Market Surveillance Committee Monthly Market Assessment Report

26 February 2023 to 25 March 2023

June 2023

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

MONTHLY MARKET ASSESSMENT REPORT

Philippine Electricity Market Corporation

MMAR-2023-03

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ASSESSMENT OF THE MARKET

NOTABLE HIGHLIGHTS

1. **Higher prices persisted in the Mindanao region** due to high level of capacities on outage.
2. **Congestions in transmission lines and transformer equipment** resulted from the current design of the transmission system, as well as the N-1 contingency impositions by the System Operator (SO). Some notable congestions were as follows:
   - **Maasin-Ubay line 1** was congested for 1,550 intervals, or equivalent to 19% of the time, brought about by the frequent maximization of the line's capacity limit.
   - **Mexico-Hermosa lines 1&2** were congested for 1,039 and 1,421 intervals, or equivalent to 13% and 18% of the time, respectively, brought about by the nature and design of the system caused by high demand situation.
   - **Samboan-Amlan line 1** was congested for 326 intervals, or equivalent to 4% of the time, similarly brought about by the current system design.

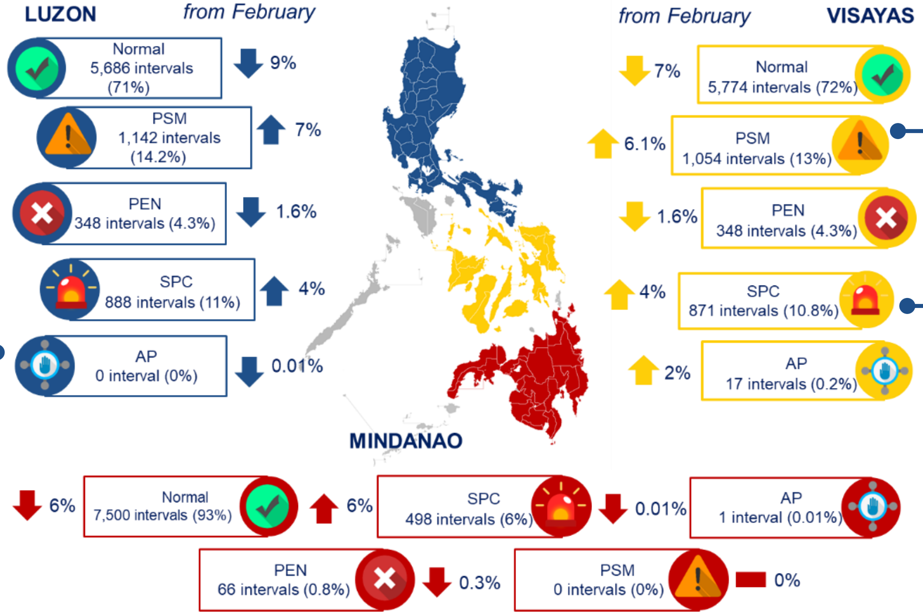
Pricing Error Notice (PEN)

- Impositions were due to inappropriate input data which affected prices and schedules both for Luzon and Visayas.
- Regional impositions for 66 intervals in Mindanao were likewise due to inappropriate input data which affected the resulting prices and schedules.

Market Intervention (MI) event was noted on **24 March 2023.**

- **This affected intervals 1325H-1445H** when the SO initiated MLD to prevent over-loading of 138kV Cebu-Mandaue Line 1.

SUMMARY OF PRICING CONDITIONS



Price Substitution Methodology (PSM)

- System-wide imposition for 1,054 intervals on 26 February to 01 March 2023, 03-05, and 09-24 March 2023.
- Regional imposition for 88 intervals in Luzon on 26, 28 February to 01 March 2023, 10, 12-14, and 17-18 March 2023 when the inter-connection between the grids was unavailable.

Secondary Price Cap (SPC)

- **System-wide:** increased impositions from last month due to depleted supply margin resulting in high market prices from 22-25 March 2023.
- **Regional:** 17 intervals for the Luzon region during those instances when the inter-connection between the Luzon and Visayas grids was unavailable and
  - There were 498 intervals in Mindanao when the prevailing prices in the respective regions were noted to be high.

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MARKET OUTCOME: LUZON AND VISAYAS

EFFECTIVE SUPPLY

12,050
MW
(11,701MW in February)

DEMAND PLUS RESERVE SCHEDULE

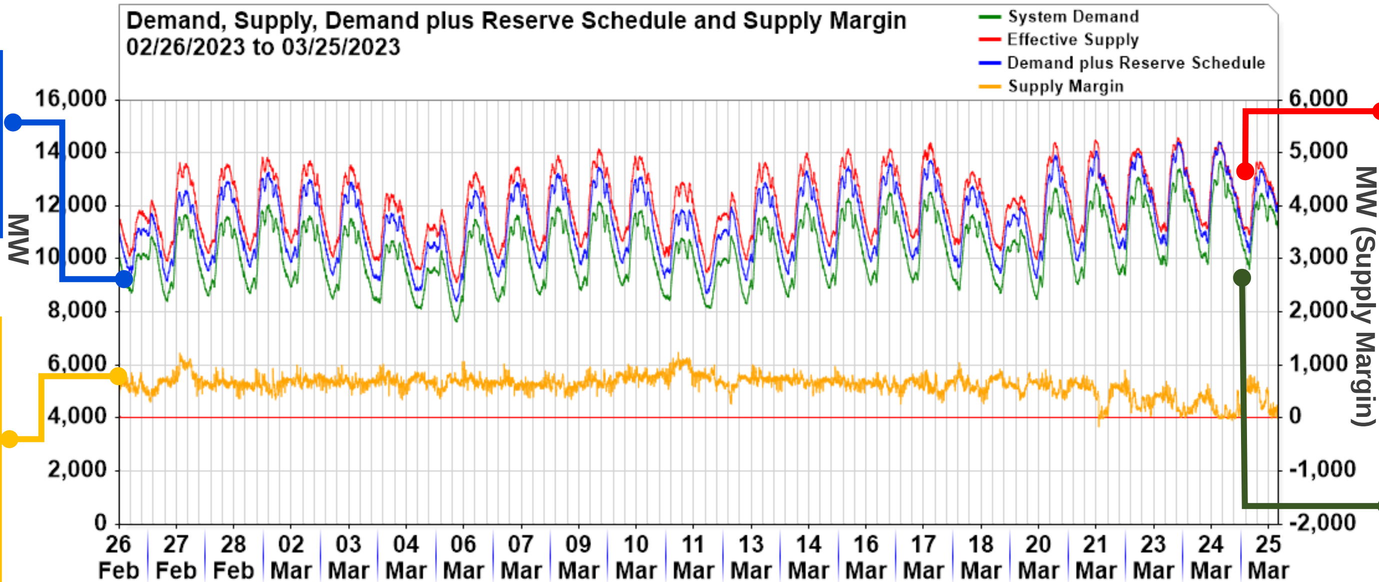
11,422
MW
(11,069MW in February)

SUPPLY MARGIN

629
MW
(632 MW in February)

Demand plus Reserve Schedules increased by an average of 3.2% mainly caused by the onset of summer season which influenced the electricity consumption for the month.

Supply Margin decreased by 0.4% considering the dynamics between the supply and demand. Episodes of thin supply margin was observed during instances of abrupt change in the supply level due to, among others, forced outages and other technical limitations experienced by the generator participants.



Effective Supply increased by 3% highly related to the decrease in the **capacities on outage** this month. The **lesser ramp limited capacities** this billing period, as considered in the determination of the effective supply, contributed to the resulting higher effective supply for this billing period.

System Demand increased by 4.1% also caused by the onset of summer season.

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MARKET OUTCOME: MINDANAO

EFFECTIVE SUPPLY

2,356

MW

(2,364MW in February)

DEMAND PLUS RESERVE SCHEDULE

1,960

MW

(1,921MW in February)

SUPPLY MARGIN

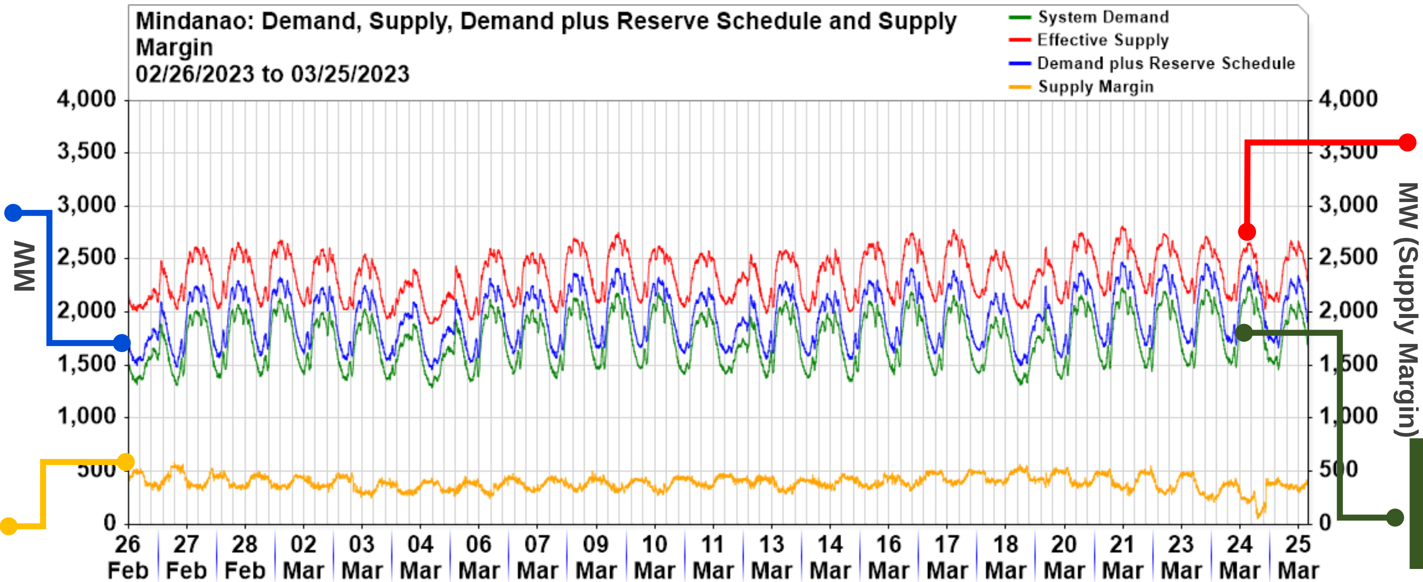
395

MW

(443MW in February)

Demand plus Reserve Schedules increased by an average of 2.1% mainly caused by the onset of summer season which influenced the electricity consumption for the month.

Supply Margin decreased by 10.7% considering the dynamics between the supply and demand. Episodes of thin supply margin was observed during instances of abrupt change in the supply level due to, among others, forced outages and other technical limitations experienced by the generator participants.



Effective Supply decreased by 0.3% due to the noted increase in the **capacities on outage** this month. The **effects of ramp limited capacities**, as considered in the determination of the effective supply likewise contributed to the resulting decrease in the effective supply for this billing period.

System Demand increased by 3.3% also caused by the onset of summer season.

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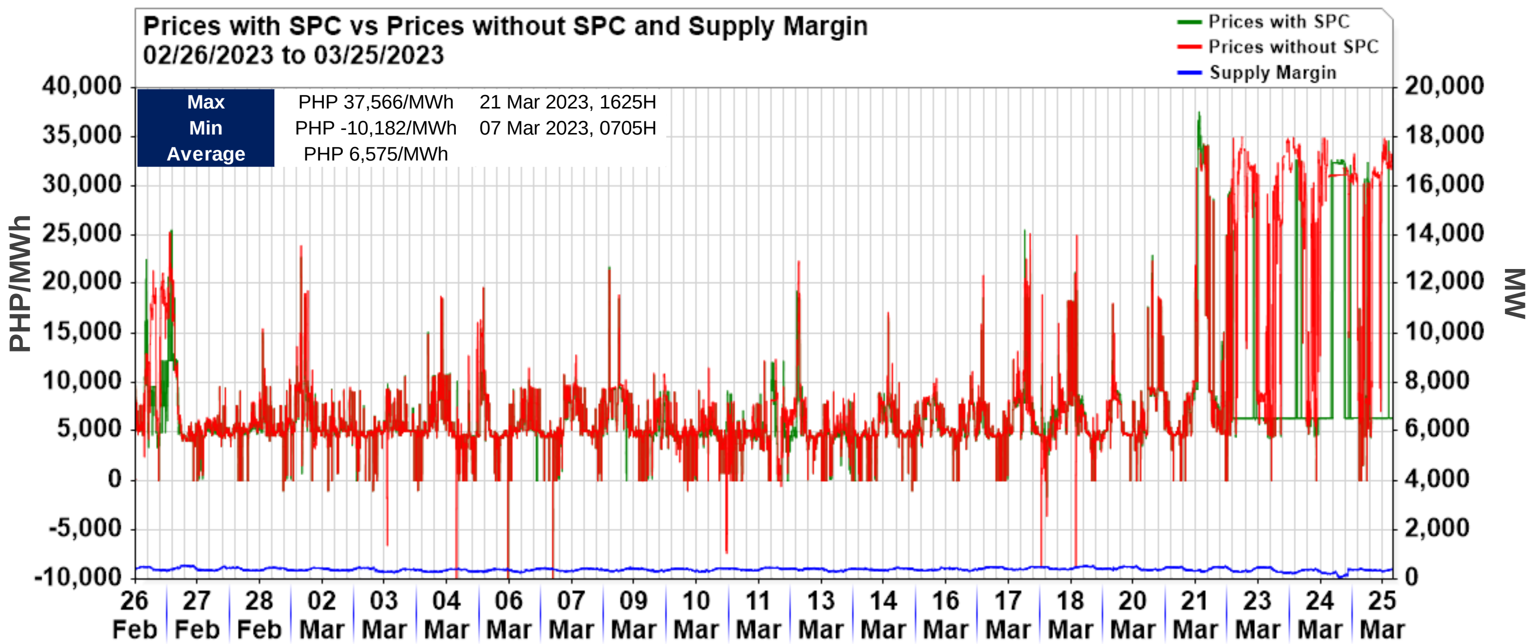
MARKET OUTCOME: LUZON AND VISAYAS

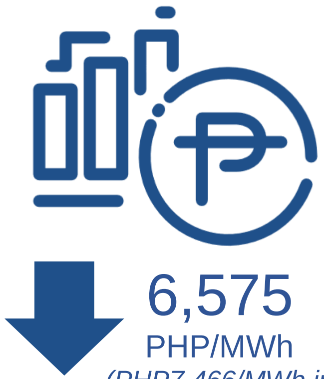
Zone	Average LWAP (PHP/MWh)
NLUZON	6,495.22
MMANILA	6,601.41
SLUZON	6,528.30
LEYTE	6,728.03
CEBU	6,493.11
NEGROS	6,552.08
BOHOL	9,700.02
PANAY	6,686.18

Given the dynamics between the supply and demand, the level of market prices decreased by 11.9% or was noted to be at an average of PHP 6,575/MWh from PHP 7,466/MWh last billing period. The estimated monthly average price would have been at PHP8,575/MWh if SPC was not imposed. Based on year-on-year comparison, it posted a 5.6% decrease from an average price of PHP 6,966/MWh last year. While it was noted that the capacities on outages in March 2023 billing period was higher than the same period of last year, the decrease on the price was mainly brought about by the changes in the offer behavior from the trading participants.

Congestions in Leyte-Bohol interconnection were still persistent this billing month due to the tight supply situation in the Bohol grid which, in turn, continuously affected the power rates in the area causing the disparity, as depicted in the table of prices provided in this portion.



PRICE



6,575

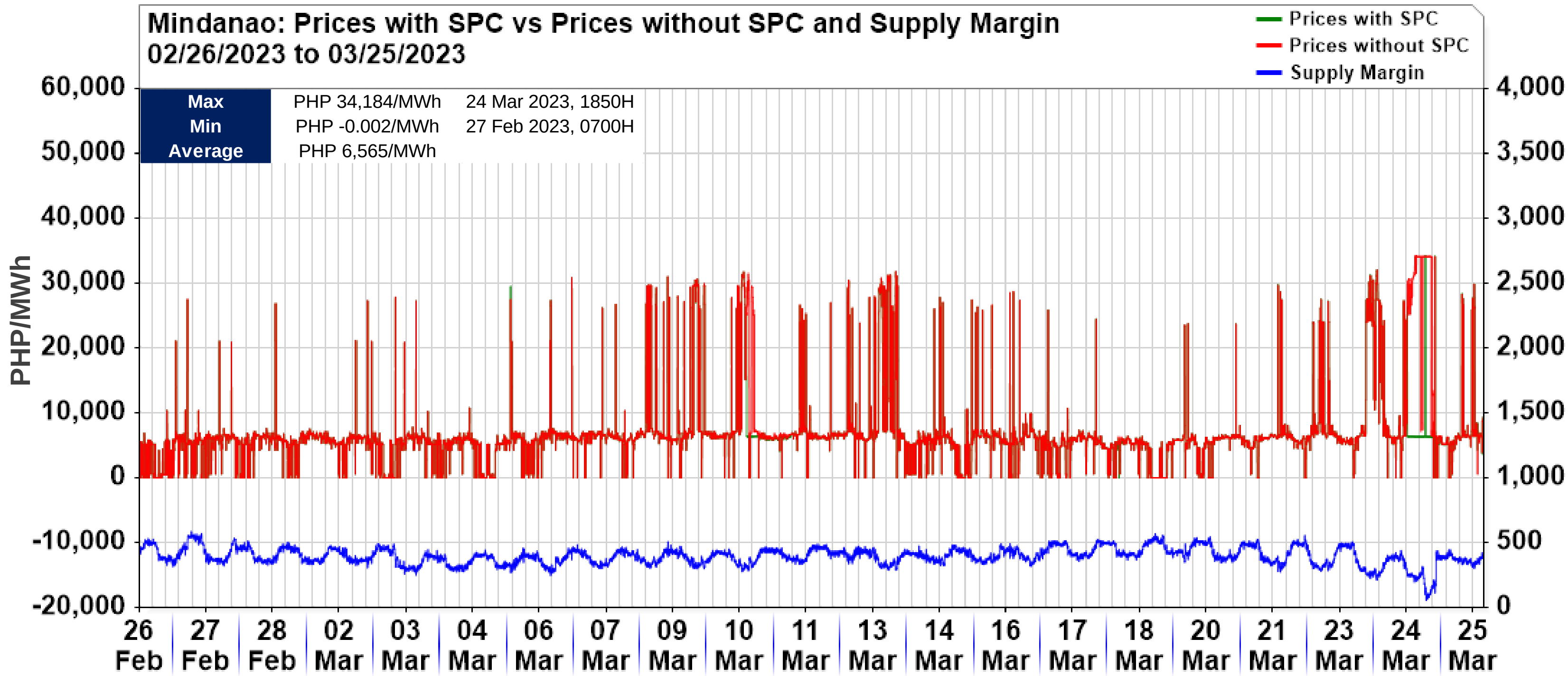
PHP/MWh

(PHP7,466/MWh in February 2023)

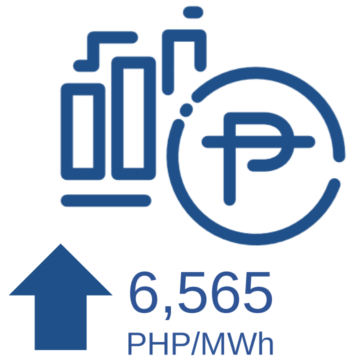
MARKET OUTCOME: MINDANAO

Zone	Average LWAP (PHP/MWh)
LANAO	6,192.53
NCENTMIN	6,283.65
NEASTMIN	6,719.48
NWESTMIN	7,430.00
SEASTMIN	6,454.84
SWESTMIN	6,505.65

For the Mindanao region, the level of market prices for March 2023 billing was noted to have increased when compared to last month by an average of 26.3%. Episodes of price spikes were mainly brought about by the abrupt changes in the supply due to forced outages of baseload power plants in the region which led for oil-based power plants with high offered prices to be dispatched in the WESM.



PRICE



6,565

PHP/MWh

(PHP5,198/MWh in February 2023)

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MARKET OUTCOME: LUZON AND VISAYAS

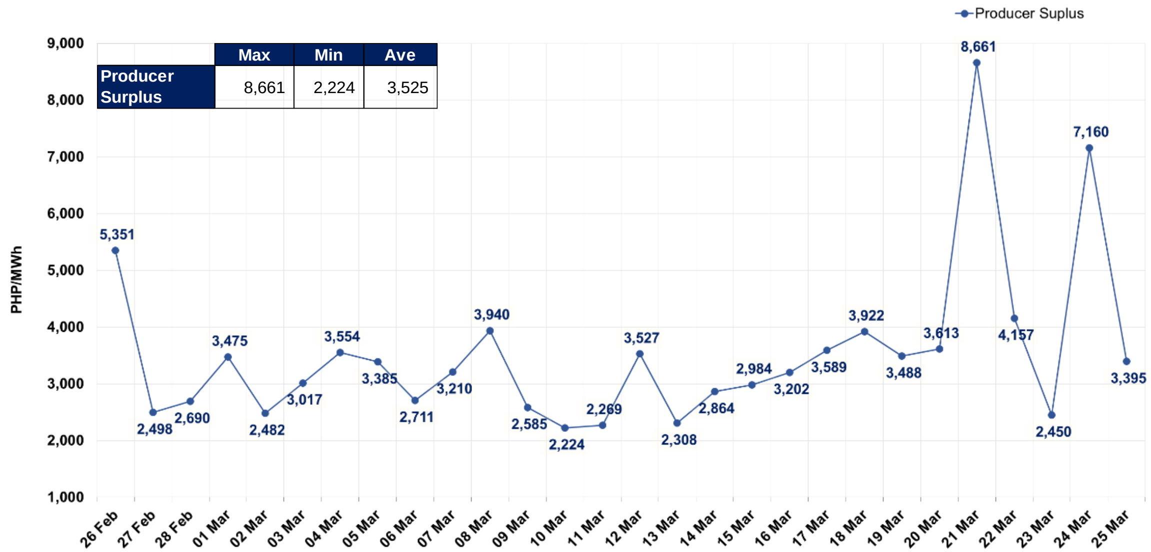
RAMP LIMITED CAPACITY

3,172
MW
(2,916MW in February 2023)

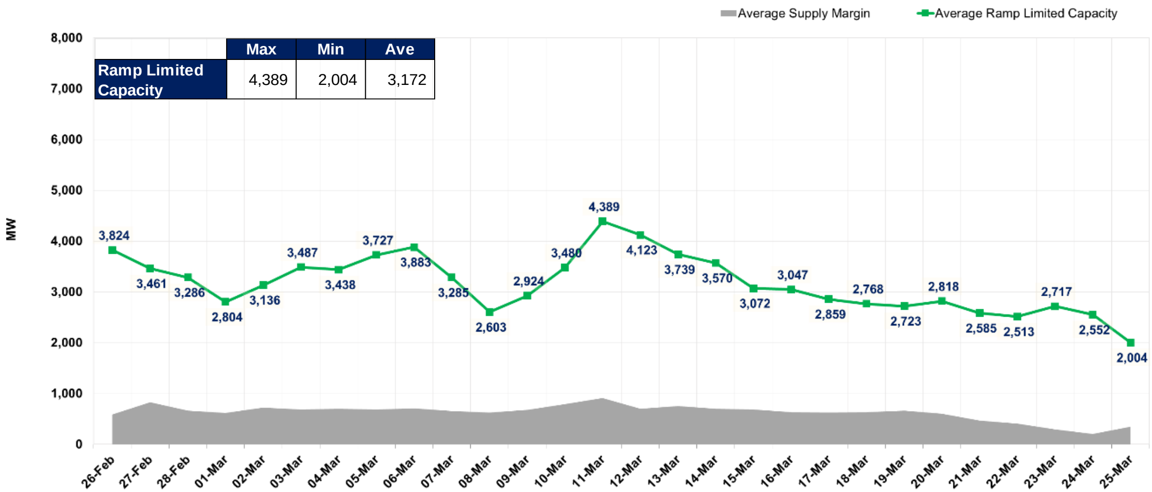
PRODUCER SURPLUS

3,525
PHP/MWh
(PHP3,909/MWh in February 2023)

	Max	Min	Ave
Producer Surplus	8,661	2,224	3,525



	Max	Min	Ave
Ramp Limited Capacity	4,389	2,004	3,172



Producer/generator surplus had a 10% decrease as compared to February 2023 billing period which was affected by the changes in the offered and resulting prices in the market. Offers from Coal and Hydro power plants had the most significant changes in the offer pattern which likewise contributed to the aforementioned changes.

For the month of March 2023, **ramp-limited capacities** increased, on average, by 9%, in consideration of the submitted ramp rates from the generators which were subsequently considered in the optimization of the market.

Meanwhile on 11 March 2023, there was a noted increase in the supply margin, even with the high level of ramp limited capacity, due to the entry of the 180MW capacity and the decline in the demand level noting that this day falls under weekend.

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CAPACITY PROFILE

Luzon-Visayas					
Status	Market Participant Name	Market Trading Node	Plant Type	Pmax (MW)	Change (MW)
				New	
New	Greencore Power Solutions 3, Inc.	01ARAYSOL_G02	Solar	30.9	30.9
	Bayog Wind Power Corp.	01BALWIND_G01	Wind	80	80
	Mariveles Power Generation Corporation	01MPGC_U01	Coal	150	150
	PH Renewables, Inc.	02PNGYSOL_G01	Solar	75	75
Decreased	Jobin-SQM Inc.	01PASQSOL_G01	Solar	92.4	(3.6)
	Green Core Geothermal Inc.	06PAL1A_G01	Geothermal	110.5	(2)
	AC Energy Philippines, Inc.	08STBAR_PB2	Oil-Based	24	(24)
	AC Energy Philippines, Inc.	05PHNPB3_G01	Oil-Based	24	(24)
				TOTAL	282.3

LUZON-VISAYAS

The WESM's registered capacity in Luzon and Visayas recorded changes for the March 2023 billing period from 21,969.2 MW to 22,251.5 MW due to the registration of a new Solar, Wind and Coal power plant and net registration changes from 3 power plants.

COAL 9,843 MW (44%)

NATURAL GAS 3,286 MW (15%)

OIL-BASED 2,233 MW (10%)

HYDRO 2,583 MW (12%)

GEOTHERMAL 1,649 MW (8%)

SOLAR 1,408 MW (6%)

BIOMASS 373 MW (2%)

WIND 507 MW (2%)

BATTERY 370 MW (2%)

MINDANAO

The WESM's registered capacity in Mindanao for the March 2023 billing period retained its level at 4,231.3 MW.

COAL 2,266 MW (52%)

OIL-BASED 657 MW (15%)

HYDRO 1,105 MW (26%)

GEOTHERMAL 104 MW (2%)

SOLAR 67 MW (2%)

BIOMASS 42 MW (1%)

WIND 427 MW (2%)

BATTERY 80 MW (1%)

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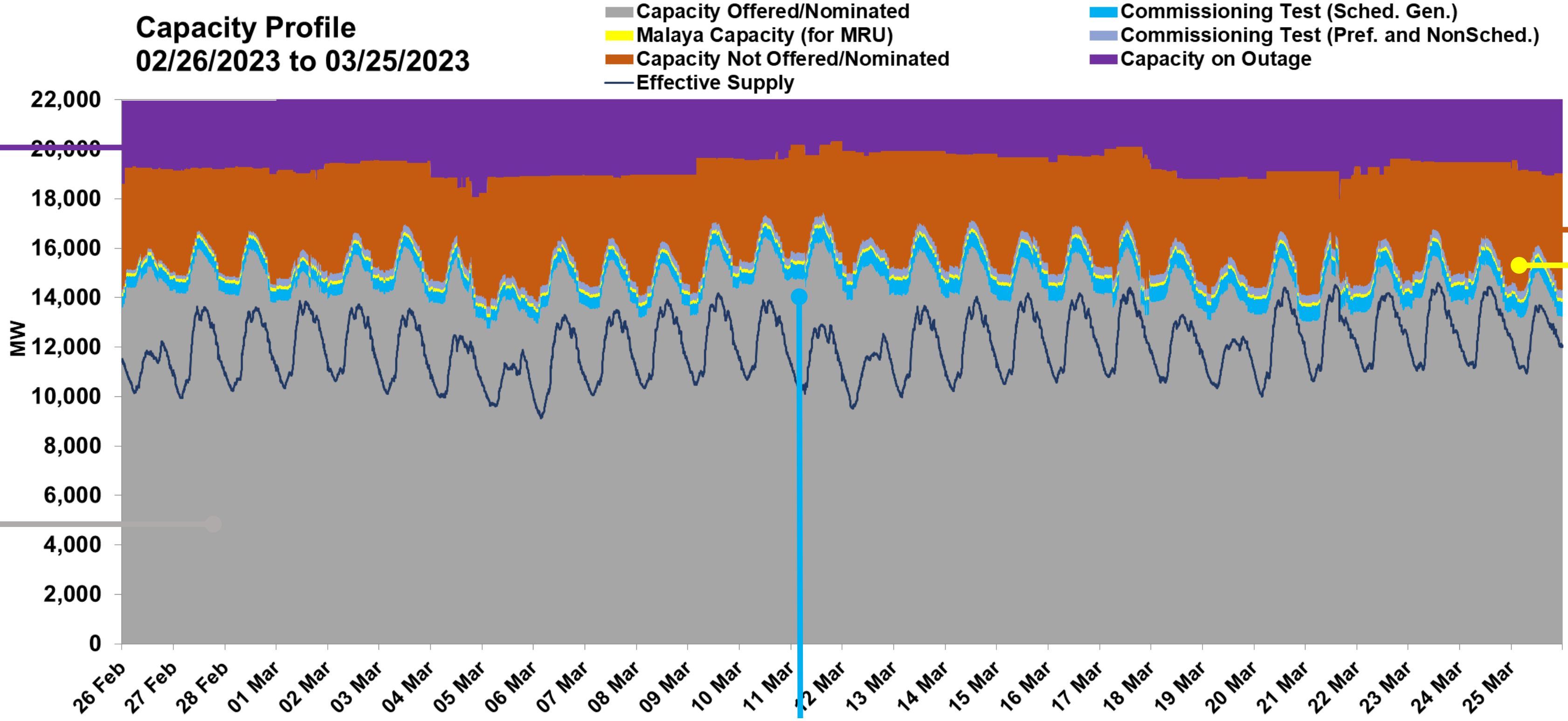
CAPACITY PROFILE: LUZON-VISAYAS

Capacity on Outage (13% of Registered Capacity) decreased by 25.3%, which was mostly from Coal and Geothermal power plants under maintenance outage category.

Capacity NOT Offered/Nominated (17% of Registered Capacity) increased by 4.9% or from an average of 3,690 MW last billing period to 3,870 MW which is attributable to resource constraints.



Note: *Capacities not offered are further subject to validation and assessment of the PEMC-Enforcement and Compliance Office (ECO).*

Capacities Offered/Nominated (65% of Registered Capacity) increased by 5.6% or was noted at an average of 14,508 MW as compared to last billing period's 13,740 MW.

Capacities under Commissioning Test (4% of Registered Capacity) increased from 629 MW to 833 MW this billing period.

Malaya Capacity as MRU (1% of Registered Capacity) retained its level at 130 MW.

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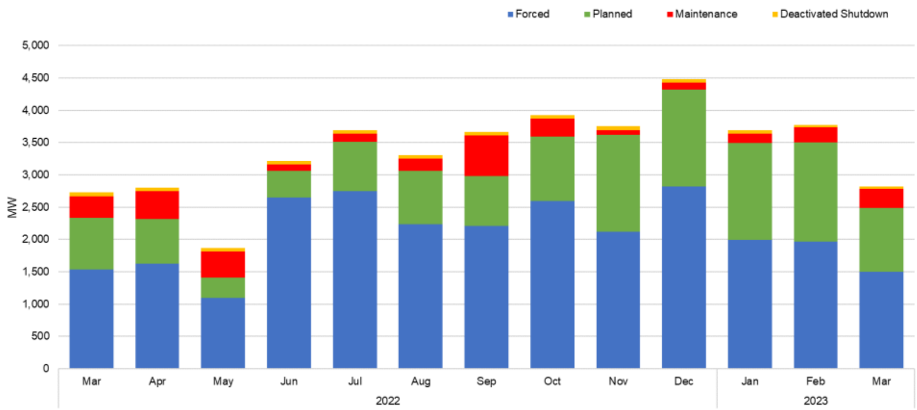
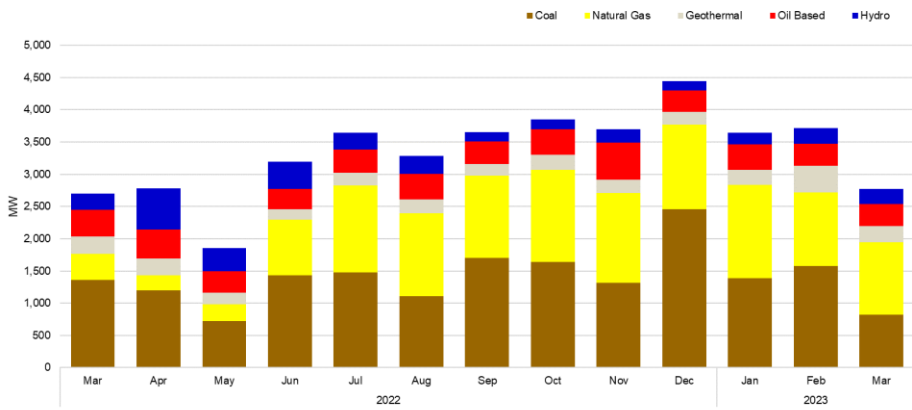
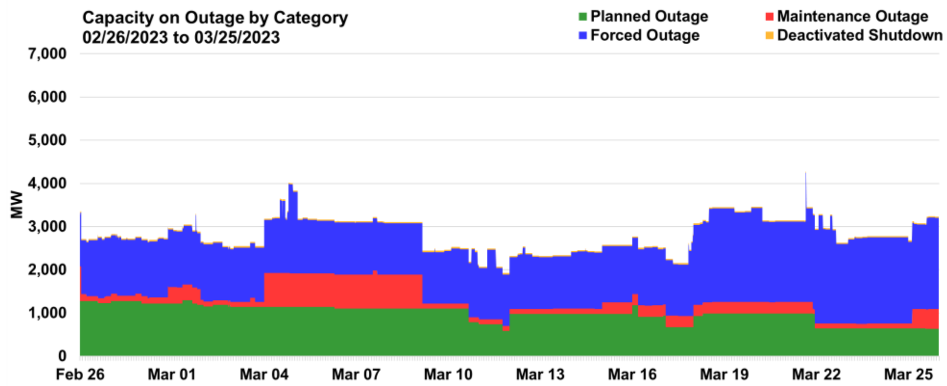
CAPACITY PROFILE: LUZON-VISAYAS

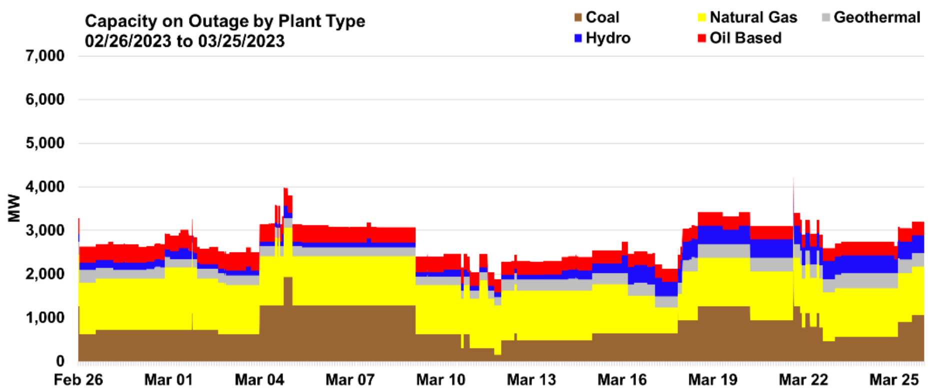
CAPACITY ON OUTAGE BY CATEGORY



CAPACITY ON OUTAGE BY PLANT TYPE







The March 2023 billing period opened with a relatively high level of capacities on outage at around 3,300MW. Outage levels eventually decreased following the resumption of large Coal power plants. However, the sudden increase in outages specifically on 05 March 2023 was due to technical issues encountered by various Coal power plants. As the month ended, the outage level was at an average of about 3,200 MW.

The recorded average capacities on outage were mainly due to forced and planned outages of power plants wherein the latter are approved in the Grid Operating and Maintenance Program (GOMP) of the System Operator.

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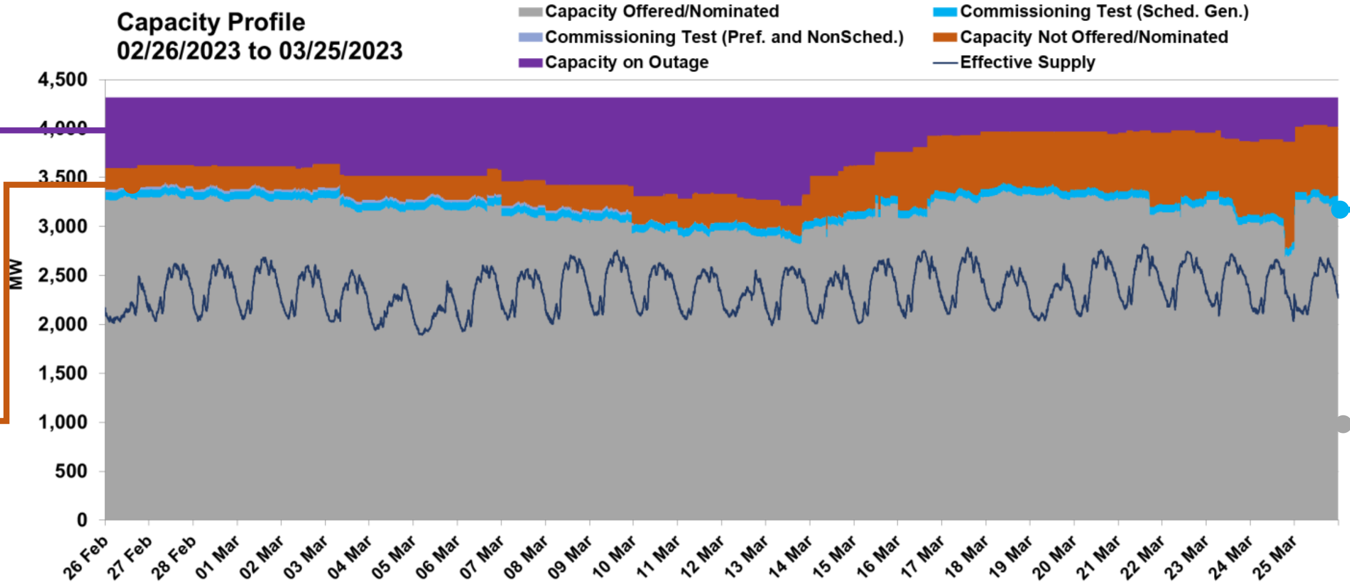
CAPACITY PROFILE: MINDANAO

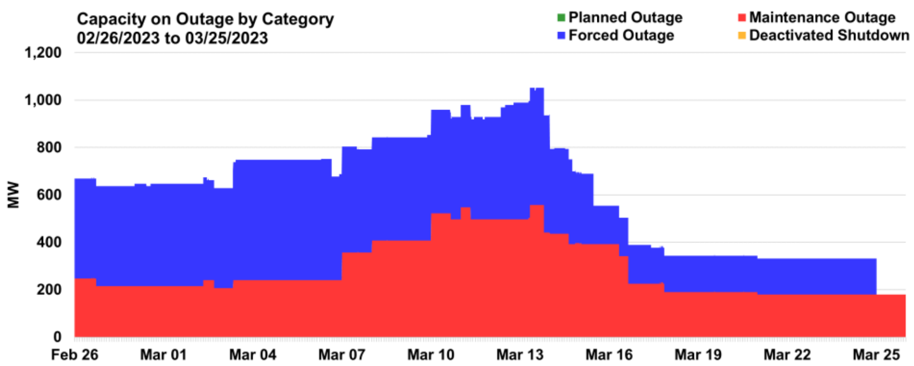
Capacity on Outage (16% of Registered Capacity) decreased from an average of 677MW last month to 663MW this month due to the changes in the outage levels from Coal and Hydro power plants.

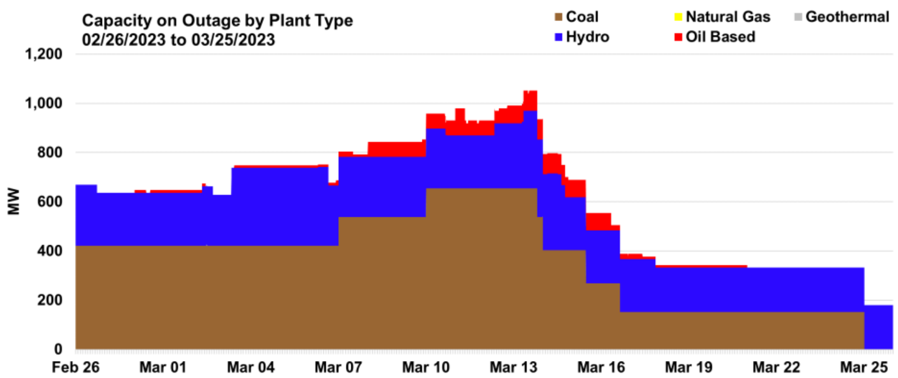
Capacity NOT Offered/Nominated (10% of Registered Capacity) increased by 63.5% or from an average of 247 MW last billing period to 404 MW which is attributable to resource constraints.



Capacities under Commissioning Test (2% of Registered Capacity) decreased by an average of 14.2% or from an average of 108MW last month to 92MW this billing period.

Capacities Offered/Nominated (75% of Registered Capacity) decreased by 4.1% or was noted at an average of 3,161 MW as compared to last billing period's 3,297 MW.





Capacities on outage in the Mindanao region for the March 2023 billing period opened with a relatively high level of capacities at around 660MW, and eventually increased to around 1,050MW on 13 March 2023 due to the outages from Coal and Hydro power plants under forced outage category. Outage level eventually declined by an average of 180MW towards the end of the month.

Note: *The comprehensive information on plant outages in all categories is shown in Annex A, for convenience and reference.*

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MARKET TRANSACTIONS

BILATERAL CONTRACT QUANTITIES

78.2%

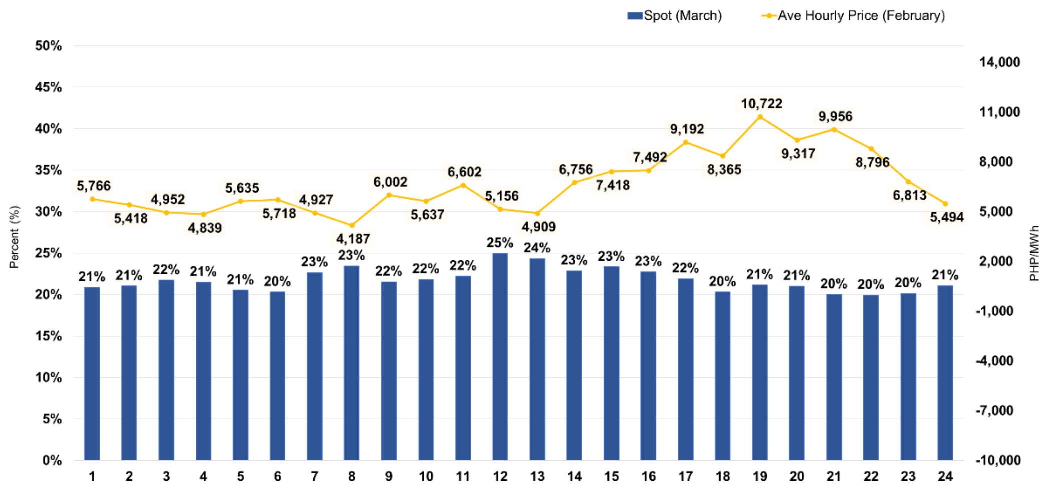
(81.9% in February 2023)

SPOT EXPOSURES

21.8%

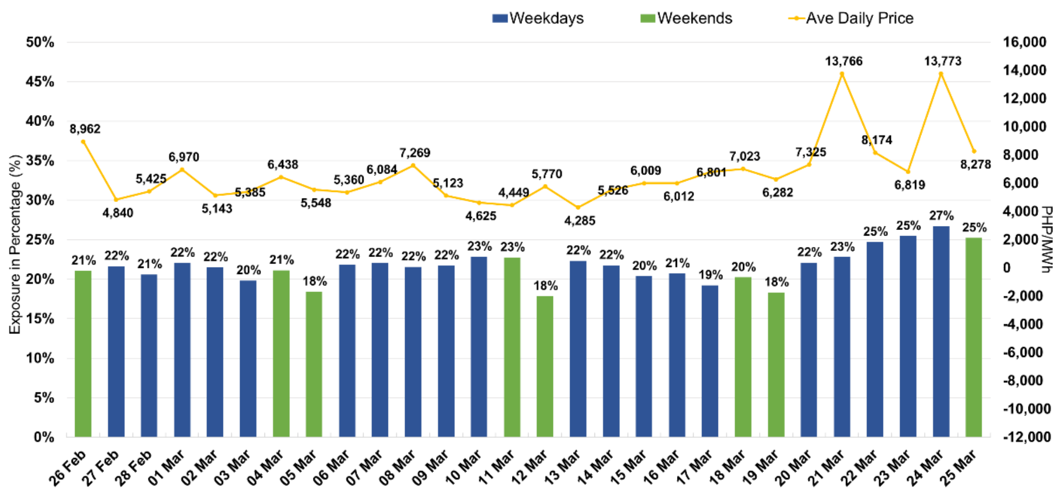
(18.1% in February 2023)

HOURLY SPOT



Total spot quantities of generator participants in March were at an average of 21.2% during off-peak hours and 22.2% during peak hours. The increase was mainly due to the expired power supply contracts that forced the participants to be exposed in the spot market.

DAILY SPOT



Spot exposures during weekdays averaged at 22.2% while it was 20.8% during the weekends.

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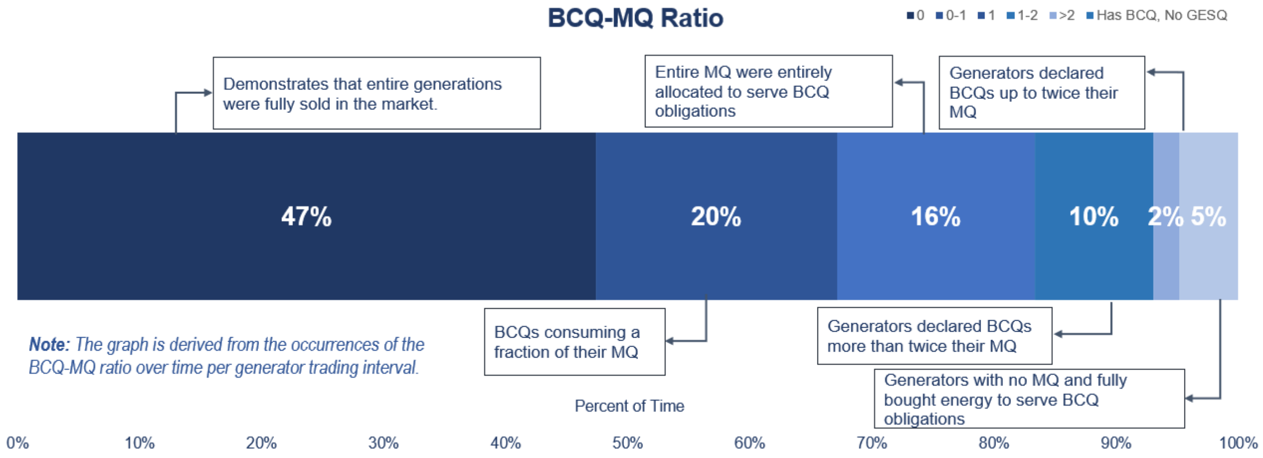
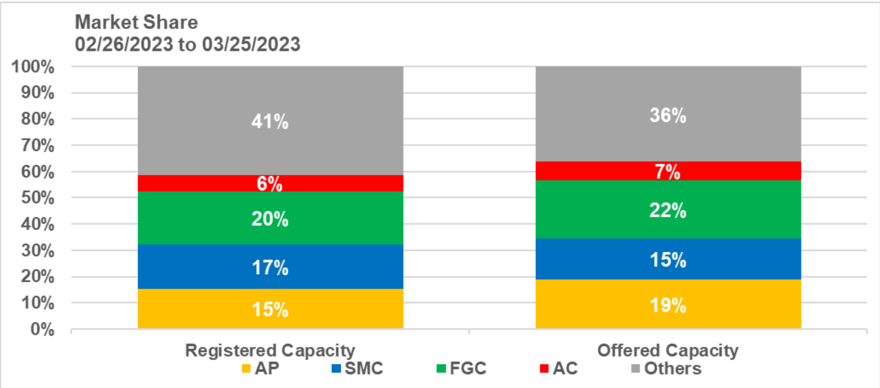
MARKET TRANSACTIONS



STRUCTURAL COMPETITION INDICES

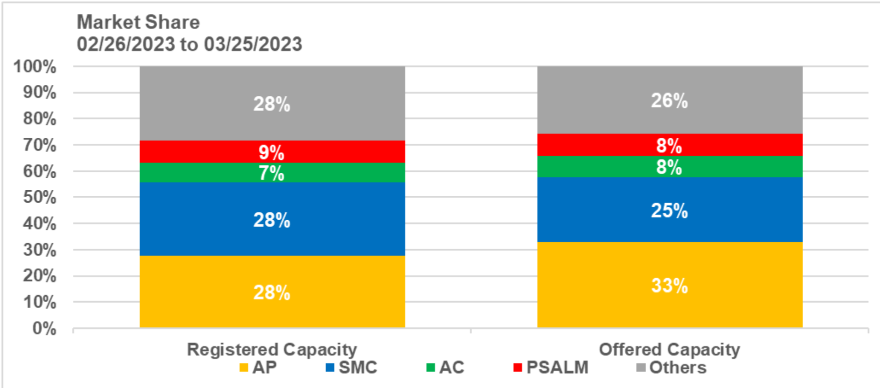
MARKET SHARE: LUZON-VISAYAS



Aboitiz Power (AP), San Miguel Corporation (SMC), First Gen Corporation (FGC), and Ayala Corporation (AC) dominated the market with their combined market shares comprising 59% of the total registered capacities in the WESM. The shares of the major participant remained similarly close to last billing period.

Note: *The Major Participant Grouping information used in this report is consistent with the ERC's list.*

MARKET SHARE: MINDANAO



Aboitiz Power (AP), San Miguel Corporation (SMC), FDC Misamis Corporation (FDC), and Power Sector Assets and Liabilities Management (PSALM) dominated the market in the Mindanao with their combined market shares comprising 72% of the total registered capacities in the WESM.

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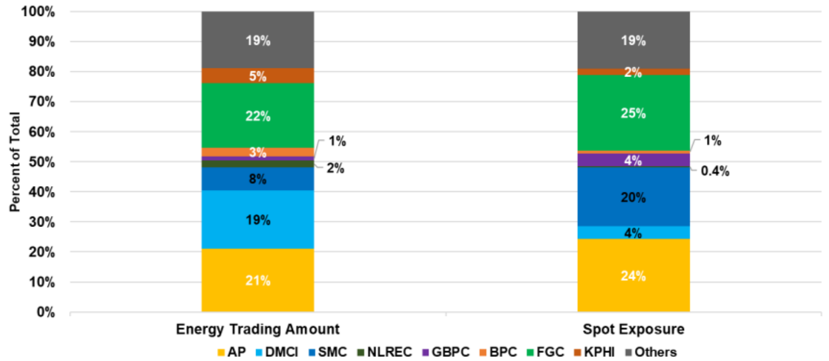
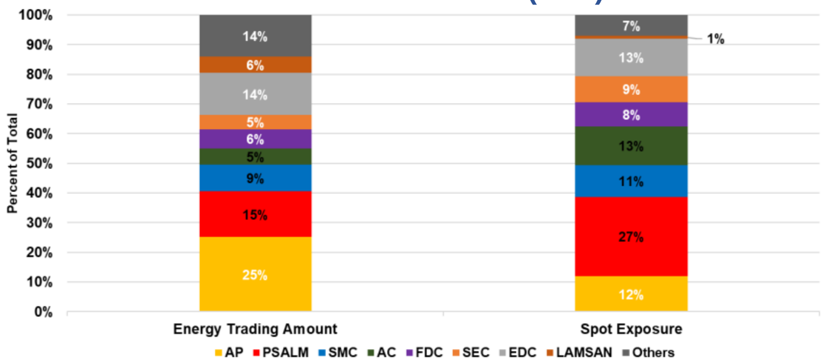
ENERGY TRADING AMOUNT (ETA): LUZON-VISAYAS



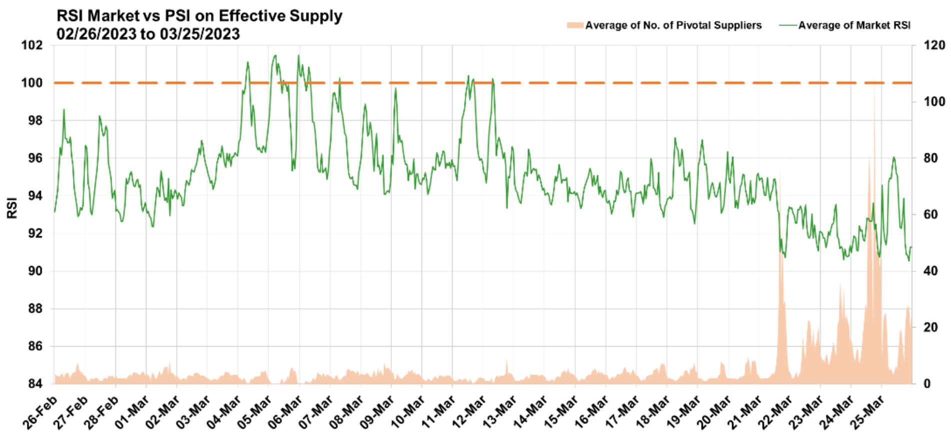
The top 3 participants with highest shares in terms of ETA and spot exposure comprised about 62% of the total shares in both measures.

ENERGY TRADING AMOUNT (ETA): MINDANAO



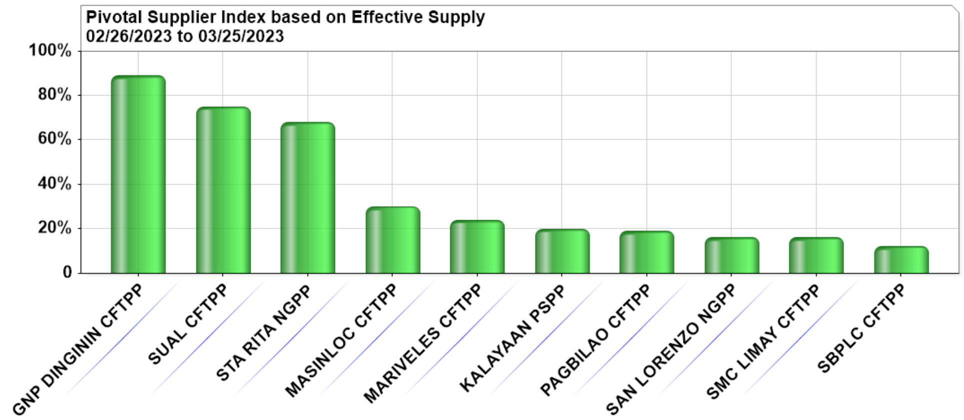
The top 3 participants with highest shares in terms of ETA and spot exposure comprised about 55% of the total shares in both measures.

MARKET RSI



- The market Residual Supply Index (RSI) was below the 100% mark for about 96.1% of the time this billing period compared to 99.7% last period, signifying the presence of pivotal plants in Luzon and Visayas.
- During the period, the market resulted in RSIs ranging from 90.5% to 101.5% and averaged at 95.1%. The average market prices for intervals with RSI below 100% was PHP6,886/MWh, while those with RSIs above 100 was at PHP3,429/MWh.
- Meanwhile, the market RSI in the Mindanao region was below the 100% mark for about 4.92% of the time signifying low level of pivotal plants.

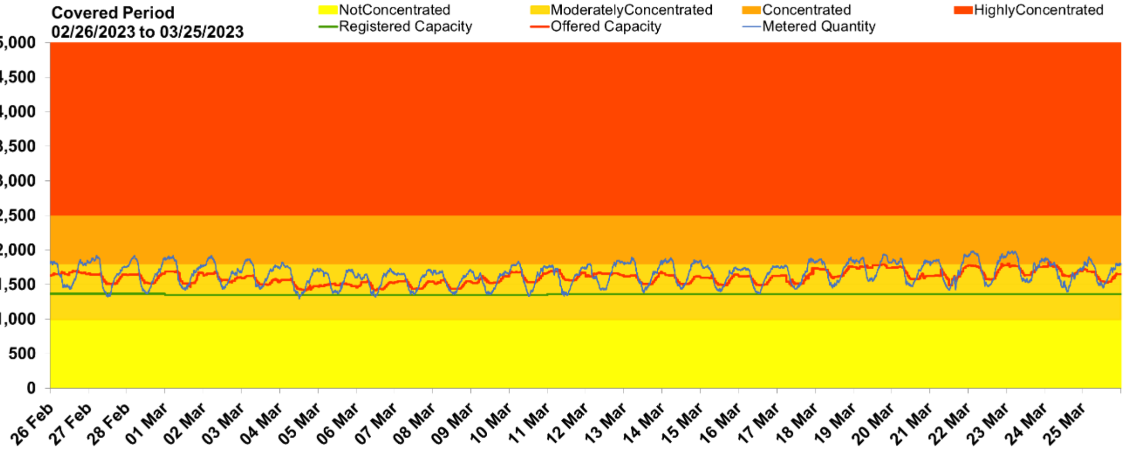
PIVOTAL PLANTS



- A total of 187 power plants were pivotal during the period from 185 last month, with 69% or 129 plants coming from Luzon and 58 plants from Visayas.
- The noted decrease in effective supply influenced the resulting RSI and the number of pivotal suppliers per dispatch interval.
- The Mindanao region has only 14 pivotal suppliers due to the currently experienced excess capacity in the region.

STRUCTURAL COMPETITION INDICES

MARKET HHI: LUZON-VISAYAS



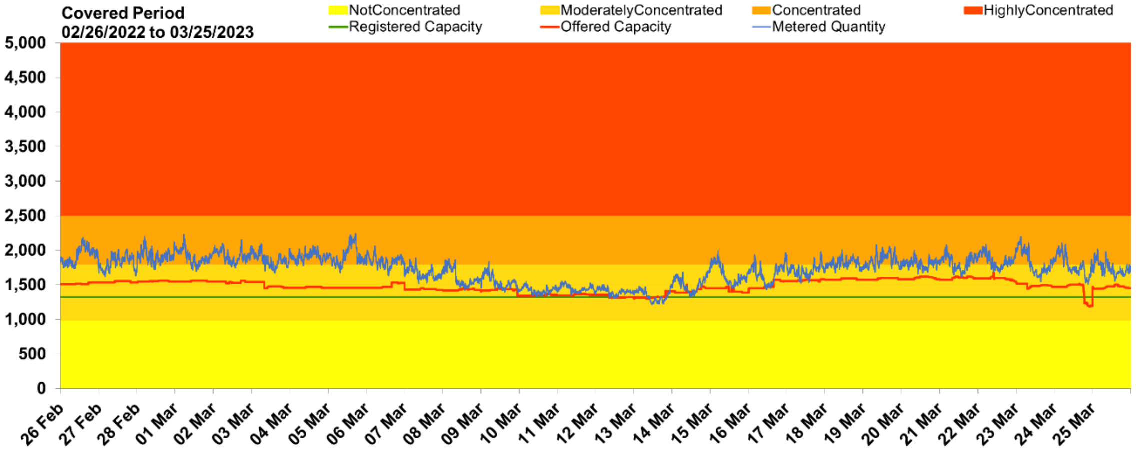
Herfindahl-Hirschman Index (HHI), by major participant grouping.

- Based on Offered Capacity, the market is **moderately concentrated** for 99.6% of the time (8,032 intervals) and **concentrated market** for 0.4% of the time (32 intervals).
  - This was brought about by the effects of **changes in the availability of generators** which subsequently affected the resulting market shares.
- Based on Metered Quantities, the market is a **moderately concentrated market** 78% of the time (6,260 intervals) and **concentrated market** for 22% of the time or for 1,804 intervals.
  - Three (3) major participant groups have consistently covered more than 50% of the MQ shares which were due to their frequent dispatch and subsequently affected the resulting market concentration.
- Based on Registered Capacity, the market is **moderately concentrated** for March 2023 billing period.

MARKET HHI: MINDANAO

Herfindahl-Hirschman Index (HHI), by major participant grouping.

- Based on Offered Capacity, the market is **moderately concentrated** for 100% of the time (8,064 intervals).
- Based on Metered Quantities, the market is **moderately concentrated market** 57% of the time (4,560 intervals) and **concentrated market** for 43% of the time or for 3,504 intervals as affected by the actual dispatch of the generators.
- Based on Registered Capacity, the market is **moderately concentrated** for March 2023 billing period.



DEFINITIONS, REFERENCES, AND INTERPRETATION

- **Pricing Error Notice (PEN)**
  - a pricing algorithm in the market and are categorized according to cause, as either Network congestion pricing errors or non-congestion pricing errors. Pricing error notice shall be issued only for the market run where the pricing error is determined by the Market Operator to have occurred.

- **Secondary Price Cap (SPC)**
  - a preventive mitigating measure instituted by the ERC to avoid excessive high market prices through its imposition on succeeding intervals, upon breach of PHP9,000/MWh Rolling Average of the generator-weighted average price (GWAP) for a running period of 3 days or 864 5-minute intervals. In this case, market prices are capped at PHP6,245/MWh.

- **Administered Price (AP)**
  - administered price determination methodology which shall be implemented by the Market Operator to impose administered prices on dispatch intervals under market suspension or market intervention.
  - administered price shall be established by the Market Operator in accordance with guiding principles as set forth by the WESM rules.

- **Generator/Producer Surplus**
  - represents the difference between the price a generator receives and their willingness to sell for each quantity.
  - daily average price of the producer/generator surplus is derived from the daily weighted average price of all the generator trading participants during peak and off-peak hours. Increase and decrease in the daily weighted average price depend on the generator schedule per dispatch interval

- **Pivotal Suppliers**
  - The market measures how critical a particular generator is in meeting the total demand at a particular time, taking into consideration the variables that change dynamically, mainly demand (energy withdrawn), required spinning (or operational) reserve and generation availability.

- **Price Substitution Methodology (PSM)**
  - a pricing algorithm that 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.
  - The price substitution methodology shall apply to a *dispatch interval* when the trigger factor exceeds the threshold, which shall be set at 0.2, subject to annual review.
  - The dispatch schedules arrived at in the original (constrained) market solution for the relevant dispatch interval will stand and will be the basis for dispatch by the System Operator irrespective of the results of the unconstrained solution. Redispatch of generation units will be implemented by the System Operator in accordance with relevant provisions of the WESM Rules and Market Manuals, the Philippine Grid Code and other relevant rules, regulations, issuances, guidelines, and procedures.

- **Ramp Limited Capacity**
  - generator restricted capacities due to the plants' intrinsic ramp rates.
  - Ramp rate is essentially the speed at which a generator can increase (ramp up) or decrease (ramp down) generation. Generating units have different characteristics, making some more suited to supplying certain needed functions.

- **Energy Trading Amount**
  - The energy trading amount for a trading participant and settlement interval shall be determined using the final energy dispatch prices for that node, the gross energy settlement quantities, and bilateral contract quantities for that node in the dispatch intervals within the same settlement interval.

Annex A. List of Major Plant Outages

Plant Type	Plant/ Unit Name	Capacity (MW)	Date Out	Date In	Duration (Days)	Outage Type	Remarks
				Luzon			
COAL	SMC 4	150	03/25/2023 14:04			Forced Outage	Emergency shutdown due to leakage on bed material from furnace to furnace windbox
COAL	Masinloc 2	344	03/25/2023 2:33			Maintenance Outage	Maintenance outage ETC at March 29 2023.
COAL	QPPL	460	03/17/2023 19:52			Forced Outage	Emergency shutdown due to boiler tube leak.
COAL	SMC 1	150	03/15/2023 0:11	03/21/2023 21:17	7	Maintenance Outage	Maintenance outage.
COAL	Masinloc 3	335	03/11/2023 23:55	03/21/2023 23:09	10	Planned Outage	Planned Outage.
COAL	GNP Dinginin 1	668	03/03/2023 23:55	03/09/2023 3:51	5	Maintenance Outage	Maintenance Outage.
COAL	SMC 4	150	02/20/2023 0:06	03/11/2023 18:26	20	Planned Outage	On Planned Outage unitl March 13 2023
COAL	Masinloc 1	315	12/23/2022 23:40	03/10/2023 16:07	77	Planned Outage	Planned outage until February 21 2023.
GEO	Makban 1	57	03/18/2023 7:04			Planned Outage	Planned Outage Gas Removal System (GRS) Commissioning
GEO	Bacman 1	60	03/12/2023 0:03			Planned Outage	Planned Outage.
GEO	Tiwi 5	57	02/24/2023 13:31	02/27/2023 3:50	3	Forced Outage	Vaccuum low low trip.
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	Magat 3	97	03/17/2023 23:30			Forced Outage	Declared unavailable due to hydrological constraints.
HYD	Caliraya 2	14	03/17/2023 0:00	03/21/2023 21:40	5	Planned Outage	Planned outage until March 21 2023.
HYD	Caliraya 1	14	03/17/2023 0:00			Planned Outage	Planned outage until March 26 2023.
HYD	Magat 2	97	03/16/2023 0:00			Planned Outage	Planned outage until April 20 2023.
HYD	Magat 1	97	03/16/2023 0:00			Planned Outage	Planned outage until April 20 2023.
HYD	Magat 4	97	03/14/2023 0:01	03/17/2023 7:47	3	Forced Outage	Declared unavailable due to hydrological constraints.
HYD	Caliraya 1	14	03/13/2023 9:05	03/16/2023 23:59	4	Forced Outage	On forced outage due to high vibration on thrust bearing.
HYD	Binga 4	35	02/16/2023 8:01	03/02/2023 0:27	14	Planned Outage	Planned Outage.
HYD	Binga 3	35	02/16/2023 8:01	03/01/2023 19:47	13	Planned Outage	Planned Outage.
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.
HYD	Angat A 1	6	08/22/2022 8:01			Planned Outage	Planned Outage until April 21 2023
NATG	Sta. Rita 1	257.3	03/17/2023 23:53			Planned Outage	On planned outage until March 29 2023.
NATG	Sta. Rita 2	255.7	03/17/2023 23:09			Forced Outage	Tripped due to gas turbine protection activation.
NATG	San Lorenzo 2	265	02/25/2023 20:48	03/17/2023 2:12	19	Planned Outage	Maintenance Outage.
NATG	San Lorenzo 1	265	02/25/2023 23:47	03/16/2023 4:28	18	Planned Outage	Maintenance Outage
NATG	Ilijan B3	220	06/05/2022 0:00			Forced Outage	End of Cooperation Period of Ilijan NGPP.
NATG	Ilijan B2	190	06/05/2022 0:00			Forced Outage	End of Cooperation Period of Ilijan NGPP.
NATG	Ilijan B1	190	05/02/2022 20:08			Forced Outage	End of Cooperation Period of Ilijan NGPP.
NATG	Avion 1	47.2	02/22/2023 0:01	03/02/2023 22:26	9	Planned Outage	Planned outage.
OIL	TMO Unit 4	52	02/27/2023 0:01	03/11/2023 0:01	12	Planned Outage	Planned outage.
OIL	TMO Unit 3	55.2	02/21/2023 0:01	02/28/2023 0:00	7	Planned Outage	Annual PM.
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	MGTPP	85	09/29/2021 16:52			Forced Outage	Tripped from 14MW due to turbine bearing shaft vibration. IEMOP deregistration effective December 25 2021.
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
				Visayas			
BIOF	SCBE	7.4	03/25/2023 15:43			Maintenance Outage	Offline ongoing plant testing.
BIOF	SCBE	7.4	03/20/2023 15:51	03/23/2023 7:06	3	Maintenance Outage	Offline under test and commissioning.
BIOF	FFHC	9	03/19/2023 16:06	03/22/2023 7:22	3	Forced Outage	Offline due to lack of fuel(Bagasse)
BIOF	VMC	2.5	03/13/2023 9:38			Maintenance Outage	Offline due to weekly maintenance.
BIOF	South Negros	25	12/12/2022 17:41			Forced Outage	Offline due to unavailability of bagasse.
BIOF	SCBE	7.4	02/02/2023 16:35	03/16/2023 9:36	42	Maintenance Outage	Offline conduct turbine inspection.
COAL	Kepco Salcon 1	103	03/23/2023 0:40			Forced Outage	Emergency cut-out due to possible boiler tube leak
COAL	Kepco Salcon 1	103	02/26/2023 13:43	03/02/2023 15:19	4	Forced Outage	BOILER TUBE LEAK
COAL	PEDC 3	150	02/14/2023 0:22	03/17/2023 20:22	32	Forced Outage	Under investigation
GEO	Upper Mahiao 3	32	03/01/2023 22:16	03/05/2023 10:02	3	Forced Outage	Auto tripped with ground fault indication.
GEO	Upper Mahiao 2	32	11/23/2022 9:50			Maintenance Outage	Emergency shutdown due to problem in control valve
GEO	Nasulo	48.3	02/17/2023 0:22	02/26/2023 13:59	10	Planned Outage	Offline to conduct minor PMS inspection of turbine generator bearing and control valve.
GEO	Malitbog 2	72	01/21/2023 0:13			Maintenance Outage	CUT OUT
OIL	TPVI 3	6.8	03/23/2023 11:59			Forced Outage	Emergency cut-out due to main bearing temperature high
OIL	TPC Carmen 1	10	03/12/2023 7:03	03/16/2023 14:48	4	Forced Outage	ERRATIC LOAD (GOV. PROBLEM)
OIL	TPVI 6	6.8	03/02/2023 8:00	03/06/2023 6:57	4	Planned Outage	APMS of seawater pipeline steam condenser and heat exchangers
OIL	TPVI 5	6.8	03/02/2023 8:00	03/06/2023 6:57	4	Planned Outage	APMS of seawater pipeline steam condenser and heat exchangers
OIL	TPVI 4	6.8	03/02/2023 8:00	03/06/2023 6:57	4	Planned Outage	APMS of seawater pipeline steam condenser and heat exchangers
OIL	TPVI 2	6.7	03/02/2023 8:00	03/06/2023 6:57	4	Planned Outage	APMS of seawater pipeline steam condenser and heat exchangers
OIL	TPVI 1	6.7	03/02/2023 8:00	03/06/2023 6:57	4	Planned Outage	APMS of seawater pipeline steam condenser and heat exchangers
OIL	TPVI 3	6.8	02/09/2023 22:29	03/21/2023 16:07	40	Forced Outage	EMERGENCY CUT-OUT DUE TO GAS LEAK AT HORIZONTAL BELLOWS A8
				Mindanao			
BIOF	14TACUR	6	02/08/2023 0:00	03/27/2023 23:30	48	Maintenance Outage	PMS (Non-GOP). ETC March 11 2023.
COAL	STE U2	116	03/10/2023 0:00	03/16/2023 15:35	7	Maintenance Outage	PMS(GOMP). ETC. March 16 2023 at 2359H.
COAL	STE U1	116	03/07/2023 0:00	03/13/2023 19:22	7	Maintenance Outage	PMS(GOMP). ETC March 13 2023.
COAL	MCC U3	55	01/28/2023 0:00			Maintenance Outage	Maintenance schedule (Non-GOP) from January 28 to March 13 2023 extended until May 10 2023.
COAL	GKP U1	151.9	01/26/2023 23:41	03/25/2023 0:17	57	Forced Outage	Â Non-Nomination
COAL	FMP U3	135	02/17/2023 2:03	03/15/2023 11:29	26	Forced Outage	Emergency shutdown due to tube leak of boiler air pre-heater primary air fan system. ETC March 15 2023.
COAL	FMP U2	135	02/01/2022 22:08			Forced Outage	Extended PMS. ETC April 16 2023.
HYD	BHP U0	6.6	03/13/2023 7:00			Maintenance Outage	PMS (Non-GOP). ETC April 03 2023 0700H.
HYD	AG6 U3	50	03/12/2023 8:09	03/17/2023 20:41	6	Forced Outage	Forced outage due to governor trip indication. No ETI.
HYD	13NABUN	3	03/06/2023 7:00	03/10/2023 17:09	4	Forced Outage	Plant emergency shutdown due to emergency repair of conveyance line; damaged pipeline due to landslide resulting from earthquake
HYD	AG1 U1	35	03/03/2023 8:08	03/17/2023 20:41	15	Maintenance Outage	PMS(GOMP). ETC March 17 2023.
HYD	PG4 U3	75	03/03/2023 8:01	03/06/2023 15:51	3	Forced Outage	Replacement of By-Pass Valve and Generating Unit Air Cooler(9) and Cleaning of Heat Exchangers. ETC March 6 2023.
HYD	10AGUS6	26.1	03/02/2023 8:03	03/10/2023 16:01	8	Maintenance Outage	PMS (GOP).
HYD	AG2 U3	60	02/01/2023 9:25			Maintenance Outage	PMS(Non-GOP). ETC March 31 2023
HYD	AG2 U2	60	02/01/2023 9:40			Maintenance Outage	PMS(Non-GOP). ETC March 31 2023
HYD	AG2 U1	60	02/01/2023 13:05			Maintenance Outage	PMS(Non-GOP). ETC March 31 2023
HYD	AG1 U2	35	02/16/2023 8:03	03/02/2023 16:50	14	Maintenance Outage	PMS (GOP). ETC March 02 2023.
OIL	WMPC Unit 4	10.7	03/13/2023 8:00	03/21/2023 0:01	8	Maintenance Outage	PMS (GOP). Unit was on forced outage since March 08 2022 1818H. ETC March 19 2023.
OIL	WMPC Unit 9	10.7	03/12/2023 12:00	03/17/2023 10:00	5	Forced Outage	Unit on forced outage due to oil mist concentration high stop alarm. ETC March 16 2023.
OIL	TMU2 U2	50	03/11/2023 0:00	03/16/2023 8:08	5	Maintenance Outage	PMS(GOMP). ETC March 15 2022.
OIL	WMPC Unit 5	10.7	03/09/2023 21:00			Forced Outage	Declared unavailable starting 2100H March 9 2023 due to Cylinder A6 Exhaust Gas Leak. ETC 1600H March 10 2023.
OIL	TMI2 U1	50	03/08/2023 0:13	03/11/2023 8:02	3	Maintenance Outage	PMS (GOMP). March 10 2023.
OIL	WMPC Unit 7	10.7	03/03/2023 10:00	03/10/2023 16:21	7	Forced Outage	Failure to Synchronize. Leakage Bay Pump. No declared ETC.

Notes:

1. *List of Major Plant Outages includes all generating units with capacities above 10MW located in Luzon and above 5MW for plants located in Visayas.*
2. *Outages with duration of 1 day and below were not included in the list of Major Plant Outages*
3. *Daily outages with drastic effects to the market are monitored through separate indices.*