Annual Market Assessment Report

26 December 2023 to 25 December 2024

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

JUNE 2025

EXECUTIVE SUMMARY

By the end of the 2024 Billing Year, the system-wide total registered capacity was recorded at 29,962 MW, which translates to a 10% increase from the previous year.

Regional registered capacities and the corresponding changes from the previous year were as follows:

- Luzon – 21,863.30 MW (73% of the total capacity) 12% increase
- Visayas – 3,676.30 MW (12% of the total capacity) 7% increase
- Mindanao – 4,422.40 MW (15% of the total capacity) 2% increase

Average capacity on outage increased from 3,165 MW to 3,671.81 MW, representing a 16% rise compared to the previous year. The average capacity on outage accounts for 13% of the total average registered capacity.

An assessment of the capacity on outage by plant type reveals that coal plants accounted for the largest share among all plant types, followed by natural gas, hydro, and oil plants. This trend has remained consistent across comparative years, with the same ranking in terms of percentage share of outages.

In terms of outage category, planned, maintenance, and forced outages showed significant increases in 2024, averaging 28%, with no recorded deactivated shutdowns for the year.

In 2024, coal plants comprised more than half of the entire generation mix in the grid, ranging from 56% to 63%, despite having only around 42% share in registered capacity. Meanwhile, geothermal plants maintained the highest utilization, despite representing just 6% of the total registered capacity. The capacity factor of geothermal plants reached 66% for the year, primarily driven by their consistent plant availability, stable resource supply, and classification as preferential/priority dispatch units.

In line with the Department of Energy's (DOE) targets for the transition to renewable energy (RE) resources, these plants contributed 23% of total generation in 2024. As a reference, the DOE's aspirational target is currently set at 35% by 2030, as outlined in the Philippine Development Plan (PDP) 2023–2050, which includes generation from off-grid areas

The Philippine Gross Domestic Product (GDP) posted a year-on-year growth rate of 5.6%. In terms of on-grid electricity demand, an 8.13% growth rate was recorded, increasing from an average of 12,858.02 MW in the previous year to 13,903.74 MW in 2024. The stronger growth in electricity demand relative to GDP indicates rising electricity consumption, driven by increased industrial activity and improvements in overall energy requirements within the economy.

The year-on-year comparison of the Load-Weighted Average Price (LWAP) posted an average decrease of 14.25%, from PHP 6,511/MWh in 2023 to PHP 5,583/MWh in 2024, signaling an improvement in supply availability within the grid.

Daily spot energy transactions (in MWh) increased from 17.95% to 22.91% in 2024, in line with the overall rise in electricity demand. Despite this growth in spot market activity, the majority of available capacity remained covered by bilateral contracts.

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ANNUAL MARKET ASSESSMENT REPORT

The Annual Market Assessment Report (AMAR) provides an evaluation of the integrated operations of the Wholesale Electricity Spot Market (WESM) across Luzon, Visayas, and Mindanao for the covered period (26 December 2023 to 25 December 2024). It includes an overview of market performance, trends, and the underlying drivers of these results, offering a basis for assessing market competition and determining the prevailing conditions in the WESM.

I. Highlights of Major Activities in the WESM

- Commencement of the Full Commercial Operations of the Reserve Market[1]

  In February 2024, the Department of Energy (DOE) has commercially launched the operations of the Reserve Market which has operated until March 2024 before the Energy Regulatory Commission (ERC) has decided to temporarily suspend the reserve billing and settlement[2] due to the observed sudden increase in WESM Prices due to co-optimization of energy and reserves.

  In conjunction with the suspension, the ERC Ordered a partial settlement[3] of thirty percent (30%) of the total reserve trading amount of all WESM trading transactions, based on all the capacities offered in the Reserve Market covered by the March 2024 billing period.

  On 05 August 2024 at 0005h trading interval, the DOE and ERC lifted[4] the suspension of the billing and settlement for the Reserve Market which has allowing the resumption[5] of operations.

  On 03 December 2024, the ERC issued an Order[6] allowing the settlement of the Reserve Trading Amount (RTA) for the March 2024 billing month to commence in the January 2025 billing month, on a staggered basis—over three months for Luzon and Mindanao, and six months for Visayas.

- Market suspension during alert during Red Alert notice

  Pursuant to the ERC Order on Case No. 2024-017 MC, dated 30 April 2024, the Commission ordered the automatic suspension of the WESM whenever red alert notices are issued by the System Operator (SO). This directive aligns with the observed continuous increase in market prices during the summer season, primarily caused by rising heat indices. As a result, Red Alert notices were issued on multiple occasions, leading to market suspensions that affected the Luzon and Visayas grids, with a total of 1,477 and 402 trading intervals, respectively.

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[1] DOE Advisory 2024-01-001-SEC, dated 25 January 2024 entitled "*Advisory on the Commencement of the Full Commercial Operations of the Reserve Market*"
[2] ERC Case No. 2023-002RC Order, dated 25 March 2024 entitled "*In the Matter of the Application for the Issuance of Rules on the Price Determination Methodology for the Implementation of the Co-optimized Energy and Reserve Market in the Wholesale Electricity Spot Market (WESM)*"
[3] ERC Case No. 2023-002RC Order, dated 09 May 2024
[4] ERC Case No. 2023-002RC Notice of Resolution, dated 26 July 2024
[5] DOE Advisory 2024-08-001-SEC, dated 02 August 2024 entitled "*Resumption of the Full Commercial Operations of the Reserve Market*"
[6] ERC Case No. 2023-002RC Order, dated 03 December 2024

During market suspension, Administered Prices will be applied in the WESM, based on the ERC-approved WESM Price Determination Methodology, considering the four (4) most recent weeks of the same trading interval that has been suspended. For these impositions, generating participants are allowed to file for additional compensation, subject to validation by the Market Operator.

- Completion of Transmission Projects

  For the covered period, there had been two (2) major transmission projects that were completed by the National Grid Corporation of the Philippines, as follows:

  - Cebu-Negros Panay 230-kiloVolt (kV) Backbone Project Stage 3 (CNP3) energization on 27 March 2024
  - Cebu-Bohol Interconnection Project (CBIP) energization for line 1 on 27 March 2024 and line 2 on 27 September 2024

  These projects addressed multiple line congestions previously observed in the Visayas region, thereby reducing congestion costs and consequently lowering market prices. This led to a reduction in congestion-related costs, resulting in price alignment between Visayas regional and zonal prices.

  In 2024, the Panay zone exhibited the most significant deviation from the regional average price, reaching a 51% variance (PHP 5,347.52/MWh) in July. This was followed by Bohol, which recorded a 50% variance (PHP4,836.02/MWh) in June, and Negros, with a 36% variance (PHP2,832.20/MWh) in January.

- Combined Peak Demand of the Philippines

  The new all-time highest peak demand and reserve requirement was recorded on 09 May 2024 at 1430h, reaching 20,556 MW, up from 17,879 MW recorded on 07 June 2023 at 1415h. This observation coincided with the summer season, when the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) recorded a high heat index ranging from 42 to 51 degrees Celsius, which was therefore tagged as dangerous levels.[7].

II. Assessment of the Market

A. Supply

i. Registered Capacity

- By the end of the 2024 Billing Year, the system-wide total registered capacity was recorded at 29,962 MW, which translates to a 10% increase from the previous year.
  - Regional registered capacities and the corresponding changes from the previous year were as follows:
    - Luzon – 21,863.30 MW (73% of the total capacity) 12% increase

[7] J. Casucian. *GMA News: "PAGASA: 25 areas under danger level head index on May 9"* dated 08 May 2024. Link: https://www.gmanetwork.com/news/scitech/weather/906169/pagasa-25-areas-under-danger-level-heat-index-on-may-9/story/

- Visayas – 3,676.30 MW (12% of the total capacity) 7% increase
- Mindanao – 4,422.40 MW (15% of the total capacity) 2% increase

- A net increase of 2,735.33 MW was recorded in the total registered capacity for 2024. The primary contributors to this growth were the recent additions of power plants, accounting for 2,762.7 MW, as enumerated in *Annex A*: Newly Registered Plants. An additional capacity of 0.8 MW resulted from plant disaggregation.
- Moreover, a net decrease of 3.17 MW was noted due to changes in the capacity of 48 plants, as listed in *Annex B*. One (1) biofuel power plant with a total capacity of 25 MW ceased operations in the WESM.
    - Of the newly registered power plants in the WESM, about 36% or an aggregated capacity of 987.3 MW was attributed to the entry of Renewable Energy (RE) plants.
    - Nearly half (48%) of the newly registered capacity can be attributed to the entry of a one (1) natural gas facility — the Batangas Combined Cycle Power Plant Units 1 to 3 — with a total capacity of 1,320 MW.
- Per resource type, coal power plants continued to dominate the spot market, holding the largest share—approximately 42%—of the total registered capacity.

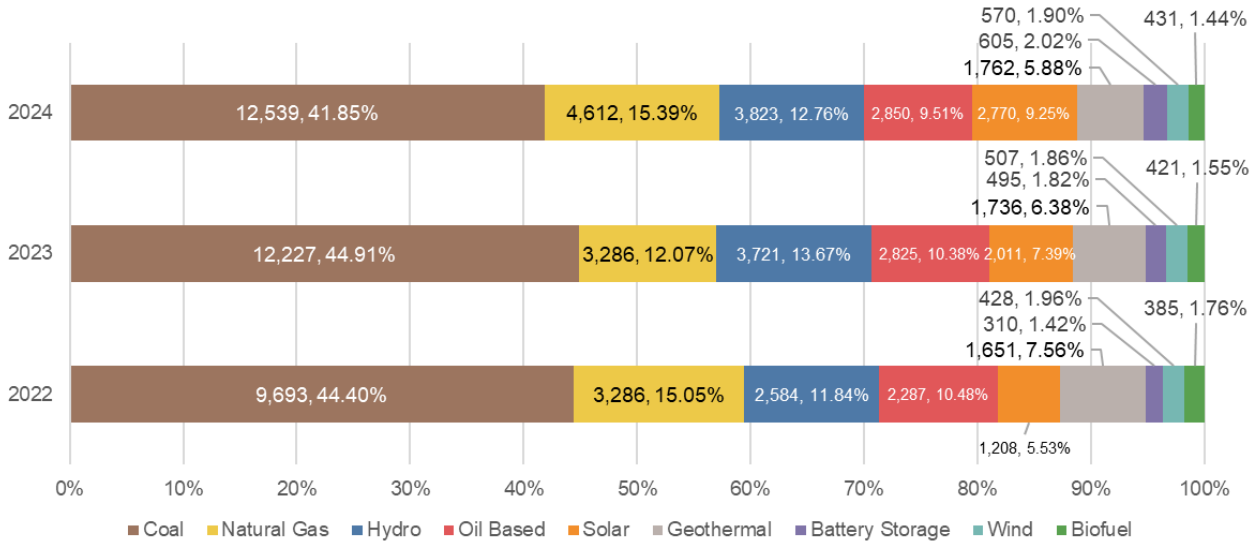
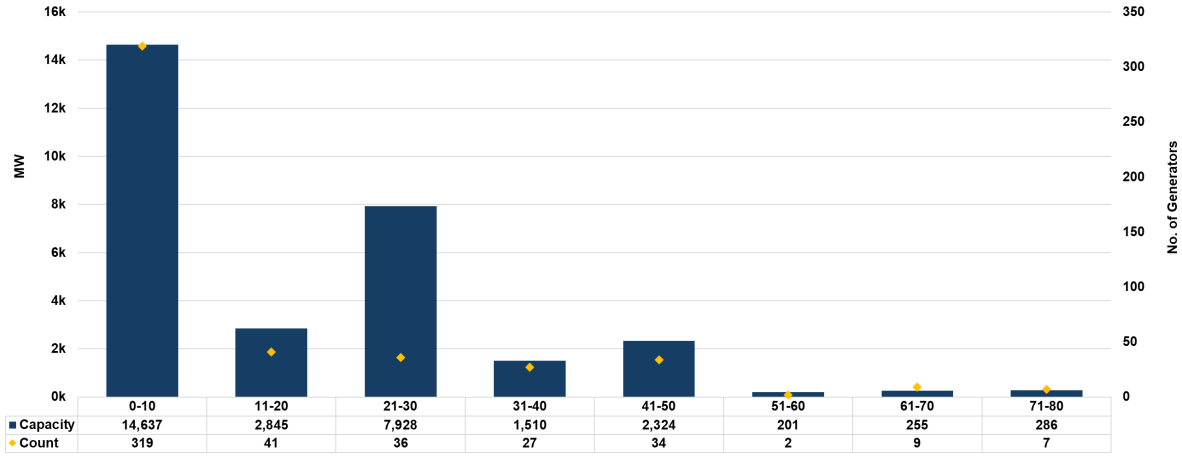


Figure 1: Capacity Mix, 2022, 2023 and 2024

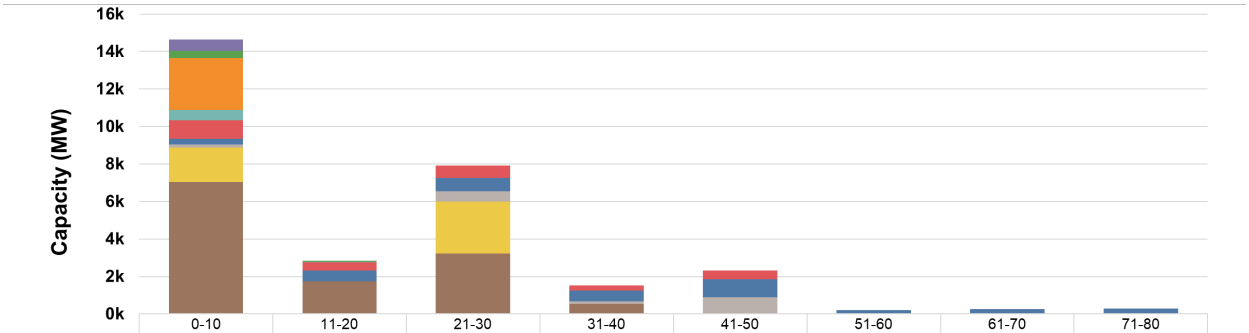
- Looking at the age of registered power plants, 67% of registered generator resources fell within the 0–10 year range, with an aggregate capacity of 14,637 MW. This accounts for nearly half (49%) of the total WESM registered capacity as of 2024.



	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
Capacity	14,637	2,845	7,928	1,510	2,324	201	255	286
Count	319	41	36	27	34	2	9	7

Figure 2: Registered Capacity by Age of Plants, 2024

- Figure 3 presents the registered capacity by plant age and type. Notably, all plants over 50 years old are hydropower facilities, reflecting the long-standing presence of hydro in the country's energy landscape.
- Following coal plants, solar plants accounted for the majority of plants with ages 10 years and below, highlighting the rapid expansion of solar technology in the country. Solar comprised 19% of the total capacity mix within the 0–10 year age bracket, underscoring its growing role in the country's energy transition. However, despite this progress, only 28% of the newly added capacity falls under renewable energy, indicating that non-renewable sources continue to dominate recent capacity developments.



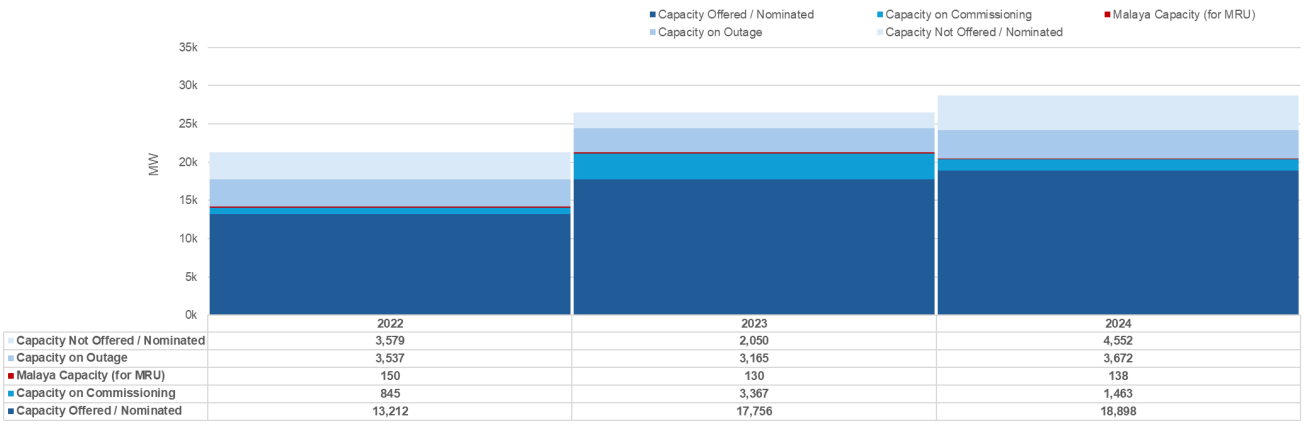
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
BATTERY	605	-	-	-	-	-	-	-
BIOFUEL	391	65	-	-	-	-	-	-
SOLAR	2,770	-	-	-	-	-	-	-
WIND	537	32	-	-	-	-	-	-
OIL	1,002	437	682	267	463	-	-	-
HYDRO	283	555	712	563	969	201	255	286
GEOTHERMAL	167	20	542	140	893	-	-	-
NATGAS	1,830	-	2,782	-	-	-	-	-
COAL	7,052	1,736	3,211	540	-	-	-	-

Figure 3:Registered Capacity by Age of Plants by Resource Type, 2024

ii. Capacity Profile

- Capacities Offered/Nominated represent 66% of the registered capacity, which increased by 6% compared to the previous year. This was mainly driven by the entry of new power plants into commercial operation, nominating their capacities to be utilized by the system.

- There has been a 57% decrease in Capacities on Commissioning, caused by the eventual commercial operations of plants previously undertaking testing. A total of 2,165.7 MW of capacity completed commissioning tests in 2024. Of this, 1,095.3 MW had undergone testing and commissioning prior to 2024 and was carried over, while the remaining 1,070.4 MW consisted of new plants that completed their testing and commissioning within 2024. *Annex C* provides details.
- Capacities not offered/nominated represent 16% of the registered capacity, mainly due to resource constraints and capacity derations experienced by plants in the WESM.
- Capacities on Outage represent 13% of the registered capacity and will be further discussed in the succeeding sections of this report.



	2022	2023	2024
Capacity Not Offered / Nominated	3,579	2,050	4,552
Capacity on Outage	3,537	3,165	3,672
Malaya Capacity (for MRU)	150	130	138
Capacity on Commissioning	845	3,367	1,463
Capacity Offered / Nominated	13,212	17,756	18,898

Figure 4: Average Capacity Profile - 2022 to 2024

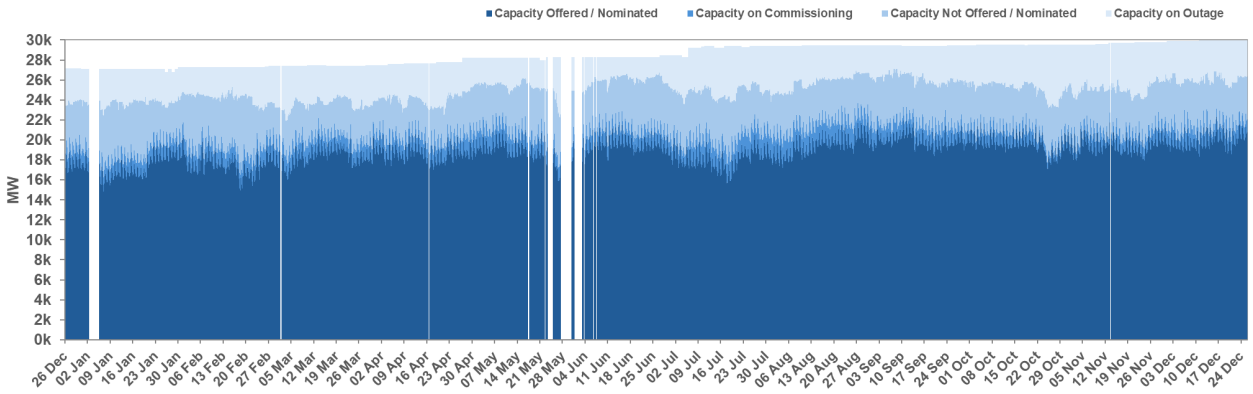


Figure 5: Capacity Profile per interval, 2024

Note: Missing trading intervals were under Market Intervention and/or Market Suspension.

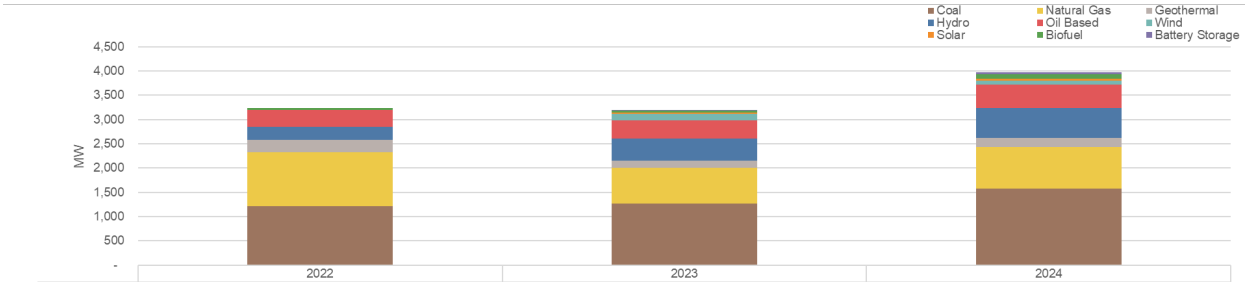
iii. Capacities on Outage

- Average capacity on outage increased from 3,165 MW to 3,671.81 MW, representing a 16% rise compared to the previous year. The average capacity on outage accounts for 13% of the total average registered capacity.
- Capacities on outage were recorded to have peaked at over 6,037.06 MW on 27 May 2024 at the 0500h trading interval, during the summer season when hydro plants experienced

insufficient water supply as a consequence of the El Niño phenomenon. Moreover, during the last quarter of the year—when most maintenance outages are scheduled to take advantage of the generally low level of demand attributed to long holidays and cooler temperatures in the country—capacities on outage peaked at 6,424.75 MW on 25 October 2024 at the 1400h trading interval.

a. Capacity on Outage per Plant type[8]

- An assessment on the capacity on outage by plant type reveals that coal plants accounted for the most share among all plant types, followed by natural gas, hydro, and oil plants. This trend has been quite consistent for the comparative years having the same ranking in terms of percentage shares on outages.



	2022	2023	2024
Battery Storage	-	20	43
Biofuel	42	36	96
Solar	4	28	37
Wind	0	130	82
Oil Based	341	385	481
Hydro	265	445	616
Geothermal	261	158	196
Natural Gas	1,114	734	847
Coal	1,212	1,265	1,580

Figure 6: Yearly Average Capacity on Outage by Plant Type, 2022 to 2024

- The 2024 per-interval outage data show consistently high outage levels across plant types. Notably, outages from hydro plants significantly increased starting 02 March 2024, reaching a total hydro outage capacity of 521.75 MW. As a result of the El Niño phenomenon, hydro plant outage capacity increased by 38% compared to the previous year, peaking at 1,696.14 MW on 21 April 2024. Despite this peak in outages for hydro plants, no red and/or yellow alert notice was raised by the SO.
- Coal plants began 2024 with a high level of capacity on outage at 2,283.5 MW, carried over from 2023. This was primarily due to the forced outages of six (6) coal plants, with a combined rated capacity of 1,482.5 MW.
- High levels of capacity on outage for natural gas plants were observed during the 3rd and 4th quarters of 2024, due to fuel gas supply restrictions from the Batangas LNG terminal.

[8] Computation is based on a per-plant type basis and includes intervals during periods of market intervention and suspension.

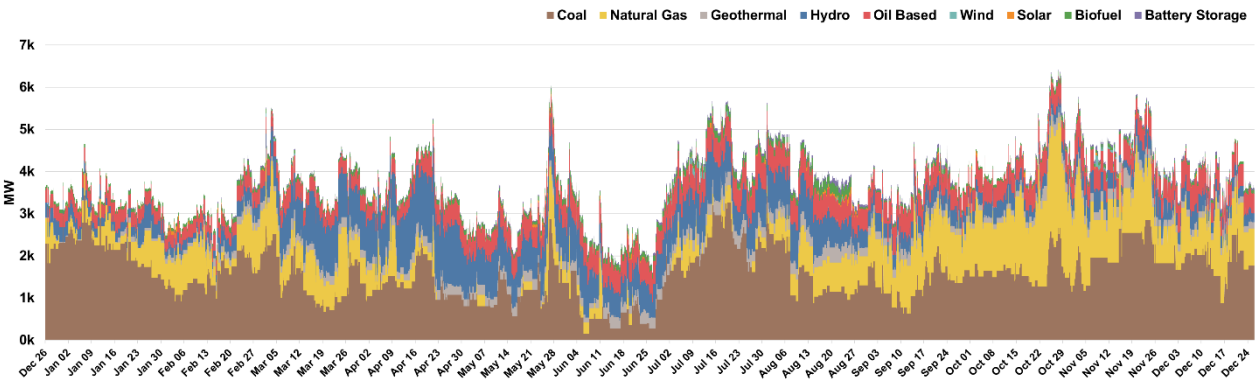
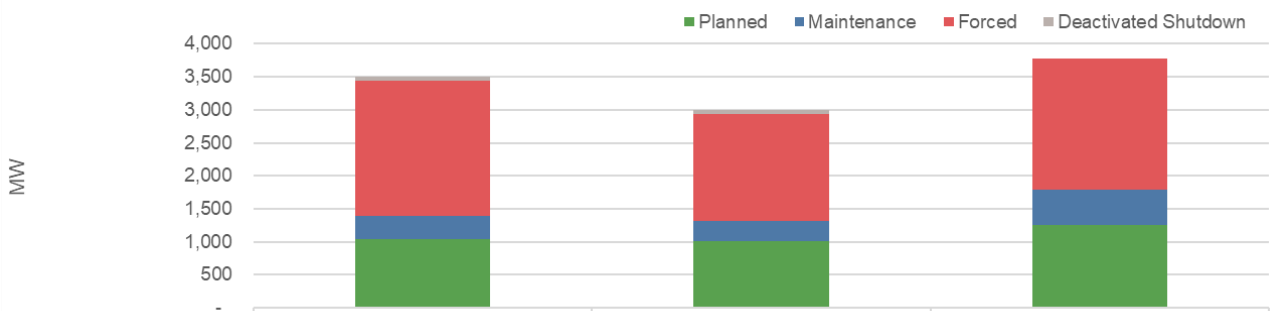


Figure 7: Per Interval Capacity on Outage by Plant Type, 2024

b. Capacity on Outage per Category[9]

- In terms of capacity on outage by category, planned, maintenance, and forced outages showed significant increases in 2024, with an average rise of 28%. No deactivated shutdowns were recorded for 2024.
- Similar to previous years, forced outages continued to have the highest share among all outage categories.



	2022	2023	2024
Deactivated Shutdown	55	55	
Forced	2,048	1,619	1,974.94
Maintenance	359	311	536.53
Planned	1,034	1,005	1,257.17

Figure 8: Yearly Average Capacity on Outage by Category, 2022 to 2024

- On a per-interval basis, forced outages remained dominant throughout the year but were more elevated during the summer season. On the other hand, planned outages were scheduled outside the summer season, which falls in the second quarter of the year, and in accordance with the Grid Operating and Maintenance Program (GOMP), as approved by the DOE. Planned and maintenance outages are likewise prohibited by the DOE during the summer season, with exemptions for hydro plants, in order to avoid thin supply margin

[9] Computation is based on a per category basis and includes intervals during periods of market intervention and suspension.

situations. Furthermore, forced outages are subject to investigation and validation by PEMC to ensure the validity of these outages.

- The highest level of forced outages in 2024 was recorded at 5,487.5 MW on 26 May at the 1535h trading interval, accounting for about 95% of total outages during that interval. On the same day, a Yellow Alert was declared by the SO for the 2100h to 2200h intervals. However, it was lifted earlier at 1800h due to lower forecasted demand.

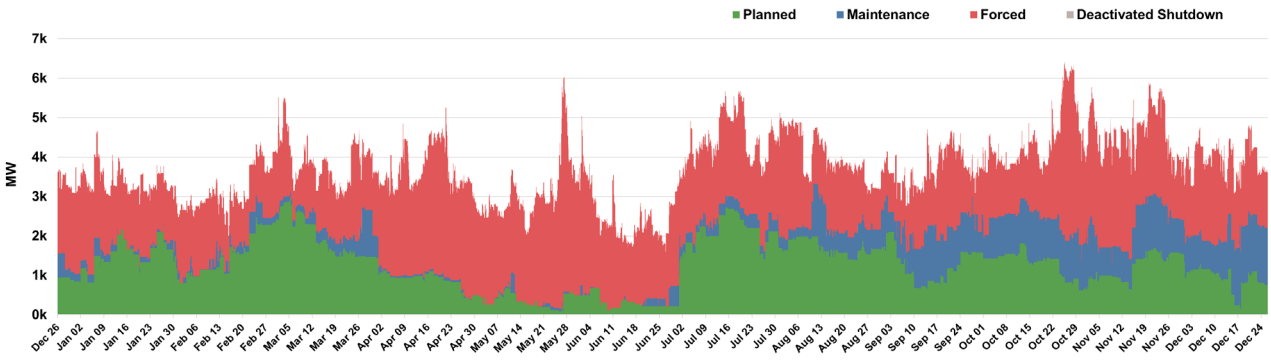
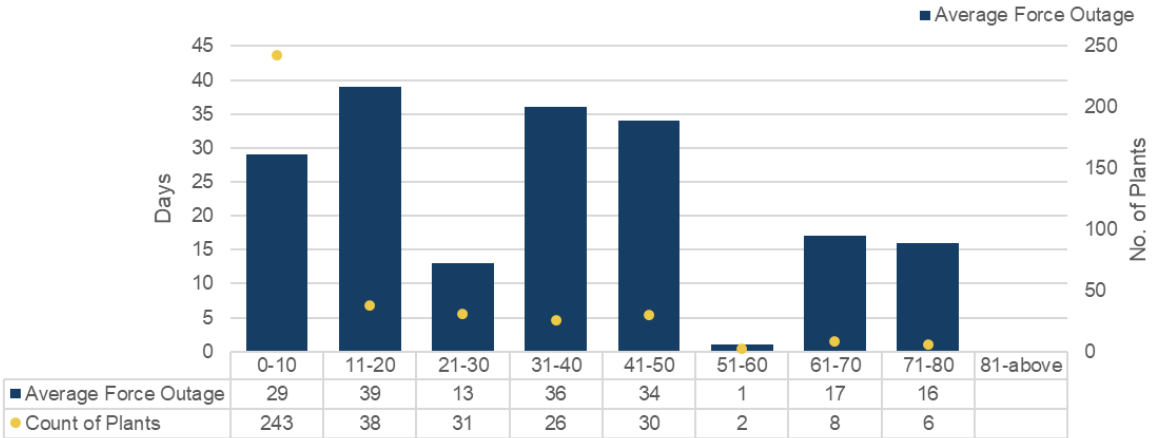


Figure 9: Per Interval Capacity on Outage by Category, 2024

- For the year 2024, outage data revealed a notable correlation between power plant age and the duration[10] of forced outages. Facilities within the 11 to 20-year age bracket recorded the longest average forced outage duration, averaging at 39 days. While this age bracket shows the highest average outage duration, it is important to note that the number of plants within each age group significantly influences the resulting average.
- In contrast, newer plants (0–10 years old), which account for a larger portion of the total fleet, showed shorter average outage durations. This trend suggests that a higher number of younger plants contributed to a lower overall average outage duration, reflecting better operational reliability and efficiency.

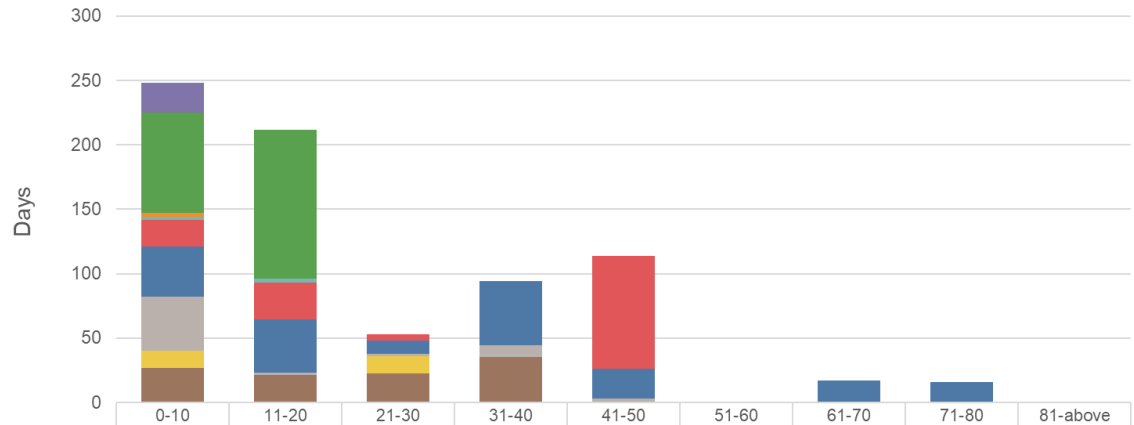


	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-above
Average Force Outage	29	39	13	36	34	1	17	16	
Count of Plants	243	38	31	26	30	2	8	6	

[10] Outage duration was computed by dividing the total number of trading intervals by 288, representing the number of trading intervals in a single day.

Figure 10: Average Forced Outage Days per Age Range of Generator's Unit[11], 2024

- In terms of further categorizing the average forced outages based on resource types, the total forced outage per resource type was calculated. Biofuel plants belonging to the 11–20 year age bracket exhibited the highest average outage duration, with 116 days recorded in 2024 due to technical problems at the plant.
- Although coal plants accounted for the highest registered capacity, coal plants within the 31–40 year age bracket recorded the highest average forced outage duration during the observed period.

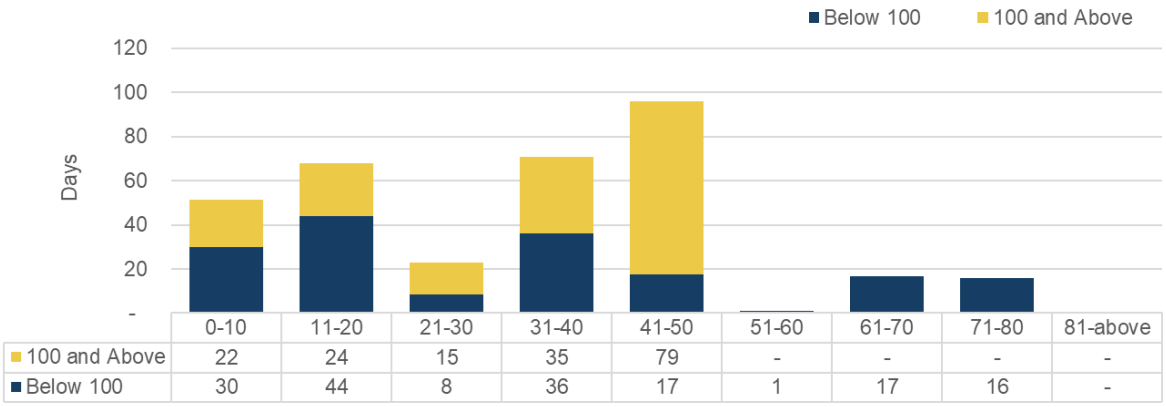


	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-above
BATTERY	24	-	-	-	-	-	-	-	-
BIOFUEL	78	116	-	-	-	-	-	-	-
SOLAR	3	-	-	-	-	-	-	-	-
WIND	3	3	-	-	-	-	-	-	-
OIL	21	29	5	0	88	-	-	-	-
HYDRO	39	41	11	49	23	1	17	16	-
GEOTHERMAL	42	2	2	10	3	-	-	-	-
NATGAS	14	-	13	-	-	-	-	-	-
COAL	27	21	23	35	-	-	-	-	-

Figure 11: Average Forced Outage Days per Age Range of Generator Units[12] per Plant Type, 2024

- This portion intends to look at the average duration of forced outages per plant unit capacity, categorized as less than 100MW and greater than 100MW. It revealed that majority of forced outages occurred in units with capacities greater than 100MW.
- In 2024, newer power plants (under 20 years old) with capacities below 100 MW recorded to have higher average number of days on forced outages. Meanwhile, older plants (31–50 years old) with capacities of 100MW and above experienced higher average number of days forced outage.

[11] Computed based on Generator's trading node.
[12] Computed based on Generator's trading node.



	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-above
100 and Above	22	24	15	35	79	-	-	-	-
Below 100	30	44	8	36	17	1	17	16	-

Figure 12: Average Forced Outage Days Based on Unit Capacity, 2024

iv. Generation Mix

- For 2024, coal plants comprised more than half of the entire generation in the grid, ranging from 56% to 63% on a monthly basis, despite having only around a 42% share in registered capacity.
- A similar reliance was observed for natural gas plants, where the share in generation was generally higher compared to their share in registered capacity.
- These observations on reliance on coal and natural gas plants were made regardless of the high recorded outages from these plants throughout the year.
- In line with the DOE's set targets for the energy transition to RE resources, these plants' contribution was recorded at 23% of total generation for 2024. As a reference, the aspirational target of the DOE is currently set at 35% by 2030, as outlined in the Philippine Development Plan (PDP) 2023–2050, which will include generation from off-grid areas.

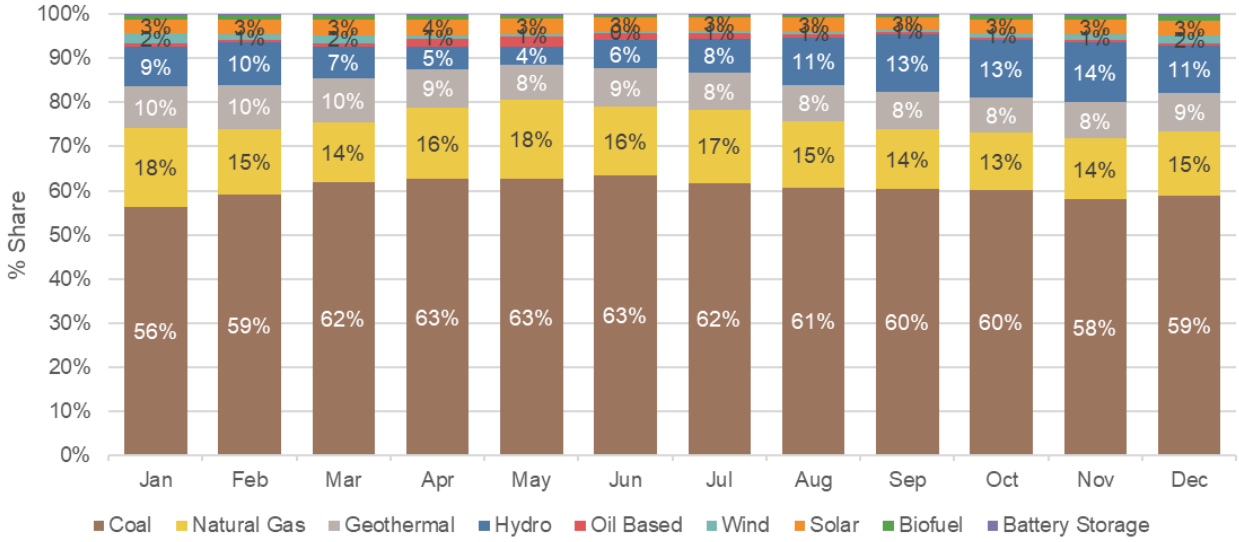


Figure 13: Generation Mix per Plant Type - 2024

v. Capacity Factor[13]

- Geothermal plants maintained the highest utilization in 2024, despite representing only 6% of the total registered capacity. The capacity factor of geothermal plants reached 66% for the year, primarily driven by their consistent plant availability, stable resource supply, and classification. Fewer outages resulted in high availability and a reliable resource, coupled with their classification as preferential/priority dispatch units.
- Coal plants, despite their dominance with a 42% share of registered capacity and contributing 65% to the generation mix, ranked second in capacity factor at 65%, indicating that more than half of their total capacity was consistently dispatched throughout the billing year. This was followed by natural gas plants, which posted a capacity factor of 51% throughout the period, consistent with their baseload characteristics.
- Despite the 2024 El Niño phenomenon, hydro plants maintained a high capacity factor of around 32% during the period.

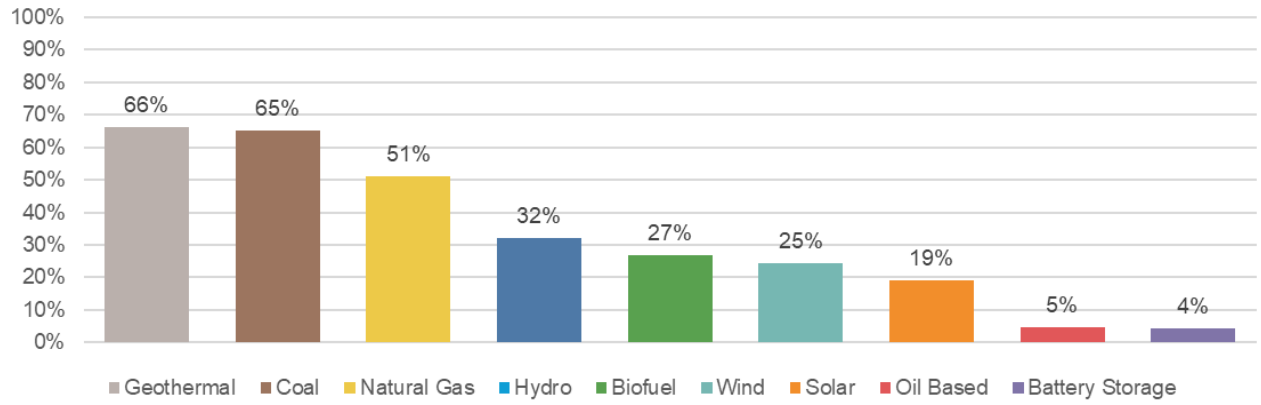


Figure 14: Capacity Factor by Plant Type, 2024

B. Demand

- For 2024, the Philippine Gross Domestic Product (GDP) posted a year-on-year growth rate of 5.6%. In terms of on-grid electricity demand, an 8.13% growth rate was recorded, increasing from an average of 12,858.02 MW in the previous year to 13,903.74 MW in 2024. The stronger growth in electricity demand relative to GDP indicates rising electricity consumption driven by increased industrial activities and improvements in overall energy requirements within the economy.
- Figure 15 Figure 15 presents the relative year-on-year increase in the effective supply, demand, and GDP, highlighting trends and shifts compared to prior years, as well as the correlation of the GDP to the other values.

[13] Capacity factor is the ratio between the total metered quantity and the total registered capacity.

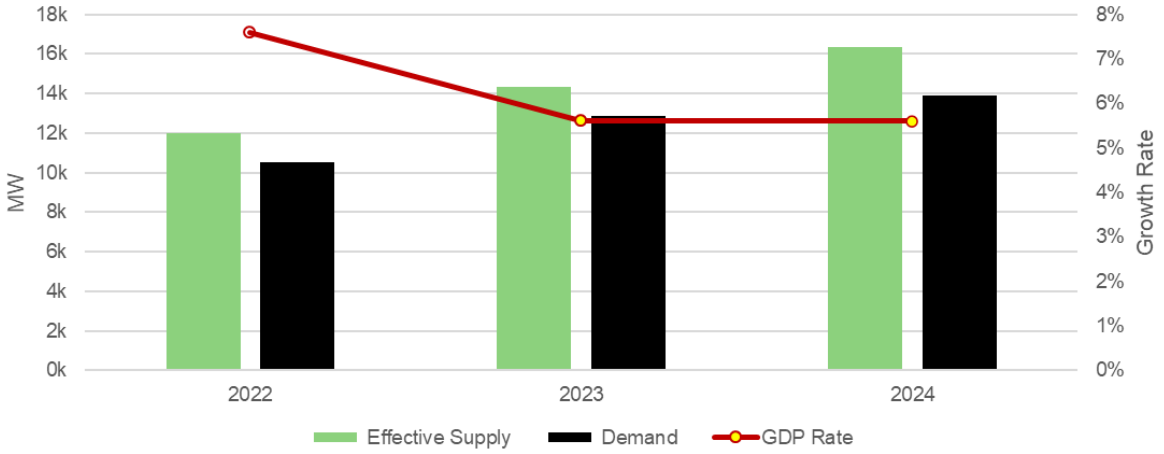


Figure 15: Growth Rate: Effective Supply and Demand, 2022 to 2024

- Reviewing the 24-hour demand period reflects typical daily consumption patterns, as illustrated in Figure 16, The lowest demand is observed during the early morning hours, from 0400h to 0700h, where demand averaged below 12,000 MW and showed a steady increase starting at 0800h. Peak demand occurs between 1400h and 1600h, coinciding with increased economic activities during this period. Demand stabilizes in the early evening at 1700h and picks up again at 1900h as the evening peak begins, before gradually declining toward midnight. This pattern demonstrates a strong correlation between system load behavior and daily socio-economic activity.

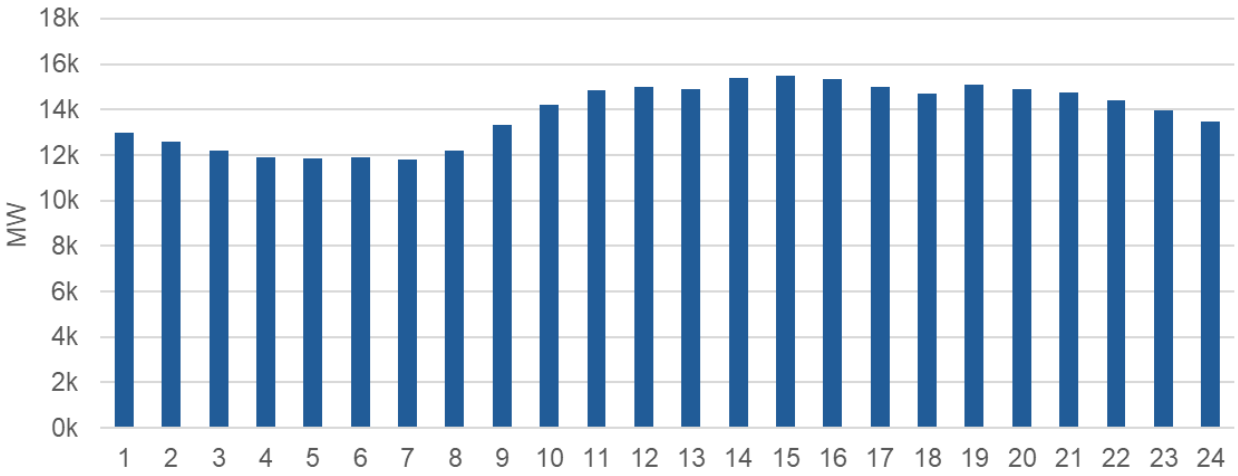


Figure 16: 24-Hour Average System Demand Distribution, 2024

- The highest demand for 2024 was recorded at 19,229.06 MW on 24 April 2024 (Thursday) at the 1430h interval. On this day, the System Operator declared a system-wide Yellow Alert for Luzon, Visayas, and Mindanao, while Luzon and Visayas were placed under a Red Alert[14]. Table 1 provides a regional breakdown of alert levels and the corresponding periods affected across the grids.

[14] Issued when the power supply is insufficient to meet consumer demand, or reserves are critically low.

Table 1: Top Pivotal Suppliers, 2024

	Yellow Alert	Red Alert
LUZON	1400h-1500h, 1700h-2200h and 1700h-2300h Lifted at 2320H	1600h Lifted at 1605H
VISAYAS	1100H-1200H and 1800H-2100H Lifted at 2156H	1300H-1700H and 1900H-2000H Lifted at 2043H
MINDANAO	1100H-1600H Lifted at 1509H	

- ERC has issued an Order declaring Market Suspension during the issuance of a Red Alert notice, which shall be lifted when the available capacity (for the relevant region or grid) minus actual regional demand is above zero MW (0 MW) for 24 consecutive hours, upon confirmation by the Market Operator and the System Operator.

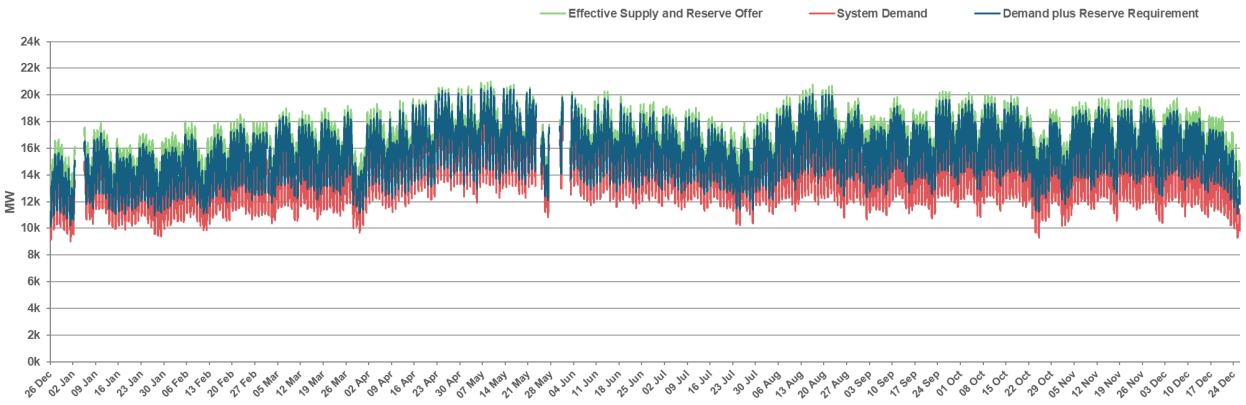


Figure 17: Per Interval Supply and Demand, 2024

C. Price

i. Load Weighted Average Price

- The year-on-year comparison of the Load-Weighted Average Price (LWAP) posted an average decrease of 14.25%, from PHP 6,511/MWh in 2023 to PHP 5,583/MWh in 2024, signaling an improvement in supply availability within the grid.
- Using the Pearson correlation coefficient with the LWAP as the reference data, Table 2 shows that variables such as supply margin, and market RSI show an inverse relationship with prices—when these values decline, prices tend to rise.

Table 2: Correlation Coefficient using Pearson Methodology

	Pearson Coefficient
Load	0.4767
Supply Margin	-0.6218
Effective Supply	0.3838
System Demand	0.4778
System Demand Plus Reserve Requirements	0.4320
Market RSI	-0.4730

- With the improvement in transmission lines upon completion and energization of the Cebu-Negros Panay 230-kiloVolt (kV) Backbone Project Stage 3 (CNP3) on 27 March 2024 and the Cebu-Bohol Interconnection Project (CBIP) on 27 March 2024 for line 1 and on 27 September 2024 for line 2, it highly addressed the congestions in the Bohol and Panay regions.
- Figure 18 illustrates the month-on-month price trends in the Visayas region, showing that starting the September billing period, zonal prices in Bohol, Negros, and Panay aligned with the overall Visayas regional prices. It is worth noting that in other Visayas zones, such as Cebu and Leyte, prevailing prices generally align with the regional price.

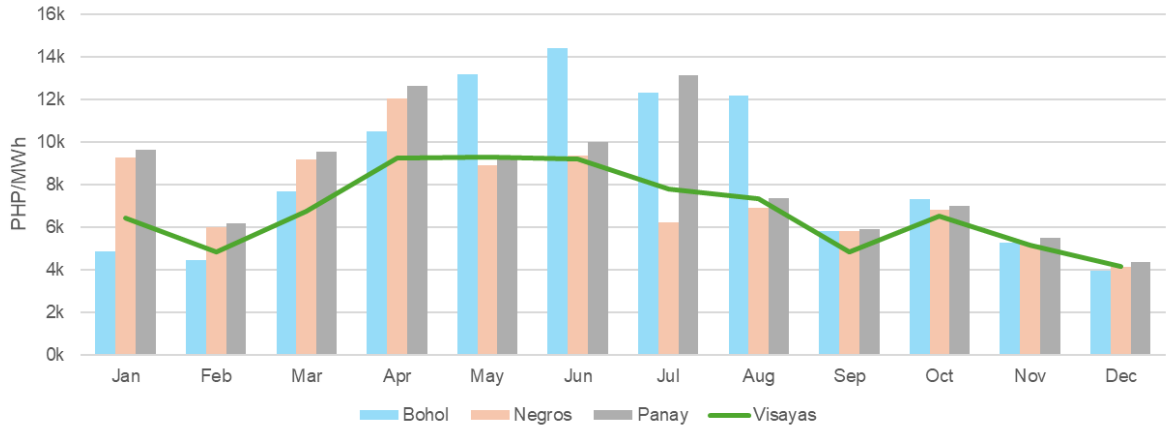


Figure 18: Visayas, Bohol, Negros and Panay, 2024 LWAP

- Another contributing factor to this shift was the imposition of pre-determined prices, such as the Administered Prices (AP) during market interventions and/or suspension events, and the Secondary Price Cap (SPC). During these periods, the true costs of electricity are not fully reflected in market prices, despite tight supply margins, and may therefore send misleading signals regarding the cost of electricity in the Philippines. This may affect investor decision-making and could significantly impact the country's economy. The imposition of AP and SPC will be discussed in Section III.
- Furthermore, additional compensation may be filed and collected from end-users relative to these impositions, which are not reflected in the resulting market prices

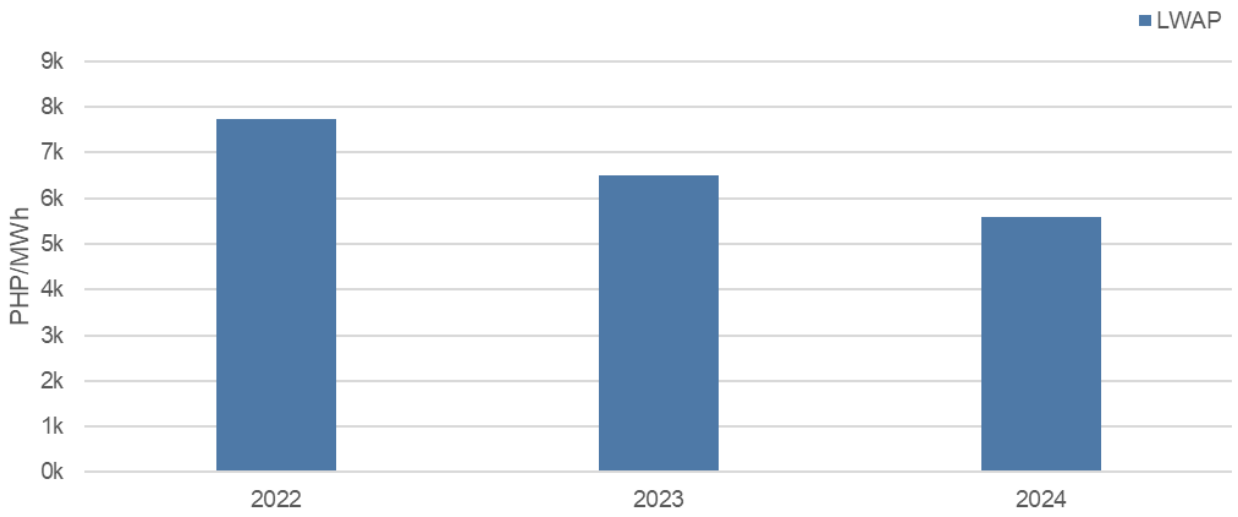


Figure 19: System LWAP, 2022 to 2024

- On a per-interval basis for 2024, high prices remained prevalent despite a lower resulting LWAP for the year. The summer season exhibited the most frequent occurrences of high prices, as expected, driven by increased demand relative to the higher heat index.
- The highest recorded LWAP was PHP 56,728.48/MWh on 04 March 2024 at the 2050h trading interval, when the supply margin was relatively thin at 259.05 MW, demand was at 14,425.23 MW, and the outage level was at 4,783.65 MW.
    - On that day, forty-five (45) price spikes occurred over thirty-eight (38) intervals between 1605h and 2230h:
        - Eighteen (18) spikes affecting both the Luzon and Visayas (LuzVis) regions;
        - Twenty (20) spikes affecting the Luzon region only; and
        - Seven (7) spikes affecting the Visayas region only.
    - The HVDC link from Mindanao to Visayas also reached its maximum limit of 450MW during the price spikes in LuzVis while the HVDC link from Visayas to Luzon reached its maximum limit of 420MW during the spikes in Luzon and spikes in Visayas, separately.
- The co-optimization of energy and reserve is evident in the co-optimized solutions of the MMS, resulting in the presence of opportunity costs in both energy and reserve prices.

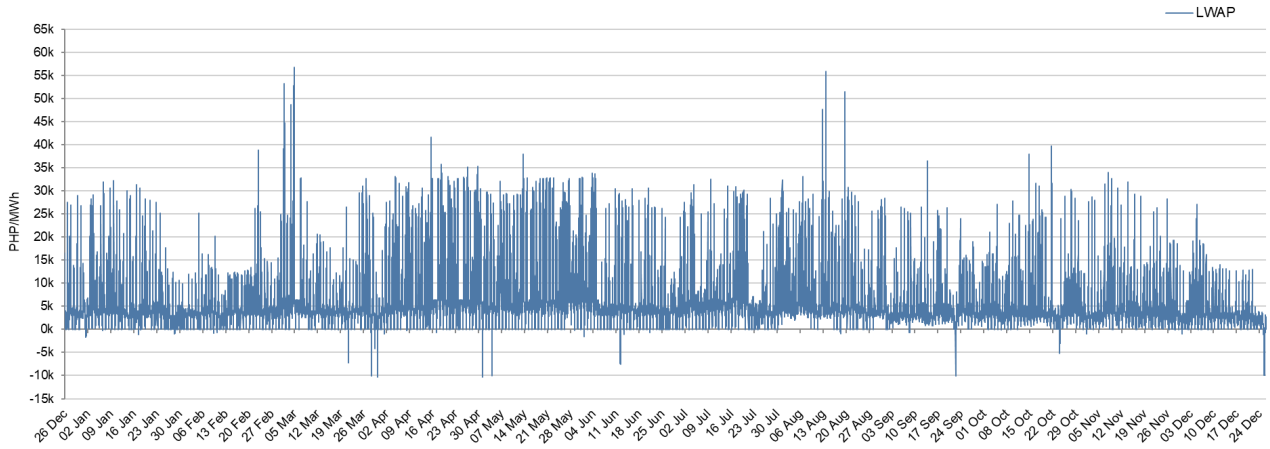


Figure 20: Per Interval LWAP, 2024

ii. Price Distribution

- This section presents the interval-based distribution of market prices across defined price ranges. In 2024, the majority—68% of prices—fell within the PHP 0/MWh to PHP 5,000/MWh range, representing a shift from previous years when prices were predominantly within the PHP 5,000/MWh to PHP 10,000/MWh range.

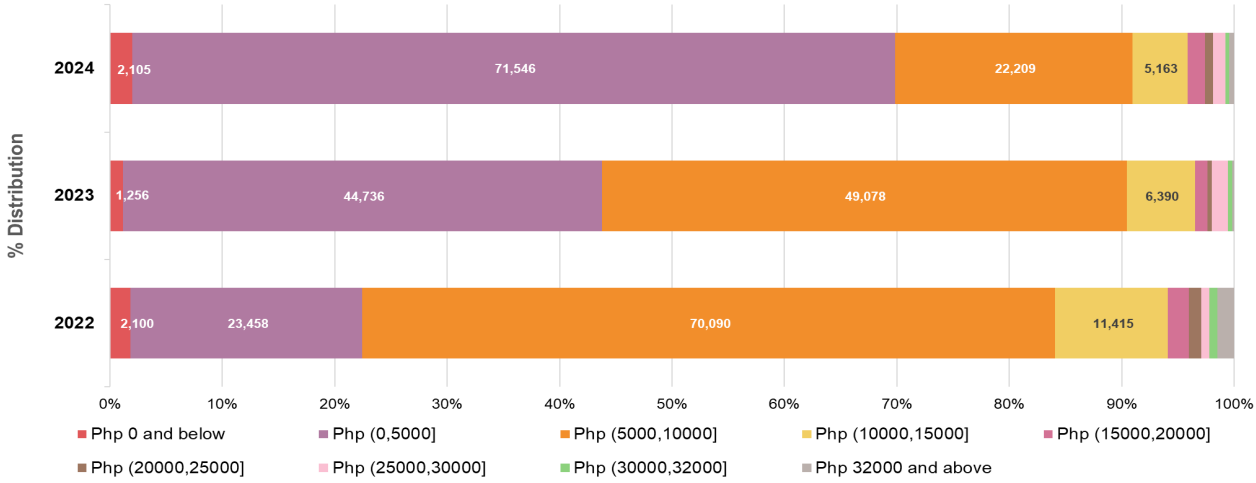


Figure 21: LWAP Distribution, 2022 to 2024

iii. Pricing Condition

Across all regions, trading intervals were under normal pricing conditions for 96,220 instances, or 85% of the time. However, the remaining intervals were subject to various market pricing adjustments or corrections, as follows:

a. Price Substitution Methodology (PSM)[15]

- Among the three (3) major grids, only Mindanao experienced a significant increase in PSM imposition in 2024 compared to 2023. This increase was primarily due to incidents of system-wide PSM events that affected the Mindanao region. Table 3 provides the network lines and equipment that caused the PSM.
- Overall, system-wide PSM imposition increased on a year-on-year basis by 68%, with the Mindanao region showing a 331% increase.

Table 3: Congested Lines Caused System-wide PSM

Line ID	Line Name and Rating	Frequency of Congestion
1BAUA_1BPP1	BAUANG-BPPC 230 kV LINE 1	1,876
1MEXI_1HER2	MEXICO-HERMOSA 230 kV LINE 2	1,079
1MEXI_1HER1	MEXICO-HERMOSA 230 kV LINE 1	890
1BAUA_1LAT1	BAUANG-LATRINI 230 kV LINE 1	479
1BAUA_1LAT2	BAUANG-LATRINI 230 kV LINE 2	421
1HERM_1MAL1	HERMOSA-MALOLOS 230 kV LINE 1	250
1HERM_1DUH1	HERMOSA-DUHAT 230 kV LINE 1	104
2QUEZ_2ARA1	QUEZON-DONAIMELDA 230 kV LINE 1	47
3AMAD_3CLA1	AMADEO-CLACA 230 kV LINE 1	39
11VILL_11JAS1	VILLA-JASAA 138 kV LINE 1	26
1BING_1NGS1	BINGA-EHVNAGSAAG 230 kV LINE 1	23
3AMAD_3CLA2	AMADEO-CLACA 230 kV LINE 2	13
3DASM_3AMA1	DASMAEHV-AMADEO 230 kV LINE 1	8
11VILL_11JAS2	VILLA-JASAA 138 kV LINE 2	6
11JASA_12BUT1	JASAA-BUTUA 138 kV LINE 1	2
3BINA_3CLA1	BINAN-CLACA 230 kV LINE 1	2
11JASA_12NAS1	JASAA-NASIP 138 kV LINE 1	1
13DAVA_13BUN1	DAVAO-BUNAW 138 kV LINE 1	1
1BYOM_1AMB1	BYOMBNG-AMBKLAO 230 kV LINE 1	1

b. Administered Price (AP)

- For 2024, the ERC has issued an Order[16] for the automatic declaration of market suspension when a Red Alert notice was raised by the SO during the summer season, comprising 98% or 1,999 trading intervals affecting the Luzon region. The remaining 2%, or 32 trading intervals, were triggered by emergency conditions as declared by the SO.

[15] Section 6.2.5 of the Price Determination Methodology provides the price substitution methodology shall be implemented in all the regions where the WESM is in operation. In cases where a region/s has no interconnection with other regions, or has no exchange of power with other regions, this region/s shall be separately assessed for the application of the price substitution methodology.

[16] ERC Order on Case No. 2024-017 MC dated 30 April 2024

- In the Visayas grid, 25% of AP impositions in 2024 were due to market suspensions, while the majority—69%—were triggered by emergency conditions. Additional causes of regional AP impositions included system security threats, accounting for 5%, and force majeure events, which comprised only 1% of the total impositions.
- The system-wide imposition of AP was triggered by force majeure events, as declared by the Market Operator (MO), affecting a total of 40 trading intervals.
- *Annex E* provides the summary of market intervention and market suspension events for 2024.

c. Secondary Price Cap (SPC)[17]

- In line with the ERC issuance on the implementation of the SPC, a system-wide application of the SPC was recorded for 5,291 trading intervals—representing approximately 5% of the total trading intervals for 2024.
- Both the Luzon and Visayas regions experienced a decline in SPC impositions in 2024 by 66% and 68%, respectively, while the Mindanao region recorded an increase of 548% primarily due to the system-wide imposition affecting the region.
- A total of 472 trading intervals were recorded with a prolonged system-wide application of the SPC. This occurred from the 2230h trading interval on 23 April 2024 until the 1345h trading interval on 25 April 2024. During this period, the Luzon and Visayas regions were placed under both Yellow and Red Alert statuses at various intervals, while Mindanao was under Yellow Alert at various intervals, indicating insufficient and low available capacity to supply the demand across all three grids
- Figure 22 to Figure 24 present the year-on-year pricing conditions across the three major grids, illustrating the trends and observations discussed in the preceding sections.

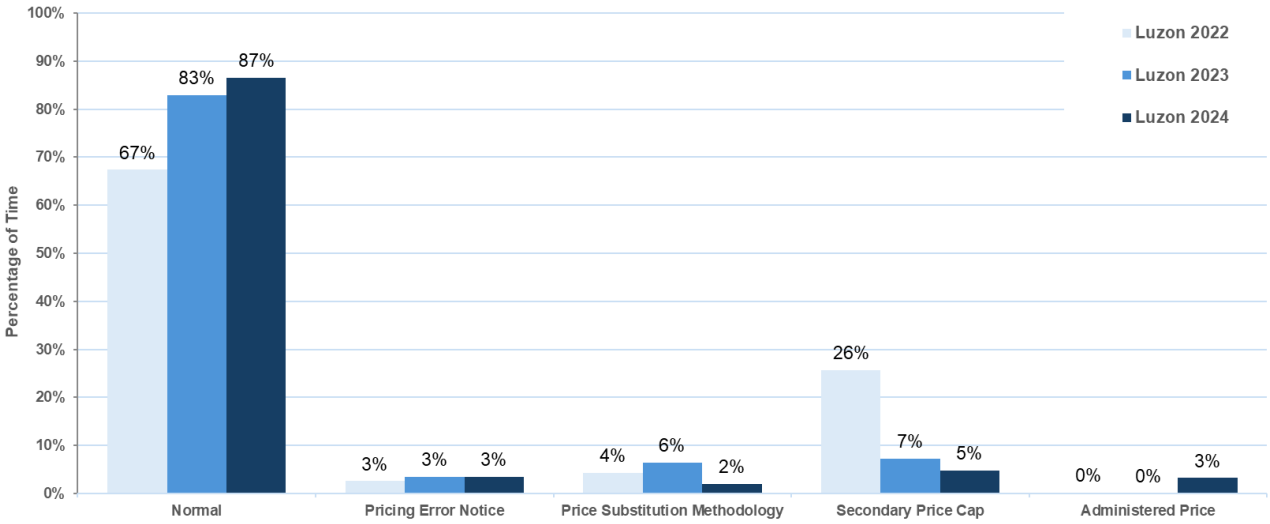


Figure 22 Summary of Pricing Conditions in Luzon, 2022 to 2024

[17] ERC Resolution No. 7 Series of 2021. Secondary Price Cap (SPC) will be imposed if the Cumulative Price Threshold (CPT) was breached by the computed rolling generator-weighted average price on 72nd hour or the equivalent number of intervals.

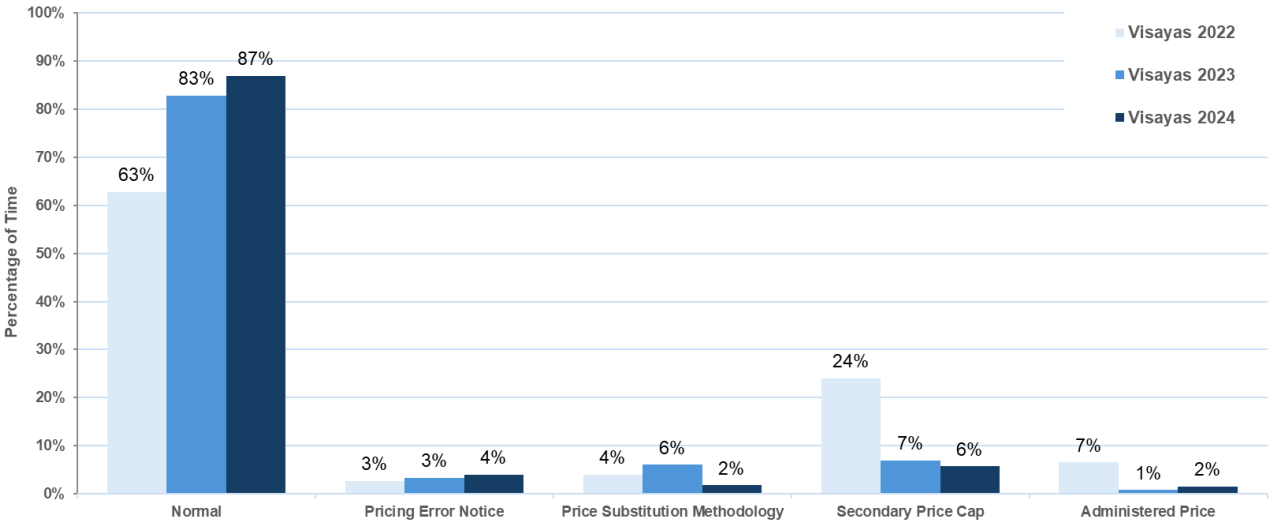


Figure 23: Summary of Pricing Conditions in Visayas, 2022 to 2024

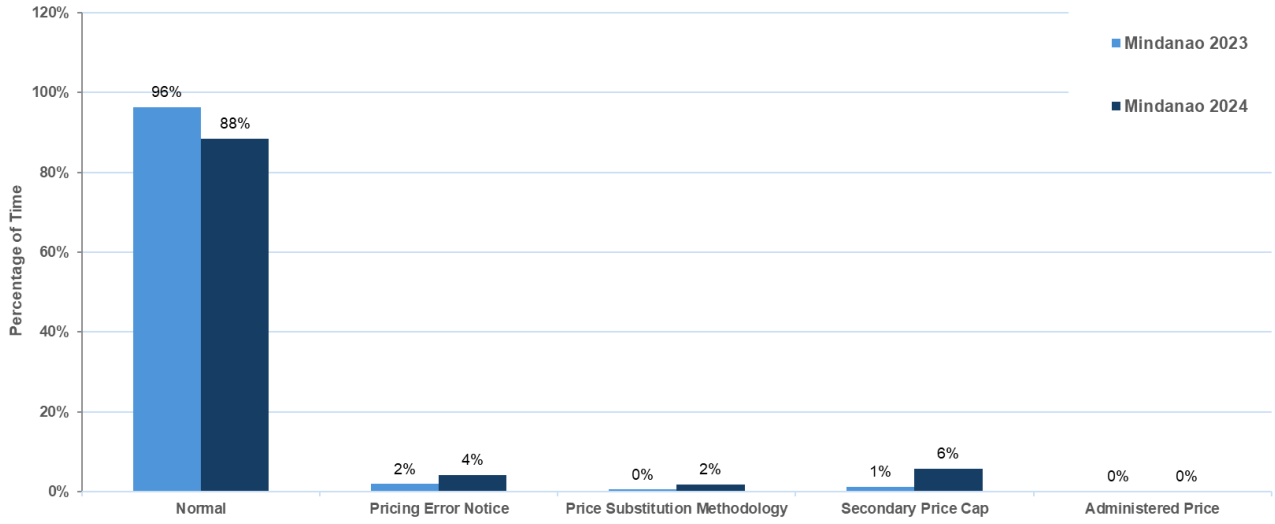


Figure 24: Summary of Pricing Conditions in Mindanao, 2023 to 2024
Note: Mindanao data only became available in February 2023

- Table provides detailed information on the pricing conditions across the major grids.

Table 4: Pricing Condition per Region, 2022 to 2024

		Normal		Pricing Error Notice		Price Substitution Methodology		Secondary Price Cap		Administered Price	
Region/Grid	Billing Year	Count/Total No. of Trading Interval/s	%	Count/Total No. of Trading Interval/s	%	Count/Total No. of Trading Interval/s	%	Count/Total No. of Trading Interval/s	%	Count/Total No. of Trading Interval/s	%
Luzon	2022	70,833	67.38%	2,657	2.53%	4,495	4.28%	26,927	25.62%	208	0.20%
	2023	87,162	82.92%	3,586	3.41%	6,696	6.37%	7,593	7.22%	83	0.08%
	2024	91,492	86.80%	3,823	3.63%	3,266	3.10%	4,758	4.51%	2,069	1.96%
Visayas	2022	65,995	62.78%	2,767	2.63%	4,238	4.03%	25,265	24.03%	6,855	6.52%
	2023	87,014	82.78%	3,565	3.39%	6,343	6.03%	7,365	7.01%	833	0.79%
	2024	91,128	86.45%	4,122	3.91%	2,992	2.84%	5,459	5.18%	1,707	1.62%
Mindanao	2022										
	2023	92,683	96.35%	1,791	1.86%	467	0.49%	1,190	1.24%	61	0.06%
	2024	92,666	87.91%	4,162	3.95%	3,027	2.87%	5,512	5.23%	41	0.04%

- Table provides summary of Market Intervention and Market Suspension events with its corresponding affected total trading intervals.

Table 5: Number of Market Intervention and Market Suspension, 2024

Classification	Initiated/Order	Region/s Affected	Total Trading Intervals
Market Intervention	SO	Luzon (Luz)	32
		Visayas (Vis)	1,169
	MO	System (Lu-Vis-Min)	40
Market Suspension	ERC	Luzon (Luz)	1,999
		Visayas (Vis)	402

III. Generator Offer Pattern Behavior

- This section examines generator-trading participants' offer patterns, as submitted to the WESM via the Market Participant Interface (MPI), in accordance with WESM Rules Clause 3.5, and accounts for generators with capacities on outage.
- This report utilizes the generators' offer pattern behavior prices, in consideration of their availability for each trading interval averaged in an hourly basis, and were compared and assessed for potential changes in the bidding behavior between the first and second halves of 2024.
- Figure 25 to Figure 28 provide a comparison between the first and second halves of 2024 on the offer pattern behavior of coal, natural gas, hydro, and oil-based power plants.
- In 2024, coal and natural gas power plants remained the most cost-efficient resource types, consistently offering around two-thirds of their capacities at an average price of PHP 0/MWh or lower throughout the year, despite some price fluctuations. This trend is closely linked to the baseload capabilities of these plants, which are largely contracted by distribution utilities and suppliers.

Figure 25: Average 24-Hour Offer Price for Coal Plant

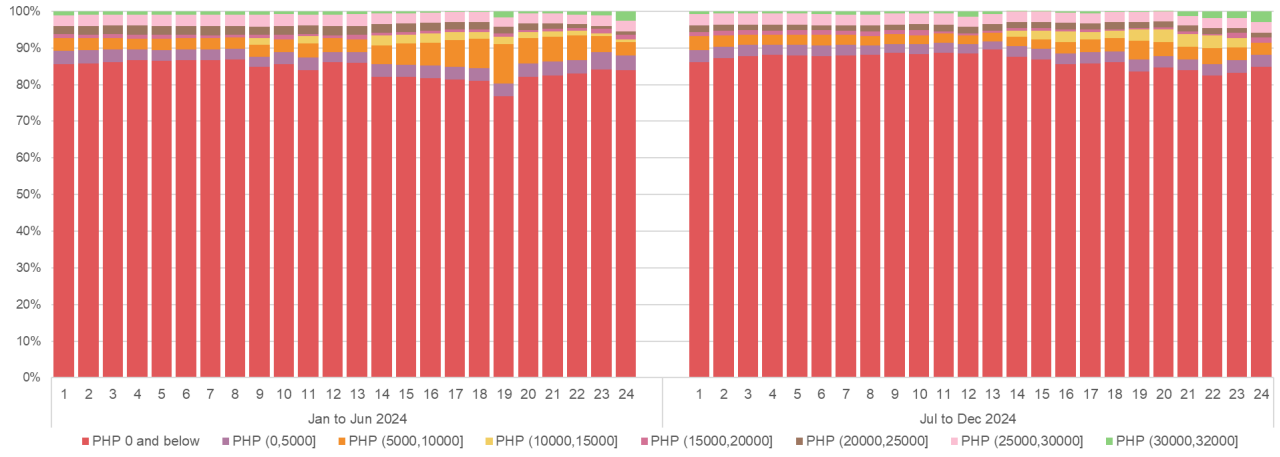


Figure 26: Average 24-Hour Offer Price for Natural Gas Plant

- Conversely, it was observed that hydro and oil-based power plants remained the most expensive sources of electricity throughout the year. This was primarily due to increased outage capacities of hydro plants in the first half of the year—attributed to limited water supply—and higher fuel costs for oil-based plants.
- It is important to note that despite high offer prices, actual dispatch is determined by the merit order of generator offers, with due consideration of system requirements.
- The observed low offers from oil-based plants were largely due to capacities covered by contracts to meet energy demand.

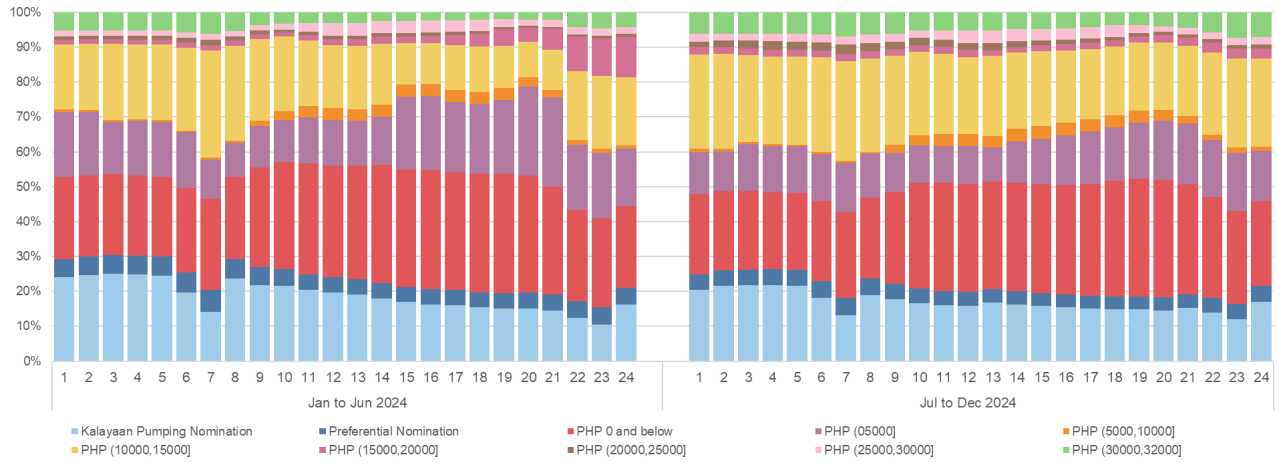


Figure 27: Average 24-Hour Offer Price for Hydro Plant

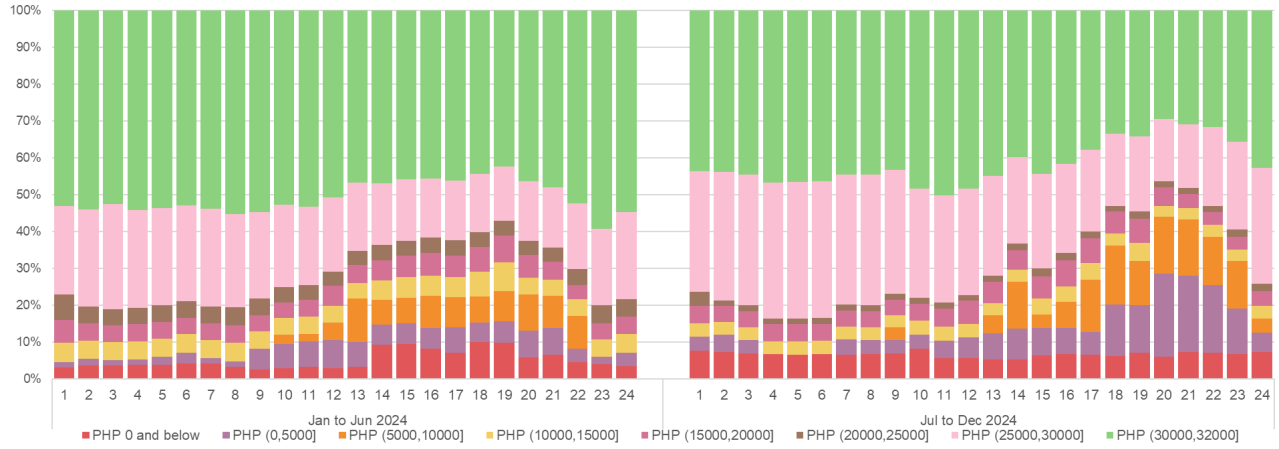


Figure 28: Average 24-Hour Offer Price for Oil-based Plant

IV. Competitiveness Analysis

A. Residual Supply Index (RSI)[18]

- While overall prices declined by 14% in 2024, a positive development was observed in market competitiveness, marked by a 3% increase in trading intervals where the Residual Supply Index (RSI) exceeded 100. This indicates a modest improvement in supply conditions, suggesting that the market was less dependent on pivotal suppliers in more intervals compared to the previous year.

[18] The Residual Supply Index (RSI) is a dynamic continuous index measured as the 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 than 100% indicates the presence of pivotal generator/s or supplier/s.

- For the billing year, the average market price during intervals with RSI below 100% was PHP 6,731/MWh, while intervals with RSI above 100% recorded a lower average price of PHP 3,695/MWh.

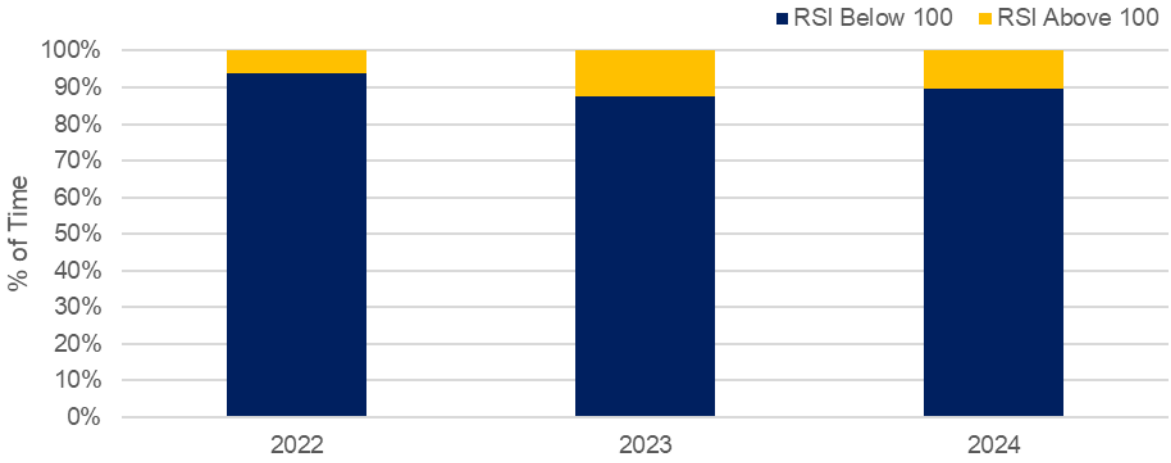


Figure 29: Market RSI, 2022 to 2024

- High reliance on pivotal suppliers was observed during the summer season, primarily due to the unavailability of hydro plants caused by resource constraints associated with the El Niño phenomenon. This period also coincided with elevated demand levels, as typically expected during the summer months.
- This necessitated the ERC to declare market suspension[19] during Red Alerts during summer months of 2024.
- Table 6 presents the maximum and minimum RSI values along with their corresponding LWAP, date, and time interval of occurrence, and vice versa.

Table 6: Max and Min RSI and Price, 2024

	RSI		Date and Time Interval	Price		Date and Time Interval
Max	112.24	(6,601.14)	12/25/2024 15:15	56,728.48	95.07	3/4/2024 20:50
Min	9.66	6,017.15	12/27/2023 18:15	(10,208.41)	97.50	5/1/2024 7:05

[19] ERC Order Case No.2024-017MC, dated 30 April 2024 entitled "*in the Matter of Declaration of Market Suspension During Red Alerts During Summer Months of 2024*"

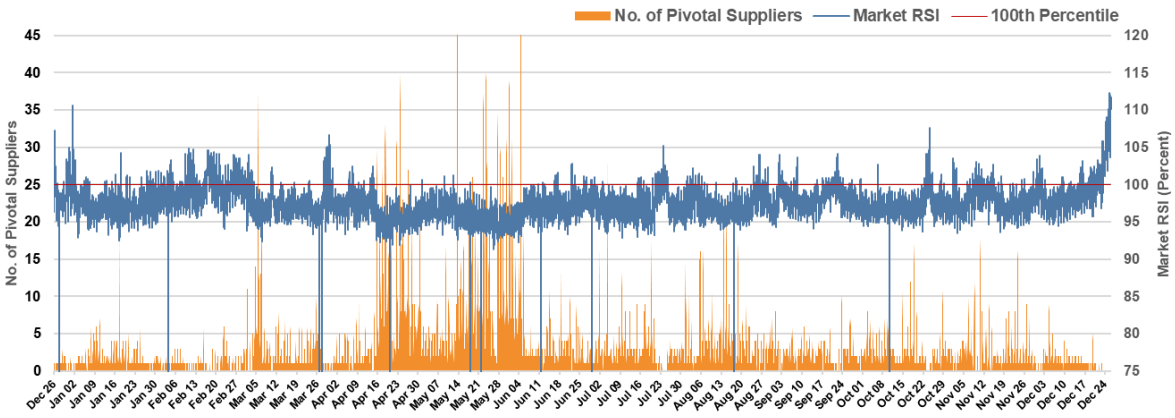


Figure 30: Per Interval Market RSI, 2024

B. Pivotal Suppliers

- Out of 105,408 trading intervals for the year 2024, the GNP Dinginin Coal Power Plant topped the list of pivotal suppliers at 82%, or nearly 83,162 intervals.
- The combination of elevated system demand and constrained supply levels, particularly during the summer season, resulted in a high incidence of pivotal suppliers, as discussed in the previous section.
- Notably, 11 out of the top 15 pivotal suppliers were coal plants, while only 3 were natural gas plants and 1 was a hydro power plant, highlighting the system's continued dependence on coal plants with the largest capacity in the system.

Table 7: Top Pivotal Suppliers, 2024

Rank	Plant Type	Plant	Frequency	% of Time
1	Coal	GNP DINGININ	86,162	82%
2	Natural Gas	ILIJAN	53,267	51%
3	Coal	SUAL	41,535	39%
4	Coal	MASINLOC	40,442	38%
5	Natural Gas	STA RITA	28,997	28%
6	Coal	MARIVELES	16,287	15%
7	Coal	PAGBILAO	12,976	12%
8	Coal	SMC LIMAY	12,161	12%
9	Coal	GNP KAUSWAGAN	8,757	8%
10	Natural Gas	SAN LORENZO	7,558	7%
11	Coal	CALACA	3,658	3%
12	Coal	GNP KAUSWAGAN	1,532	1%
13	Coal	SBPLC	1,122	1%
14	Hydro	KALAYAAN	932	1%
15	Coal	MPGC	660	1%

V. Spot Market Transactions

A. Spot Exposure

- Daily spot energy transactions (in MWh) increased from 17.95% to 22.91% in 2024, in line with the overall increase in electricity demand. Despite this growth in spot market activities, the majority of available capacities remained covered by bilateral contracts, indicating that while reliance on the spot market increased, contract-based transactions continued to dominate the energy procurement landscape.
- Although the spot market experienced price volatility, the 2024 LWAP remained at a notably competitive level, reflecting improved market efficiency despite fluctuations.

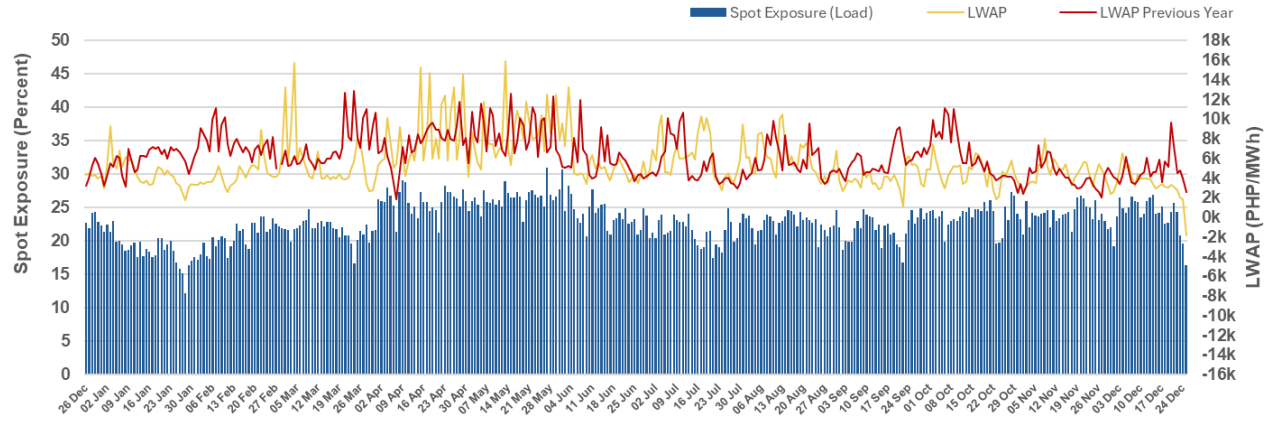


Figure 31: Daily Spot Market Exposure, 2023 vs 2024

- On an hourly basis throughout the day, spot market exposure increased, while the LWAP exhibited a declining trend.
- For both years, the 1200h interval recorded the highest percentage of spot market exposure. However, the lowest exposure occurred at different intervals: 1800h in 2023 and 0500h in 2024, indicating a shift in trading behavior and dispatch patterns across years.

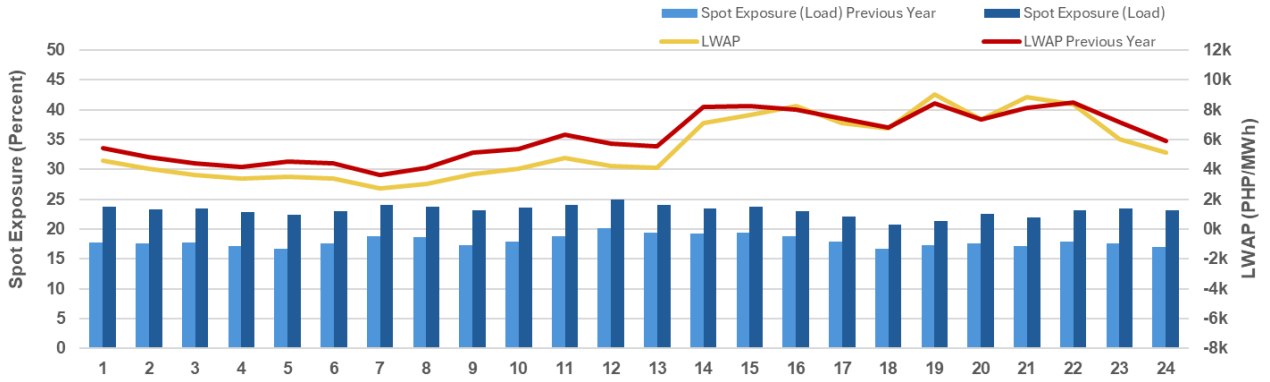


Figure 32: Hourly Spot Market Exposure, 2023 vs 2024

Annex A. Newly Registered Plants

Plant Type	Resource ID	Facility Name	Registered Capacity
Luzon			
SOLR	01ARESOL_G01	Armenia Solar Power Project (SPP)	37.8
OIL	01CALIBUNK_G01	Calibu Bunker-C Fired Diesel Power Plant	27.5
WIND	01CAPRIS_G02	Caparispisan II Wind Power Project	50
SOLR	01DOMSOL_G01	Sto. Domingo Solar Power Plant (SDSPP)	46.2
BAT	01GAMU_BAT	Gamu Battery Energy Storage System (BESS)	40
SOLR	01LAOSOL_G01	Laoag Solar Power Plant	130.2
HYD	01MANSOK_G01	Man-asok Hydroelectric Power Plant (HEPP)	3.2
SOLR	01MEGASOL_G01	Gamu Solar Power Project	46.2
COAL	01MPGC_U03	Mariveles Coal-fired Thermal Power Plant Unit 3	150
COAL	01MPGC_U04	Mariveles Coal-fired Thermal Power Plant Unit 4	150
SOLR	01NUEVASOL_G01	Bongabon Solar Power Plant	30.9
SOLR	01RASLAG_G04	RASLAG IV Solar Power Project	26.4
SOLR	01SANMIGSOL_G01	San Miguel Solar Power Project	55
SOLR	01SHIZEN_G01	Palauig Solar Power Project	49.5
SOLR	01SUPSOL_G01	Subic New PV Power Plant Project	62.7
OIL	01TPCBUNK_G01	Bunker C-Fired Diesel Power Plant	17.9
BIOF	01TRUSTBIO_G01	Trustpower Corporation Biogas Power Plant (Phase 1)	1.7
SOLR	03CLABSOL_G01	Calabanga Solar Power Project	50
HYD	03COLASI_G01	Colasi Mini Hydroelectric Power Plant (MHEPP)	4
NATG	03EERI_G01	Batangas Combined Cycle Power Plant Unit 1	440
NATG	03EERI_G02	Batangas Combined Cycle Power Plant Unit 2	440
NATG	03EERI_G03	Batangas Combined Cycle Power Plant Unit 3	440
HYD	03LMHP_G01	Laguio (Laginbayan) Malaki 1 Hydropower Project	2
BAT	03LUMBAN_BAT	Lumban Battery Energy Storage System (BESS)	50
SOLR	03MARAGSOL_G01	Maragondon Solar Power Plant	48.1
SOLR	03TANSOL_G01	Tanauan Solar Power Plant	48.1
GEO	03TGPP_G01	Tiwi Geothermal Binary Power Plant	16.7
SOLR	01BONGSOL_G01	Bongabon Solar Power Project	18.8
SOLR	01SJSOL_G01	San Jose Solar Power Plant (SPP)	15.3
SOLR	03NAICSOL_G01	Naic Solar Rooftop Power Plant (SRPP)	5
Visayas			
GEO	04BILGPP_G01	2.000 MW (Phase 1) Biliran Geothermal Power Plant Project	1
HYD	04UTH_G01	Upper Taft Hydroelectric Power Plant	14.2
GEO	06BBGPP_G01	Bago Binary Geothermal Power Plant	4.7
OIL	08NABASDPP_U01	PPC3 Nabas Bunker C-Fired Diesel Power Plant Unit 1	3*
OIL	08NABASDPP_U02	PPC3 Nabas Bunker C-Fired Diesel Power Plant Unit 2	3.4*
SOLR	07DAGSOL_G01	Dagohoy Solar Power Project	20.2
BIOF	08CASA_G02	8.000 MW (Unit 2) Biomass Co-Generation Power Plant	7
WIND	08PWIND_G02	Nabas Wind Power Plant Phase 2 (Nabas-2)	13.2
SOLR	06CALASOL_G01	Calatrava Solar Power Project (SPP)	137.4
Mindanao			
BAT	09SANGALI_BAT	Sangali Battery Energy Storage System (BESS)	20
HYD	10LIAN_G01	Liangan Hydroelectric Power Project	11.9
BIOF	11CRYSSUG_G01	Crystal Sugar Company, Inc Biomass Cogeneration Plant	12
OIL	11PKBUK_U01	PBI Bunker C-Fired Diesel Power Plant Unit 1	5.2**
OIL	11PKBUK_U02	PBI Bunker C-Fired Diesel Power Plant Unit 2	5.2**
OIL	13MAGDBNK_U01	SEDI Bunker C-Fired Diesel Power Plant Unit 1	4.6***
OIL	13MAGDBNK_U02	SEDI Bunker C-Fired Diesel Power Plant Unit 2	4.6***
OIL	13MAGDBNK_U03	SEDI Bunker C-Fired Diesel Power Plant Unit 3	4.6***
BIOF	14COTSUGR_G01	MW Cotabato Cogeneration Power Plant	3.4
HYD	14SIGHYDRO_G01	MW Siguil Hydroelectric Power Project	14.5

*Note: * Disaggregated: Orignail Registered Capacity total 6.4MW (no change)*

*** Disaggregated: Orignail Registered Capacity total 10.4MW (no change)*

*** Disaggregated: Orignail Registered Capacity total 13MW (increased by 0.8MW)*

Annex B. Plants with Change in Capacity

Plant Type	Resource ID	Facility Name	Registered Capacity	
			2023	2024
Luzon				
HYD	01ANGAT_A	Angat Hydroelectric Power Plant Unit A	19.6	38.7
BIOF	01BT2020_G01	Bataan 2020 RE Biomass Cogeneration Power Plant	13	11
SOLR	01CAGYSOL_G01	Cagayan North Solar Power Plant	115	60
HYD	01CASECN_G01	Casecnan Multipurpose Hydroelectric Power Plant (HEPP)	165	168
BAT	01CNCEP_BAT	Concepcion Battery Energy Storage System (BESS)	60	50
SOLR	01SNMARSOL_G01	San Marcelino Solar Power Project	326.4	308.3
OIL	01T_ASIA_G01	PPGC Diesel Power Plant	50	48
BIOF	02PNGEA_G01	(Units 2 & 3) Phase 1 Payatas Biomass Power Plant (Payatas BPP)	1.3	0.6
SOLR	02PNGYSOL_G01	Pinugay Solar Power Plant	71.6	80.1
OIL	02TMOBIL_G02	Navotas Bunker C-Fired Diesel Power Plant Power Barge 2 / Mobile 4	51.5	41.2
OIL	02TMOBIL_G04	Navotas Bunker C-Fired Diesel Power Plant Power Barge 4 / Mobile 6	52	44
HYD	03BOTOCA_G01	Botocan Hydroelectric Power Plant	20.8	23
HYD	03INARI_G01	Inarihan Hydroelectric Power Plant	1.7	1.6
HYD	03KAL_G01	Kalayaan Hydro Electric Power Plant 1	180	181.1
HYD	03KAL_G02	Kalayaan Hydro Electric Power Plant 2	180	181
HYD	03KAL_G03	Kalayaan Hydro Electric Power Plant 3	180	181.4
HYD	03KAL_G04	Kalayaan Hydro Electric Power Plant 4	180	185
HYD	03LWERLAB_G01	Lower Labayat Hydroelectric Power Plant	1.5	1.4
GEO	03PALAYAN_G01	Palayan Binary Power Plant	30.97	31
NATG	03SNGAB_G01	San Gabriel Combined-Cycle Power Plant (CCPP)	420	417.4
NATG	03STA-RI_G01	Sta. Rita Natural Gas Power Plant 1	257.3	263
NATG	03STA-RI_G02	Sta. Rita Natural Gas Power Plant 2	255.7	263
NATG	03STA-RI_G03	Sta. Rita Natural Gas Power Plant 3	265.5	263
NATG	03STA-RI_G04	Sta. Rita Natural Gas Power Plant 4	264	263
Visayas				
OIL	04CLBYBNK_G01	Calbayog Bunker C-Fired Diesel Power Plant	11.2	11
OIL	05CARMENDPP_U01	Carmen Diesel Power Plant Unit 1	10.1	10
OIL	05CARMENDPP_U02	Carmen Diesel Power Plant Unit 2	10.1	10
OIL	05CARMENDPP_U03	Carmen Diesel Power Plant Unit 3	10.2	10
COAL	05CEDC_U01	Circulating Fluidized Bed Coal-Fired Thermal Power Plant Unit 1	82	83.2
COAL	05CEDC_U02	Circulating Fluidized Bed Coal-Fired Thermal Power Plant Unit 2	82	83.4
COAL	05CEDC_U03	Circulating Fluidized Bed Coal-Fired Thermal Power Plant Unit 3	82	83.1
COAL	05TPC_G02	Sangi Coal Fired Power Plant	82	83.6
SOLR	06CARSOL_G01	Islasol II Solar Power Plant	27.2	27.1
SOLR	06HELIOS_G01	Cadiz Solar Power Plant (SPP)	108.1	105
BAT	06KABAN_BAT	Kabankalan Battery Energy Storage System	20	30
GEO	06NASULO_G01	Nasulo Geothermal Power Plant	47.5	48.3
GEO	06PAL1A_G01	Palinpinon Geothermal Power Plant I	110.5	112.4
GEO	06PAL2A_U03	Palinpinon Geothermal Power Plant II Unit 3	19.5	20
SOLR	06SACASL_G01	Phase 1A & 1B Solar Power Plant	19.8	19.5
BIOF	06VMC_G02	Biomass Co-Generation Power Plant	21.5	35
HYD	08TIMBA_G01	Timbaban Hydro Power Plant	18.9	18
Mindanao				
HYD	10AGUS6_U01	Agus VI Hydroelectric Power Plant (HEPP) Unit 1	31.5	34.5
HYD	10AGUS6_U02	Agus VI Hydroelectric Power Plant Unit 2	31.1	34.5
HYD	10AGUS6_U04	Agus VI Hydroelectric Power Plant Unit 4	25	40
HYD	12ASIGA_G01	ASIGA Hydroelectric Power Plant	8.6	8.2
HYD	13TUDAY2_G01	Tudaya 2 Hydroelectric Power Plant	8.1	8
COAL	14SARANG_U01	Phase 1 Coal-Fired Thermal Power Plant	118.5	122
COAL	14SARANG_U02	Phase 2 Coal-Fired Power Plant	118.5	122

Annex C. Plants Completed their Testing and Commissioning within 2024

Region	Plant Type	Resource ID	Facility Name	Registered Capacity
			2021	
Visayas	BAT	04ORMOC_BAT	SMGP Ormoc Battery Energy Storage System(BESS)	40
			2022	
Luzon	BIOF	03CADPI_G01	Central Azucarera Don Pedro, Inc.	25
			2023	
Luzon	BAT	01CNCEP_BAT	SMGP Concepcion Battery Energy Storage System (BESS)	60
Luzon	COAL	01MPGC_U01	Mariveles Coal-Fired Power Plant (CFPP) - 150.025 MW Unit 1	150
Luzon	BAT	01MAGAT_BAT	Magat Battery Energy Storage System	24
Luzon	HYD	01IBULAO_G01	Ibulao Hydroelectric Power Project	6
Luzon	SOLR	01TRUSTSOL_G01	Trust Solar Power Plant	15.4
Luzon	COAL	01MPGC_U02	Mariveles Coal-fired Thermal Power Plant Unit 2	150
Luzon	SOLR	01CAGYSOL_G01	Cagayan North Solar Power Plant	115
Luzon	SOLR	01CAYBSOL_G01	Cayanga-Bugallon Solar Power Plant	75.1
Luzon	HYD	03LWERLAB_G01	Lower Labayat Hydroelectric Power Plant	1.5
Luzon	HYD	01MATUNO_G01	Matuno River Hydroelectric Power Plant	8.7
Luzon	SOLR	01ARAYSOL_G02	Arayat-Mexico Solar Power Plant Project Phase 2	30.8
Luzon	SOLR	01PAVGSOL_G01	Pavi Green Bataan Renewable Energy, Inc. Orion Solar Power Plant	16.2
Luzon	SOLR	01SNMARSOL_G01	Santa Cruz Solar Energy Inc. San Marcelino Solar Power Project	326.4
Visayas	OIL	04CLBYBNK_G01	Calbayog Bunker C-Fired Diesel Power Plant	11.2
Mindanao	BAT	11JASA_BAT	SMGP Jasaan Battery Energy Storage System (BESS)	20
Mindanao	COAL	11VILLA_BAT	SMGP Villanueva Battery Energy Storage System	20
			2024	
Luzon	COAL	01MPGC_U03	Mariveles Coal-fired Thermal Power Plant Unit 3	150
Luzon	HYD	03LWERLAB_G01	BEHMC Lower Labayat Hydroelectric Power Plant	1.5
Luzon	SOLR	01LAOSOL_G01	PV Sinag Power Inc. Solar Power Plant	58.6
Luzon	SOLR	03CLABSOL_G01	Calabanga Solar Power Project	59.8
Luzon	SOLR	01SANMIGSOL_G01	PFBSI San Miguel Solar Power Project	55
Luzon	NATG	03EERI_G01	EERI Batangas Combined Cycle Power Plant Unit 1	440
Luzon	COAL	01MPGC_U04	Mariveles Coal-fired Thermal Power Plant Unit 4	150
Luzon	OIL	01CALIBUNK_G01	API Calibu Bunker-C Fired Diesel Power Plant	27.5
Luzon	SOLR	03TANSOL_G01	PSSC Tanauan Solar Power Plant	48.1
Luzon	SOLR	03MARAGSOL_G01	PSSC Maragondon Solar Power Plant	48.1
Visayas	GEO	04BILGPP_G01	2.000 MW (Phase 1) Biliran Geothermal Power Plant Project	2
Mindanao	BIOF	14COTSUGR_G01	CSCCI Cotabato Cogeneration Power Plant	3.4
Mindanao	HYD	14SIGHYDRO_G01	Siguil Hydroelectric Power Project	14.5
Mindanao	HYD	10LIAN_G01	Liangan Hydroelectric Power Project	11.9

Annex D. Min, Max, Average, and Year-on-Year Statistics

	2023 (26 Dec 2022 to 25 Dec 2023)	2024 (26 Dec 2023 to 25 Dec 2024)					Year-on-Yearr % Change
	Average	Min	Date and Time Interval	Max	Date and Time Interval	Average	
Capacity Offered / Nominated (MW)	17,756	14,419.60	1/7/2024 0:25	22,313.00	12/16/2024 12:15	18,898	6.43%▲
Capacity Not Offered / Nominated (MW)	2,050	1,962.50	3/30/2024 11:30	8,058.10	2/18/2024 7:30	4,552	122.10%▲
Capacity on Commissioning (MW)	3,367	581.20	11/11/2024 13:15	2,205.20	7/24/2024 15:40	1,463	56.53%▼
Capacity on Outage (MW)	3,165	1,601.56	6/26/2024 21:20	6,424.75	10/25/2024 14:00	3,672	16.02%▲
Demand (MW)	14,348	9,008.01	1/1/2024 7:30	19,229.06	4/24/2024 14:30	16,369	14.08%▲
Effective Supply (MW)	12,858	11,336.33	12/26/2023 5:05	21,030.56	5/9/2024 14:00	13,904	8.13%▲
Spot Exposure (%)	17.95					22.91	27.63%▲
Load-Weighted Average Price (PHP/MWh)	6,510.89	- 10,208.41	5/1/2024 7:05	56,728.48	3/4/2024 20:50	5,583.01	14.25%▼
Outage Per Plant Type (MW)							
Coal	1,265.29	155.00	6/5/2024 22:55	3,562.00	7/31/2024 13:15	1,579.88	24.86%▲
Natural Gas	733.85	45.80	5/23/2024 12:00	3,048.00	10/21/2024 15:40	847.24	15.45%▲
Geothermal	157.73	3.60	1/8/2024 20:05	484.30	11/16/2024 19:25	196.05	24.29%▲
Hydro	444.97	127.80	2/7/2024 18:00	1,696.14	4/21/2024 11:00	615.79	38.39%▲
Oil Based	385.20	305.50	12/26/2023 0:05	812.90	7/28/2024 16:00	480.65	24.78%▲
Wind	130.21	18.80	11/7/2024 19:20	262.20	11/7/2024 23:35	82.22	36.85%▼
Solar	28.09	1.60	5/7/2024 12:50	189.70	10/1/2024 1:55	37.38	33.08%▲
Biofuel	36.44	24.60	12/2/2024 20:20	303.50	8/15/2024 5:20	95.58	162.31%▲
Battery Storage	20.41	20.00	12/29/2023 20:15	150.00	8/21/2024 16:10	42.63	108.84%▲
Outage Per Category (MW)							
Planned	1,004.90	39.36	5/26/2024 4:50	2,988.95	3/5/2024 9:05	1,257.17	25.10%▲
Maintenance	310.67	2.00	4/6/2024 11:55	2,026.80	12/17/2024 13:10	536.53	72.70%▲
Forced	1,618.99	673.00	3/7/2024 16:15	5,487.50	5/26/2024 15:35	1,974.94	21.99%▲
Deactivated Shutdown	55.00						100.00%▼

Annex E. 2024 Summary of Market Suspension and Market Intervention Events

Date	Interval	No. of Interval/s	Affected Region/s	Classification
23-25 May 2024	1305h - 0050h	430	L	Due to Red Alert Notices
23-24 May 2024	1305h - 2230h	402	V	Due to Red Alert Notices
27-30 May 2024	1305h - 1800h	924	L	Due to Red Alert Notices
31 May - 03 June 2024	1905h - 0045h	645	L	Due to Red Alert Notices

Date	Interval	No. of Interval/s	Initiated by	Affected Region/s	Classification
February 3, 2024	1925h	1	MO	L-V-M	Force Majeure
March 26, 2024	1930h - 1940h	3	MO	L-V-M	Force Majeure
March 27, 2024	2135h	1	MO	L-V-M	Force Majeure
March 28, 2024	1635h	1	MO	L-V-M	Force Majeure
April 20, 2024	0905h - 0920h	4	MO	L-V-M	Force Majeure
May 13, 2024	1810h - 1840h	7	MO	L-V-M	Force Majeure
May 18, 2024	0540h	1	MO	L-V-M	Force Majeure
May 21, 2024	1735h	1	MO	L-V-M	Force Majeure
June 11, 2024	1755h - 1800h	2	MO	L-V-M	Force Majeure
June 29, 2024	0430h - 0455h	6	MO	L-V-M	Force Majeure
August 15, 2024	1150h-1200h	3	MO	L-V-M	Force Majeure
August 17, 2024	0815h	1	MO	L-V-M	Force Majeure
October 10, 2024	1015h-1055h	9	MO	L-V-M	Force Majeure
December 27, 2023	1755h - 1830h	8	SO	V	Threat to the Systems Security
January 2-5, 2024	1510h - 1235h	834	SO	V	Emergency
January 17, 2024	1850h - 1910h	5	SO	V	Threat to the Systems Security
March 1-2, 2024	1900h - 0030h	67	SO	V	Threat to the Systems Security
April 16, 2024	1615h - 1735h	17	SO	L	Emergency
April 23, 2024	1540h - 1650h	15	SO	L	Emergency
April 30, 2024	1340h - 1405h	6	SO	V	Emergency
May 7, 2024	0820h - 0920h 1255h - 1520h	13 30	SO	V	Emergency
May 17, 2024	0855h - 1600h	86	SO	V	Emergency
May 21, 2024	1335h - 1405h 1635h - 1650h	3 4	SO	V	Emergency
May 22, 2024	1155h - 1210h 1245h - 1545h	4 37	SO	V	Emergency
May 27, 2024	1425h - 1450h	6	SO	V	Emergency
June 3, 2024	1510h - 1900h	47	SO	V	Emergency
June 6, 2024	1320h - 1630h	39	SO	V	Emergency
June 7, 2024	1410h - 1635h	30	SO	V	Emergency
July 26, 2024	1455H-1640H	22	SO	V	Emergency
November 13, 2024	1535h-1705h	19	SO	V	Force Majeure