activation of high vibrations.
OL	TPC Carmen 2	10	09/25/2023 13:59			Forced Outage	Manually shutdown due to fuel linkage intermediate shaft
OL	TPC Carmen 2	10	09/11/2023 15:51	09/15/2023 9:07	4	Forced Outage	Manually shutdown due to inspection of piston on cylinder #11 due to suspected cut-off piston rings
OL	TPC Carmen 4	10	09/04/2023 11:36	09/08/2023 0:02	4	Forced Outage	AUTO-TRIPPED DUE TO LUBE OIL PRESSURE LOW
OL	CPPC 7	6.5	09/02/2023 0:02	09/16/2023 13:16	15	Planned Outage	Preventive Maintenance ECD September 19 2023
Mindanao							
BIOF	LSK U1	15	07/10/2023 0:01			Forced Outage	Shutdown-OMC.ETC August 9 2023.
BIOF	LSK U1	15	07/10/2023 0:01			Maintenance Outage	PMS (GOMP).ETC July 17 2023.
COAL	STE U2	116	07/20/2023 0:00			Maintenance Outage	For PMS(GOMP). ETC August 6 2023
COAL	STE U1	116	07/04/2023 0:00			Maintenance Outage	PMS(GOMP) ETC July 31 2023.
COAL	GNPK U3	151.3	07/01/2023 16:22	07/07/2023 10:55	6	Forced Outage	Forced Outage. Indication Boiler tube leak. ETC July 7 2023.
HYD	PG4 U2	75	07/11/2023 8:00	07/14/2023 18:29	3	Maintenance Outage	PMS (Non-GOMP). ETC July 15 2023.
HYD	AG2 U3	60	07/07/2023 8:21	07/22/2023 13:27	15	Maintenance Outage	Planned Outage. PMS-GOMP. ETC July 23 2023.
HYD	AG6 U4	25	07/03/2023 8:01			Maintenance Outage	Planned Outage. PMS(Non -GOMP). ETC August 1 2023.
HYD	AG7 U2	15	07/01/2023 9:08	07/19/2023 9:57	18	Maintenance Outage	PMS(GOMP). ETC July 20 2023.
HYD	PG4 U3	75	06/24/2023 8:00	06/27/2023 20:31	4	Maintenance Outage	PMS(Non-GOMP) starting 06/24/2023 0800H unit was on forced outage prior. ETC 06/28/2023.
HYD	AG6 U1	31.5	05/24/2023 16:50			Forced Outage	Emergency shutdown due to governor oil pump failure. Unplanned Outage. ETC October 20 2023.
OL	KET U1	7.8	07/15/2023 13:00	07/18/2023 9:00	3	Maintenance Outage	Planned outage to facilitate replacement of unit's smokestack. ETC July 17 2023.
OL	WMPC Unit 4	10.7	05/01/2023 21:59			Forced Outage	Tripped due to generator earth fault. Unplanned Outage. ETC October 20 2023.
BIOF	14TACUR	6	08/16/2023 17:30	08/19/2023 10:54	3	Forced Outage	Emergency shutdown due to evaporator leak. No ETC
BIOF	LSK U1	15	07/18/2023 0:00	08/09/2023 12:01	23	Forced Outage	The extended shutdown is due to the Outside Management Control (OMC) lack of fuel supply. ETC August 9 2023.
BIOF	LSK U1	15	07/18/2023 0:00			Forced Outage	Shutdown-OMC.ETC August 9 2023.
COAL	STE U1	116	08/25/2023 5:50			Forced Outage	Forced outage due to boiler fouling. No ETC.
COAL	STE U2	116	08/23/2023 13:00			Forced Outage	Forced Outage due to fouling of boiler. No ETC.
COAL	DCPP Unit 2	150	08/22/2023 0:22			Maintenance Outage	Planned Outage. PMS ETC 10/01/2023 2359H
COAL	MCC U1	55	07/27/2023 21:59	08/05/2023 10:20	9	Forced Outage	Emergency shutdown due to coal feeder problem.
COAL	STE U2	116	07/20/2023 0:00	08/06/2023 23:59	18	Planned Outage	For PMS(GOMP). ETC August 6 2023
COAL	STE U1	116	07/04/2023 0:00	08/01/2023 8:03	28	Planned Outage	PMS(GOMP) ETC July 31 2023.
HYD	AG2 U1	60	08/25/2023 9:05			Maintenance Outage	PMS(Non-GOMP). ETC August 27 2023.
HYD	AG6 U5	43.8	08/22/2023 9:02	08/24/2023 15:03	2	Planned Outage	PMS (GOMP). ETC August 29 2023 2359H.
HYD	AG6 U4	25	08/18/2023 9:04	08/21/2023 16:07	3	Planned Outage	PMS(GOMP). ETC August 21 2023.
HYD	PG4 U3	75	08/08/2023 0:02			Planned Outage	PMS (GOMP). ETC 08/30/2023
HYD	AG2 U3	60	08/04/2023 8:07	08/06/2023 16:24	2	Forced Outage	Emergency shutdown due to Flush Over of Main Disconnection Switch. (Unplanned Outage)
HYD	AG1 U2	35	08/01/2023 9:23			Planned Outage	PMS (GOMP). ETC October 19 2023
HYD	AG6 U4	25	07/03/2023 8:01	07/28/2023 15:07	25	Maintenance Outage	Planned Outage. PMS(Non -GOMP). ETC August 1 2023.
HYD	AG6 U1	31.5	05/24/2023 16:50			Forced Outage	Emergency shutdown due to governor oil pump failure. Unplanned Outage. No ETC.
OL	WMPC Unit 9	10.7	08/21/2023 10:07	08/24/2023 12:30	3	Forced Outage	Forced outage due to continuous surging turbo charger. ETC 08/24/2023 1700H
OL	TM1 U2	50	08/16/2023 0:01	08/18/2023 16:00	3	Planned Outage	PMS (GOMP). ETC 08.18.2023
OL	NBPC 1	5	08/10/2023 0:00			Forced Outage	DG02 on extended PMS undergoing repair and maintenance due to charge air cooler contaminated of water. No ETC.
OL	NBPC 1	5	08/10/2023 0:00			Forced Outage	Extended PMS (Non-GOMP). ETC None.
OL	TM1 U1	49	08/07/2023 0:01	08/14/2023 22:00	8	Planned Outage	PMS (GOMP). ETC 08/15/2023 2359H.
OL	NBPC 1	5	08/07/2023 0:00	08/10/2023 0:00	3	Maintenance Outage	PMS(Non-GOMP). ETC August 9. 2023.

Appendix A. Major Plant Outages

Plant Type	Plant/ Unit Name	Capacity (MW)	Date Out	Date In	Duration (Days)	Outage Type	Remarks
Mindanao							
OIL	WMPC Unit 10	10.7	07/31/2023 8:50	08/16/2023 10:00	16	Forced Outage	Tripped due to waterleak. Unplanned Outage. No ETC.
OIL	WMPC Unit 4	10.7	05/01/2023 21:59			Forced Outage	Tripped due to generator earth fault. Unplanned Outage. ETC October 20 2023.
SOLR	ADG U0	20	08/17/2023 19:42			Forced Outage	Unable to generate due to damage main switchgear at line 1 to replace feeder cable of line 1. Unplanned Outage. No ETC.
BAT	MACO BAT1	20	09/25/2023 10:30			Forced Outage	Unplanned Outage. Root-cause under investigation.
BAT	JASAAN BAT1	20	09/18/2023 11:45	09/23/2023 14:40	5	Maintenance Outage	Maintenance Outage
COAL	GNPK U1	151.9	09/20/2023 10:21			Maintenance Outage	Planned Outage. (PMS) ETC 10/30/2023 2359H.
COAL	GNPK U1	151.9	09/20/2023 0:01			Maintenance Outage	Planned Outage. (PMS) ETC 10/30/2023 2359H.
COAL	GNPK U4	151	09/18/2023 21:56	09/23/2023 5:30	4	Forced Outage	Forced Outage due to UCB Triggered Off Signal (Tentative Indication). No ETC
COAL	STE U2	116	09/18/2023 8:35	09/25/2023 14:03	7	Forced Outage	Emergency shutdown due to tube leak. (Unplanned Outage). No ETC.
COAL	FMP U3	135	09/17/2023 22:15			Maintenance Outage	PMS (GOMP). ETC October 02 2023.
COAL	DCPP Unit 1	151.4	09/17/2023 0:25			Maintenance Outage	PMS (GOMP). ETC October 11 2023.
COAL	STE U1	116	09/12/2023 10:19	09/17/2023 14:13	5	Forced Outage	Emergency shutdown due to Boiler Fouling. ETC Sept 21 2023
COAL	STE U2	116	09/11/2023 18:45	09/16/2023 14:12	5	Forced Outage	Emergency shutdown due to Boiler Fouling. ETC Sept 20 2023
COAL	FMP U2	135	09/05/2023 10:52	09/11/2023 0:01	6	Forced Outage	Emergency maintenance re: tube leak at boiler backpass. ETC: 12-Sep-2023
COAL	MCC U2	55	09/01/2023 0:01	09/11/2023 23:48	11	Maintenance Outage	PMS (Non-GOMP). ETC September 20 2023
COAL	STE U2	116	08/23/2023 13:00	09/01/2023 4:11	9	Forced Outage	Forced Outage due to fouling of boiler. No ETC.
COAL	STE U1	116	08/25/2023 5:50	09/02/2023 17:35	8	Forced Outage	Forced outage due to boiler fouling. No ETC.
COAL	FMP U1	135	08/28/2023 0:01	09/08/2023 18:10	14	Maintenance Outage	PMS (GOMP). ETC September 9 2023
COAL	DCPP Unit 2	150	08/22/2023 0:22			Maintenance Outage	Planned Outage. PMS ETC 10/01/2023 2359H
HYD	AG6 U1	31.5	09/23/2023 18:49			Forced Outage	Shutdown. Repair of governor oil pump not yet resolved. Note Forced outage since 05/24/2023 1650. Closed at 09/23/2023 1511H for test run of governor.
HYD	PG4 U3	75	09/18/2023 8:02	09/23/2023 7:51	5	Maintenance Outage	PMS (Non-GOMP). ETC September 23 2023.
HYD	AG4 U1	52.7	09/15/2023 11:00	09/19/2023 9:02	4	Forced Outage	Emergency shutdown due to frequent governor hunting.
HYD	PG4 U1	75	09/05/2023 0:02	09/07/2023 20:54	3	Maintenance Outage	PMS (Non-GOMP). ETC: September 8 2023
HYD	AG2 U1	60	09/02/2023 14:45	09/11/2023 14:24	9	Forced Outage	Tripped due to high temperature of turbine guide bearing (Unplanned Outage).
HYD	PG4 U2	75	09/02/2023 0:01	09/04/2023 12:15	3	Forced Outage	Emergency shutdown due to low water inflow.
HYD	AG4 U1	52.7	09/02/2023 8:05	09/15/2023 8:59	18	Maintenance Outage	Planned Outage (GOMP). ETC: September 29 2023.
HYD	PG4 U3	75	08/08/2023 0:02	08/30/2023 15:39	23	Maintenance Outage	PMS (GOMP). ETC 08/30/2023
HYD	AG6 U1	31.5	05/24/2023 16:50	09/21/2023 9:15	120	Forced Outage	Emergency shutdown due to governor oil pump failure. Unplanned Outage. No ETC.
HYD	AG2 U1	60	08/25/2023 9:05	08/27/2023 16:38	2	Maintenance Outage	PMS(Non-GOMP). ETC August 27 2023.
HYD	AG1 U2	35	08/01/2023 9:23			Maintenance Outage	PMS (GOMP). ETC October 19 2023
OIL	WMPC Unit 4	10.2	05/01/2023 21:59			Forced Outage	Tripped due to generator earth fault. Unplanned Outage. ETC October 20 2023.
OIL	KEP U2	7.8	08/29/2023 13:01	08/31/2023 13:00	2	Forced Outage	Forced Outage due to Smoke Stop replacement. ETC August 31 2023.
OIL	WMPC Unit 4	10.7	05/01/2023 21:59			Forced Outage	Tripped due to generator earth fault. Unplanned Outage. ETC October 20 2023.
OIL	NBPC 1	5	08/10/2023 0:00	08/31/2023 13:00	22	Forced Outage	DG02 on extended PMS undergoing repair and maintenance due to charge air cooler contaminated of water. No ETC.
SOLR	NVVOGTSE1	5	09/25/2023 9:13			Forced Outage	Affected by SOCOTECO 1 substation failure (Outside management control outage).
SOLR	ADG U0	20	08/17/2023 19:42			Forced Outage	Unable to generate due to damage main switchgear at line 1 to replace feeder cable of line 1. Unplanned Outage. No ETC.