Market Surveillance Committee Monthly Market Assessment Report

26 December 2022 to 25 January 2023

April 2023

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

MONTHLY MARKET ASSESSMENT REPORT

(26 December 2022 – 25 January 2023)

Philippine Electricity Market Corporation

MMAR-2023-01

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ASSESSMENT OF THE MARKET

NOTABLE HIGHLIGHTS

1. **No secondary price cap** imposition monitored during the January billing period.
    - Significant decrease in the level of demand, coupled with ample amount of supply, translated to lower market prices.

2. **Congestions in transmission lines and transformer equipment** resulted from the current design of the transmission system, as well as N-1 contingency impositions by the System Operator (SO). Some notable congestions were as follows:
    - **Maasin-Ubay line 1** was congested for 4,043 intervals, or equivalent to 45% of the time, brought about by the frequent maximization of the line's capacity limit.
    - **Samboan-Amlan line 1** was congested for 49 intervals, or equivalent to 1% of the time brought about by current system design, and
    - **Cebu-Mandaue Line 1** for 317 intervals, or equivalent to 4% of the time, brought about by the unavailability of Cebu-Mandaue line 2.

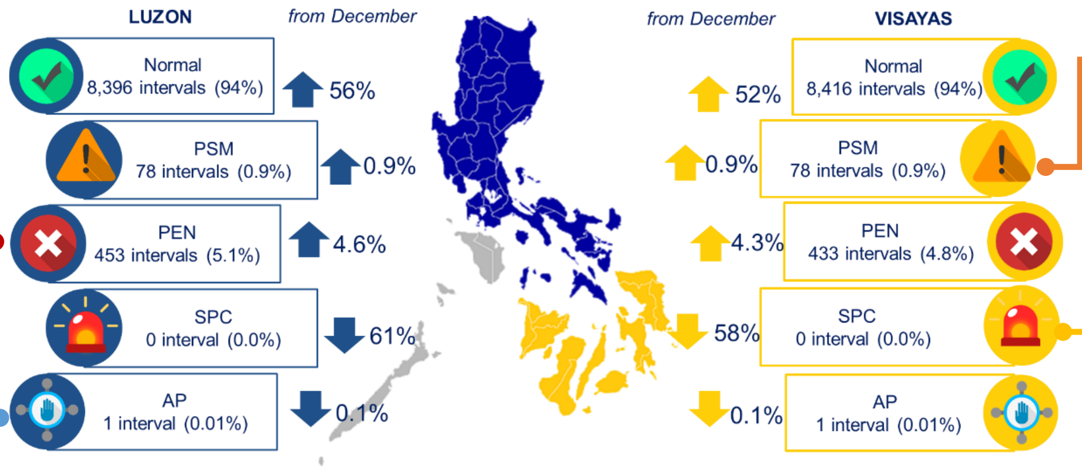
SUMMARY OF PRICING CONDITIONS

Pricing Error Notice (PEN)

- Impositions were due to **inappropriate input data** which affected prices and schedules both for Luzon and Visayas.
- Regional imposition for 20 intervals were noted in Luzon during those instances when the inter-connection between the grids was unavailable.

One (1) interval under Market Intervention (MI)

- 13 January 2023 at 1120H, MO- initiated Market intervention due to no RTD generated caused by database-related error experienced during the implementation of database configuration changes



Price Substitution Methodology (PSM)

- System-wide imposition for 78 intervals on 18, 21, 22, and 25 January 2023.

No Secondary Price Cap (SPC) impositions noted for the month in review.

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MARKET OUTCOME

EFFECTIVE SUPPLY

11,086 MW

(11,649MW in December)

DEMAND PLUS RESERVE SCHEDULE

10,351 MW

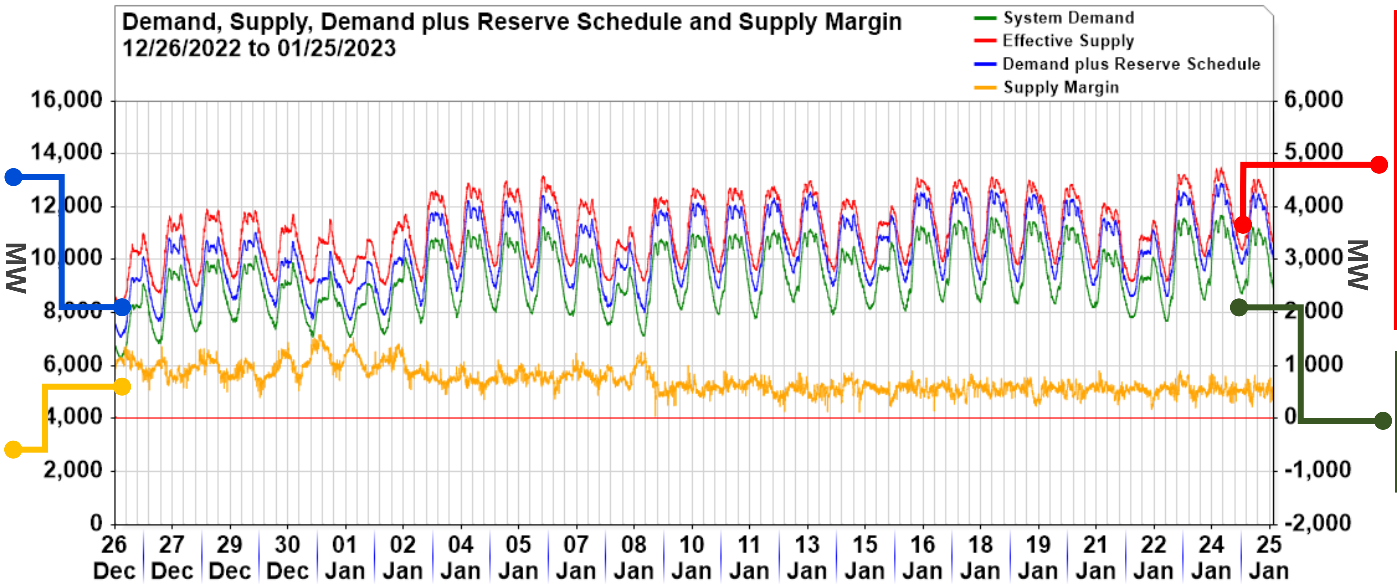
(11,233MW in December)

SUPPLY MARGIN

736 MW

(416 MW in December)

Demand plus Reserve Schedules decreased by an average of 7.9% mainly caused by **cooler temperature during the rainy and holiday season** which influenced the electricity consumption for the month. Lower level of demand was observed at the start of the month coming from the holiday season where the demand level is naturally low.



Effective Supply

- Decreased by 4.8% or was noted at an average of 11,086MW from 11,649MW last month.
- Notwithstanding the decrease in the **capacities on outage** this month, the **effects of ramp limited capacities**, as considered in the determination of the effective supply, became prevalent.

Supply Margin improved by 76.6%, considering the dynamics between the supply and demand. Episodes of thin supply margin was observed during the instances of abrupt change in the supply level due to, among others, forced outages.

System Demand decreased by 9.5% or was noted to be at 9,362 MW from 10,344 MW last month.

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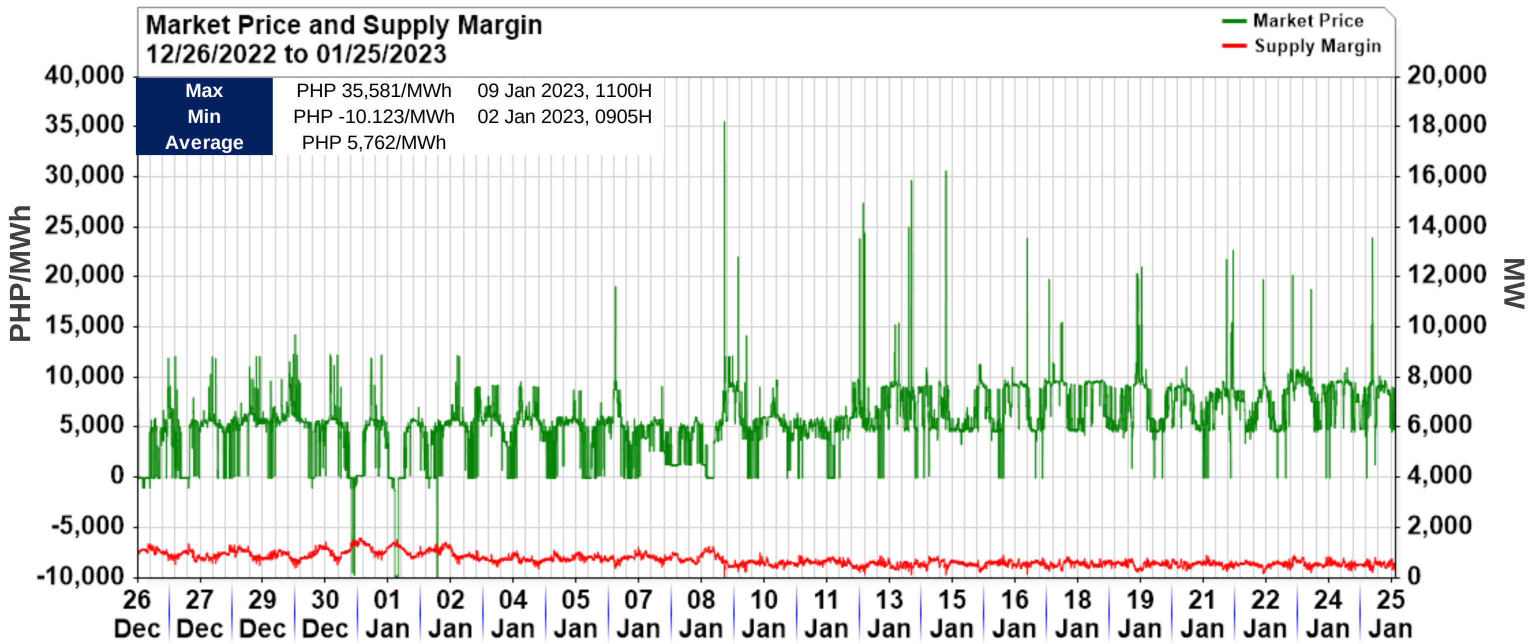
Zone	Average LWAP (PHP/MWh)
NLUZON	5,599.96
MMANILA	5,753.16
SLUZON	5,681.48
LEYTE	5,826.72
CEBU	5,791.28
NEGROS	5,639.29
BOHOL	14,085.32
PANAY	5,628.69

MARKET OUTCOME

Given the dynamics of supply and demand, the level of market prices decreased by 31.6% or was noted to be at an average of PHP5,762/MWh from PHP8,424/MWh last month. The year-on-year comparison posted a 15.9% decrease from an average price of PHP6,851/MWh last year noting that outages in January 2023 were significantly lower than the same month of last year.

Congestion in Leyte-Bohol interconnection was still persistent due to tight supply situation in the Bohol grid which, in turn, continuously affected the power rates in the area causing disparity, as depicted in the table of prices.



PRICE

5,762

PHP/MWh

(PHP8,424/MWh in December 2022)

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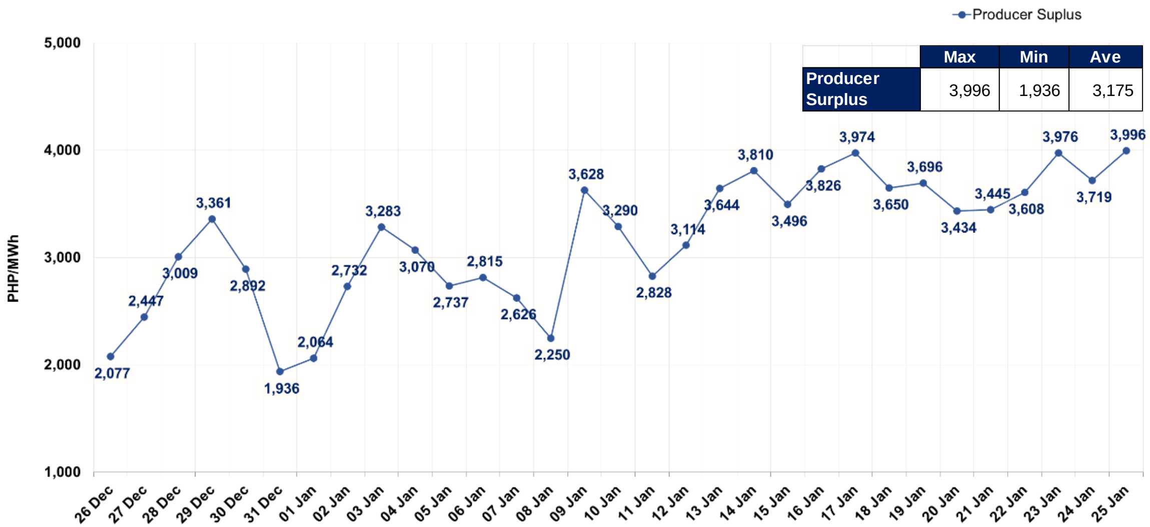
MARKET OUTCOME

RAMP LIMITED CAPACITY

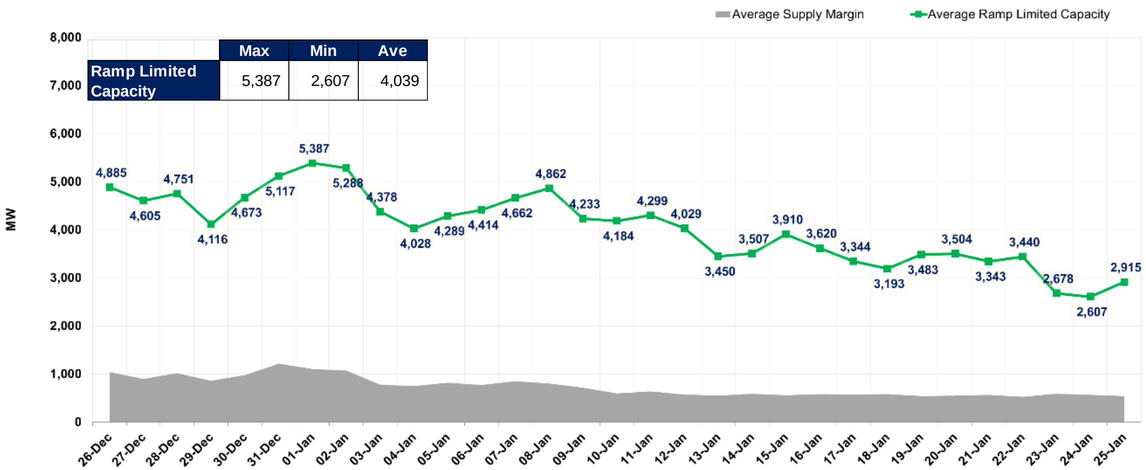
4,039
MW
(2,134MW in December 2022r)

PRODUCER SURPLUS

3,175
PHP/MWh
(PHP3,731/MWh in December 2022)



	Max	Min	Ave
Producer Surplus	3,996	1,936	3,175



	Max	Min	Ave
Ramp Limited Capacity	5,387	2,607	4,039

Producer/generator surplus, averaged at PHP3,175/MWh this month from PHP3,731/MWh last month. This is a 15% decrease as compared to December 2022 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 January 2023, **ramp-limited capacities** increased by 89% from an average of 2,134 MW last month to 4,039 MW this month which may be affected by the behavior of the participants in submitting ramp rates that are considered in the optimization of the market.

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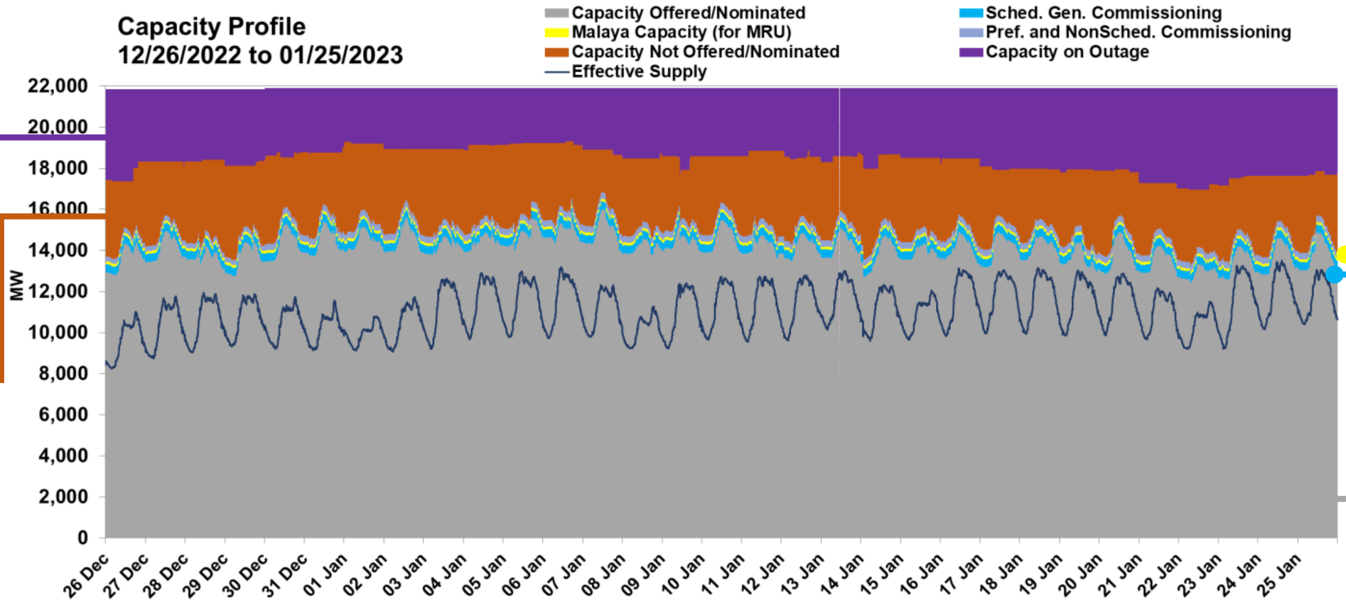
CAPACITY PROFILE

The WESM's registered capacity recorded changes in January 2023 billing period from 21,830.7 MW to 21,908.5 MW due to the registration of a new solar plant and net registration changes from 2 power plants:

Status	Market Participant Name	Market Trading Node	Plant Type	Pmax (MW) New	Change (MW)
New	Universal Power Solutions, Inc.	01CURSOL_G02	Solar	68.7	68.7
Increased	Therma Mobile, Inc.	02TMOBIL_G02	Oil-based	51.5	2.5
		02TMOBIL_G03		55.2	1.8
		02TMOBIL_G04		52	5.2
Decreased	Alternergy Wind One Corporation	03AWOC_G01	Wind	53.6	(0.4)
				TOTAL	77.8

COAL 9,693 MW (44%)
NATURAL GAS 3,286 MW (15%)
OIL-BASED 2,297 MW (10%)
HYDRO 2,584 MW (12%)
GEOTHERMAL 1,651 MW (8%)
SOLAR 1,277 MW (6%)
BIOMASS 385 MW (2%)
WIND 427 MW (2%)
BATTERY 310 MW (1%)



Capacity on Outage (16% of Registered Capacity) decreased by 21.5%, which was mostly from several Coal power plants previously on forced outage.

Capacity NOT Offered/Nominated (16% of Registered Capacity) decreased by 7% or from an average of 3,722 MW last month to 3,455 MW this month attributable to capacities not nominated by non-scheduled, priority dispatch or must dispatch facilities due to resource constraints.

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

Capacities under Testing and Commissioning (3% of Registered Capacity) decreased from 857 MW to 701 MW this month.

Capacities Offered/Nominated (64% of Registered Capacity) increased by 11.7% or was noted at an average of 14,062 MW as compared to last month's 12,590 MW.

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

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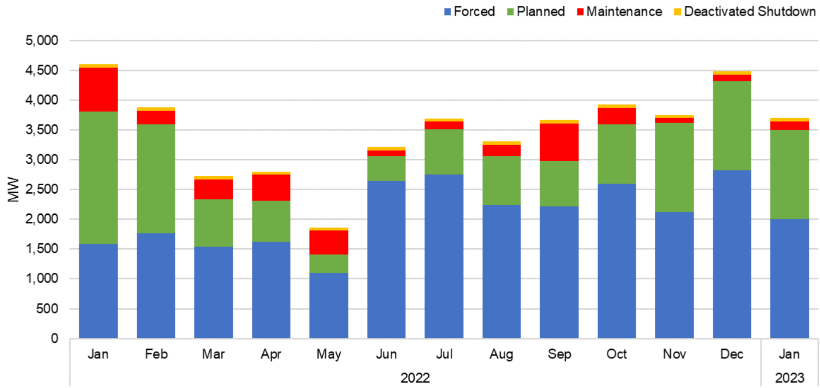
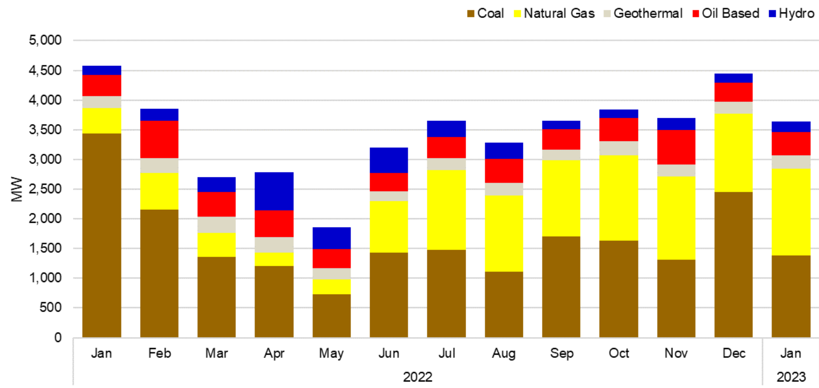
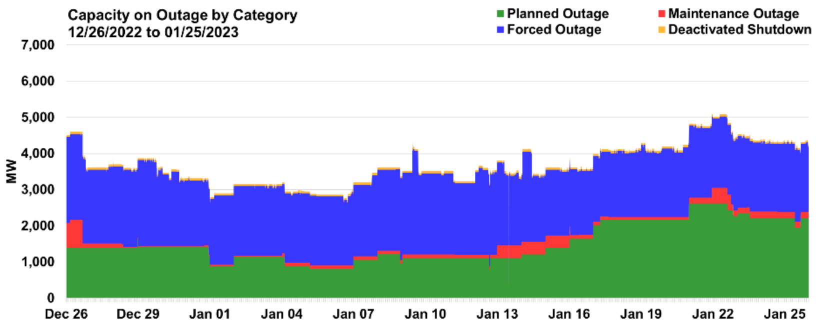
CAPACITY PROFILE

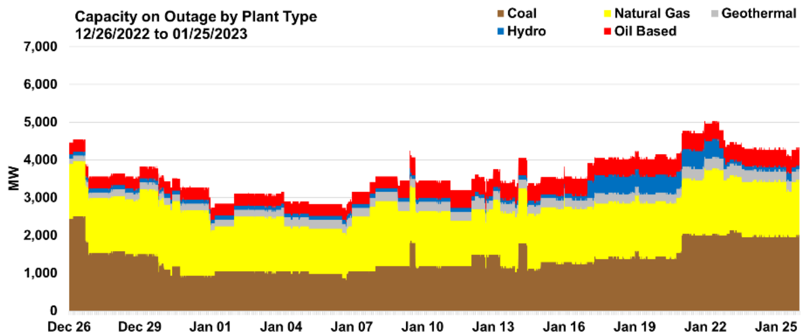
CAPACITY ON OUTAGE BY CATEGORY



CAPACITY ON OUTAGE BY PLANT TYPE







The January 2023 billing period opened with a relatively high level of capacities on outage at around 4,400MW, but eventually declined to around 3,500MW throughout the month due to the resumption of large Coal power plants under forced outage category.

The recorded average capacities on outage were mainly due to planned outages of power plants as approved in the Grid Operating and Maintenance Program (GOMP) of the System Operator. However, the sudden increase in outages specifically on 09 and 14 January 2023 were due to technical issues encountered by various Coal power plants. As the month ended, the outage level was at about an average of 4,000 MW.

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

82.8%

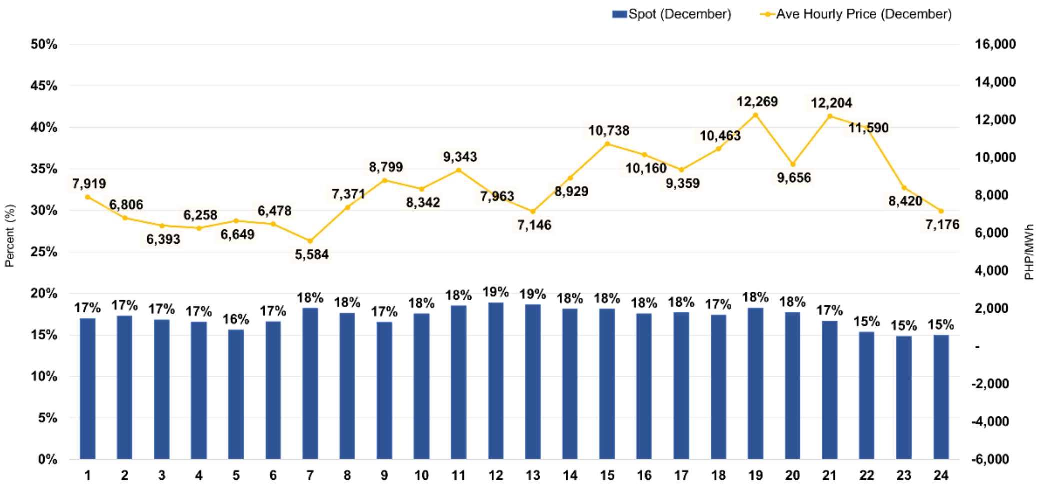
(84.2% in December 2022)

SPOT EXPOSURES

17.2%

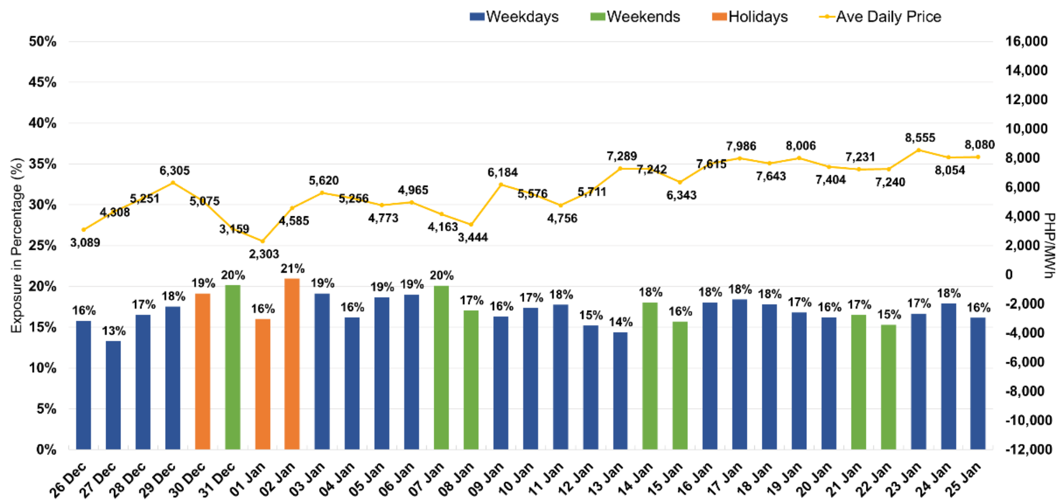
(15.8% in December 2022)

HOURLY SPOT



Total spot quantities of generator participants in January posted an average of 16.4% during off-peak hours and 17.9% during peak hours.

DAILY SPOT



Spot exposures during weekdays averaged at 17.2% while it was 17.4% during the weekends.

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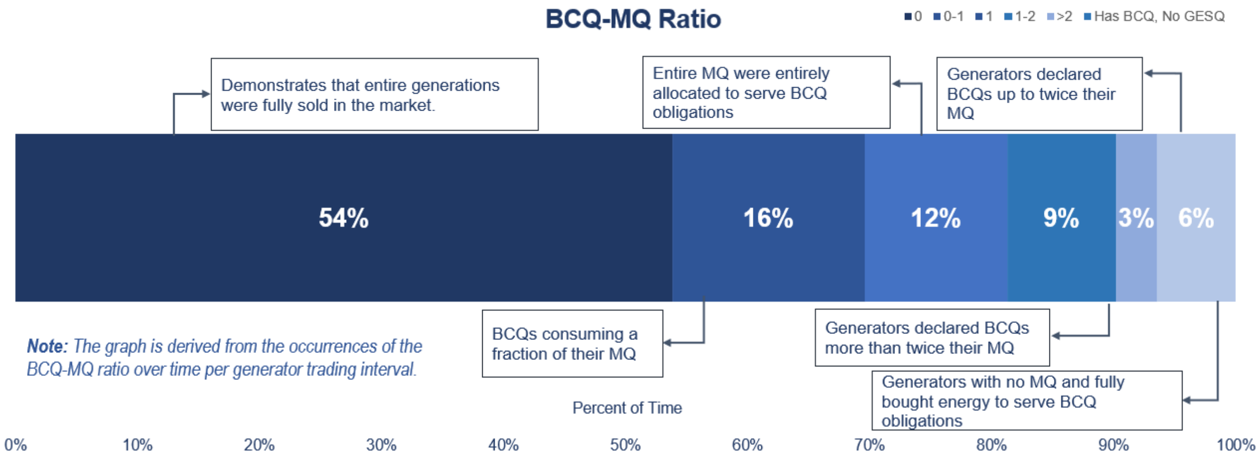
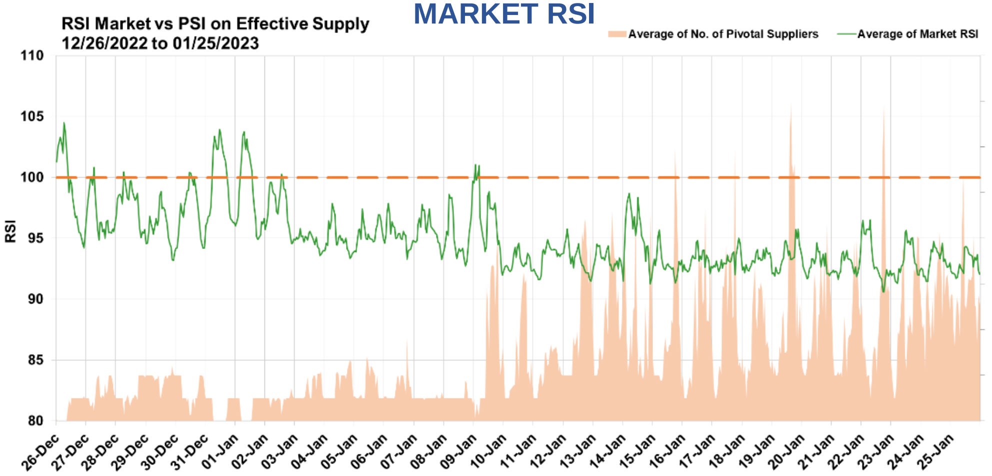


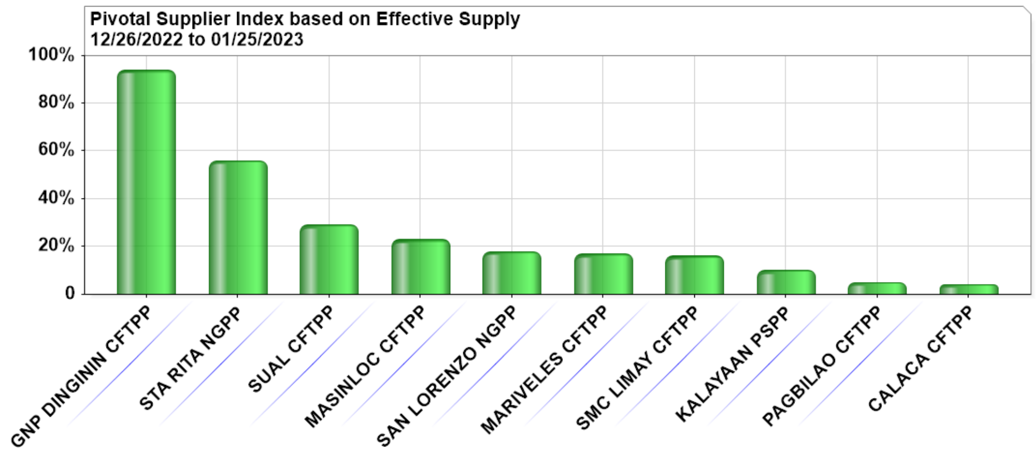
STRUCTURAL COMPETITION INDICES

MARKET RSI



- The market Residual Supply Index (RSI) was below the 100% mark for about 94.4% of the time this billing period compared to 92.9% last period, signifying the presence of pivotal plants.
- During the January 2023 billing period, the market resulted in RSIs ranging from 90.6% to 104.5% and averaged at 94.7%. The average market prices for intervals with RSI below 100% was PHP6,261/MWh, while those with RSIs above 100 had recorded average price of PHP665/MWh.

PIVOTAL PLANTS



- A total of 46 power plants were pivotal during the period from 163 last month, with 76% or 35 plants coming from the Luzon region and 11 plants from the Visayas region.
- The noted decrease in effective supply still translated to a low RSI and high number of pivotal suppliers per dispatch interval.

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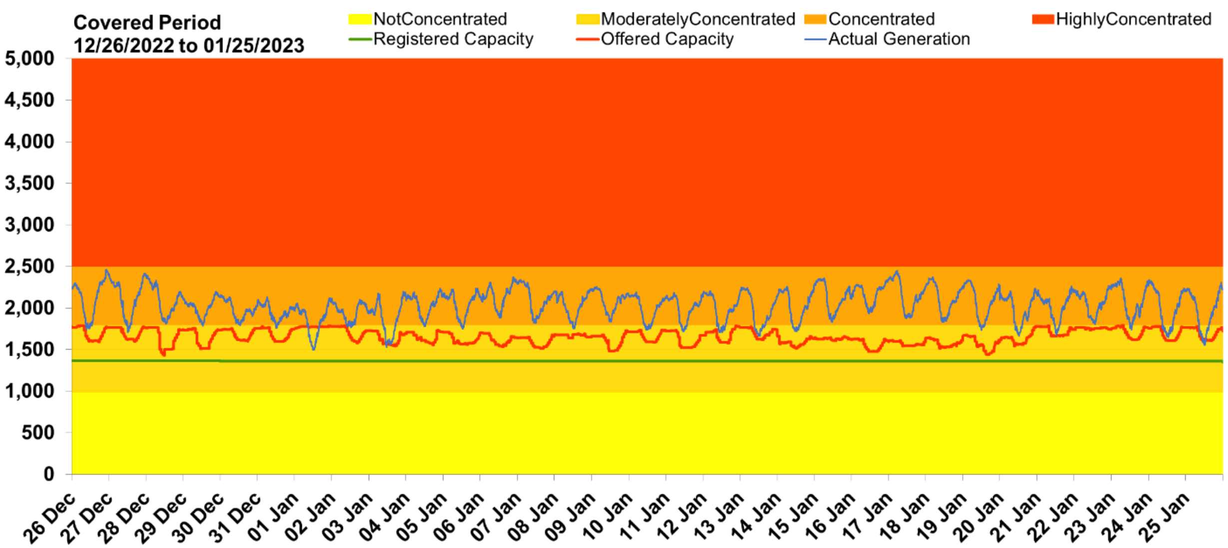
MARKET CONCENTRATION, ENERGY TRADING AMOUNT (ETA), AND SPOT EXPOSURE

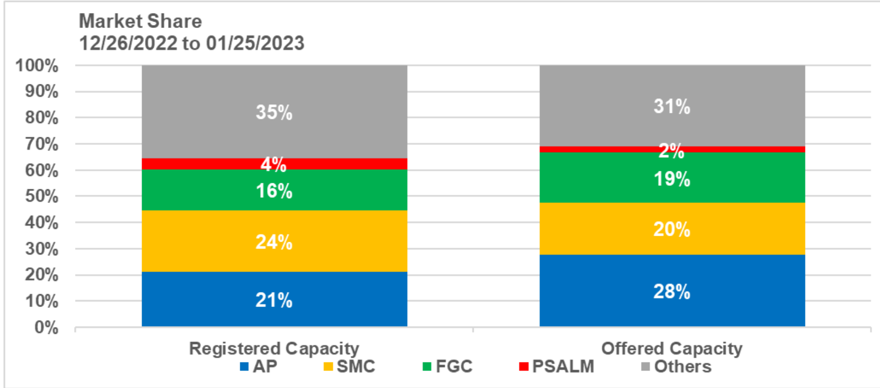
MARKET HHI



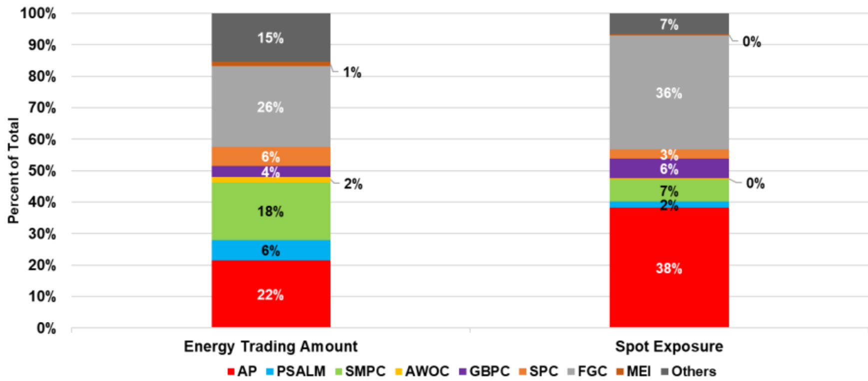
Herfindahl-Hirschman Index (HHI), by major participant grouping.

- <u>Based on Offered Capacity,</u> the market is **moderately concentrated** for the whole month of January 2023
  - This was brought about by the effects of **changes in the availability of generators** which subsequently affected the resulting market shares.
- <u>Based on Metered Quantities,</u> the market is **moderately concentrated market** 10.5% of the time (940 intervals) and **concentrated market** for 89.5% of the time or for 7,988 intervals.
  - Three (3) major participant groups have consistently covered more than 50% of the MQ shares which were due to their frequent dispatch, mostly covered by BCQ, and subsequently affected the resulting market concentration.
- <u>Based on Registered Capacity,</u> the market is **moderately concentrated** for January 2023.

MARKET SHARE



Aboitiz Power (AP), San Miguel Corporation (SMC), First Gen Corporation (FGC), and Power Sector Assets and Liabilities Management (PSALM) dominated the market with their combined market shares comprising 65% of the total registered capacities in the WESM. The shares of the major participant remained similarly close to last billing period.



The top 3 participants with highest shares in terms of ETA and spot exposure comprised about 66% of the total shares in both measures. This may also indicate high level of market concentration that affects market competition.

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.

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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	SLPGC 1	150	01/20/2023 17:56	01/25/2023 23:27	5	Forced Outage	Emergency shutdown due leak at HP turbine casing.
COAL	Sual 1	647	12/23/2022 23:44	12/26/2022 16:30	3	Maintenance Outage	Maintenance outage until December 28 2022 to repair boiler tube leak.
COAL	SMC 1	150	12/24/2022 18:26	12/30/2022 7:19	6	Forced Outage	Unplanned outage due to suspected reheater tube leak.
COAL	SLTEC 2	124	12/17/2022 0:18	01/23/2023 12:59	38	Planned Outage	On planned outage until January 31 2023.
COAL	Masinloc 3	335	12/24/2022 11:40	12/26/2022 19:31	2	Forced Outage	Tripped due to feed water transmitter problem.
COAL	GN Power 2	316	10/15/2022 0:17	01/14/2023 0:00	91	Planned Outage	General maintenance outage.
COAL	Calaca 2	300	01/12/2023 1:31	01/13/2023 6:58	1	Forced Outage	Tripped due to rotor insulator fault.
COAL	Calaca 1	240	12/20/2022 0:00	12/29/2022 18:45	10	Forced Outage	Extended Maintenance Outage
COAL	ANDA 1	72	12/01/2022 9:30	01/05/2023 4:02	35	Planned Outage	Planned Outage.
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	Kalayaan 2	180	01/17/2023 0:00	01/22/2023 20:17	6	Planned Outage	Planned Outage until January 24 2023.
HYD	Kalayaan 1	180	01/17/2023 0:00	01/22/2023 14:26	6	Planned Outage	Planned Outage until January 24 2023.
HYD	Angat M 3	50	11/02/2021 8:15			Forced Outage	Draw-out of Main Unit 3 generator breaker.
NATG	Sta. Rita 4	264	01/21/2023 22:45	01/22/2023 18:27	1	Maintenance Outage	Rectification of observed leak at the auxiliary system.
NATG	Sta. Rita 2	255.7	01/06/2023 23:52	01/08/2023 22:44	2	Planned Outage	Planned Outage.
NATG	Sta. Rita 3	265.5	01/16/2023 0:06	01/25/2023 10:19	9	Planned Outage	Planned outage until January 27 2023.
NATG	Sta. Rita 1	257.3	01/12/2023 23:41	01/16/2023 0:47	3	Maintenance Outage	Maintenance outage until January 14 2023.
NATG	Sta. Rita 3	265.5	01/07/2023 18:02	01/11/2023 4:05	3	Forced Outage	Manually tripped due to gas leak and fire at Gas Turbine
NATG	Sta. Rita 1	257.3	01/01/2023 23:53	01/04/2023 2:56	2	Planned Outage	Planned Outage.
NATG	San Lorenzo 1	265	12/28/2022 23:46	01/01/2023 0:04	3	Planned Outage	Planned Outage.
NATG	San Lorenzo 2	265	12/25/2022 23:50	12/31/2022 22:45	6	Planned Outage	Planned Outage.
OIL	Limay 6	60	01/19/2023 20:13	01/20/2023 9:04	1	Forced Outage	Unit 6 Transformer tripped due to winding temperature greater than max..
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
SOLR	Subsol	56.6	01/22/2023 7:00	01/25/2023 7:03	3	Planned Outage	GOP
Visayas							
BIOF	FFHC	9	01/23/2023 10:07	01/24/2023 16:41	1	Maintenance Outage	Offline due to weekly maintenance.
BIOF	HPCO	2	01/22/2023 16:48	01/23/2023 16:47	1	Maintenance Outage	Offline due to weekly maintenance.
BIOF	FFHC	9	01/20/2023 10:42	01/21/2023 7:20	1	Forced Outage	Offline due to unavailability of bagasse.
BIOF	SCBE	7.4	01/19/2023 18:02			Forced Outage	Offline due to condenser level high.
BIOF	SCBE	7.4	01/18/2023 11:59	01/19/2023 16:10	1	Forced Outage	Auto-tripped due to high vibration.
BIOF	FFHC	9	01/16/2023 9:42	01/17/2023 15:17	1	Maintenance Outage	Offline due to weekly maintenance.
BIOF	HPCO	2	01/15/2023 11:19	01/16/2023 16:32	1	Maintenance Outage	Offline due to weekly maintenance.
BIOF	URC 1	40	01/15/2023 7:07	01/16/2023 7:33	1	Maintenance Outage	Offline due to preventive maintenance.
BIOF	SCBE	7.4	01/13/2023 15:47	01/18/2023 10:26	5	Forced Outage	Auto-tripped due to turbine problem.
BIOF	FFHC	9	01/13/2023 6:41	01/14/2023 11:59	1	Forced Outage	Offline due to insufficient fuel (bagasse) supply.
BIOF	FFHC	9	01/08/2023 22:09	01/11/2023 5:20	2	Maintenance Outage	Offline due to weekly maintenance
BIOF	HPCO	2	01/08/2023 18:00	01/09/2023 16:49	1	Maintenance Outage	Offline due to weekly maintenance
BIOF	HPCO	2	12/31/2022 22:15	01/03/2023 21:11	3	Forced Outage	Offline due to insufficient bagasse
BIOF	URC 1	40	12/31/2022 21:59	01/03/2023 10:04	3	Maintenance Outage	Offline due to year end maintenance.
BIOF	FFHC	9	12/31/2022 18:06	01/05/2023 11:07	5	Maintenance Outage	Offline due to weekly maintenance.
BIOF	HPCO	2	12/31/2022 2:10	12/31/2022 16:08	1	Forced Outage	Offline due to lack of bagasse fuel
BIOF	VMC	2.5	03/13/2022 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	05/06/2022 6:45	01/13/2023 10:44	252	Forced Outage	Offline due to internal problem
BIOF	HPCO	2	12/25/2022 1:40	12/26/2022 20:00	2	Maintenance Outage	Offline due to weekly maintenance.
BIOF	FFHC	9	12/25/2022 11:32	12/28/2022 7:13	3	Maintenance Outage	Offline due to weekly maintenance.
COAL	PEDC 1	83.7	01/23/2023 0:55			Planned Outage	PMS
COAL	THVI 2	169	01/15/2023 0:15			Planned Outage	APMS ECD 02-09-23 0000H
COAL	THVI 1	169	01/06/2023 18:19	01/13/2023 21:53	7	Forced Outage	TVI UNIT 1 AUTO TRIPPED DUE TO BOILER DRUM LEVEL LOW
COAL	Kepco Salcon 1	103	01/01/2023 3:56	01/06/2023 13:48	5	Forced Outage	MANUALLY CUT-OUT FOR REPAIR WORKS ON REHEATER 2 OUTLET HEADER TUBE
COAL	CEDC 1	82	12/26/2022 4:01	12/28/2022 9:10	2	Maintenance Outage	UNIT MANUALLY CUT-OUT TO FACILITATE REPAIR OF HIGH PRESSURE HEATER (HPH) NO. 1 ECD 12/28/2022 2359H
COAL	THVI 1	169	12/25/2022 11:44	12/29/2022 18:41	4	Forced Outage	Unit tripped due to steam drum level high-high
GEO	Malitbog 2	72	01/21/2023 0:13			Maintenance Outage	CUT OUT
GEO	Upper Mahiao 2	32	11/23/2022 9:50			Maintenance Outage	Emergency shutdown due to problem in control valve
OIL	Bohol 1	4	01/18/2023 16:28	01/20/2023 6:20	2	Forced Outage	Severe gas leak on cylinder no. 5.
OIL	TPC Carmen 3	10	01/18/2023 12:52	01/21/2023 2:04	3	Forced Outage	AUTO - TRIPPED DUE TO OIL MIST INTENSITY
OIL	Bohol 3	4.2	01/16/2023 12:11	01/17/2023 20:07	1	Forced Outage	Affected by the tripping of Tagbilaran-Garcia 69kv line tripped at 1211H with an indication of Z2CN 48.5 km.
OIL	Bohol 1	4	01/16/2023 12:11	01/17/2023 20:06	1	Forced Outage	Affected by the tripping of Tagbilaran-Garcia 69kv line tripped at 1211H with an indication of Z2CN 48.5 km.
OIL	TPC Carmen 1	10	12/29/2022 15:34	12/30/2022 14:14	1	Forced Outage	GAS CUTTING CYL 9
OIL	Bohol 2	4	12/28/2022 10:33	12/30/2022 23:12	3	Forced Outage	Exhaust gas leak.
OIL	TPVI 3	6.8	10/12/2022 0:11			Forced Outage	UNIT TRIPPED DUE TO ERRATIC MAIN BEARING NO. 7 SUDDEN HIGH TEMPERATURE INDICATION
OIL	TPVI 1	6.7	12/17/2022 21:00			Forced Outage	EMERGENCY CUT-OUT DUE TO HEAVY WATER LEAK AT CHARGE-AIR COOLING WATER RETURN PIPELINE
OIL	PB101 Unit 1	6	11/15/2022 0:01	01/30/2023 16:21	77	Maintenance Outage	Extended maintenance outage

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*