



Monthly Market Assessment Report

26 October 2020 to 25 November 2020

DECEMBER 2020

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

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Monthly Market Assessment Report for November 2020 Billing Month

1. ASSESSMENT OF THE MARKET

- Normal pricing condition in the Luzon region consisted about 90 percent of the total trading intervals in November 2020, lower than last month's monthly percent share of 97 percent. Consistently, the same percentage share was noted from last month in the Visayas region at 93 percent.
- Price Substitution Methodology (PSM) was applied to 13 intervals or 2 percent of the total outcomes both in the Luzon and Visayas regions.
 - For both regions, 11 of the PSM-applied intervals was the result of the constraint in the Sucat – Biñan line 3 that connects the Manila to South Luzon. Meanwhile, the constraint in the Leyte – Cebu interconnection accounted for the remaining 2 intervals.
- Prices with errors not caused by congestion occurred around 2 percent or 16 intervals of the time for Luzon and 6 percent or 41 intervals for Visayas while noting that some intervals may have coincident reasons for the pricing error on an interval.
 - In Luzon, a total of 15 intervals were caused by inappropriate input data which affected both regions' prices and schedules whereas only 9 intervals were due to localized transformer constraints.
 - In Visayas, there were 15 intervals for inappropriate input data and 19 for localized transformer constraint reasons. Moreover, over-generation events in Luzon and Visayas for 2 intervals and 13 intervals, respectively, were apparent due to the impact of declining system demand because of the passage of the typhoons. This drop in demand caused power plants to be scheduled at their minimum stable load on top of schedules from price takers.
- None of the intervals were imposed with secondary price caps this month. However, Market Intervention (MI) and Market Suspension (MS) events initiated by the System Operator (SO) and the Energy Regulatory Commission (ERC), respectively, resulted to administered prices for 47 consecutive intervals in the Luzon region from 12 to 13 November.

Table 1. Summary of Pricing Conditions (Ex-ante), November 2020

Pricing Condition	No. of Intervals			
	Luzon	% of Time	Visayas	% of Time
Normal	668	89.8%	690	92.7%
Congestion	13	1.7%	13	1.7%
Pricing Error Notice	16	2.2%	41	5.5%
Administered Price	47	6%	0	0%
Secondary Cap	0	0%	0	0%
Total	744	100%	744	100%

- Market prices this month were generally low because of the system demand effects of the passage of several typhoons on some days, the on-going community quarantine, and cooler recorded temperatures all throughout the month. In addition, the onslaught of the tropical depressions took a toll on several generating plants causing a drop in power supply during the affected days.

Notable Highlight:

1. *Unusual level of demand*
 - *Observance of low level of demand due to imposed community quarantine and weather conditions during the rainy season*
2. *Passage of tropical depressions in the Philippine Area of Responsibility (PAR)*
 - *Strong typhoons resulted to significant drop in demand and supply in the market*
3. *Luzon region under Market Intervention and Market Suspension from 0100H of 12 November to 2300H of 13 November*
 - *Typhoon Ulysses caused power system disturbance upon its landfall in the Quezon province which also traversed Central Luzon*
4. *Occurrence of price spike events at the onset of the billing month*
 - *Price spike events recorded on 28 October as power supply was heavily affected by the passage of Typhoon Quinta*

2. MARKET OUTCOME

2.1 Price¹

2.1.1 Price and Supply Margin

- On 19 August, the GCQ was reinstated, coming from MECQ declaration from 4 to 18 August, and was continuously imposed throughout the November billing month. While quarantine protocols continue to be implemented, there were episodes of price spikes this period due to the weakening power supply caused by the onslaught of the Typhoon Quinta.
- Similar to the pattern of other months this year, November billing month recorded the highest monthly average supply margin at 2,576 MW which resulted in the lowest monthly average market price at PHP1,978/MWh for the same month in the previous 5 years.
- Since the implementation of the community quarantine in March 2020, most months had an unusually high level of average monthly supply margin which resulted to low WESM prices.

¹ The market prices were represented by the following: (i) ex-ante load weighted average price (LWAP) for trading intervals without pricing error during ex-ante, (ii) ex-post LWAP for trading intervals with pricing error during ex-ante but without pricing error during ex-post, (iii) LWAP based on the market re-run result for trading intervals with pricing error both during ex-ante and ex-post, and (iv) estimated load reference price (ELRP) for trading intervals where the ERC-approved Price Substitution Mechanism (PSM) was applied.

- The significant decline in demand of electricity, following the community quarantine measures which significantly softened economic activities and the effects of the devastating typhoons, drove the resulting low prices this November.
- This observation was contrary to the past years historical trend where around the same season higher demand and lower supply margin were noted.

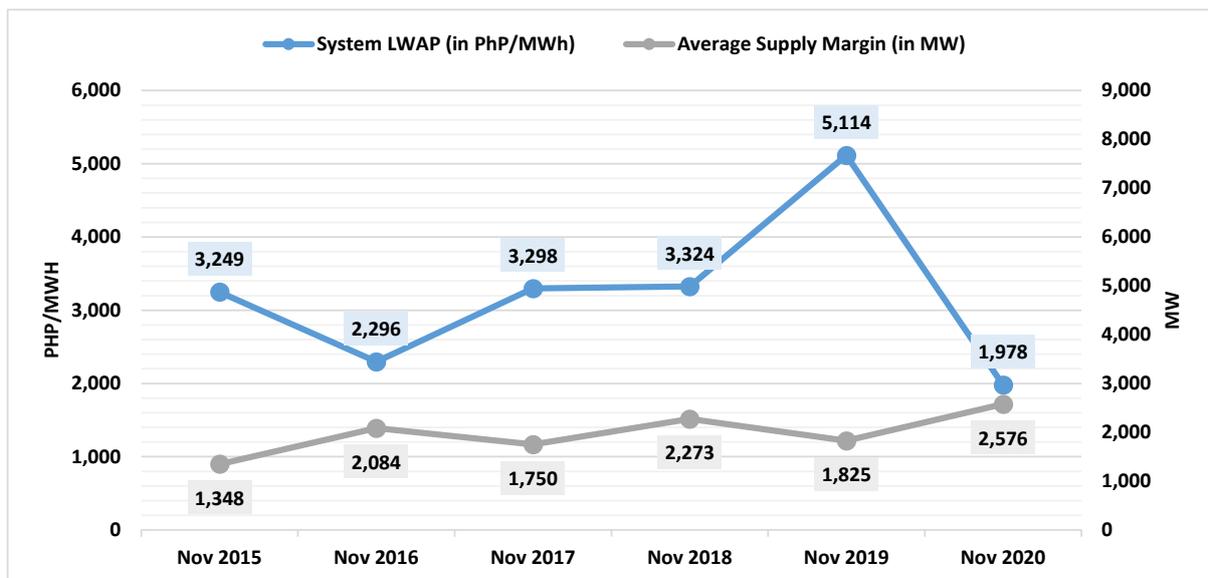


Figure 1. System LWAP and Supply Margin, November 2015-2020

- Monthly load weighted average price (LWAP) dropped by 2.8 percent from PHP2,034/MWh in October to PHP1,978/MWh in November.
 - Monthly average peak prices marginally rose by 7.6 percent from PHP2,311/MWh to PHP2,486/MWh.
 - Monthly average off-peak prices further fell by 15.4 percent from PHP1,750 to PHP1,481/MWh.
- The average supply margin widened by 11.4 percent from 2,313 MW in October to 2,576 MW in November.
- Comparing the average values of market price and supply margin from last year, there was still an unusual level due to the community quarantine which was aggravated by the effects of the passage of the typhoons.

Table 2. System LWAP and Supply Margin, October and November 2015-2020

Year	Month	Average Supply Margin	% Change in Average Supply Margin	System LWAP	% Change in System LWAP
2015	October	1,575	-14%	2,539	28%
	November	1,348		3,249	
2016	October	1,799	16%	2,429	-5%
	November	2,084		2,296	
2017	October	1,704	3%	3,960	-17%
	November	1,750		3,298	
2018	October	1,963	16%	3,819	-13%
	November	2,273		3,324	
2019	October	1,901	-4%	4,219	21%
	November	1,825		5,114	
2020	October	2,313	11%	2,034	-3%
	November	2,576		1,978	

- Hourly resolution of LWAP saw the highest level at PHP22,219/MWh on 28 October 2020, 1400H as a result of the recovering demand plus reserve schedule at 12,597 MW from the effect of Typhoon Quinta despite the difficulty of supply at 12,987 MW to keep up with the increase demand as several power plants were still unavailable. This interval recorded the lowest supply margin for November 2020 at 390 MW.
- About 97 percent of the time, the hourly system LWAP was below the PHP4,000/MWh level.
- Prices during the weekdays averaged at PHP2,241/MWh while during weekends it was at PHP1,514/MWh. Meanwhile, prices during the holidays (All Saint's Day on 01 November and All Soul's Day on 02 November) averaged at PHP806/MWh.
 - Weekday – Off-peak: PHP1,599/MWh; Peak: PHP2,688/MWh
 - Weekend – Off-peak: PHP1,496/MWh; Peak: PHP1,544/MWh
 - Holiday – Off-peak: PHP726/MWh; Peak: PHP1,624/MWh
- The highest average price for an interval was noted on 1800H at PHP3,293/MWh and the lowest was on 0700H at PHP1,207/MWh regardless of the day type (i.e. weekday or weekend). Comparing this to last month, the highest was on 1400H at PHP3,602/MWh and the lowest was still on 0700H at PHP1,409/MWh.
- After the occurrence of high-priced intervals on the onset of the month, the rest of the intervals then resulted to consistently low prices until the end of the billing month
- Several price spike² events were recorded on the following date:
 - 28 October 2020 at 0900H, 1400H, and 1500H
- The price spike events, in general, was caused by high level of forced outages and derated capacities of plants which some were affected by tripping of transmission lines due to the passage of Typhoon Quinta.

² Price spike refers to the significant upward movement of prices brought about by high-priced clearing prices breaching the set threshold for peak and off-peak hours in a season. Prices used in the determination of price spikes are subject to validation and are based on the day-after results of the market.

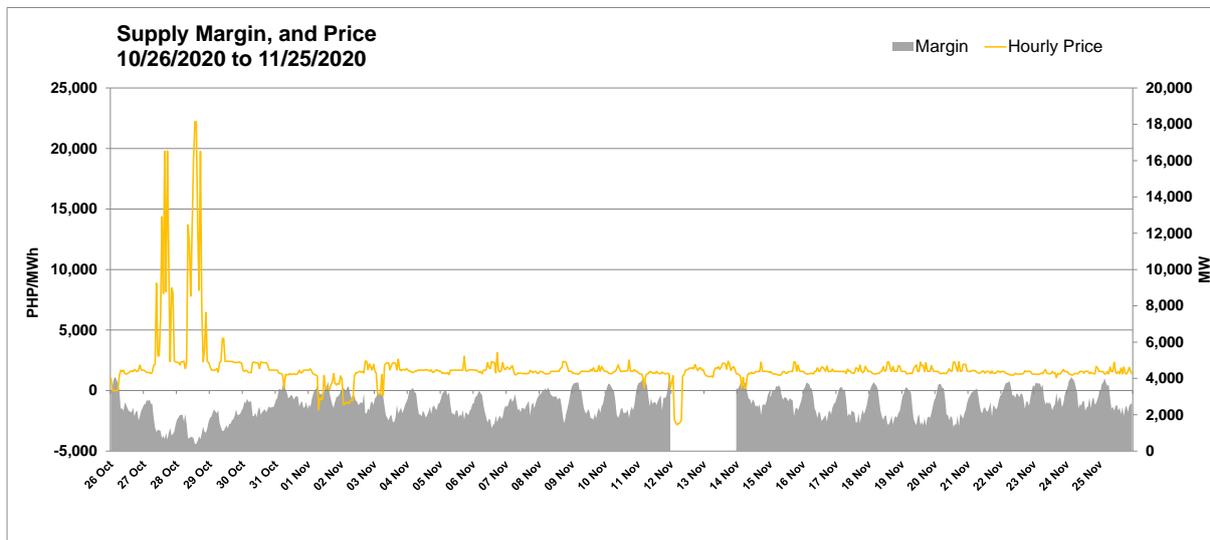


Figure 2. Hourly Supply Margin and Price, November 2020

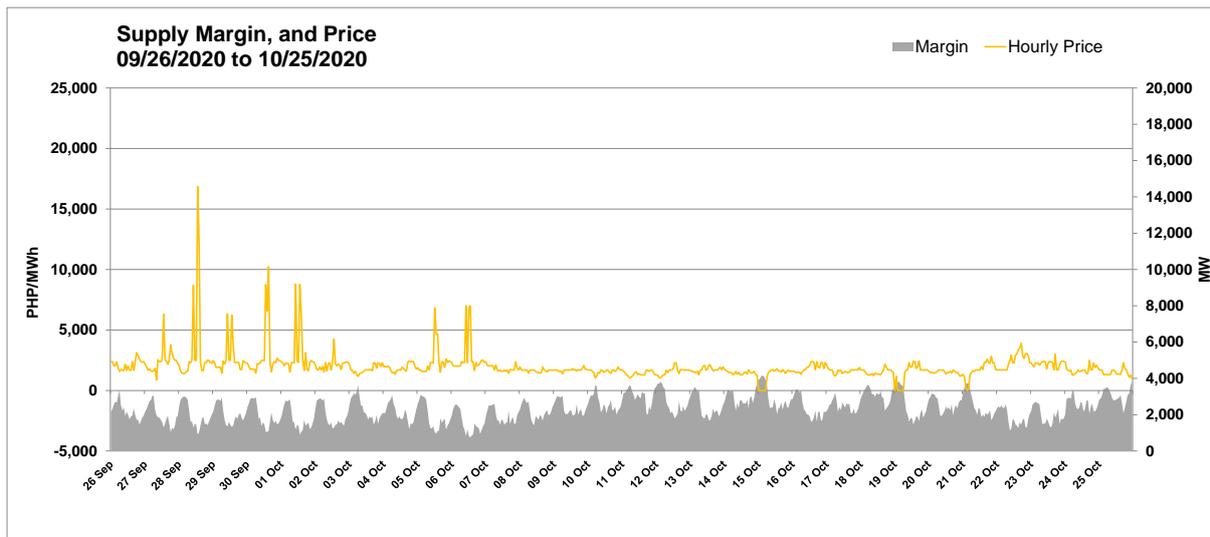


Figure 3. Hourly Supply Margin and Price, October 2020

2.1.2 Load Nodal Price Duration Curve³

- For peak⁴ hours, about 90 percent of the load nodal prices fell below PHP2,400/MWh in November and PHP2,549/MWh in October while distribution of prices during the off-peak hours were seen below PHP2,056/MWh in November and PHP2,371/MWh in October in about the same percentage of time.
- Maximum off-peak and peak load nodal price reached PHP27,846/MWh and PHP22,501/MWh in November, respectively.

³ Load nodal prices under normal pricing condition are used.

⁴ Peak and off-peak intervals differ between Luzon and Visayas regions.

- Almost half or 47 percent of the peak nodal prices were seen ranging from PhP0/MWh to PhP2,000/MWh while for off-peak nodal prices, this was at 75 percent at the same range.
- Based on the graph below, both the November 2020 peak and off-peak price curves are slightly translated to the left as compared with the October 2020 price curves, indicating lower nodal prices for the month for both hour types.
- Nodal prices reaching PhP20,000/MWh and above were more evident this month for both peak and off-peak intervals as opposed to last month as an effect of the thin supply margin on 28 October.

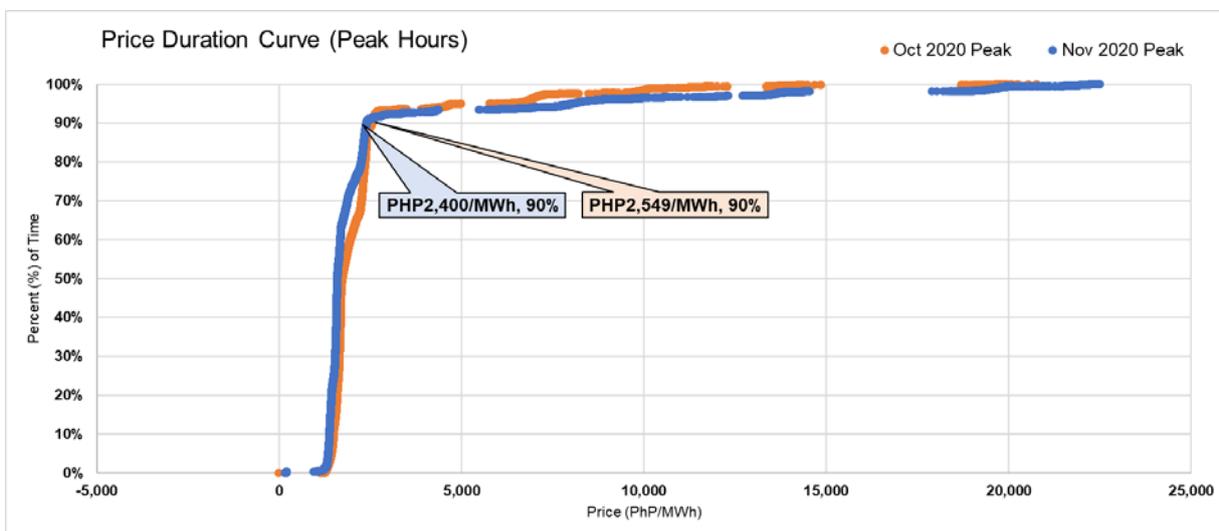


Figure 4. Load Nodal Price Duration Curve (Peak), October and November 2020

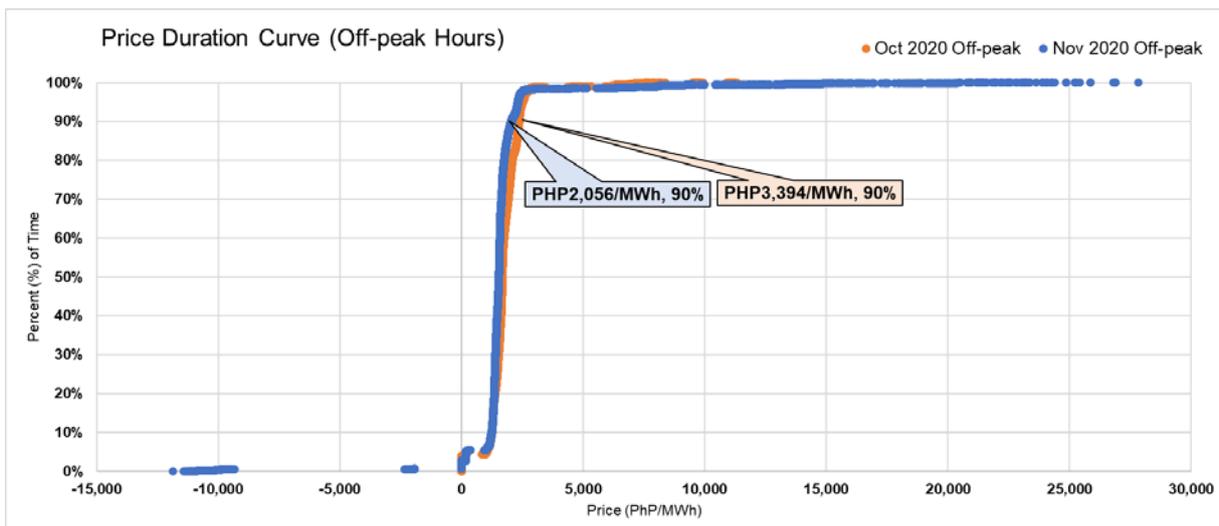


Figure 5. Load Nodal Price Duration Curve (Off-peak), October and November 2020

2.2 Supply

- A significant increase of 652.6 MW in the WESM registered capacity was recorded this month from a total of 20,205.97 MW to 20,858.57 MW owing to the following:
 - Entry of the 668-MW GNPower Dinginin Ltd. Co. coal plant on 31 October
 - Decline in capacities of Millennium GTPP from 100 MW to 85 MW and Nabas DPP from 6.8 MW to 6.4 MW
- Available capacity⁵ constituted an average of 14,950 MW or 72 percent of the total registered capacity.
- Capacity not offered comprised an average of 2,934 MW or 14 percent.
- Outage capacity accounted for an average of 2,868 MW or 14 percent.
- During the November billing month, a number of strong tropical depressions caused disturbances in the power system of the country, namely Typhoon Quinta on 25 October, Typhoon Rolly on 01 November, and Typhoon Ulysses on 12 November.
- One of the consequences of the tropical depressions even led to the declaration of market intervention and market suspension by the System Operator (SO) and the Energy Regulatory Commission (ERC), respectively from 0100H of 12 November to 2300H of 13 November 2020 at 2300H.

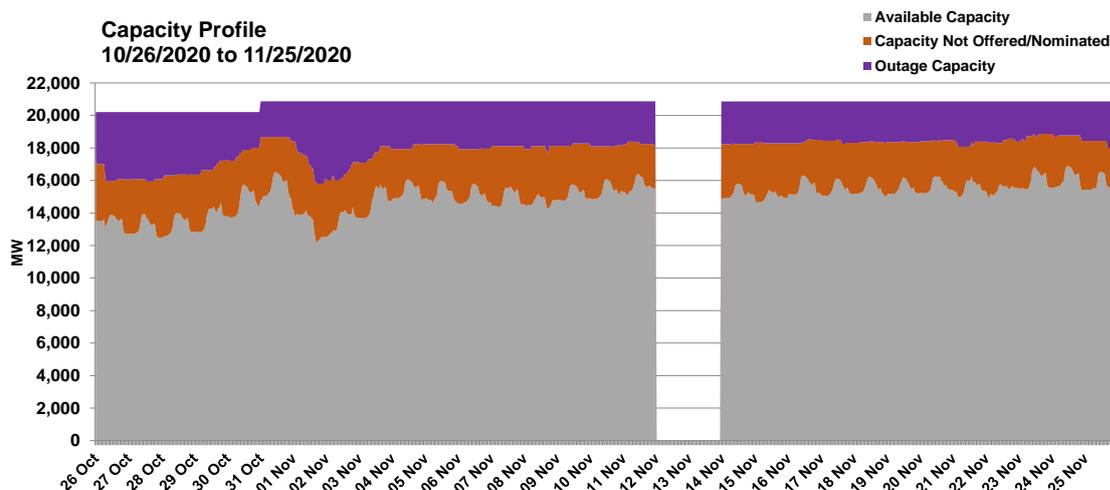


Figure 6. Capacity Profile, November 2020

2.2.1 Outage Capacity⁶

- Outage capacity rose by 17 percent from an average of 2,525 MW last month to an average of 2,963 MW this month.
- Planned outages declined to 244 MW on average or 8 percent of the total outages. Majority or about 84 percent was composed of forced outages averaging at 2,552

⁵ Available capacity refers to the aggregate of Capacity Offered/Nominated, Malaya Capacity for MRU, and Capacity of Plants on Testing and Commissioning

⁶ Notable plants on outage are detailed in the Annex

MW, and maintenance outages at 202 MW or 7 percent of the total outages. Meanwhile, deactivated shutdown accounted for only about 55 MW on average or 2 percent of the outages.

- Total outage capacity for the month closed at 2,966 MW, slightly lower than its opening level at 3,011 MW.
- Coal plants majorly contributed to the level of forced outages while hydro plants figured in the planned outages. Geothermal plants, meanwhile, majorly accounted for the maintenance outages and deactivated shutdown.

Table 3. Outage Factor by Plant Type and Outage Category, November 2020

Plant Type	Planned Outage (8%)	Forced Outage (84%)	Maintenance Outage (7%)	Deactivated Shutdown (2%)
Coal	4%	46%	16%	0%
Natural Gas	0%	29%	2%	0%
Geothermal	0%	12%	76%	100%
Hydro	73%	1%	0%	0%
Oil-based	23%	12%	6%	0%
TOTAL	100%	100%	100%	100%

- Planned outages level was halved from last month, averaging at 244 MW this month as influenced by forced outages from Kalayaan PSPP units.
- On the other hand, forced outages' monthly average level increased by 40 percent from 1,825 MW to 2,552 MW.
- Maintenance outages were kept at a low level similar with last month at an average of 202 MW.
- Total outages were almost consistently below 3,000 MW throughout the month except for the spike in level due to the significant increase in average level of forced outages owing to several plant outages as an effect of the passage of strong typhoons.
- This month noted the highest hourly outage for the year at 6,840 MW on 12 November at 0600H as a result of the passage of Typhoon Ulysses.

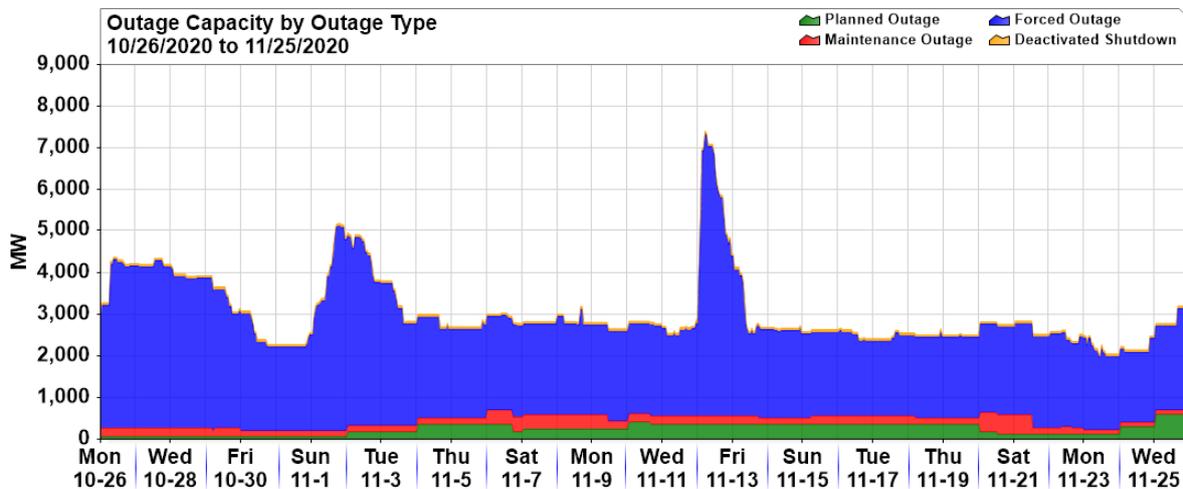


Figure 7. Outage Capacity by Outage Category, November 2020

Table 4. Outage Summary by Outage Category, October and November 2020

Outage Category	Nov 2020 (in MW)			Oct 2020 (in MW)		
	Max	Min	Average	Max	Min	Average
Planned	600	60	244	851	60	527
Maintenance	466	109	202	210	114	174
Forced	6,794	1,681	2,552	2,769	1,514	1,825
Deactivated Shutdown	55	55	55	55	55	55
TOTAL	7,406	2,047	3,053	3,147	2,122	2,581

- In terms of type of power plants, coal generators accounted for less than half of the outages at 40 percent from 44 percent last month. The decline in coal outage share was influenced by the increase in geothermal and hydro outage from 13 percent to 15 percent and from almost none or 0.1 percent to 7 percent, respectively. Natural gas plants experienced a similar but minimal decline from 26 percent to 25 percent. Oil-based plants came in last with 12 percent share.
- While decreases in percentage shares were noted for coal and natural gas plants, looking at the corresponding average outage levels, these were increases from their last month level.
- Notable was the spike in outages from geothermal and natural gas plants caused by the Typhoon Quinta on the onset of the month. The following plants were affected by the passage of the typhoon – Tiwi GPP units 2, 5, and 6 (174 MW), Bacman GPP units 1, 2, and 3 (140 MW), Sta Rita NGPP unit 2 (256 MW), and Ilijan NGPP (1,200 MW).
- On 01 November, another typhoon, named Typhoon Rolly in the Philippines, caused another disturbance in the power grid by rendering transmission lines unavailable and causing outages from numerous power plants. The following plants went on outage during its passage – Ilijan NGPP (1,200 MW), Sta. Rita NGPP unit 2 (256 MW), San Lorenzo NGPP unit 1 (265 MW), Bacman GPP unit 1

(60 MW), Tiwi GPP units 2 and 6 (117 MW), Makban GPP units 1, 4, 5, 7, and 8 (221 MW), and Pagbilao CFTPP unit 1 (382 MW).

- The Typhoon Ulysses that hit the country caused the highest recorded hourly outage for the month on 12 November, 0600H. Outages during the interval reached as high as 2,544 MW for natural gas plants and 2,582 MW for coal plants with a total combined outage capacity of all plant types at 6,840 MW. All these outage events were on top of the existing outages from San Gabriel NGPP (420 MW), and Sual CFTPP unit 2 (647 MW).

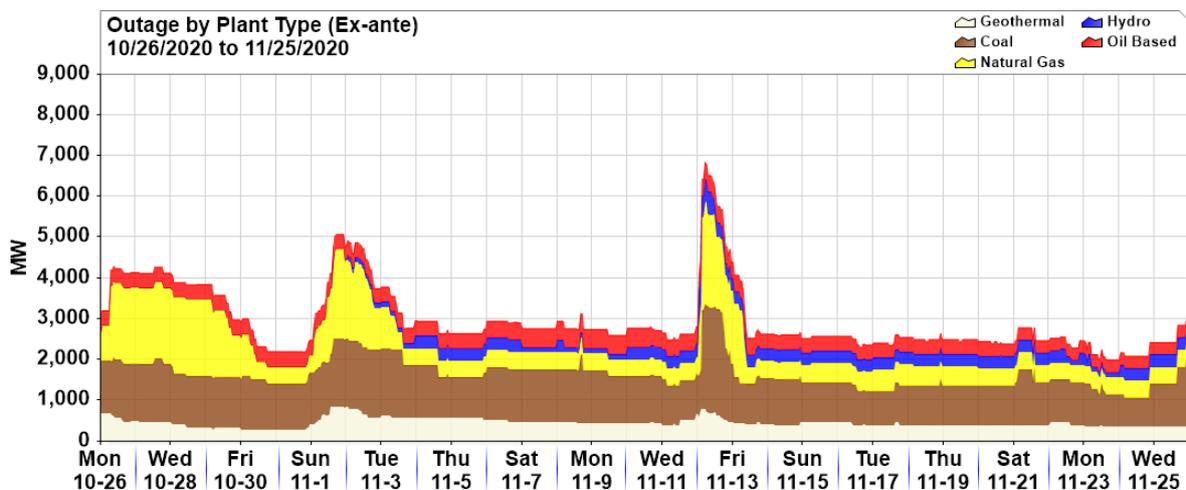


Figure 8. Outage Capacity by Plant Type, November 2020

Table 5. Outage Summary by Plant Type, October and November 2020

Plant Type	Nov 2020 (in MW)			Oct 2020 (in MW)		
	Max	Min	Average	Max	Min	Average
Coal	2,582	707	1,190	1,682	707	1,121
Natural Gas	2,544	420	746	726	420	669
Geothermal	859	270	455	676	172	323
Hydro	888	0	202	97	0	2
Oil-based	467	300	370	491	360	411
TOTAL	6,840	1,990	2,963	3,182	2,083	2,525

2.3 System Demand

- Monthly system demand further dropped to an average of 9,375 MW with cooler recorded temperatures compared to last month as an effect of the season, a consequence of the on-going quarantine measure for the pandemic, and the passage of strong typhoons. This was a 4 percent reduction from last month's average of 9,788 MW.
- In comparison to the last month, the average off-peak demand at 8,504 MW this period saw a 6 percent decline as well as a 3 percent cut in the average peak demand recorded at 10,389 MW.

- Maximum system demand in November reached 11,854 MW for peak hours and 10,332 MW for off-peak hours both on 20 November, Friday.
- Minimum system demand in November was at 6,604 MW for peak hours and 5,907 MW for off-peak hours which transpired during the two holidays - 01 November, Sunday and 02 November, Monday, respectively.
- For the year 2020, the highest recorded hourly system demand was on 10 March 2020, 1400H at 13,162 MW, prior the enforcement of the community quarantine on 15 March 2020.
- Notable was the decline in average temperatures during Mondays and Tuesdays due to the typhoons coinciding with those days.

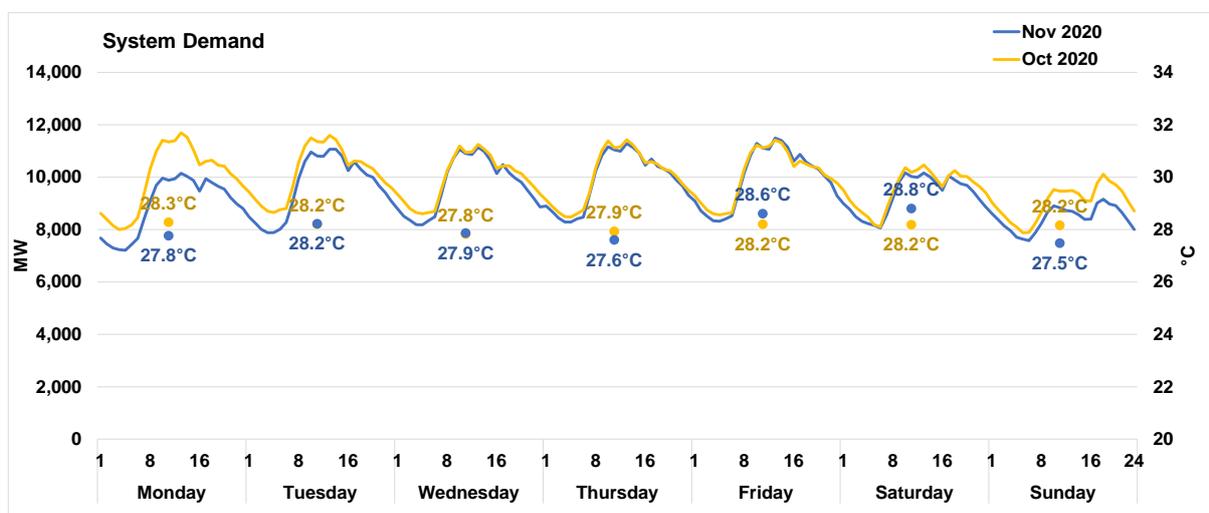


Figure 9. Average Hourly System Demand, October and November 2020

- On a yearly comparison, the demand was down by 8 percent from 10,218 MW in 2019 to 9,375 in 2020, owing to the community quarantine which was aggravated by the presence of the typhoons.
- The downturn in average demand was attributable to the 10 percent decrease during off-peak hours from 9,397 MW to 8,504 MW and a likewise decline during the peak hours by 9 percent from last year from 11,418 MW to 10,389 MW.
- The average temperatures per weekday in November this year were most of the time lower than last year.

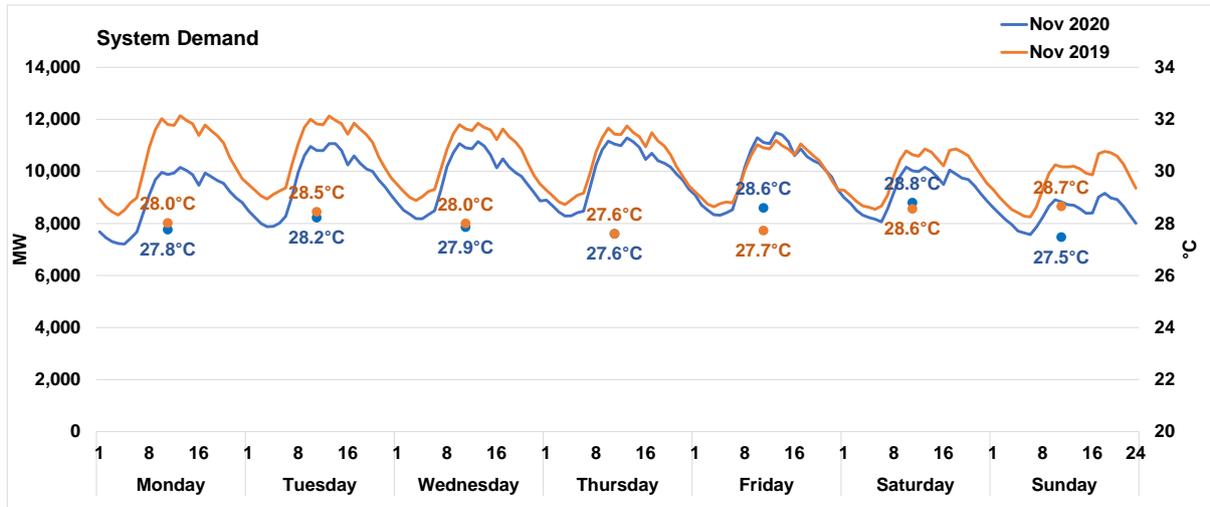


Figure 10. Average Hourly System Demand, November 2019 and 2020

- Year 2020 was exempt from the consistent annual pattern of increasing demand every November, which deviant trend was primarily because of the community quarantine period.
- The all-time highest hourly system demand was still on 21 June 2019, 1400H at 13,378 MW.
- Similar with previous billing months under the community quarantine where this year's average level of demand was lower than their previous 1 to 2 years of average demand, the November billing month was no different in pattern.

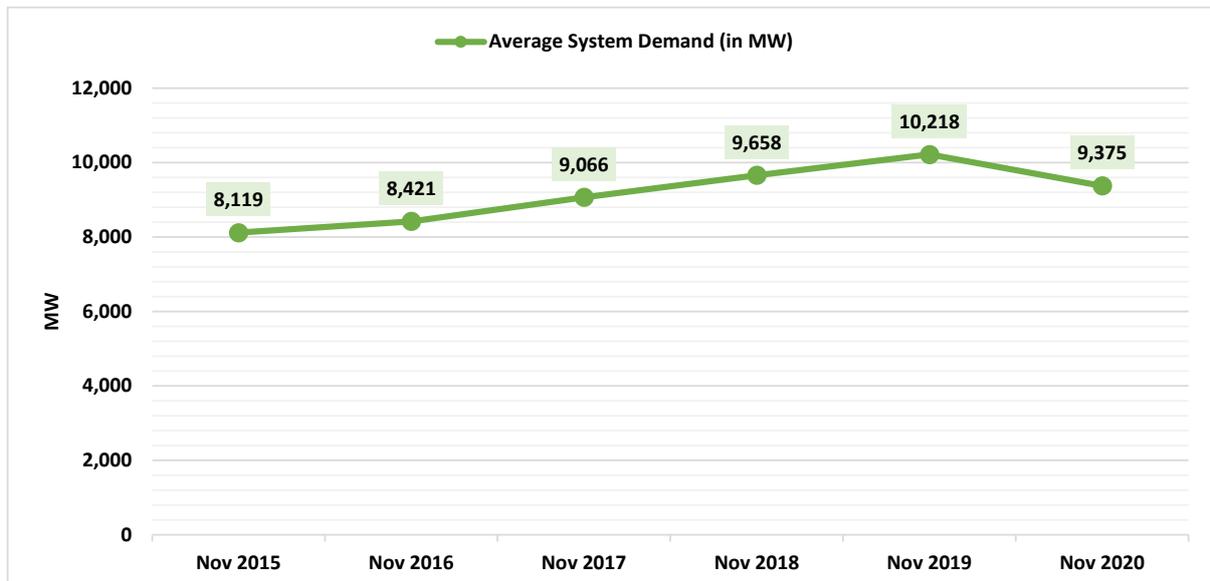


Figure 11. Average System Demand, November 2015-2020

3. SPOT TRANSACTIONS

3.1 Spot Exposure

3.1.1 Load

- Spot quantities⁷ of load participants in November stood at 12.7 percent of the total metered quantities, lower than last month's 13.6 percent spot exposure, which signaled that consumers had less reliance on the market in sourcing their energy needs despite lower prices this month.
- Most of the load quantities at around 85.6 percent of their total consumption, an increase from last month's 85.0 percent, were still transacted outside the spot market and were contracted with generators.

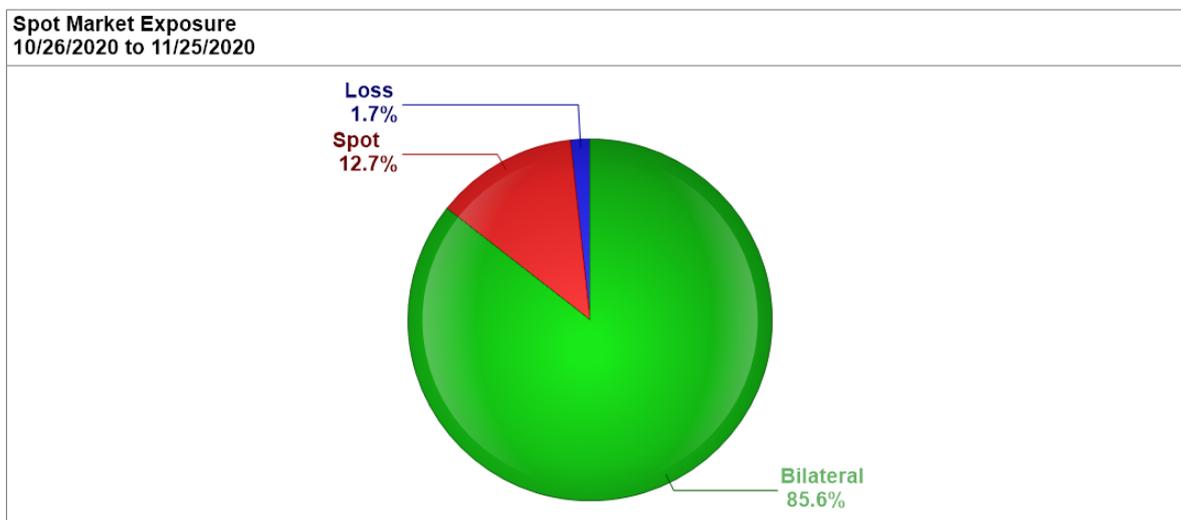


Figure 12. Spot Market Exposure, November 2020

3.1.2 Generator

- Average hourly spot exposure of generators resulted to a significant drop in percentage share in off-peak hours. However, minimal increases were noted during most of the peak intervals where prices are generally higher.
- Spot exposure in off-peak hours averaged at 15.6 percent while it was 13.4 percent during peak hours. Exposure in off-peak hours was lower than last month's 17.3 percent while the latter was higher during peak hours from last month's 13.1 percent.
- Higher spot percentage were observed during the morning off-peak hours than other intervals, where generally, lower spot prices were evident.

⁷ Spot quantity refers to the energy transacted in the market. It is the difference between the metered quantity and the bilateral contract quantity. For generator trading participants, positive spot values indicate energy sold while negative values show energy bought in the market.

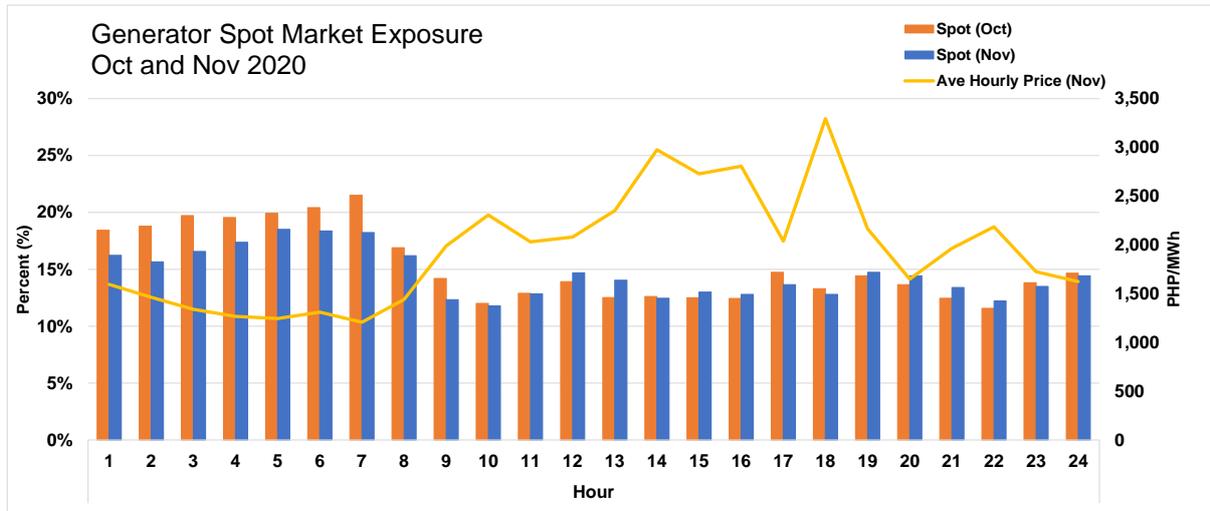


Figure 13. Hourly Generator Spot Market Exposure, October and November 2020

- A low generator market exposure, ranging from 10 to 12 percent, occurred during the high prices and high outage capacity from 28 to 29 October. The low spot exposure resulted from limited generator quantities, caused by high plant outage due to Typhoon Quinta, that were prioritized to serve their bilateral contract obligations.
- Following this, generators sold less quantities at high prices in the market for the first few days of the period.
- During the MI/MS event, generator spot exposure slid to its lowest for the month at 9 percent while the highest was recorded on 15 November at 20 percent.

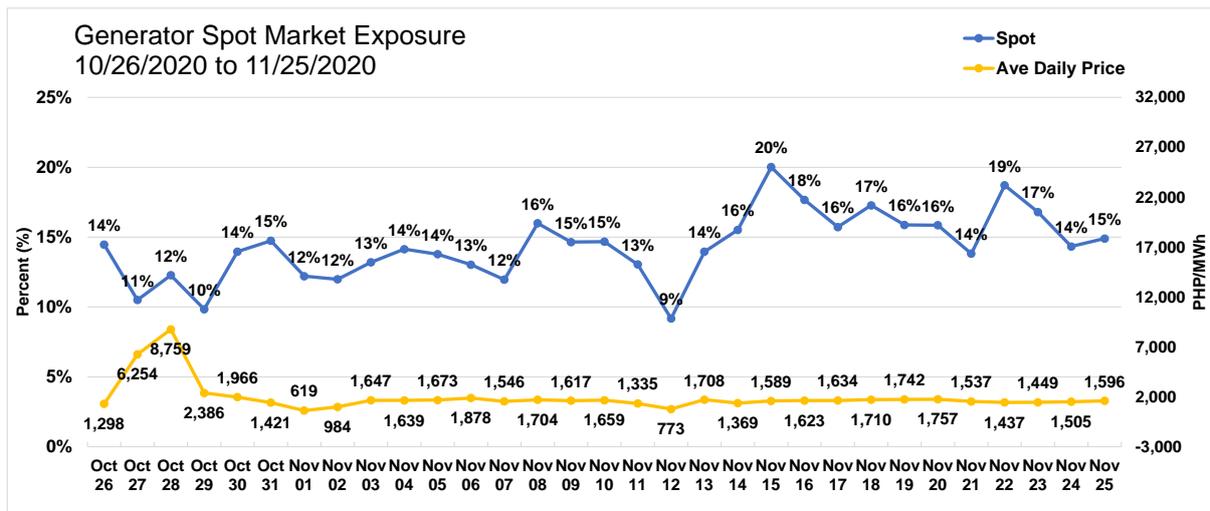


Figure 14. Daily Generator Spot Market Exposure, November 2020

- Based on the spot quantity duration curve⁸ of November billing month, hourly spot quantities of generators were 40 MWh or less at about 90 percent of the time with maximum and minimum spot quantities at 448 MWh and -1,075 MWh, respectively.
- The presence of hourly spot quantities bought in the market above 500 MWh, reaching as high as 1,075 MWh, was on the account of large generating facilities on outage buying energy to serve bilateral contract obligations during the onset of the month.

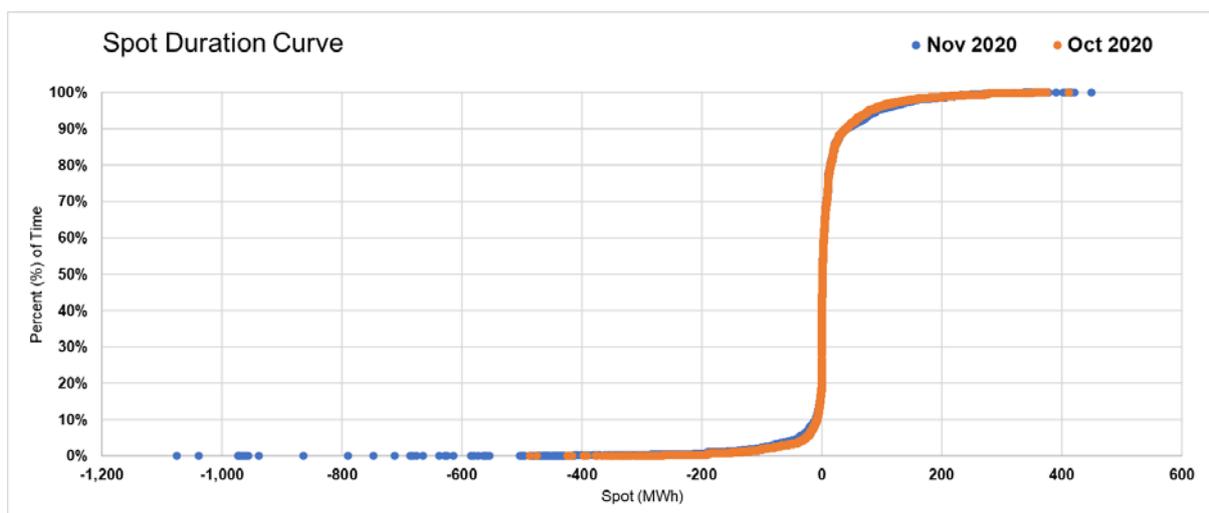


Figure 15. Spot Duration Curve, October and November 2020

- The resulting BCQ to MQ ratio of 0 demonstrates that the entire capacity of generators was being fully sold in the market at around 48 percent of the total generator trading intervals.
- About 18 percent was on the account of partial allocation of BCQ with respect to the generator's MQ.
- Meanwhile, about 15 percent of the total generator trading intervals had a BCQ to MQ ratio of 1 which resulted from all metered quantities being allocated to serve bilateral contract obligations.
- About 10 percent was the result of BCQ being greater than MQ, reaching up to twice the MQ.
- Presence of BCQ/MQ ratios greater than 2 or 200%, consisting about 3% of the total, was the result of very small MQs (<1MWh) as compared to their BCQ, such that dividing by a very small number yields an extremely high number.
- The remaining 7 percent, however, were accounted for by generators which fully bought energy in the market to serve their bilateral contract obligations because of no generated MQ.

⁸ The spot duration curve utilizes data on a per generator trading interval, meaning, all the data consisted of spot quantities of every generator per interval for the period considered. Positive spot values indicate quantities sold in the market while negative values are quantities bought.

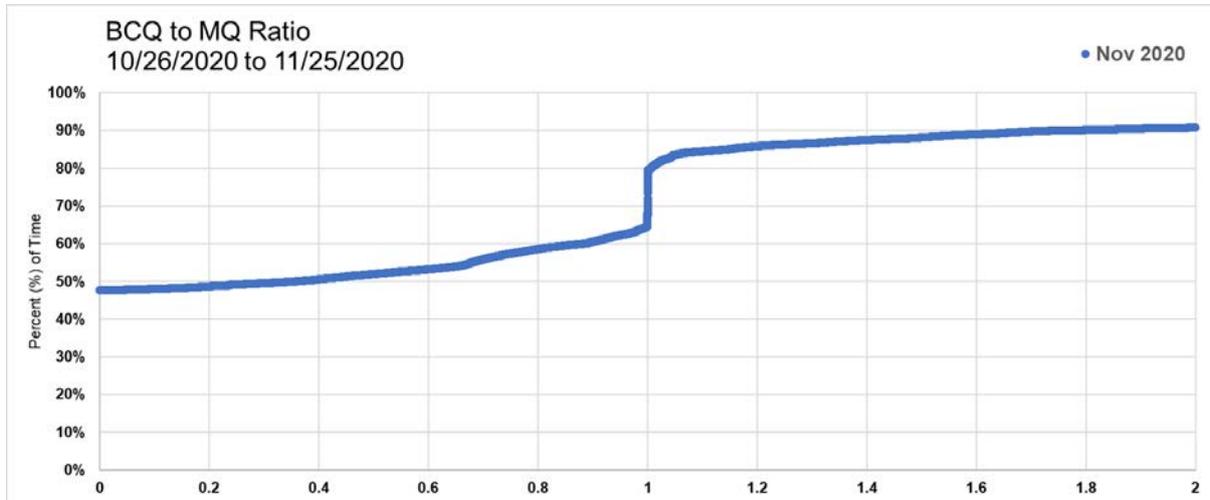


Figure 16. BCQ to MQ Ratio, November 2020

- Generator spot quantities for October and November billing months were still much more concentrated on the -200 MWh to 200 MWh range and were almost identical in distribution except for the evident spot transactions below -600 MWh (energy bought) in November.
- About 74 percent of the total generator spot transactions in November was on the account of energy being sold in the market (positive MWh quantity). Last month’s October billing period was observed to have the same trend wherein most of the generator spot quantities were sold in the market instead of being bought.

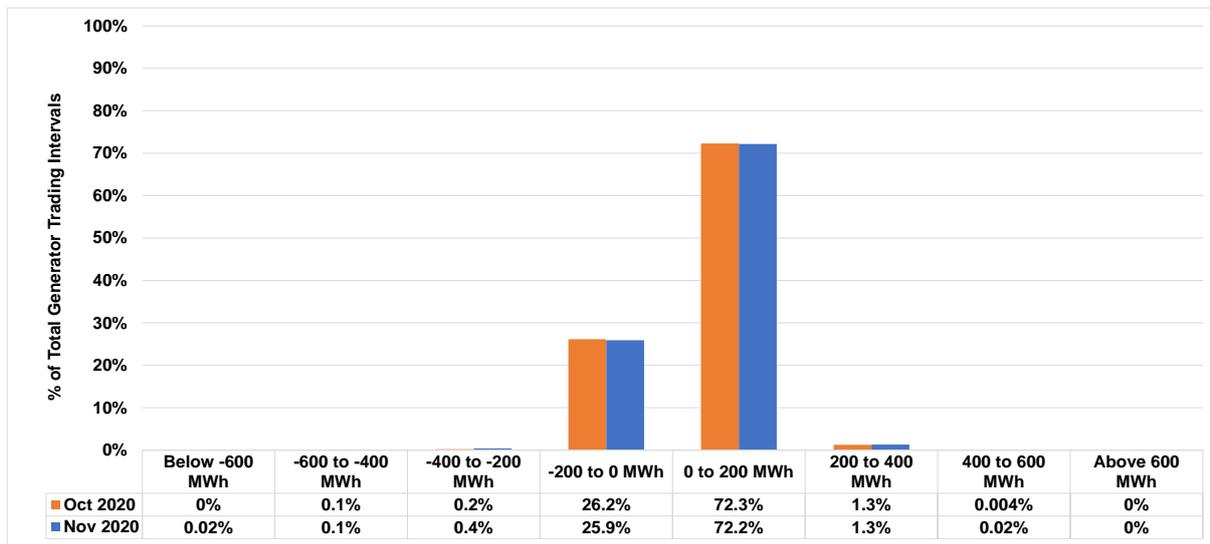


Figure 17. Spot Frequency Distribution Table, October and November 2020

3.2 Pivotal⁹ Plants

- Out of the 744 trading intervals in November 2020 billing month, only 15 intervals had a Residual Supply Index¹⁰ (RSI) below the 100 percent mark from 26 intervals in October, indicating the less frequent presence of pivotal suppliers.
- All occurred during the onset of the month where the market experienced tighter supply margin brought about by Typhoon Quinta.
- The market resulted in an average RSI of 115 percent indicating that supply was still generally abundant to satisfy the demand.
- Intervals with RSI below 100 percent had an LWAP of PHP14,950/MWh from last month's PHP5,712/MWh while those with RSI above 100 resulted in a lower LWAP of PHP1,677/MWh from last month's PHP1,869/MWh.
- A total of nineteen (19) power plants were pivotal during the period with five (5) from Luzon and five (5) from Visayas in the top ten list.
- During the November billing month, the market resulted in an RSI ranging from 96 to 143 percent with the presence of higher RSIs during the passage of Typhoon Rolly on 01 November due to wider supply margin.

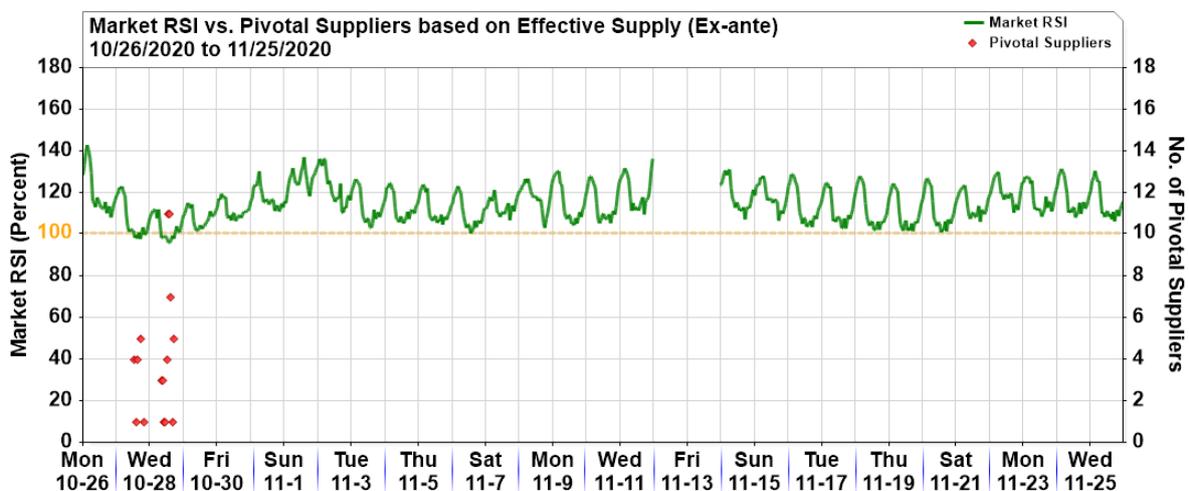


Figure 18. Market RSI vs Pivotal Suppliers, November 2020

⁹ The Pivotal Supply Index (PSI) measures how critical a generator is in meeting the total demand at a time. It is a binary variable (1 for pivotal and 0 for not pivotal) which measures the frequency that a generating unit is pivotal for a period.

¹⁰ The Residual Supply Index (RSI) measures the ratio of the available generation without a generator to the total generation required (including operational reserve) to supply the demand. RSI also determines whether there are pivotal suppliers in an interval. An RSI below 100 indicates the presence of pivotal plants.

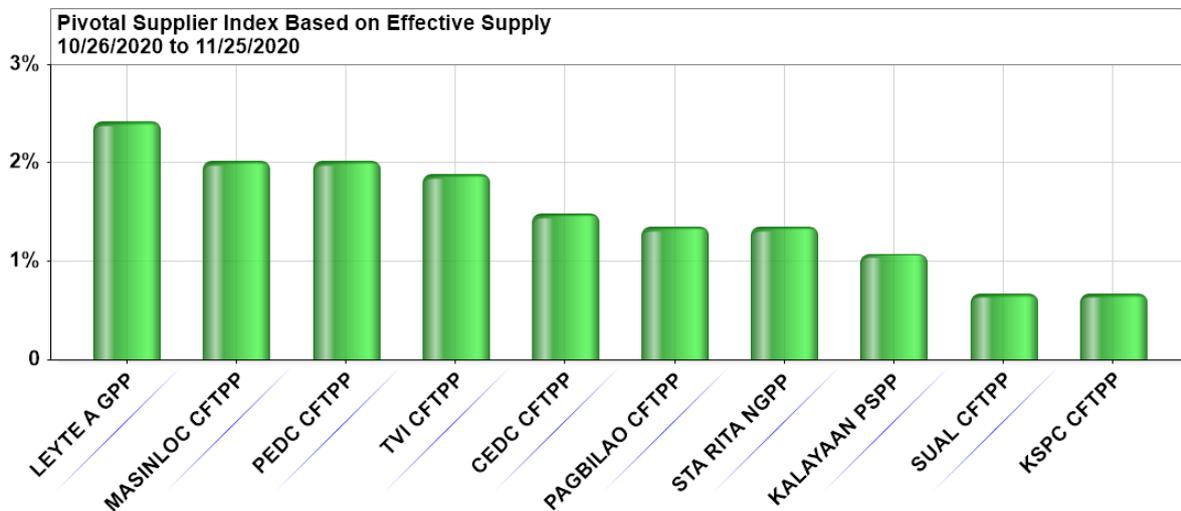


Figure 19. Top Pivotal Plants, November 2020

3.3 Total Trading Amount (TTA)¹¹ Share

- Aboitiz Power (AP) took the top spot this month, recording the highest TTA share of sellers in the market with approximately 33.1 percent. Power Sector Assets and Liabilities and Management (PSALM) rose to second spot with 26.0 percent. Semirara Mining and Power Corporation (SMPC) went down from its previous top spot to third in the list with 16.6 percent. The top 3 sellers noted a cumulative 75.6 percent share during the billing month.
- Meanwhile, PSALM and AP also had the highest spot share at around 28.6 percent and 27.7 percent, respectively, with SMPC coming in third in spot share with 21.1 percent.
- Global Business Power Corporation (GBPC) was up by 2 spots, placing fourth in terms of TTA share despite garnering the lowest spot share in the top list this month.
- Vivant Energy Corporation (VEC) declined to fifth position based on TTA while also securing the same spot in terms of spot share.
- Gregorio Araneta, Inc. (GAI) went up by one spot, placing seventh spot this month in terms of TTA share despite incurring a higher ranking in spot share at fifth.
- Meanwhile, San Miguel Corporation (SMC) and Millennium Energy, Inc. (MEI) was off the top 8 list as a result of posting a lower TTA this month as SPC Power Corporation (SPC), placing sixth, and Universal Robina Corporation (URC), placing eighth, took their spots.
- Meanwhile, 8 generator trading participants registered negative TTAs which resulted from being net buyers in the spot market.

¹¹ The Total Trading Amount (TTA) refers to the amount of revenue from spot market transactions excluding quantities that are declared by the generators as covered by bilateral power supply contracts, which are settled outside the WESM

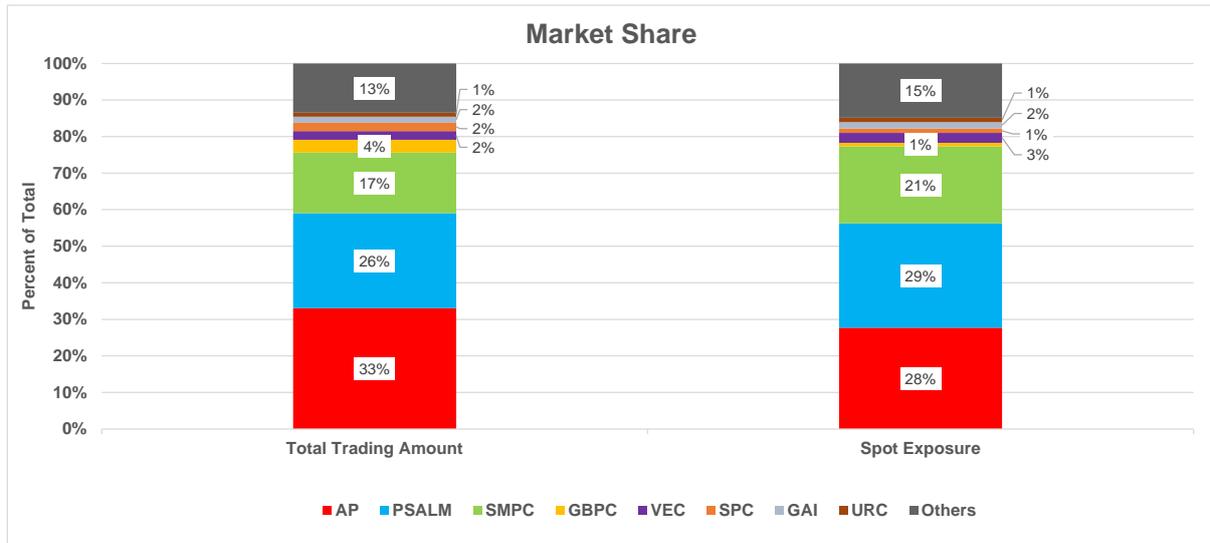


Figure 20. Total Trading Amount and Spot Exposure Share, November 2020

Annex A. List of Major Plant Outages

Region	Plant Type	Plant/ Unit Name	Capacity (MW)	Date Out	Date In	Duration (Days)	Outage Type	Remarks	Date Commissioned/ Commercial Operation
LUZON	GEO	Makban 6	55	04/11/2013 22:44			Deactivated Shutdown	Conducted gas compressor test	Apr 1979
VISAYAS	GEO	PGPP2 Unit 4	20	06/27/2014 6:07	11/02/2020 20:11	2320.59	Forced Outage	Steam being utilized by Nasulo plant	Aug 1983
LUZON	OIL	Malaya 1	300	05/03/2019 18:21			Forced Outage	Motorization of unit generator caused by the non-opening of phase B of PCB 8-05CB08M	Aug 1975
VISAYAS	COAL	TPC Sangli 1	60	12/17/2019 6:05			Forced Outage	Generator differential trip	Dec 2013
LUZON	GEO	Tiwi 1	60	05/27/2020 0:02			Forced Outage	Low steam supply. Divert steam supply to unit 2	Jan 1979
VISAYAS	GEO	Upper Mahiao 3	32	07/22/2020 17:01			Maintenance Outage	Trip with Loss of Excitation. Economic Shutdown	Jul 1997
LUZON	NATG	San Gabriel	420	09/05/2020 17:14			Forced Outage	Tripped at 211MW load. System Frequency is 59.401hz.	Mar 2016
LUZON	OIL	Limay 3	60	09/14/2020 0:01	11/20/2020 12:01	67.50	Planned Outage	Maintenance Outage until 28 October 2020	May 1993
LUZON	COAL	Sual 2	647	09/16/2020 14:45			Forced Outage	Tripped due to high turbine vibration	Oct 1999
VISAYAS	GEO	Leyte 2	39.3	09/19/2020 1:58			Maintenance Outage	Corrective maintenance. data gathering for the high vibration (0200H-0600H)	Jun 1983
VISAYAS	GEO	PGPP1 Unit 1	37.5	09/19/2020 23:47			Maintenance Outage	Offline due to scheduled maintenance.	Aug 1983
LUZON	COAL	Calaca 2	300	10/16/2020 16:36	11/04/2020 15:36	18.96	Forced Outage	Boiler Tube Leak.	Sep 1984
VISAYAS	COAL	THW 2	169	10/21/2020 3:56	10/28/2020 1:28	6.90	Forced Outage	Under assessment	Dec 2017
LUZON	GEO	Makban 5	55	10/21/2020 8:19	10/29/2020 4:55	7.86	Maintenance Outage	Maintenance Outage	Apr 1979
VISAYAS	GEO	Leyte 1	41	10/23/2020 0:38	11/22/2020 23:03	30.93	Maintenance Outage	Repair leaking steam line	Jun 1983
LUZON	GEO	Makban 2	63.2	10/23/2020 12:20	11/05/2020 21:23	13.38	Forced Outage	Excessive oil leak at main oil pump	Apr 1979
LUZON	COAL	SLTEC 2	122.9	10/23/2020 23:05	11/23/2020 6:13	30.30	Forced Outage	Coal feeder trouble (chute leak)	Aug 2015
LUZON	NATG	Sta. Rita 2	255.7	10/24/2020 11:16	10/29/2020 4:39	4.72	Forced Outage	Main Steam drain leak	Jun 2000
VISAYAS	GEO	PGPP1 Unit 3	37.5	10/25/2020 5:05	10/26/2020 7:03	1.08	Forced Outage	Offline to conduct corrective works on cooling tower fans	Aug 1983
LUZON	GEO	Tiwi 5	57	10/25/2020 16:19	10/26/2020 16:26	1.00	Forced Outage	On houseload operation as contingency for the passage of Typhoon Quinta	Jan 1979
LUZON	GEO	Bacman 3	20	10/25/2020 16:58	10/29/2020 5:42	3.53	Forced Outage	Emergency shutdown as contingency for the passage of Typhoon Quinta	Sep 1993
LUZON	GEO	Bacman 1	60	10/25/2020 17:11	10/28/2020 10:22	2.29	Forced Outage	Emergency shutdown as contingency for the passage of Typhoon Quinta	Sep 1993
LUZON	GEO	Bacman 2	60	10/25/2020 17:14	10/28/2020 10:29	2.72	Forced Outage	Tripped while on house load operation as contingency for the passage of Typhoon Quinta	Sep 1993
LUZON	GEO	Tiwi 2	60	10/25/2020 18:32	10/26/2020 11:44	0.72	Forced Outage	From houseload as contingency measure due to the passage of Typhoon QUINTA	Jan 1979
LUZON	GEO	Tiwi 6	57	10/25/2020 18:41	10/26/2020 15:04	0.85	Forced Outage	Tripped while on house load operation as contingency for the passage of Typhoon Quinta	Jan 1979
LUZON	NATG	Ilijan A1	190	10/26/2020 0:29	10/29/2020 13:58	3.56	Forced Outage	Contingency measure for the passage of Typhoon QUINTA	Jun 2002
LUZON	NATG	Ilijan A2	190	10/26/2020 6:33	10/29/2020 17:11	3.44	Forced Outage	Affected by the passage of Typhoon QUINTA (tripping of Dasma-Ilijan-Tayabas 500kV Line)	Jun 2002
LUZON	NATG	Ilijan A3	220	10/26/2020 6:33	10/29/2020 15:40	3.38	Forced Outage	Affected by the passage of Typhoon QUINTA (tripping of Dasma-Ilijan-Tayabas 500kV Line)	Jun 2002
LUZON	NATG	Ilijan B1	190	10/26/2020 6:33	10/30/2020 10:08	4.15	Forced Outage	Affected by the passage of Typhoon QUINTA (tripping of Dasma-Ilijan-Tayabas 500kV Line)	Jun 2002
LUZON	NATG	Ilijan B2	190	10/26/2020 6:33	10/30/2020 7:21	4.03	Forced Outage	Affected by the passage of Typhoon QUINTA (tripping of Dasma-Ilijan-Tayabas 500kV Line)	Jun 2002
LUZON	NATG	Ilijan B3	220	10/26/2020 6:33	10/30/2020 8:49	4.09	Forced Outage	Affected by the passage of Typhoon QUINTA (tripping of Dasma-Ilijan-Tayabas 500kV Line)	Jun 2002
LUZON	COAL	SLTEC 1	121	10/26/2020 8:19	10/30/2020 17:25	4.38	Forced Outage	Isolated due to the tripping of Calaca-Salong 230kV Line	Sep 2014
VISAYAS	GEO	PGPP2 Unit 2	20	10/26/2020 19:07	10/27/2020 2:38	0.31	Forced Outage	Auto-tripped. On-going investigation on cause of tripping	Aug 1983
LUZON	COAL	SLPGC 1	150	10/27/2020 12:26	10/27/2020 18:19	0.25	Forced Outage	Tripped due to high turbine vibration.	Jan 2015
VISAYAS	OIL	Bohol 2	4	10/27/2020 19:29	10/31/2020 18:01	3.94	Forced Outage	Auto-tripped without indication.	Sep 1978
VISAYAS	OIL	PDP3 H	13	10/28/2020 17:20	11/01/2020 9:22	3.67	Forced Outage	Shutdown due to broken exhaust port Cyl. A2	Mar 2005
LUZON	GEO	Makban 4	63.2	10/29/2020 5:19	10/29/2020 23:47	0.77	Maintenance Outage	Maintenance of unit transformer	Apr 1979
VISAYAS	COAL	TPC Sangli 2	85	10/29/2020 22:27	10/30/2020 6:23	0.33	Forced Outage	AUTO TRIPPED UPON SYNCHRONIZATION AT TOLEDO SS	Dec 2013
LUZON	GEO	Bacman 3	20	10/31/2020 20:11	11/08/2020 13:03	7.70	Forced Outage	Shutdown as contingency measures for incoming Typhoon ROLLY	Sep 1993
LUZON	GEO	Tiwi 5	57	10/31/2020 20:11			Forced Outage	On houseload operation as contingency measures for incoming Typhoon ROLLY	Jan 1979
LUZON	COAL	SLPGC 1	150	10/31/2020 21:25	11/16/2020 13:49	15.68	Forced Outage	Emergency shutdown due to boiler tube leak.	Jan 2015
LUZON	GEO	Bacman 2	60	10/31/2020 22:32	11/06/2020 14:24	5.66	Forced Outage	On houseload operation as contingency measures for incoming Typhoon ROLLY	Sep 1993
LUZON	NATG	Ilijan A2	190	11/01/2020 1:37	11/03/2020 10:48	2.38	Forced Outage	Contingency measure for the passage of Typhoon ROLLY	Jun 2002
LUZON	NATG	Ilijan A3	220	11/01/2020 1:55	11/03/2020 9:34	2.32	Forced Outage	Contingency measure for the passage of Typhoon ROLLY	Jun 2002
LUZON	NATG	Ilijan A1	190	11/01/2020 2:06	11/03/2020 7:43	2.23	Forced Outage	Contingency measure for the passage of Typhoon ROLLY	Jun 2002
LUZON	GEO	Bacman 1	60	11/01/2020 2:12	11/10/2020 23:01	9.87	Forced Outage	Shutdown as contingency measures for incoming Typhoon ROLLY	Sep 1993
LUZON	GEO	Tiwi 2	60	11/01/2020 3:33			Forced Outage	On houseload operation as contingency measures for incoming Typhoon ROLLY	Jan 1979
LUZON	GEO	Tiwi 6	57	11/01/2020 5:58			Forced Outage	On houseload operation as contingency measures for incoming Typhoon ROLLY	Jan 1979
VISAYAS	GEO	Nasulo	48.3	11/01/2020 6:21	11/01/2020 22:46	0.68	Forced Outage	Emergency shutdown to conduct hotspot correction of CT and CVWT connectors.	Apr 2014
LUZON	NATG	Ilijan B1	190	11/01/2020 9:26	11/02/2020 16:17	1.29	Forced Outage	Affected by the passage of Super Typhoon ROLLY (contingency measure)	Jun 2002
LUZON	NATG	Ilijan B3	220	11/01/2020 10:24	11/02/2020 17:41	1.30	Forced Outage	Affected by the passage of Super Typhoon ROLLY (contingency measure)	Jun 2002
LUZON	NATG	Ilijan B2	190	11/01/2020 10:35	11/02/2020 18:51	1.35	Forced Outage	Affected by the passage of Super Typhoon ROLLY (contingency measure)	Jun 2002
LUZON	GEO	Makban Ormat 1	3	11/01/2020 11:39	11/02/2020 9:47	0.92	Forced Outage	On emergency shutdown due to the passage of Super Typhoon ROLLY	Apr 1979
LUZON	GEO	Makban Ormat 2	3	11/01/2020 11:39	11/02/2020 9:47	0.92	Forced Outage	On emergency shutdown due to the passage of Super Typhoon ROLLY	Apr 1979
LUZON	GEO	Makban 7	20	11/01/2020 11:44	11/02/2020 10:09	0.93	Forced Outage	On houseload operation as contingency measure due to passage of Typhoon Rolly	Apr 1979
LUZON	GEO	Makban 8	20	11/01/2020 12:00	11/02/2020 9:42	0.90	Forced Outage	On houseload operation as contingency measure due to passage of Typhoon Rolly	Apr 1979
LUZON	GEO	Makban 5	55	11/01/2020 12:05	11/02/2020 1:01	0.54	Forced Outage	On houseload operation as contingency measure due to passage of Typhoon Rolly	Apr 1979
LUZON	GEO	Makban 4	63.2	11/01/2020 12:24	11/02/2020 14:41	1.10	Forced Outage	Unit tripped from houseload as contingency measure due to passage of Typhoon Rolly	Apr 1979
LUZON	GEO	Makban 1	63.2	11/01/2020 12:49	11/02/2020 10:57	0.92	Forced Outage	On houseload operation as contingency measure due to passage of super Typhoon Rolly	Apr 1979
LUZON	COAL	Pagbilao 1	382	11/01/2020 14:13	11/03/2020 14:26	2.00	Forced Outage	Affected by the passage of Super Typhoon ROLLY	Mar 1996
LUZON	NATG	Avion 2	50.3	11/01/2020 15:10	11/02/2020 17:30	1.10	Forced Outage	Affected by the passage of Super Typhoon ROLLY	Aug 2015
LUZON	NATG	Sta. Rita 2	255.7	11/01/2020 15:44	11/01/2020 22:29	0.28	Forced Outage	Plant contingency measure due to the passage of Super Typhoon ROLLY.	Jun 2000
LUZON	NATG	San Lorenzo 1	264.8	11/01/2020 16:35	11/02/2020 3:43	0.46	Forced Outage	Affected by the passage of Super Typhoon ROLLY (contingency measure)	Sep 2002
LUZON	GEO	MGPP 2	12	11/01/2020 17:18	11/01/2020 20:29	0.13	Forced Outage	Affected by the passage of Super Typhoon ROLLY	Dec 2017
LUZON	GEO	MGPP 1	20	11/01/2020 17:18	11/01/2020 20:27	0.13	Forced Outage	Affected by the passage of Super Typhoon ROLLY	Dec 2013
LUZON	HYD	Pantabangan 1	60	11/02/2020 0:01			Planned Outage	Maintenance Outage until 30 November 2020.	Dec 2009
LUZON	HYD	Pantabangan 2	60	11/02/2020 0:01			Planned Outage	Maintenance Outage until 30 November 2020.	Dec 2010
LUZON	NATG	San Lorenzo 1	264.8	11/02/2020 5:43	11/02/2020 12:36	0.29	Forced Outage	Emergency shutdown due to GT problem.	Sep 2002
VISAYAS	GEO	PGPP2 Unit 4	20	11/02/2020 20:12	11/02/2020 23:01	0.12	Forced Outage	Auto tripped. on going investigation.	Aug 1983
VISAYAS	OIL	PDP3 G	13	11/03/2020 16:01	11/04/2020 0:13	0.34	Forced Outage	Excessive gas leak	Mar 2005
LUZON	HYD	Kalayaan 1	180	11/04/2020 0:01	11/06/2020 17:07	2.71	Planned Outage	Maintenance Outage until 06 November 2020	Aug 1982
LUZON	HYD	Maris 2	4.3	11/04/2020 7:05	11/04/2020 15:22	0.35	Maintenance Outage	Under water crack inspection of pillars near trask rack area.	Oct 2017
LUZON	HYD	Maris 1	4.3	11/04/2020 7:06	11/04/2020 15:26	0.35	Maintenance Outage	Under water crack inspection of pillars near trask rack area.	Oct 2017
VISAYAS	COAL	PEDC 1	83.7	11/04/2020 20:37	11/04/2020 21:54	0.05	Forced Outage	Trip off(2nd). Cause under investigation.	Nov 2010
VISAYAS	COAL	THW 2	169	11/05/2020 20:23	11/11/2020 2:30	5.25	Forced Outage	EMERGENCY SHUTDOWN DUE TO COAL FORWARDING BELT PROBLEM	Dec 2017
LUZON	COAL	SMC 1	150	11/05/2020 23:28	11/09/2020 10:05	3.44	Maintenance Outage	Maintenance outage.	Nov 2016
LUZON	OIL	TMO Unit 4	46.8	11/05/2020 23:40	11/13/2020 17:37	7.75	Maintenance Outage	Annual Switchyard PMS.	Nov 2013
LUZON	HYD	Caliraya 1	14	11/06/2020 9:25	11/06/2020 13:41	0.18	Forced Outage	Affected by tripping of Caliraya 13.8kV Bus 1 and 2.	Oct 2002
LUZON	HYD	Caliraya 2	14	11/06/2020 9:25	11/07/2020 0:11	0.62	Forced Outage	Affected by tripping of Caliraya 13.8kV Bus 1 and 2.	Oct 2002
VISAYAS	OIL	TPC Carmen 1	10	11/06/2020 17:41	11/06/2020 20:09	0.10	Forced Outage	AUTO TRIPPED DUE TO LUBRICATION SYSTEM PROBLEM	Mar 1979
VISAYAS	OIL	TPC Carmen 2	10	11/06/2020 17:50	11/06/2020 22:17	0.19	Forced Outage	MANUALLY CUT-OUT DUE TO LUBRICATION SYSTEM PROBLEM	Mar 1979
LUZON	OIL	Limay 1	60	11/07/2020 0:01	11/10/2020 15:33	3.65	Planned Outage	Planned Outage until 13 November 2020	May 1993
LUZON	HYD	Kalayaan 2	180	11/07/2020 23:48	11/08/2020 4:08	0.18	Forced Outage	Protection problem.	Aug 1982
LUZON	COAL	Pagbilao 2	382	11/08/2020 15:24	11/08/2020 17:49	0.10	Forced Outage	Tripped. With on-going troubleshooting of PCB8-01CB24PAG during the incident.	Mar 1996
LUZON	HYD	Kalayaan 2	180	11/10/2020 0:01	11/20/2020 0:01	10.00	Planned Outage	Maintenance Outage until 19 November 2020.	Aug 1982
VISAYAS	GEO	PGPP1 Unit 2	37.5	11/10/2020 15:40	11/10/2020 18:17	0.11	Forced Outage	Auto-tripped. On going investigation on cause of tripping.	Aug 1983
LUZON	GEO	Bacman 2	60	11/11/2020 7:12	11/11/2020 8:24	0.05	Forced Outage	Hotwell pump trouble	Sep 1993
LUZON	GEO	Bacman 1	60	11/11/2020 11:12	11/12/2020 15:54	1.20	Forced Outage	Isolated due to the tripping of Naga-Daraga 230kV Line	Sep 1993
LUZON	GEO	Bacman 2	60	11/11/2020 11:12	11/12/2020 20:12	1.38	Forced Outage	Isolated due to the tripping of Naga-Daraga 230kV Line	Sep 1993
LUZON	GEO	Bacman 3	20	11/11/2020 11:12	11/13/2020 8:25	1.88	Forced Outage	Isolated due to the tripping of Naga-Daraga 230kV Line. On house load operation.	Sep 1993
LUZON	HYD	Ambuklao 2	35	11/11/2020 15:35	11/11/2020 16:38	0.04	Forced Outage	Broken Shear Pin. As CR Non-Firm	Dec 1956
LUZON	HYD	Caliraya 1	14	11/11/20					

Annex A. List of Major Plant Outages

Region	Plant Type	Plant/ Unit Name	Capacity (MW)	Date Out	Date In	Duration (Days)	Outage Type	Remarks	Date Commissioned/ Commercial Operation
LUZON	NATG	Sta. Rita 2	255.7	11/12/2020 1:08	11/13/2020 8:36	1.31	Forced Outage	Advised to shutdown due to over generation caused by typhoon Ulysses. (On Market Int	Jun 2000
LUZON	NATG	Sta. Rita 1	257.3	11/12/2020 1:21	11/13/2020 7:34	1.26	Forced Outage	Advised to shutdown due to over generation caused by typhoon Ulysses.(On market inte	Jun 2000
LUZON	NATG	San Lorenzo 2	261.8	11/12/2020 1:29	11/12/2020 6:42	0.22	Forced Outage	Advised to shutdown due to over generation caused by typhoon Ulysses.(On market inte	Sep 2002
LUZON	GEO	Makban 2	63.2	11/12/2020 1:42	11/12/2020 12:16	0.44	Forced Outage	House load due to Passage of TC Ulysses.	Apr 1979
LUZON	NATG	Ilijan A3	220	11/12/2020 1:50	11/13/2020 7:59	1.26	Forced Outage	Advised to shutdown due to over generation caused by typhoon Ulysses.(On market inte	Jun 2002
LUZON	HYD	Casencan 1	82.5	11/12/2020 1:55	11/12/2020 14:24	0.52	Forced Outage	Advised to shutdown due to over generation caused by typhoon Ulysses.(On market inte	Apr 2002
LUZON	COAL	Calaca 2	300	11/12/2020 1:59	11/13/2020 0:14	0.93	Forced Outage	Advised to shutdown due to over generation caused by typhoon Ulysses.(On market inte	Sep 1984
LUZON	NATG	Ilijan A1	190	11/12/2020 2:06	11/13/2020 9:03	1.29	Forced Outage	Advised to shutdown due to over generation caused by typhoon Ulysses.(On market inte	Jun 2002
LUZON	NATG	Sta. Rita 4	264	11/12/2020 2:09	11/13/2020 8:04	1.25	Forced Outage	Advised to shutdown due to over generation caused by typhoon Ulysses.(On market inte	Oct 2001
LUZON	COAL	Pagbilao 2	382	11/12/2020 2:12	11/12/2020 18:51	0.69	Forced Outage	Advised to shutdown due to over generation caused by typhoon Ulysses.(On market inte	Mar 1996
LUZON	COAL	SBPL	455	11/12/2020 2:24	11/12/2020 17:58	0.65	Forced Outage	Advised to shutdown due to over generation caused by typhoon Ulysses.(On market inte	Apr 2019
LUZON	COAL	Masinloc 1	315	11/12/2020 2:42	11/12/2020 22:01	0.80	Forced Outage	Advised to shutdown due to over generation caused by typhoon Ulysses.(On market inte	Jun 1998
LUZON	NATG	San Lorenzo 1	264.8	11/12/2020 4:12	11/12/2020 11:49	0.32	Forced Outage	Advised to shutdown due to over generation caused by typhoon Ulysses.(On market inte	Sep 2002
LUZON	COAL	SMC 3	150	11/12/2020 4:50	11/12/2020 20:59	0.67	Forced Outage	Advised to shutdown due to over generation caused by typhoon Ulysses.(On market inte	Nov 2017
LUZON	GEO	Makban 9	20	11/12/2020 10:01	11/14/2020 6:54	1.87	Forced Outage	Due to the passage of Typhoon ULYSSES.	Apr 1979
VISAYAS	GEO	Leyte 3	40.2	11/12/2020 15:52	11/12/2020 21:42	0.24	Forced Outage	Under assessment.	Jun 1983
LUZON	COAL	SMC 1	150	11/12/2020 21:34	11/13/2020 4:59	0.31	Forced Outage	Tripped at 75MW load. Turbine Protection actuation.	Nov 2016
LUZON	HYD	Casencan 2	82.5	11/13/2020 9:51	11/13/2020 10:36	0.03	Forced Outage	Emergency shutdown due to clogged water filter with debris.	Apr 2002
LUZON	HYD	Casencan 2	82.5	11/13/2020 12:46	11/13/2020 13:07	0.01	Forced Outage	Emergency shutdown due to clogged water filter with debris.	Apr 2002
LUZON	COAL	SMC 1	150	11/13/2020 15:21	11/14/2020 22:32	1.30	Forced Outage	Emergency shutdown to check the Boiler.	Nov 2016
LUZON	GEO	Bacman 2	60	11/13/2020 16:28	11/13/2020 18:16	0.07	Forced Outage	Under voltage protection actuated.	Sep 1993
LUZON	GEO	Makban 8	20	11/14/2020 8:24			Forced Outage	Defective cooling tower fan	Apr 1979
LUZON	GEO	Makban 4	63.2	11/14/2020 21:45	11/16/2020 9:35	1.49	Forced Outage	Unit tripped due to isolation caused by the tripping of Makban B 230kV Bus B	Apr 1979
LUZON	NATG	Avion 2	50.3	11/15/2020 5:01	11/18/2020 4:34	2.98	Maintenance Outage	Maintenance outage.	Aug 2015
LUZON	HYD	Ambuklao 1	35	11/16/2020 0:51	11/16/2020 2:33	0.07	Forced Outage	Broken Shear Pin.	Dec 1956
LUZON	GEO	Makban 9	20	11/16/2020 16:30	11/16/2020 18:39	0.09	Forced Outage	False actuation of generator protection.	Apr 1979
LUZON	GEO	Makban 4	63.2	11/17/2020 12:25	11/17/2020 17:31	0.21	Forced Outage	Low Condenser vacuum.	Apr 1979
VISAYAS	COAL	PALM 1	135	11/17/2020 14:18	11/23/2020 9:01	5.78	Forced Outage	Turbine tripped	Mar 2016
LUZON	COAL	SLPGC 1	150	11/18/2020 21:28	11/18/2020 22:45	0.05	Forced Outage	Tripped at 150MW load. System Frequency is 59.609hz.	Jan 2015
LUZON	HYD	Ambuklao 1	35	11/19/2020 10:55	11/19/2020 12:09	0.05	Forced Outage	Tripped due to broken shear pin.	Dec 1956
LUZON	COAL	GN Power 1	316	11/20/2020 0:01	11/21/2020 12:44	1.53	Maintenance Outage	Maintenance Outage	May 2013
LUZON	HYD	Kalayaan 2	180	11/20/2020 0:02	11/22/2020 11:27	2.48	Forced Outage	Extension of outage maintenance activities	Aug 1982
VISAYAS	COAL	CEDC 1	82	11/21/2020 0:31	11/24/2020 3:50	3.14	Forced Outage	Tube leak	Apr 2010
LUZON	GEO	Bacman 2	60	11/22/2020 0:08	11/22/2020 14:02	0.58	Forced Outage	Trip at 61MW load.System Frequency at 59.74hz	Sep 1993
LUZON	HYD	Binga 3	35	11/22/2020 8:03	11/22/2020 15:40	0.32	Maintenance Outage	Maintenance Outage	Jan 1960
LUZON	HYD	Kalayaan 2	180	11/22/2020 20:35	11/23/2020 1:02	0.19	Forced Outage	Excessive water leak at cooling system	Aug 1982
LUZON	HYD	Kalayaan 2	180	11/23/2020 2:54	11/23/2020 4:37	0.07	Forced Outage	Oil circulating pump trouble	Aug 1982
VISAYAS	COAL	CEDC 2	82	11/23/2020 11:12	11/23/2020 14:32	0.14	Forced Outage	UNIT TRIPPED DUE TO HIGH GENERATOR STATOR WINDING TEMPERATURE	Jun 2010
VISAYAS	COAL	PALM 1	135	11/23/2020 11:37	11/23/2020 12:01	0.02	Forced Outage	Drum level high	Mar 2016
LUZON	HYD	Kalayaan 3	180	11/24/2020 0:01			Planned Outage	Maintenance Outage	May 2004
LUZON	COAL	Masinloc 3	335	11/24/2020 20:20			Forced Outage	Excitation Trouble	Mar 2019
LUZON	COAL	Calaca 1	300	11/25/2020 0:44			Planned Outage	Maintenance Outage until 09 Jan 2021	Sep 1984
LUZON	COAL	Pagbilao 3	420	11/25/2020 15:39			Forced Outage	Inspection and repair of governor valve	Jul 2017
LUZON	COAL	SLTEC 2	122.9	11/25/2020 21:05			Forced Outage	Turbine bearing vibration high	Aug 2015