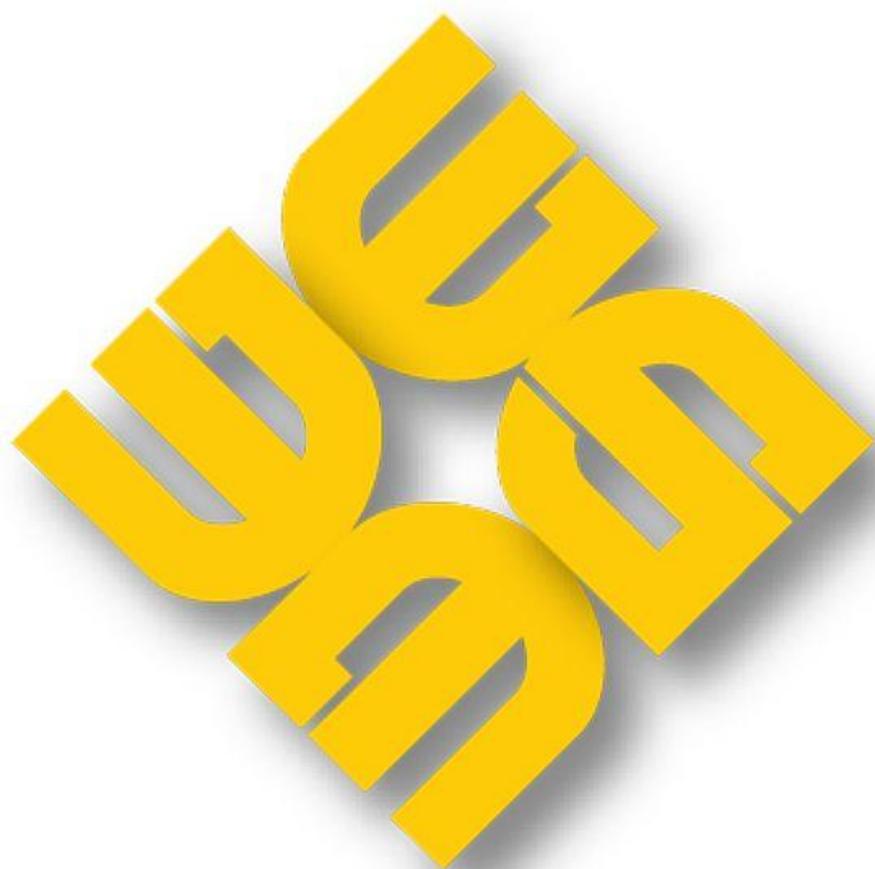


MAG-QMAR-2019-01

# QUARTERLY MARKET ASSESSMENT HIGHLIGHTS

For the Billing Period 26 December 2018 to 25 March 2019



**PHILIPPINE  
ELECTRICITY  
MARKET  
CORPORATION**

**MARKET ASSESSMENT GROUP  
(MAG)**

DISCLAIMER: The information contained in this document is based on the available electricity spot market data. The same information is subject to change as updated figures come in. As such, the PEMC does not make any representation or warranty as to the completeness of this information. The PEMC likewise accepts no responsibility or liability whatsoever for any loss or cost incurred by a reader arising from, or in relation to, any conclusion or assumption derived from the information found herein.

## EXECUTIVE SUMMARY

This quarterly report assesses the results of the WESM operation for the first billing quarter of 2019 (26 December 2018 to 25 March 2019) and how the market performed compared with the previous quarter and previous year.

Total WESM registered capacity reached 19,062 MW by the end of the March billing month, up by 160 MW from 18,902 MW of the previous quarter. The entry of 37.5-MW facility of Victorias Milling Company, Inc. on 23 February, and 335-MW third unit of the coal-fired Masinloc facility on 14 March contributed to the increase in supply. It was noted though that the 213-MW oil-based facility Therma Mobile, Inc., Navotas DPP, was deregistered from the market starting 1 March and registered again on 22 April.

Of the total registered capacity, a significant portion or 29 percent was unavailable attributable to the level of power plants on outage, averaging 3,270 MW, and capacity not offered, averaging 2,233 MW. Correspondingly, only 62 percent or 11,698 MW on the average was offered in the market. Meanwhile, preferential and non-scheduled capacities (1,533 MW) and Malaya TPP as Must Run Unit (300 MW) accounted for 8 percent and 1 percent, respectively.

Taking into account security limits and ramp rates, the effective supply averaged 12,098 MW this quarter, posting a 7.5 percent decrease from previous quarter's 13,075 MW due to the higher level of outage capacity which averaged at 3,270 MW from 2,089 MW in the last quarter of 2018.

Looking at the demand side, the first quarter of the year registered a lower average system demand at 9,138 MW compared to previous quarter's 9,740 MW brought about by the cooler temperature. This, however, was much higher than same quarter last year. System-wide reserve schedule averaged at 1,065 MW this quarter. Accordingly, the demand plus reserve schedule averaged at 10,838 MW, posting a decrease of 5.9 percent from last quarter's 9,858 MW.

Driven by the decrease in effective supply, tighter average supply margin was observed this quarter at 1,895 MW from previous quarter's 2,237 MW. Consequently, market prices increased by 33.9 percent to an average of PhP4,620/MWh coming from PhP3,450/MWh in the previous quarter.

The market shares when calculated based on registered capacity remained to be dominated by four (4) major participant groups, namely San Miguel Corporation (SMC), Aboitiz Power (AP), First Gen Corporation (FGC), and Power Sector Asset and Liabilities Management (PSALM). Noted in this quarter is the higher market share of SMC from 24 percent to 25 percent related to the registration of Masinloc CFTPP unit 3.

Correspondingly, the Herfindahl-Hirschman Index (HHI) calculated by major participant grouping indicated a moderately concentrated market based on registered capacity throughout first billing quarter of 2019.

## Table of Contents

I. Capacity Profile.....	1
II. Power Plant Outages.....	2
III. Demand and Supply Situation.....	6
IV. Market Price Outcome.....	7
V. Pricing Errors and Market Intervention.....	12
VI. HVDC Scheduling.....	14
VII. Price Setting Plants.....	15
VIII. Residual Supply.....	16
IX. Pivotal Suppliers.....	16
X. Price-Setters and Pivotal Plants.....	17
XI. Generator Offer Pattern.....	17
XII. Capacity Factor.....	21
XIII. Generation Mix.....	23
XIV. Market Concentration.....	24
a. Market Share.....	24
b. Herfindahl-Hirschman Index (HHI).....	25
c. Total Trading Amount (TTA) Share.....	26
XV. Spot Exposure.....	26

## List of Figures

Figure 1.	Capacity Profile (Ex-ante), 1 <sup>st</sup> Quarter 2019 .....	1
Figure 2.	Plant Outage Capacity (by Plant Type), 1 <sup>st</sup> Quarter 2019 .....	3
Figure 3.	Plant Outage Capacity (by Outage Category), 1 <sup>st</sup> Quarter 2019 .....	4
Figure 4.	Plant Outage Capacity (by Major Participant Grouping), 1 <sup>st</sup> Quarter 2019 .....	5
Figure 5.	Outage Factor (by Plant Type), 1 <sup>st</sup> Quarter 2019 .....	6
Figure 6.	Outage Factor (by Outage Type), 1 <sup>st</sup> Quarter 2019 .....	6
Figure 7.	Demand and Effective Supply (Ex-ante), 1 <sup>st</sup> Quarter 2018 .....	7
Figure 8.	Market Price Trend vs. Supply Margin, 1 <sup>st</sup> Quarter 2019 .....	8
Figure 9.	Market Price Trend - Luzon, 1 <sup>st</sup> Quarter 2019.....	9
Figure 10.	Market Price Trend - Visayas, 1 <sup>st</sup> Quarter 2019.....	9
Figure 11.	Price Distribution, 1 <sup>st</sup> Quarter 2019.....	10
Figure 12.	Price Duration Curve (Peak Period), 1 <sup>st</sup> Quarter 2019 .....	11
Figure 13.	Price Duration Curve (Off-Peak Period), 1 <sup>st</sup> Quarter 2019 .....	11
Figure 14.	Supply Margin and Market Price, 1 <sup>st</sup> Quarter 2019 .....	12
Figure 15.	Market RSI vs. Pivotal Suppliers (Ex-Ante), 1 <sup>st</sup> Quarter 2019 .....	16
Figure 16.	Geothermal Plants Offer Pattern, Luzon – 1 <sup>st</sup> Quarter 2019 .....	18
Figure 17.	Geothermal Plants Offer Pattern, Visayas – 1 <sup>st</sup> Quarter 2019.....	18
Figure 18.	Natural Gas Plants Offer Pattern, Luzon – 1 <sup>st</sup> Quarter 2019 .....	19
Figure 19.	Coal Plants Offer Pattern – Luzon, 1 <sup>st</sup> Quarter 2019.....	19
Figure 20.	Coal Plants Offer Pattern, Visayas – 1 <sup>st</sup> Quarter 2019.....	20
Figure 21.	Hydro Plants Offer Pattern, Luzon – 1 <sup>st</sup> Quarter 2019 .....	20
Figure 22.	Oil-based Plants Offer Pattern, Luzon – 1 <sup>st</sup> Quarter 2019.....	20
Figure 23.	Oil-based Plants Offer Pattern, Visayas – 1 <sup>st</sup> Quarter 2019.....	21
Figure 24.	Generation Mix (Based on Metered Quantity) – Luzon, 1 <sup>st</sup> Quarter 2019.....	23
Figure 25.	Generation Mix (Based on Metered Quantity), Visayas – 1 <sup>st</sup> Quarter 2019.....	24
Figure 26.	Market Share by Major Participant Group based on Registered Capacity, Offered Capacity, and Actual Generation, 1 <sup>st</sup> Quarter 2019 .....	24
Figure 27.	Hourly HHI based by Major Participant Grouping, 1 <sup>st</sup> Quarter 2019.....	25
Figure 28.	Total Trading Amount Share by Major Participant Grouping, 1 <sup>st</sup> Quarter 2019 ..	26
Figure 29.	Spot Market Exposure, 1 <sup>st</sup> Quarter 2019 .....	26

## List of Tables

Table 1.	Capacity Profile (Ex-ante), 1 <sup>st</sup> Quarter 2019, 4 <sup>th</sup> Quarter 2019, and 1 <sup>st</sup> Quarter 2018	2
Table 2.	Monthly Capacity Profile (Ex-ante), 1 <sup>st</sup> Quarter 2019.....	2
Table 3.	Outage Summary (Ex-ante), 1 <sup>st</sup> Quarter 2019, 4 <sup>th</sup> Quarter 2018, and 1 <sup>st</sup> Quarter 2018	3
Table 4.	Monthly Outage Summary (Ex-ante), 1 <sup>st</sup> Quarter 2019.....	3
Table 5.	Outage Summary, by Outage Category, 1 <sup>st</sup> Quarter 2019, 4 <sup>th</sup> Quarter 2018, and 1 <sup>st</sup> Quarter 2018.....	4
Table 6.	Monthly Outage Summary, by Outage Category, 1 <sup>st</sup> Quarter 2019.....	4
Table 7.	Outage Summary, by Major Participant Grouping, 1 <sup>st</sup> Quarter 2019, 4 <sup>th</sup> Quarter 2018, and 1 <sup>st</sup> Quarter 2018 .....	5
Table 8.	Monthly Outage Summary, by Major Participant Grouping, 1 <sup>st</sup> Quarter 2019.....	5
Table 9.	Outage Factor, 1 <sup>st</sup> Quarter 2019.....	6
Table 10.	Demand and Supply Summary (Ex-ante), 1 <sup>st</sup> Quarter 2019, 4 <sup>th</sup> Quarter 2018, and 1 <sup>st</sup> Quarter 2018.....	7
Table 11.	Monthly Demand and Supply Summary (Ex-ante), 1 <sup>st</sup> Quarter 2019 .....	7
Table 12.	Market Price Summary, 1 <sup>st</sup> Quarter 2019, 4 <sup>th</sup> Quarter 2018, and 1 <sup>st</sup> Quarter 2018	8
Table 13.	Monthly Market Price Summary, 1 <sup>st</sup> Quarter 2019 .....	8
Table 14.	Monthly Regional Price Summary – 1 <sup>st</sup> Quarter 2019.....	9
Table 15.	Monthly Price Distribution – 1 <sup>st</sup> Quarter 2019 .....	10
Table 16.	Interesting Pricing Events (Exceeding the Upper Threshold) – 1 <sup>st</sup> Quarter 2019	12
Table 17.	Interesting Pricing Events (Below the Lower Threshold) – 1 <sup>st</sup> Quarter 2019 .....	12
Table 18.	PEN, PSM and MI Summary, 1 <sup>st</sup> Quarter 2019.....	13
Table 19.	PEN Type Summary, 1 <sup>st</sup> Quarter 2019 .....	13
Table 20.	Summary of HVDC Limits Imposed by NGCP-SO and Results of HVDC Schedules (Ex-ante and Ex-post), 1 <sup>st</sup> Quarter 2019 .....	14
Table 21.	Price Setting Frequency Index at PhP10,000/MWH and below, 1 <sup>st</sup> Quarter 2019	15
Table 22.	Price Setting Frequency Index Above PhP10,000/MWH, 1 <sup>st</sup> Quarter 2019.....	15
Table 23.	Pivotal Supplier Frequency Index, 1 <sup>st</sup> Quarter 2019.....	17
Table 24.	PSI vs PSFI, 1 <sup>st</sup> Quarter 2019 .....	17
Table 25.	Capacity Factor – Luzon Plants, 1 <sup>st</sup> Quarter 2019 .....	22
Table 26.	Capacity Factor, Visayas Plants – 1 <sup>st</sup> Quarter 2019.....	23

## QUARTERLY MARKET ASSESSMENT REPORT

This quarterly report assesses the results of the WESM operation for the First Billing Quarter of 2019 (26 December 2018 to 25 March 2019) and how the market performed compared with the previous quarter and previous year.

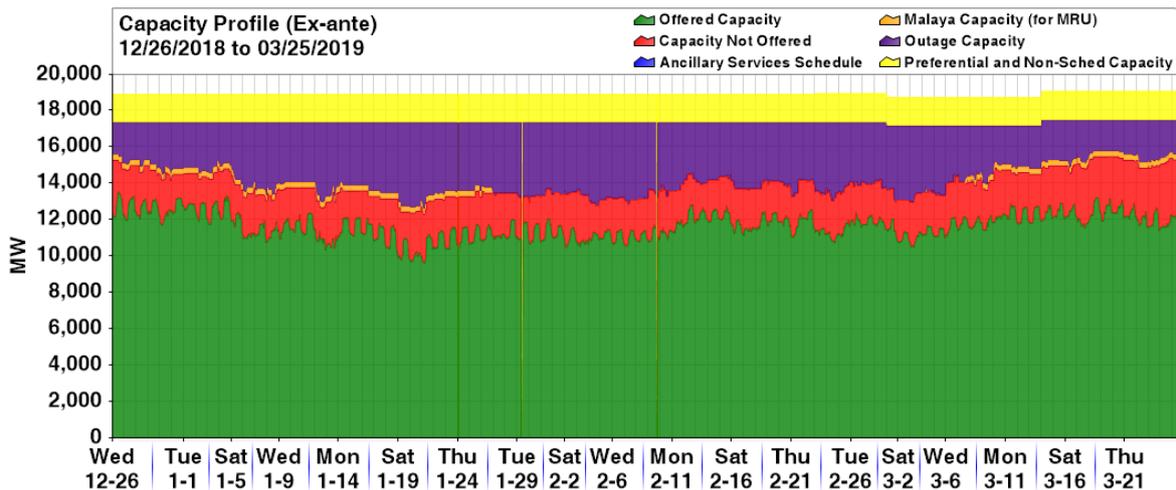
### I. Capacity Profile

The WESM registered capacity stood at 19,062 MW by the end of the first billing quarter of 2019, higher by 160 MW compared to 18,902 MW in 25 December 2018. During the billing quarter, the 37.5 MW facility of Victorias Milling Company, Inc. and 335-MW third unit of the coal fired Masinloc facility registered in the market on 23 February and 14 March, respectively. On the other hand, the 213-MW oil-based facility of Therma Mobile, Inc., Navotas DPP deregistered in the market on 1 March 2019 and registered again on 22 April.

Of the said registered capacity, about 62 percent (previous quarter's 68 percent and previous year's 61 percent) or an average of 11,698 MW was offered in the market during the quarter. Outage capacity (17 percent) posted a higher average this quarter at 3,270 MW coming from 2,089 MW in 4<sup>th</sup> Quarter of 2018 and 2,497 MW in 1<sup>st</sup> Quarter of 2018. Meanwhile, 12 percent was attributable to capacity not offered in the market which averaged at 2,233 MW (2,251 MW in previous quarter and 2,717 MW in previous year).

On the other hand, preferential<sup>1</sup> and non-scheduled capacities averaged 1,533 MW, comprising about 8 percent of the total registered capacity. Lastly, an average of 300 MW or about 1 percent of the WESM registered capacity was attributed to the capacity designation of Malaya TPP as Must Run Unit (MRU), in cases of supply shortfall and to address system security.

**Figure 1. Capacity Profile (Ex-ante), 1<sup>st</sup> Quarter 2019**



<sup>1</sup> Preferential capacity refers to the combined registered capacities of priority dispatch and must dispatch generating units.

**Table 1. Capacity Profile (Ex-ante), 1<sup>st</sup> Quarter 2019, 4<sup>th</sup> Quarter 2018, and 1<sup>st</sup> Quarter 2018**

	1st Quarter 2019 (26 Dec 2018 to 25 Mar 2019)		4th Quarter 2018 (26 Sep to Dec 2018)		1st Quarter 2018 (26 Dec 2017 to 25 Mar 2018)		% Q-on-Q Change (4Q 2018 - 1Q 2019)	% Y-on-Y Change (1Q 2018 - 1Q 2019)
	Avg MW	% of RegCap	Avg MW	% of RegCap	Avg MW	% of RegCap		
Preferential and Non-Sched Capacity	1,533	8%	1,501	8%	1,484	8%	2.1	3.3
Outage Capacity	3,270	17%	2,089	11%	2,497	13%	56.5	31.0
Malaya Capacity (for MRU)	300	1%	300	1%	595	3%	0.0	(49.5)
Capacity Not Offered	2,233	12%	2,251	12%	2,717	14%	(0.8)	(17.8)
Offered Capacity	11,698	62%	12,834	68%	11,472	61%		2.0
Registered Capacity (by the end of the billing month)	19,062		18,902		18,746		0.8	1.7

**Table 2. Monthly Capacity Profile (Ex-ante), 1<sup>st</sup> Quarter 2019**

	January 2019 (26 Dec 2018 to 25 Mar 2019)		February 2019 (26 Sep to Dec 2018)		March 2019 (26 Dec 2017 to 25 Mar 2018)	
	Avg MW	% of RegCap	Avg MW	% of RegCap	Avg MW	% of RegCap
Preferential and Non-Sched Capacity	1,520	8%	1,524	8%	1,558	8%
Outage Capacity	3,331	18%	3,755	20%	2,663	14%
Malaya Capacity (for MRU)	300	2%	300	0%	300	1%
Capacity Not Offered	2,101	11%	2,126	11%	2,496	13%
Offered Capacity	11,649	62%	11,491	61%	11,979	63%
Registered Capacity (by the end of the billing month)	18,902		18,940		19,062	

## II. Power Plant Outages

### a. Outage Capacity by Outage Plant Type

Outage capacity went up to an average of 3,270 MW from 2,089 MW during the last quarter of 2018, particularly during the February billing month which recorded an average outage capacity at 3,756 MW.

The increase in the quarter-on-quarter figures was driven by coal plants' outage capacity, from previous quarter's average at 754 MW to current quarter's 1,809 MW. Major contributors of coals plants' outage capacity were the planned outages of Calaca CFTPP unit 1 (300 MW), Pagbilao CFTPP unit 3 (420 MW), Mariveles CFTPP unit 1 (316 MW) and QPPL CFTPP (459 MW). Aside from these, Calaca CFTPP unit 2 (300 MW), SLTEC CFTPP unit 2 (123 MW), SLPGC CFTPP unit 2 (150 MW) underwent forced outages.

Next to coal, oil-based plants had the highest average outage capacity recorded at 599 MW which mainly involved the forced outage of Malaya TPP unit 2 since 19 May 2018 and planned outage of Malaya TPP unit 1 from 26 January to 4 March.

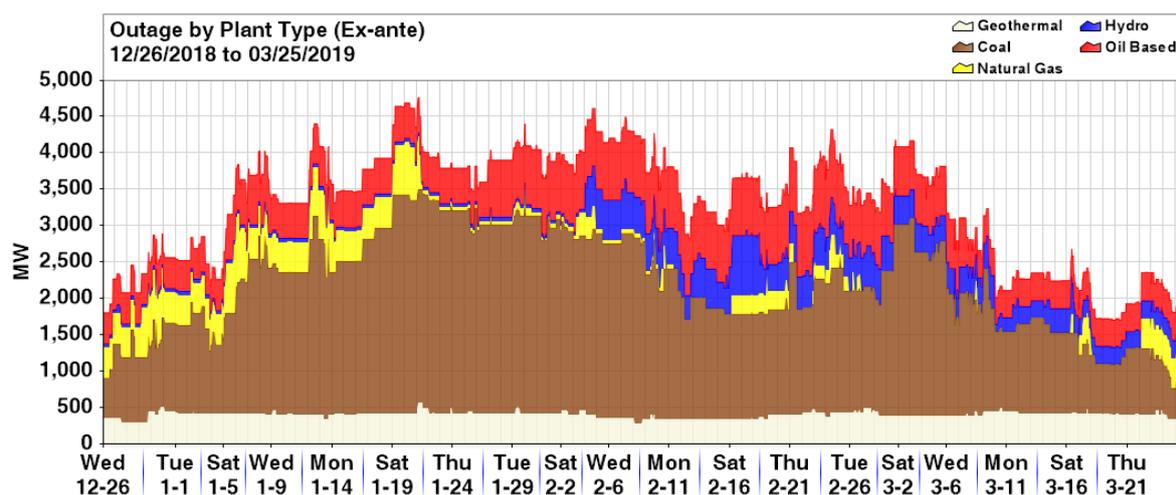
Geothermal plants' average outage capacity was recorded at 403 MW which was largely attributed to the maintenance outage of Tiwi GPP unit A (59 MW) and forced outage of Upper Mahiao unit A (32 MW) on top of the deactivated shutdown of Makban GPP unit 6 (55 MW) and Tiwi GPP unit B (44 MW).

Meanwhile, the outage capacity of hydro plants averaged at 248 MW related to the planned outage of Kalayaan PSPP unit 1 (180 MW) and maintenance outage of Kalayaan PSPP unit 2 (180 MW).

Lastly, natural gas plants observed the lowest outage capacity among resource types at an average of 211 MW related to the maintenance outage of San Gabriel NGPP (420 MW) from 8 December 2018 to 21 January 2019.

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

**Figure 2. Plant Outage Capacity (by Plant Type), 1<sup>st</sup> Quarter 2019**



**Table 3. Outage Summary (Ex-ante), 1<sup>st</sup> Quarter 2019, 4<sup>th</sup> Quarter 2018, and 1<sup>st</sup> Quarter 2018**

	1st Quarter 2019 (26 Dec 2018 to 25 Mar 2019)			4th Quarter 2018 (26 Sep to 25 Dec 2018)			1st Quarter 2018 (26 Dec 2017 to 25 Mar 2018)			% Q-on-Q Change (4Q 2018 - 1Q 2019)			% Y-on-Y Change (1Q 2018 - 1Q 2019)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Coal	3,018	421	1,809	1,611	123	754	2,864	682	1,620	87.3	242.6	139.9	5.4	(38.3)	11.7
Natural Gas	950	0	211	974	0	174	1,989	0	256	(2.4)		21.0	(52.2)		(17.6)
Geothermal	572	287	403	524	328	404	558	300	405	9.2	(12.5)	(0.3)	2.5	(4.3)	(0.6)
Hydro	900	50	248	578	50	578	540	0	98	55.7	0.0	(57.0)	66.7		153.6
Oil Based	1,054	375	599	859	424	595	461	27	118	22.7	(11.6)	0.7	128.4	1,278.7	406.2
<b>TOTAL</b>	<b>4,764</b>	<b>1,704</b>	<b>3,270</b>	<b>2,961</b>	<b>1,202</b>	<b>2,089</b>	<b>3,671</b>	<b>1,268</b>	<b>2,497</b>	<b>60.9</b>	<b>41.7</b>	<b>56.5</b>	<b>29.8</b>	<b>34.4</b>	<b>31.0</b>

**Table 4. Monthly Outage Summary (Ex-ante), 1<sup>st</sup> Quarter 2019**

	January 2019 (26 Dec 2018 to 25 Jan 2019) in MW			February 2019 (26 Jan to 25 Feb 2019) in MW			March 2019 (26 Feb to 25 Mar 2019) in MW		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
	Coal	3,008	558	1,946	3,018	1,375	2,070	2,715	421
Natural Gas	950	50	433	523	0	110	420	0	76
Geothermal	572	298	412	530	287	387	501	342	410
Hydro	120	50	51	900	50	381	560	95	320
Oil Based	756	424	490	1,054	484	809	784	375	488
<b>TOTAL</b>	<b>4,764</b>	<b>1,805</b>	<b>3,332</b>	<b>4,617</b>	<b>2,826</b>	<b>3,756</b>	<b>4,184</b>	<b>1,704</b>	<b>2,663</b>

**b. Outage Capacity by Outage Category**

Based on outage category, an average of 1,546 MW or about 47 percent of this quarter's system-wide outage capacity were related to planned outages with major power plants coinciding their planned maintenance during the low demand season. This quarter's planned outage capacity mainly involved Calaca CFTPP unit 1 (300 MW), Pagbilao CFTPP unit 3 (420 MW), and Malaya TPP unit 1 (300 MW).

Relative to last year, there was a 21 percent increase in the level of planned outages, not only to prepare for the high electricity demand during the summer season but also to ensure that power plants are well-maintained prior to the national election in May.

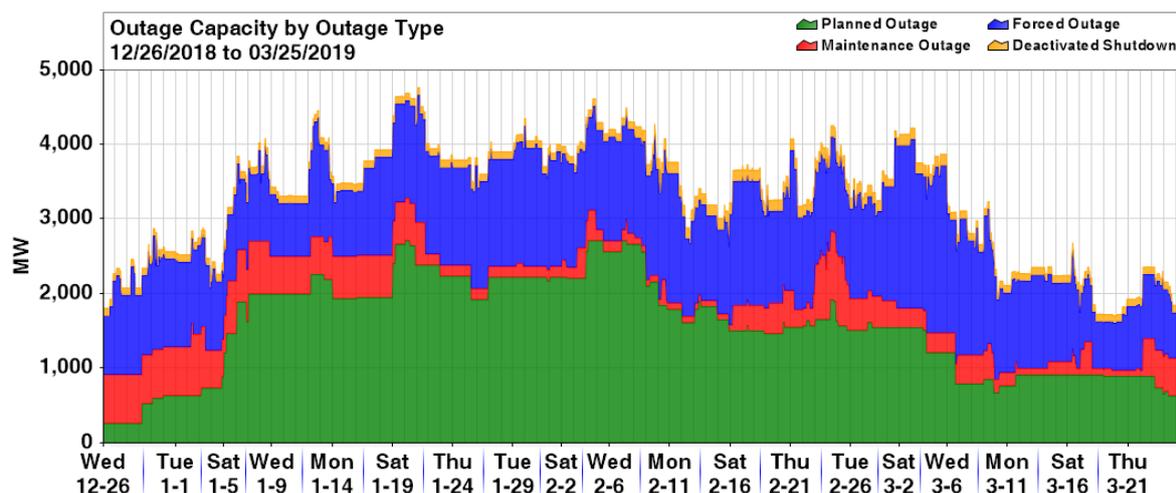
Likewise, the first quarter saw the level of forced outages doubling to 1,254 MW on the average from previous year's 588 MW (Table 5). Recording the highest level of forced outage capacity during the quarter were Calaca CFTPP unit 2 (300 MW), SLTEC CFTPP unit 2 (123 MW),

SLPGC CFTPP unit 2 (150 MW), TMO unit 2 (49 MW), and Malaya TPP unit 2 (350 MW) since 19 May 2018.

On the other hand, this quarter's maintenance outage capacity (11 percent) averaged at 362 MW (previous quarter's 476 MW) attributable to the maintenance outages of San Gabriel NGPP (420 MW) and Tiwi GPP unit A (59 MW).

Meanwhile, deactivated shutdown outage capacity, which constituted 4 percent of the total outage capacity, posted an average of 112 MW (previous quarter's 99 MW) which involved TMO unit 2 (49 MW) and units of Makban GPP unit C (55 MW) and Tiwi GPP unit B (44 MW).

**Figure 3. Plant Outage Capacity (by Outage Category), 1<sup>st</sup> Quarter 2019**



**Table 5. Outage Summary, by Outage Category, 1<sup>st</sup> Quarter 2019, 4<sup>th</sup> Quarter 2018, and 1<sup>st</sup> Quarter 2018**

	1st Quarter 2019 (26 Dec 2018 to 25 Mar 2019) in MW			4th Quarter 2018 (26 Sep to 25 Dec 2018) in MW			1st Quarter 2018 (26 Dec 2017 to 25 Mar 2018) in MW			% Q-on-Q Change (4Q 2018 - 1Q 2019)			% Y-on-Y Change (1Q 2018 - 1Q 2019)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Planned	2,715	263	1,546	854	113	457	2,127	405	1,279	218.0	132.7	237.9	27.7	(35.1)	20.9
Maintenance	1,042	84	362	1,066	60	476	1,108	0	485	(2.2)	40.0	(23.9)	(5.9)		(25.4)
Forced	2,268	598	1,254	1,759	661	1,062	1,785	202	588	28.9	(9.6)	18.1	27.0	195.5	113.3
Deactivated Shutdown	148	99	112	99	99	99	319	99	161	49.6	0.0	13.8	(53.7)	0.0	(30.3)

**Table 6. Monthly Outage Summary, by Outage Category, 1<sup>st</sup> Quarter 2019**

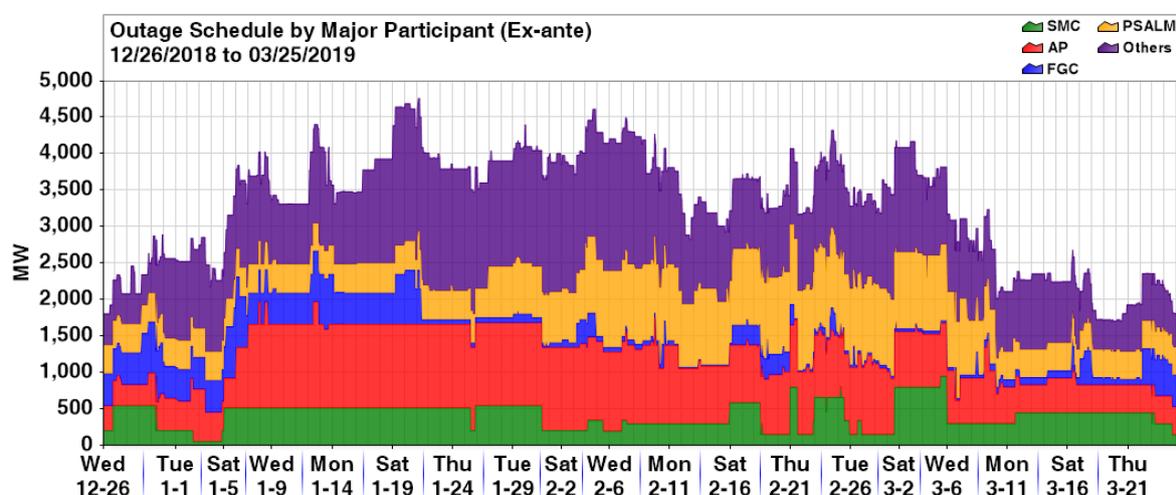
	January 2019 (26 Dec 2018 to 25 Jan 2019) in MW			February 2019 (26 Jan to 25 Feb 2019) in MW			March 2019 (26 Feb to 25 Mar 2019) in MW		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Planned	2,715	263	1,586	2,713	1,467	1,972	1,616	632	1,030
Maintenance	970	147	541	1,042	84	259	504	84	278
Forced	1,711	710	1,111	1,885	982	1,395	2,268	598	1,254
Deactivated Shutdown	99	99	99	148	99	127	148	99	111

**c. Outage Capacity by Major Group**

In terms of major group, Aboitiz Power (AP) recorded the highest average outage capacity at 820 MW or about 25 percent of this quarter's system-wide outage capacity with the planned outages of its two major coal plants, the 420-MW Pagbilao CFTPP unit 3 and the 316-MW Mariveles CFTPP unit 1. This was followed by Power Sector Asset and Liabilities Management (PSALM), registering an average of 655 MW capacity on outage involving Malaya TPP units 1

and 2 (650 MW). Next is San Miguel Corporation (SMC) with an outage capacity of 408 MW, attributable to the planned outages of its coal plants SMC Limay CFTPP units 1 and 3 (150 MW each), and Masinloc CFTPP unit 1 (315 MW). Meanwhile, the outage capacity involving First Gen Corporation (FGC) averaged at 241 MW during the billing quarter which was mainly related to the maintenance outage of San Gabriel NGPP (420 MW).

**Figure 4. Plant Outage Capacity (by Major Participant Grouping), 1<sup>st</sup> Quarter 2019**



**Table 7. Outage Summary, by Major Participant Grouping, 1<sup>st</sup> Quarter 2019, 4<sup>th</sup> Quarter 2018, and 1<sup>st</sup> Quarter 2018**

	1st Quarter 2019 (26 Dec 2018 to 25 Mar 2019) in MW			4th Quarter 2018 (26 Sep to 25 Dec 2018) in MW			1st Quarter 2018 (26 Dec 2017 to 25 Mar 2018) in MW			% Q-on-Q Change (4Q 2018 - 1Q 2019)			% Y-on-Y Change (1Q 2018 - 1Q 2019)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
SMC	947	50	408	1,162	50	502	1,297	0	483	(18.5)	0.0	(18.8)	(27.0)		(15.7)
AP	1,458	290	820	852	244	413	1,304	213	438	71.2	18.9	98.7	11.8	36.2	87.1
FGC	970	20	241	840	20	211	2,116	20	216	15.5	0.0	14.6	(54.1)	0.0	11.9
PSALM	1,096	382	655	991	382	593	761	32	151	10.6	0.0	10.5	44.0	1,093.8	333.2
Others	1,903	413	1,145	1,158	160	370	1,762	713	1,208	64.3	157.5	209.3	8.0	(42.1)	(5.2)

**Table 8. Monthly Outage Summary, by Major Participant Grouping, 1<sup>st</sup> Quarter 2019**

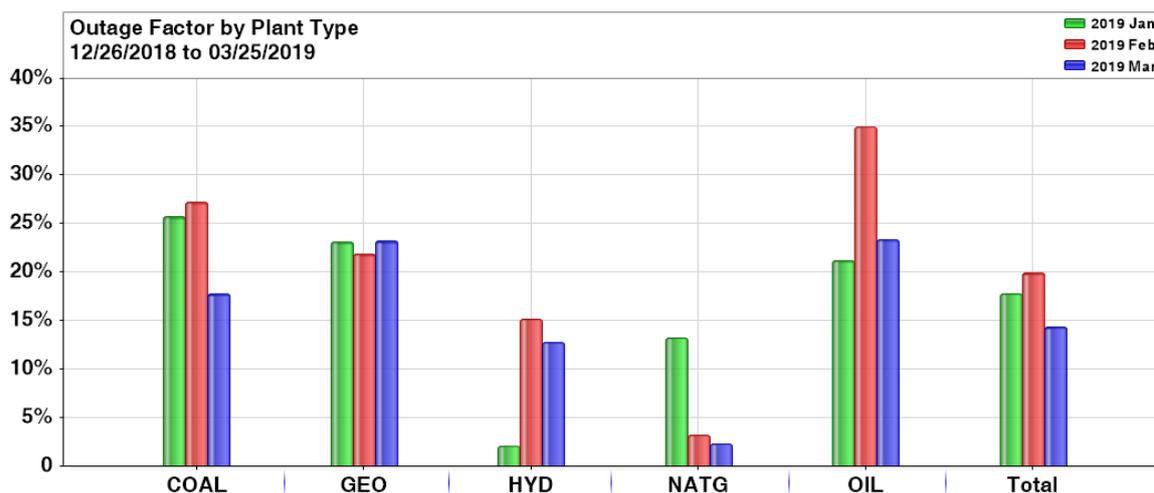
	January 2019 (26 Dec 2018 to 25 Jan 2019) in MW			February 2019 (26 Jan to 25 Feb 2019) in MW			March 2019 (26 Feb to 25 Mar 2019) in MW		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
SMC	544	50	438	805	150	371	947	145	415
AP	1,458	290	884	1,454	759	980	1,141	310	573
FGC	970	70	454	543	20	117	560	40	144
PSALM	545	382	393	1,096	396	930	1,079	382	642
Others	1,903	419	1,162	1,898	890	1,359	1,523	413	889

**d. Outage Factor**

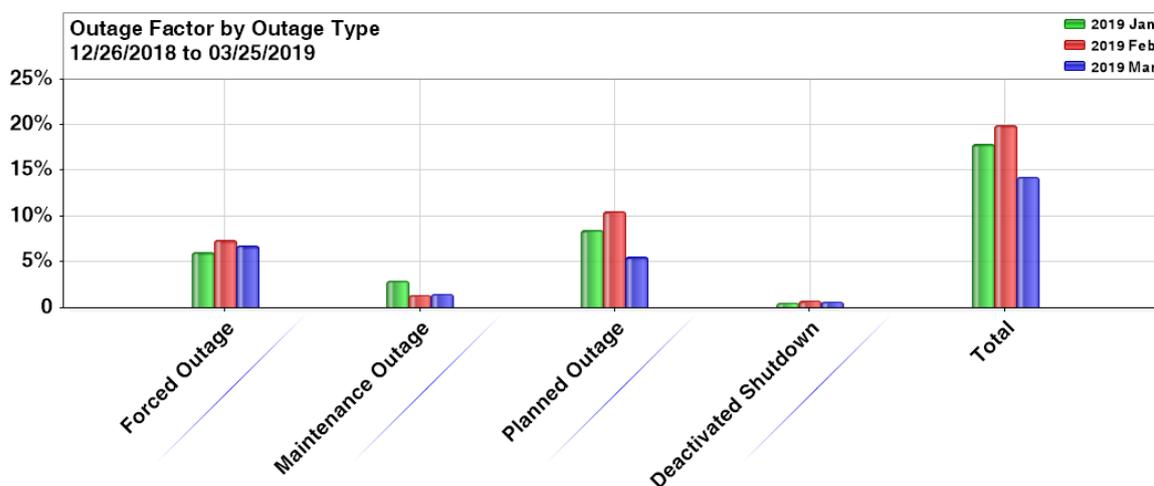
Consistent with the discussion on outage capacity in the preceding sections and as seen in Table 9 below, the system-wide total outage factor during the quarter peaked in February at 19.9 percent compared to 17.8 percent in January and 14.3 percent in March. It was noted that the planned and forced outage factors were particularly high during the February billing month at 10.5 percent and 7.4 percent, respectively.

Meanwhile, based on resource type, oil-based plants obtained the highest total outage factor at 35 percent in February followed by coal and geothermal plants at 27.3 percent and 21.9 percent, respectively.

**Figure 5. Outage Factor (by Plant Type), 1<sup>st</sup> Quarter 2019**



**Figure 6. Outage Factor (by Outage Type), 1<sup>st</sup> Quarter 2019**



**Table 9. Outage Factor, 1<sup>st</sup> Quarter 2019**

Plant Type	Total Outage Factor			Forced Outage Factor			Maintenance Outage Factor			Planned Outage Factor			D/S Outage Factor		
	Jan 2019	Feb 2019	Mar 2019	Jan 2019	Feb 2019	Mar 2019	Jan 2019	Feb 2019	Mar 2019	Jan 2019	Feb 2019	Mar 2019	Jan 2019	Feb 2019	Mar 2019
BAT															
BIOF	11.8	2.9	9.8	10.3	1.6	6.2	1.5	0.2	0.4		1.2	3.2			
COAL	25.7	27.3	17.7	6.7	10.1	9.2	0.6	0.3	0.2	18.4	16.9	8.4			
GEO	23.1	21.9	23.2	10.5	8.6	8.0	4.7	5.6	3.7	2.3	2.1	6.0	5.5	5.5	5.5
HYD	2.0	15.2	12.8	0.1	3.4	0.1		0.6	4.3	2.0	11.2	8.4			
NATG	13.3	3.2	2.3	0.2	0.0	0.2	11.0	2.3	2.1	2.0	0.9				
OIL	21.2	35.0	23.4	17.6	16.8	18.4	2.1	1.8	1.2	1.6	15.2	3.2		1.2	0.7
SOLR	0.0	0.3		0.0	0.0						0.3				
WIND															
Total	17.8	19.9	14.3	6.0	7.4	6.7	2.9	1.4	1.5	8.4	10.5	5.5	0.5	0.7	0.6

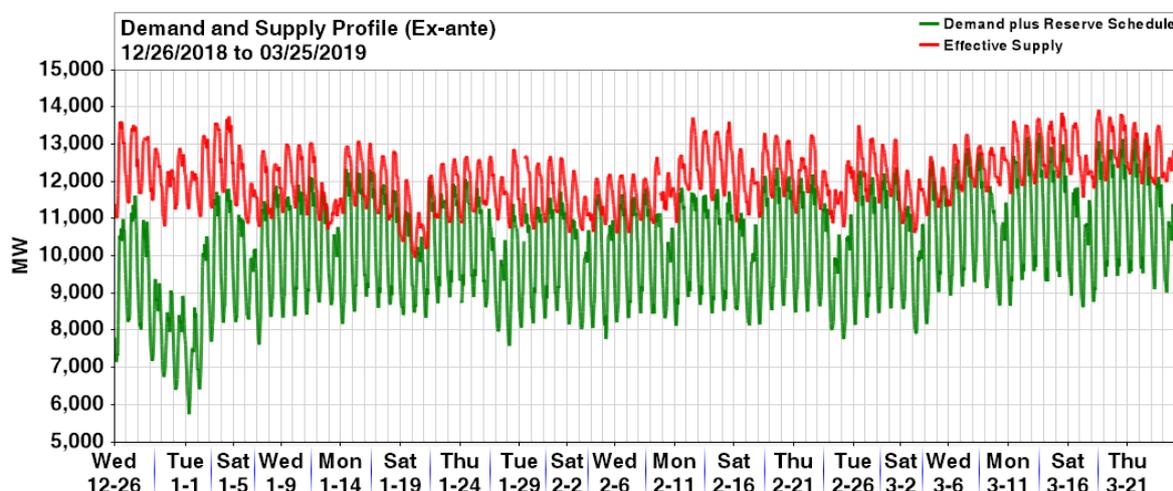
### III. Demand and Supply Situation

The 1<sup>st</sup> quarter recorded a 6.2 percent decrease in average system demand at 9,138 MW from 9,740 MW in the 4<sup>th</sup> quarter of 2018 brought about by cooler temperature and long holiday season at the start of the year. The demand plus reserve schedule averaged at 10,203 MW, demonstrating a 5.9 percent decrease from last quarter's 10,838 MW.

Similarly, effective supply<sup>2</sup> posted a lower average this quarter at 12,098 MW from previous quarter's 13,075 MW, which was attributed to the higher level of outage capacity. Monthly average effective supply ranged from 11,905 MW in February, when the outage capacity was the highest, up to 12,481 MW in March.

Consequently, supply margin<sup>3</sup> narrowed by 15.3 percent this quarter at 1,895 MW coming from previous quarter's 2,237 MW.

**Figure 7. Demand and Effective Supply (Ex-ante), 1<sup>st</sup> Quarter 2018**



**Table 10. Demand and Supply Summary (Ex-ante), 1<sup>st</sup> Quarter 2019, 4<sup>th</sup> Quarter 2018, and 1<sup>st</sup> Quarter 2018**

	1st Quarter 2019 (26 Dec 2018 to 25 Mar 2019) in MW			4th Quarter 2018 (26 Sep to 25 Dec 2018) in MW			1st Quarter 2018 (26 Dec 2017 to 25 Mar 2018) in MW			% Q-on-Q Change (4Q 2018 - 1Q 2019)			% Y-on-Y Change (1Q 2018 - 1Q 2019)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Demand	12,050	5,167	9,138	12,249	5,856	9,740	11,657	5,279	8,926	(1.6)	(11.8)	(6.2)	3.4	(2.1)	2.4
Reserve Schedule	1,581	528	1,065	1,608	592	1,098	1,231	523	932	(1.7)	(10.9)	(3.0)	28.4	0.8	14.2
Demand plus R/S	13,322	5,758	10,203	13,505	6,692	10,838	12,699	5,901	9,858	(1.4)	(14.0)	(5.9)	4.9	(2.4)	3.5
Effective Supply	13,974	9,959	12,098	14,839	10,551	13,075	13,683	9,941	11,856	(5.8)	(5.6)	(7.5)	2.1	0.2	2.0
Supply Margin	5,690	4	1,895	4,655	89	2,237	5,257	29	1,997	22.2	(96.1)	(15.3)	8.2	(87.7)	(5.2)

Note: The derived values were non-coincident.

**Table 11. Monthly Demand and Supply Summary (Ex-ante), 1<sup>st</sup> Quarter 2019**

	January 2019 (26 Dec 2018 to 25 Jan 2019) in MW			February 2019 (26 Jan to 25 Feb 2018) in MW			March 2019 (26 Feb to 25 Mar 2018) in MW		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Demand	10,860	5,167	8,731	11,075	6,674	8,946	12,050	7,078	9,801
Reserve Schedule	1,581	528	1,088	1,455	701	1,067	1,427	693	1,037
Demand plus R/S	12,350	5,758	9,819	12,383	7,596	10,013	13,322	7,923	10,838
Effective Supply	13,758	9,959	11,943	13,729	10,619	11,905	13,974	10,628	12,481
Supply Margin	5,690	4	2,125	3,293	184	1,891	3,510	14	1,644

#### IV. Market Price Outcome<sup>4</sup>

<sup>2</sup>The system effective supply is equal to the offered capacity of all scheduled generator resources, nominated loading level of non-scheduled generating units and projected output of preferential dispatch generating units adjusted for any security limit and ramp rates. Scheduled output of plants on testing and commissioning, through the imposition of security limit by SO, are accounted for in the effective supply. Likewise included is the scheduled output of Malaya plant when it is called to run as Must Run Unit (MRU).

<sup>3</sup>The supply margin is equal to the effective supply less system demand requirement plus reserve schedule.

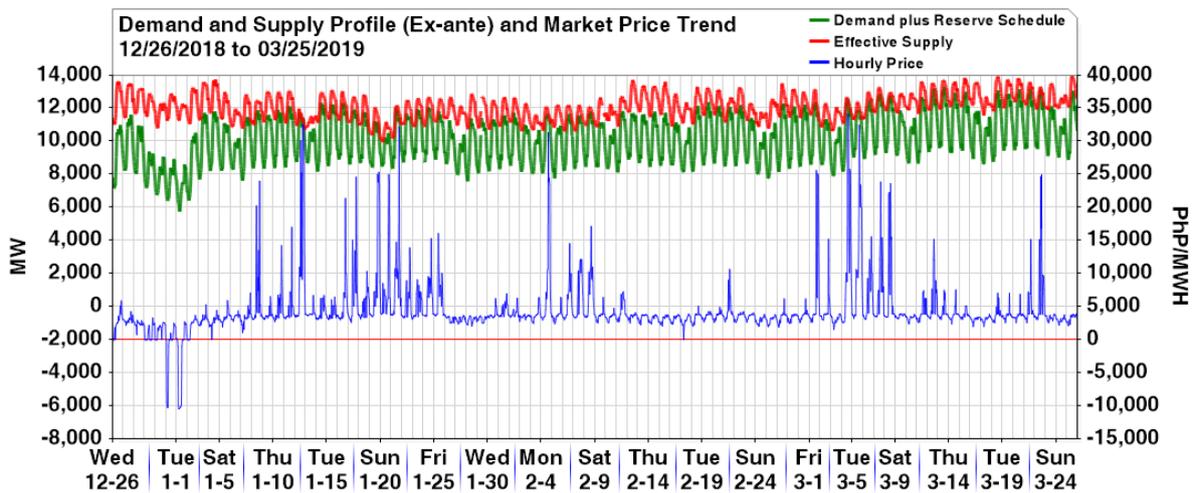
<sup>4</sup>The market prices were represented by the following: (i) ex-ante load weighted average price (LWAP) for trading intervals without pricing error during ex-ante, (ii) ex-post LWAP for trading intervals with pricing error during ex-ante but without pricing error during ex-post, (iii) LWAP based on the market re-run result for trading intervals with pricing error both during ex-ante and ex-post, and

## A. Market Prices

Driven by the decrease in average supply margin, average market prices grew by 33.9 percent, from previous quarter's PhP3,450/MWh to current quarter's PhP4,620/MWh. The year-on-year figures likewise demonstrated an increase recorded at 23.5 percent from PhP3,742/MWh in the 1<sup>st</sup> quarter of 2018.

As seen in Figure 8, frequent price spikes above PhP20,000/MWh occurred beginning the latter part of January with the whole month posting an average market price of PhP4,727/MWh. This was the highest average price recorded for a January billing month since 2013. In February, the average market price went down to PhP4,058/MWh with fewer price spikes above PhP20,000/MWh, from 18 trading intervals in January to 4 trading intervals in February. On the other hand, higher average market price was registered in March at PhP5,082/MWh following the tighter supply and demand conditions.

**Figure 8. Market Price Trend vs. Supply Margin, 1<sup>st</sup> Quarter 2019**



**Table 12. Market Price Summary, 1<sup>st</sup> Quarter 2019, 4<sup>th</sup> Quarter 2018, and 1<sup>st</sup> Quarter 2018**

	1st Quarter 2019 (26 Dec 2018 to 25 Mar 2019) in PhP/MWh			4th Quarter 2018 (26 Sep to 25 Dec 2018) in PhP/MWh			1st Quarter 2018 (26 Dec 2017 to 25 Mar 2018) in PhP/MWh			% Q-on-Q Change (4Q 2018 - 1Q 2019)			% Y-on-Y Change (1Q 2018 - 1Q 2019)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
System	34,142	-10,469	4,620	32,827	0	3,450	31,709	-10,359	3,742	4.0		33.9	7.7	1.1	23.5

**Table 13. Monthly Market Price Summary, 1<sup>st</sup> Quarter 2019**

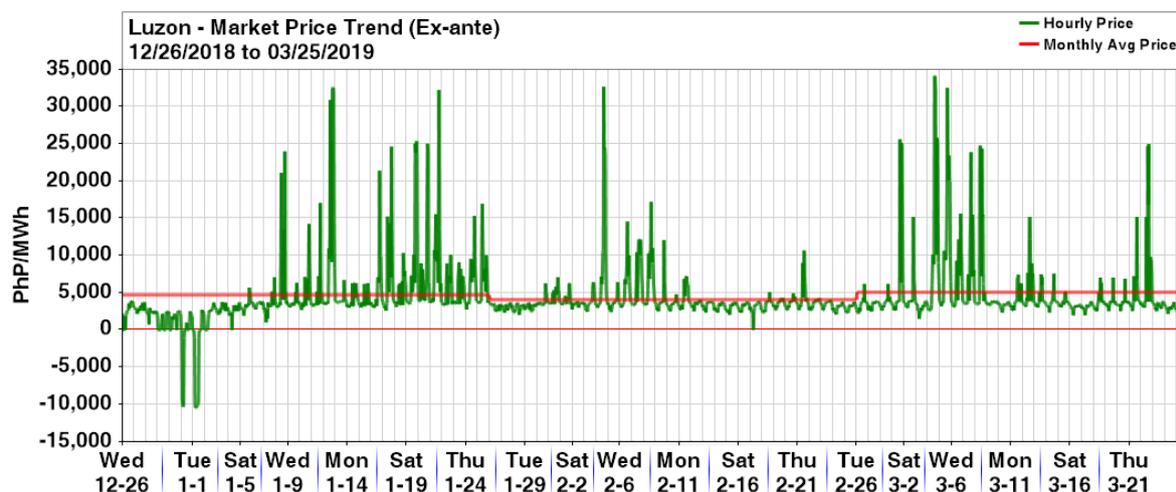
	January 2019 (26 Dec 2018 to 25 Jan 2019) in PhP/MWh			February 2019 (26 Jan to 25 Feb 2018) in PhP/MWh			March 2019 (26 Feb to 25 Mar 2018) in PhP/MWh		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
System	32,576	-10,469	4,727	31,394	0	4,058	34,142	1,518	5,082

The market prices in were higher in Luzon than Visayas by 1.8 percent and 0.2 percent in February and March, respectively, while market prices were higher in Visayas than Luzon by 2.2 percent in January.

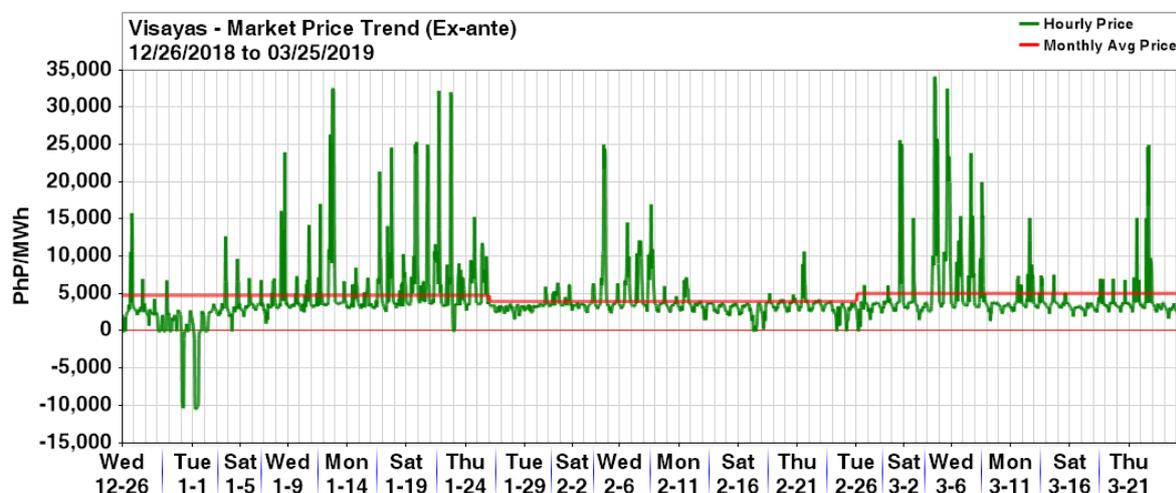
(iv) estimated load reference price (ELRP) for trading intervals where the ERC-approved Price Substitution Mechanism (PSM) was applied.

Price separation between Luzon and Visayas occurs when the HVDC link between the region is unavailable or its maximum capacity is reached.

**Figure 9. Market Price Trend - Luzon, 1<sup>st</sup> Quarter 2019**



**Figure 10. Market Price Trend - Visayas, 1<sup>st</sup> Quarter 2019**



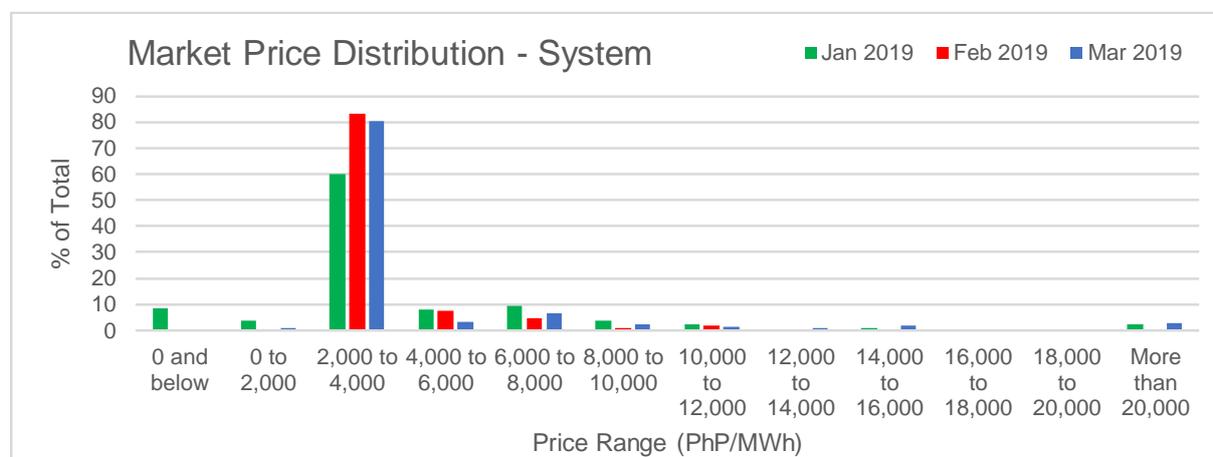
**Table 14. Monthly Regional Price Summary – 1<sup>st</sup> Quarter 2019**

	Luzon in PhP/MWh			Visayas in PhP/MWh			% Difference		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
January 2019	32,576	-10,469	4,707	32,576	-10,469	4,814	0.0	0.0	(2.2)
February 2019	32,678	0	4,078	25,052	0	4,005	30.4		1.8
March 2019	34,142	1,518	5,084	34,142	0	5,072	0.0		0.2

**B. Price Distribution**

Consistent with the average price trend discussed above, the frequency of prices above PhP20,000/MWh decreased from 2.4 percent in January to 0.5 percent in February then went up to 2.8 percent in March. In addition, higher frequency of prices below PhP6,000/MWh was noted in February at 91.4 percent compared to 80.2 percent in January and 83.9 percent in March.

**Figure 11. Price Distribution, 1<sup>st</sup> Quarter 2019**



**Table 15. Monthly Price Distribution – 1<sup>st</sup> Quarter 2019**

Price Range (PhP/MWh)	% Distribution		
	Jan 2019	Feb 2019	Mar 2019
0 and below	8.5	0.3	0.0
0 to 2,000	3.6	0.3	0.7
2,000 to 4,000	60.1	83.3	80.2
4,000 to 6,000	8.1	7.5	3.0
6,000 to 8,000	9.5	4.7	6.7
8,000 to 10,000	3.6	0.9	2.2
10,000 to 12,000	2.4	1.7	1.3
12,000 to 14,000	0.5	0.4	0.7
14,000 to 16,000	0.8	0.1	1.9
16,000 to 18,000	0.4	0.1	0.1
18,000 to 20,000	0.0	0.0	0.1
More than 20,000	2.4	0.5	2.8
	100.0	100.0	100.0

### C. Price Duration Curve

The price duration curves demonstrate the higher market prices during peak<sup>5</sup> hours compared to off-peak<sup>6</sup> hours.

Seen in Figure 12 below, bulk of the market prices during the off-peak hours of the billing quarter, at 88 percent, were within the price range PhP2,000/MWh to PhP4,000/MWh. About

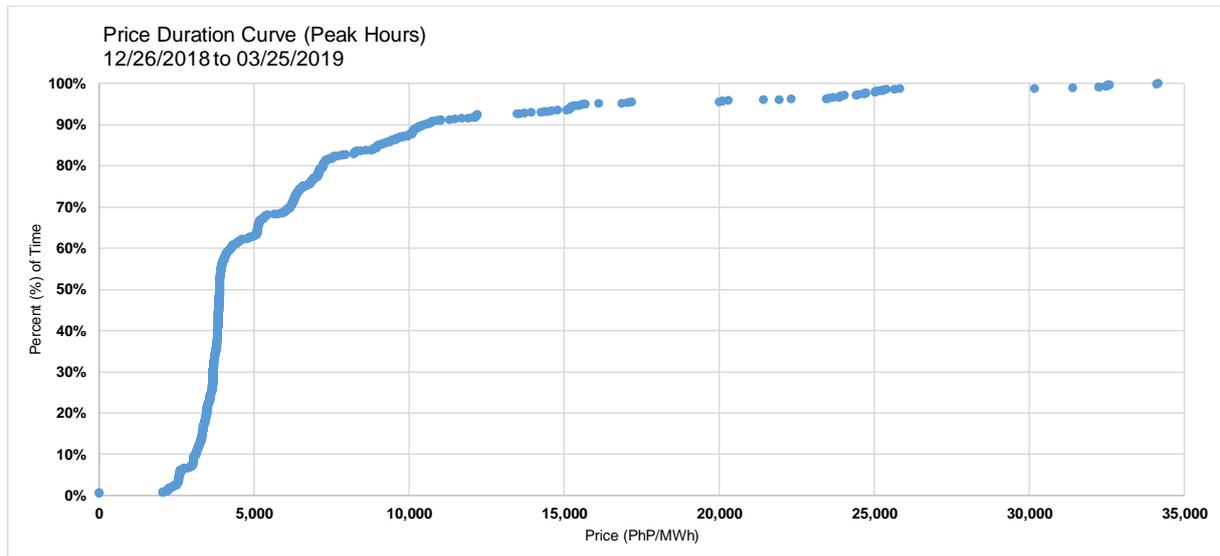
<sup>5</sup>Peak hours include 1000H-2100H from Mondays to Saturdays and 1900H-2000H on Sundays and Holidays

<sup>6</sup>Off-peak hours include 0100H to 0900H and 2200H to 2400H from Mondays to Saturdays and 0100H to 1800H and 2100H to 2400H on Sundays and Holidays

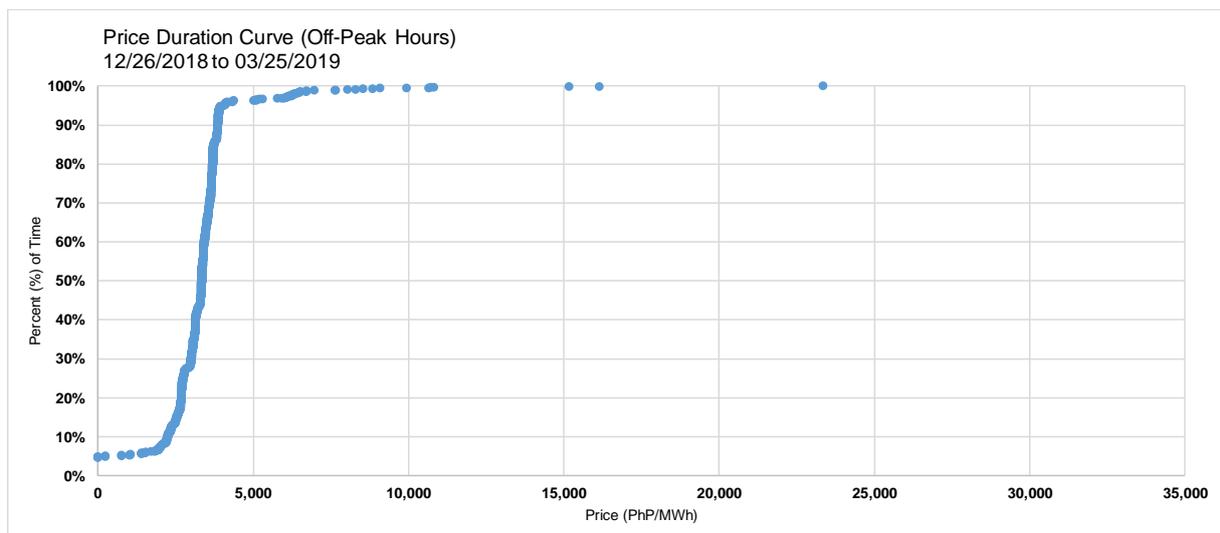
7.3 percent was at PhP2,000/MWh and below while the remaining 0.5 percent were above PhP4,000/MWh up to PhP32,000/MWh.

On the other hand, only 56 percent of the prices during the peak hours were within the PhP2,000/MWh up to PhP4,000/MWh as shown in Figure 13. Market prices within PhP4,000/MWh up to PhP10,000/MWh was recorded at 30.1 percent while 12 percent was above PhP10,000/MWh up to PhP32,000/MWh. Less than one percent was recorded below PhP2,000/MWh.

**Figure 12. Price Duration Curve (Peak Period), 1<sup>st</sup> Quarter 2019**



**Figure 13. Price Duration Curve (Off-Peak Period), 1<sup>st</sup> Quarter 2019**



#### D. Interesting Pricing Event

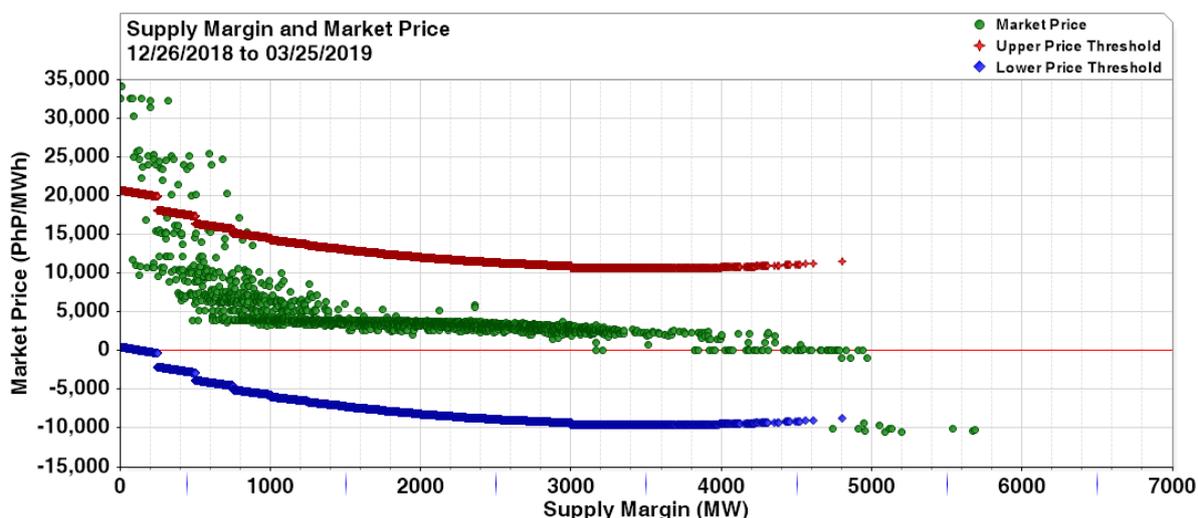
Interesting pricing events refer to intervals determined to have price outliers based on the relationship of market price and supply margin. Prices within the upper and lower reference price thresholds are considered as “normal prices”, while prices outside or beyond the

thresholds are tagged as “interesting pricing events”. Annex A provides details on the MSC-approved methodology in determining interesting pricing events.

A total of 44 trading intervals recorded market prices above the upper price threshold (20 trading intervals in January, 4 trading intervals in February, and 20 trading intervals in March). On other hand, 12 trading intervals from 31 January to 1 February had market prices falling below the lower price threshold.

Provided in Tables 16 and 17 are the details on the market price and supply margin during the said trading intervals and the corresponding reference price threshold for each interesting pricing event.

**Figure 14. Supply Margin and Market Price, 1<sup>st</sup> Quarter 2019**



**Table 16. Interesting Pricing Events (Exceeding the Upper Threshold) – 1<sup>st</sup> Quarter 2019**

Month	Day	Trading Interval	Supply Margin	Market Price	Lower Price Threshold	Upper Price Threshold	
January	8	11	716	20,282	-3,794	16,424	
		18	613	24,021	-3,794	16,424	
	11	18	793	17,052	-5,017	15,201	
		14	91	30,157	515	20,733	
	12	16	223	25,273	515	20,733	
		18	4	32,468	515	20,733	
	February	4	19	4	32,576	515	20,733
			20	83	32,532	515	20,733
		16	21	318	32,236	-2,072	18,146
			18	385	21,415	-2,072	18,146
		17	18	683	24,646	-3,794	16,424
			18	458	25,040	-2,072	18,146
		19	19	467	23,852	-2,072	18,146
			20	361	24,718	-2,072	18,146
		21	21	595	25,383	-3,794	16,424
			22	450	23,339	-2,072	18,146
	January	20	19	346	25,032	-2,072	18,146
			20	427	23,919	-2,072	18,146
18			205	32,234	515	20,733	
21		18	849	15,338	-5,017	15,201	
		16	204	31,394	515	20,733	
February		4	17	242	23,891	515	20,733
			18	305	24,488	-2,072	18,146
		19	273	23,533	-2,072	18,146	
			16	113	25,647	515	20,733
March		1	19	188	25,134	515	20,733
			20	229	24,735	515	20,733
			14	14	34,142	515	20,733
	4	15	14	34,115	515	20,733	
		16	72	32,504	515	20,733	
		19	128	25,816	515	20,733	
March	5	16	145	32,525	515	20,733	
		17	261	24,406	-2,072	18,146	
		18	509	20,102	-3,794	16,424	
	7	19	287	23,444	-2,072	18,146	
		20	346	20,099	-2,072	18,146	
		21	479	19,992	-2,072	18,146	
		16	185	23,890	515	20,733	
	8	10	282	21,937	-2,072	18,146	
		11	148	22,314	515	20,733	
		14	151	23,669	515	20,733	
22	14	130	24,689	515	20,733		
	16	96	25,014	515	20,733		

**Table 17. Interesting Pricing Events (Below the Lower Threshold) – 1<sup>st</sup> Quarter 2019**

Month	Day	Trading Interval	Supply Margin	Market Price	Lower Price Threshold	Upper Price Threshold
January	31	2	4,950	-9,404	-9,091	11,504
		3	4,741	-10,115	-9,091	11,504
		4	4,954	-10,317	-9,091	11,504
		5	4,912	-10,122	-9,091	11,504
		4	5,136	-10,015	-9,091	11,504
February	1	5	5,092	-10,469	-9,091	11,504
		6	5,200	-10,466	-9,091	11,504
		7	5,674	-10,364	-9,091	11,504
		8	5,690	-10,261	-9,091	11,504
		9	5,537	-10,126	-9,091	11,504
		10	5,119	-10,092	-9,091	11,504
		11	5,054	-9,709	-9,091	11,504

## V. Pricing Errors and Market Intervention

The first quarter saw a number of intervals with pricing errors, price substitution application, and under Market Intervention.

System-wide non-congestion pricing errors in the ex-ante affected 41 trading intervals during the quarter (20 trading intervals in January, 2 trading intervals in February and 19 trading intervals in March), which were mostly related to inappropriate input data affecting the generation of prices and schedules. Per region, the frequency of non-congestion pricing errors in Luzon affected four (4) trading intervals due to the localized constraint violation on Duhat transformers. In Visayas, non-congestion pricing errors affected 14 trading intervals during the ex-ante related to the localized constraint violation on Cadiz, Calung-Calung, Naga and Mandaue transformers.

Meanwhile, the system-wide application of Price Substitution Methodology (PSM) affected a total of 374 trading intervals in the ex-ante. PSM application this quarter was mainly due to constraint on Samboan-Amlan Line 1 (Cebu-Negros submarine cable).

On the other hand, the Market Operator declared system-wide market intervention on 24 January at 0200H and on 29 January at 1000H because of erroneous results due to loads not being scheduled causing lower generation schedules not matching the intended demand. A market intervention was also declared in the Luzon region on 9 February at 1800H due to unimplementable schedules caused by inappropriate Load Predictor (LDP)<sup>7</sup>.

**Table 18. PEN, PSM and MI Summary, 1<sup>st</sup> Quarter 2019**

	Luz-Vis						Luzon						Visayas						Total					
	Jan 2019		Feb 2019		Mar 2019		Jan 2019		Feb 2019		Mar 2019		Jan 2019		Feb 2019		Mar 2019		Jan 2019		Feb 2019		Mar 2019	
	Freq.	% of Time																						
<b>PEN (RTD)</b>	20	2.7	2	0.3	19	2.8	2	0.3	-	-	2	0.3	1	0.1	8	1.1	5	0.7	23	3.1	10	1.3	26	3.9
<b>PEN (RTX)</b>	17	2.3	1	0.1	8	1.2	1	0.1	2	0.3	2	0.3	-	-	4	0.5	5	0.7	18	2.4	7	0.9	15	2.2
<b>PSM (RTD)</b>	96	12.9	205	27.6	73	10.9	-	-	6	0.8	-	-	1	0.1	15	2.0	10	1.5	97	13.0	221	29.7	83	12.4
<b>PSM (RTX)</b>	95	12.8	201	27.0	85	12.6	-	-	-	-	-	-	1	0.1	10	1.3	6	0.9	96	12.9	211	28.4	91	13.5
<b>MI</b>	1	0.1	1	0.1	-	-	-	-	1	0.1	-	-	-	-	-	-	-	-	1	0.1	2	0.3	-	-
<b>Secondary Cap</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: The column "Total" refers to the total number of trading intervals with PEN, PSM or MI (system-wide or regional)

Shown in Table 19 below are the non-congestion pricing errors by type during the quarter. It was noted that system-wide non-congestion pricing errors were mostly related to inappropriate input data affecting a total of 36 trading intervals in the ex-ante and 22 trading intervals in the ex-post.

Meanwhile, pricing errors due to load shedding affected four (4) trading intervals in Luzon and eight (8) trading intervals in Visayas during the ex-ante.

**Table 19. PEN Type Summary, 1<sup>st</sup> Quarter 2019**

<sup>7</sup> The Load Predictor (LDP) is the forecasting application of Market Management System (MMS) Sable for the Real-time Dispatch (RTD). It is used to forecast demand for the next two hours at five-minute intervals. The forecasted system demand is used by the Real-Time Dispatch (RTD) process that computes ex-ante prices and schedules.

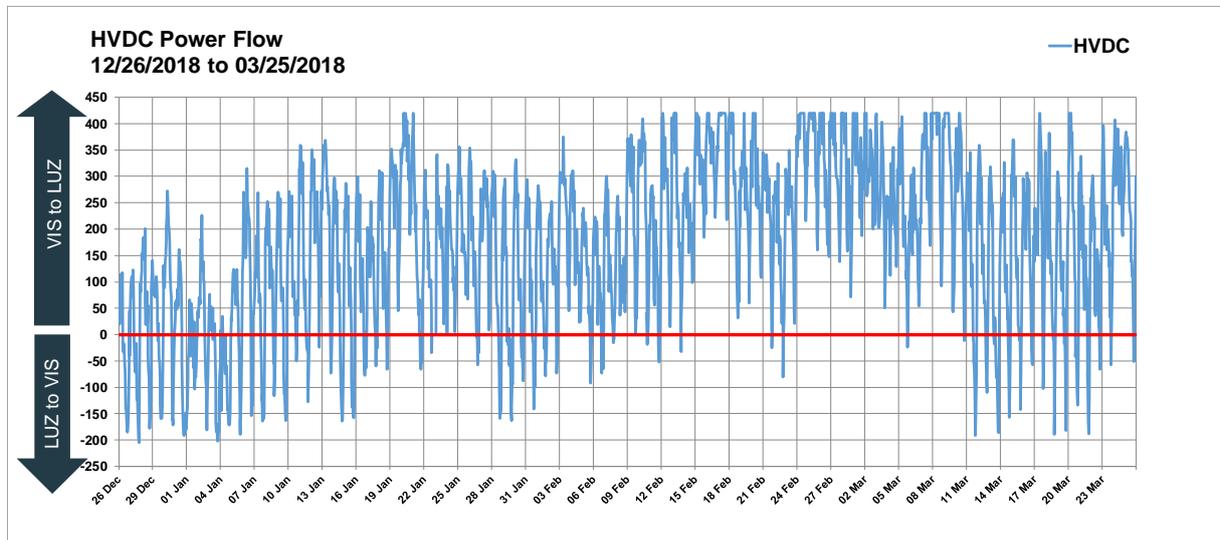
	Luz-Vis						Luzon						Visayas						Total					
	Jan 2019		Feb 2019		Mar 2019		Jan 2019		Feb 2019		Mar 2019		Jan 2019		Feb 2019		Mar 2019		Jan 2019		Feb 2019		Mar 2019	
	Freq.	% of Time																						
<b>PEN (RTD)</b>	20	2.7	2	0.3	19	2.8	2	0.3	-	-	2	0.3	1	0.1	9	1.2	5	0.7	23	3.1	11	1.5	26	3.9
Contingency	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Base Case	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0.7	-	-	-	-	5	0.7
Over-generation	5	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0.7	-	-	-	-
VoLL	-	-	-	-	-	2	0.3	-	-	2	0.3	1	0.1	7	0.9	-	-	-	3	0.4	7	0.9	2	0.3
Inappropriate Input Data	15	2.0	2	0.3	19	2.8	-	-	-	-	-	-	2	0.3	-	-	-	15	2.0	4	0.5	19	2.8	
<b>PEN (RTX)</b>	17	2.3	1	0.1	8	1.2	1	0.1	2	0.3	2	0.3	-	-	4	0.5	5	0.7	18	2.4	7	0.9	15	2.2
Contingency	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Base Case	-	-	-	-	-	-	-	2	0.3	1	0.1	-	-	-	-	-	5	0.7	-	-	2	0.3	6	0.9
Over-generation	4	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	0.5	-	-	-	-
VoLL	-	-	-	-	-	1	0.1	-	-	1	0.1	-	-	3	0.4	-	-	-	1	0.1	3	0.4	1	0.1
Inappropriate Input Data	13	1.7	1	0.1	8	1.2	-	-	-	-	-	-	-	1	0.1	-	-	13	1.7	2	0.3	8	1.2	

## VI. HVDC Scheduling

Power flow through the HVDC Interconnection was generally directed towards the Luzon region in the ex-ante, for 1,826 trading intervals during the billing quarter, with schedules ranging from 0.5 MW to 420 MW. It was noted that the 420-MW limit was maximized more frequently during the February and March billing months.

On the other hand, the HVDC power flow was directed towards the Visayas for 322 trading intervals in the ex-ante during the quarter, with schedules ranging from 0.6 MW to 205 MW.

Summary of HVDC Limits Imposed by NGCP-SO, 1<sup>st</sup> Quarter 2019



**Table 20. Summary of HVDC Limits Imposed by NGCP-SO and Results of HVDC Schedules (Ex-ante and Ex-post), 1<sup>st</sup> Quarter 2019**

Results of HVDC Scheduling	HVDC Limit during Ex-ante (Visayas/Luzon)							
	(No. of Trading Intervals)							
	January 2019			February 2019			March 2019	
	0/0	250/420	Total	250/420	250/400	Total	250/420	Total
<b>Visayas to Luzon</b>	-	539	539	675	6	681	606	606
<i>Limit Not Maximized</i>		536	536	620	6	626	544	544
<i>Limit Maximized</i> <sup>11</sup>		3	3	55		55	62	62
<b>Luzon to Visayas</b>	-	195	195	61	-	61	66	66
<i>Limit Not Maximized</i>		195	195	61		61	66	66
<i>Limit Maximized</i> <sup>11</sup>			-			-		-
<b>No Flow</b> <sup>11</sup>	9		9			-		-
<b>TOTAL</b>	9	734	743	736	6	742	672	672

## VII. Price Setting Plants<sup>8</sup>

Almost all market prices, at 94.5 percent, during the billing quarter were below PhP10,000/MWh with coal and natural gas plants as frequent price setters, namely Sual CFTPP, Ilijan NGPP, San Lorenzo NGPP, PEDC CFTPP, and PCPC CFTPP.

**Table 21. Price Setting Frequency Index at PhP10,000/MWh and below, 1<sup>st</sup> Quarter 2019**

Most Frequent Price Setters at prices PhP10,000/MWh and below		Frequency (Number of trading intervals)									
		PhP0/MWh and below			Above PhP0/MWh to PhP5,000/MWh			Above PhP5,000/MWh to PhP10,000/MWh			Total
Rank	Plant Name	Jan	Feb	Mar	Jan	Feb	Mar	Jan	Feb	Mar	
1	SUAL CFTPP	28	1		216	305	211				761
2	ILIJAN NGPP	5			208	302	186		7		708
3	SAN LORENZO NGPP	44	1		89	135	161				430
4	PEDC CFTPP	24			85	114	168	9	5	6	411
5	PCPC CFTPP	2			126	124	102				354
6	CEDC CFTPP	15	5	1	83	106	136				346
7	STA RITA NGPP	44	1		52	87	142				326
8	TPC (SANGI) CFTPP	8			53	87	115				263
9	QPPL CFTPP	44	1		65	40	55				205
10	PAGBILAO CFTPP	2	1		57	81	59				200
11	SAN GABRIEL NGPP		1		4	107	35				147
12	ANGAT HEP	44	1		22	18	1	27	15	14	142
13	AVION NGPP				46	11	27	17	8	16	125
14	ANDA CFTPP				13	49	44	2	5	8	121
15	KSPC CFTPP	5			28	43	10				86
16	EAUC DPP							52	16	13	81
17	BACMAN GPP	44	1	3	4	10	14	5			81
18	MASINLOC CFTPP				48	23	6	1			78
19	PAGBILAO 3 CFTPP	21			48		1				70
20	PALINPINON GPP I	50	12	5							67

Meanwhile, market prices above PhP10,000/MWh (5.5 percent of the time) were set by hydro and oil-based plants led by Limay CCGT, Angat HEP, SLPGC GTPP, Bauang DPP, and Calumangan DPP.

**Table 22. Price Setting Frequency Index Above PhP10,000/MWh, 1<sup>st</sup> Quarter 2019**

<sup>8</sup> A generator trading node is considered as a price setter when its last accepted offer price is between 95% to 100% of its nodal price. A generating plant is considered as price setter if at least one of its trading nodes was price setter in a given trading hour. The determination of the price setter/s in a trading interval factors in the prevailing pricing condition for the same. The price setters are determined from: (i) ex-ante for trading intervals without pricing error during ex-ante, (ii) ex-post with pricing error during ex-ante but without pricing error during ex-post, (iii) market re-run results for trading intervals with pricing error both in ex-ante and ex-post, and (iv) trading intervals where the price substitution methodology (PSM) was applied. For trading intervals affected by PSM, the unconstrained marginal plants are considered price setters. Further, in instances of regional price separation, price setters are determined separately for each region.

Rank	Plant Name	Frequency (Number of trading intervals)															Total
		Above PhP10,000/MWh to PhP15,000/MWh			Above PhP15,000/MWh to PhP20,000/MWh			Above PhP20,000/MWh to PhP25,000/MWh			Above PhP25,000/MWh to PhP30,000/MWh			Above PhP30,000/MWh to PhP32,000/MWh			
		Jan	Feb	Mar	Jan	Feb	Mar	Jan	Feb	Mar	Jan	Feb	Mar	Jan	Feb	Mar	
1	LIMAY CCGT							11	3	13				2		2	31
2	ANGAT HEP	6	4	7	1		9			3							30
3	SLPGC GTPP	4		4										5	1	2	16
4	BAUANG DPP		3	2			3						4	1	2	15	
5	CALUMANGAN DPP	3		3		1	2						6			15	
6	SUBIC DPP	2	2			1	2	2	1	1			1			12	
7	TAPGC DPP	1	1	1			2	2	1	1			1			10	
8	PB 104				4		5	1								10	
9	BOHOL DPP				1	1	7									9	
10	SAN ROQUE HEP	2		1									2	1	2	8	
11	CIP DPP	2	1				1	2	1	1						8	
12	ANDA CFTPP	1		2			1			1					2	7	
13	NAVOTAS DPP										1			5	1	7	
14	PANAY DPP III	6														6	
15	AVION NGPP	1						1			1	1				5	
16	TPC (CARMEN) DPP	3														3	
17	PB 102		2	1												3	
18	NABAS DPP	2		1												3	
19	KALAYAAN PSPP										2			1		3	
20	PANTABANGAN HEP	1									1				1	3	

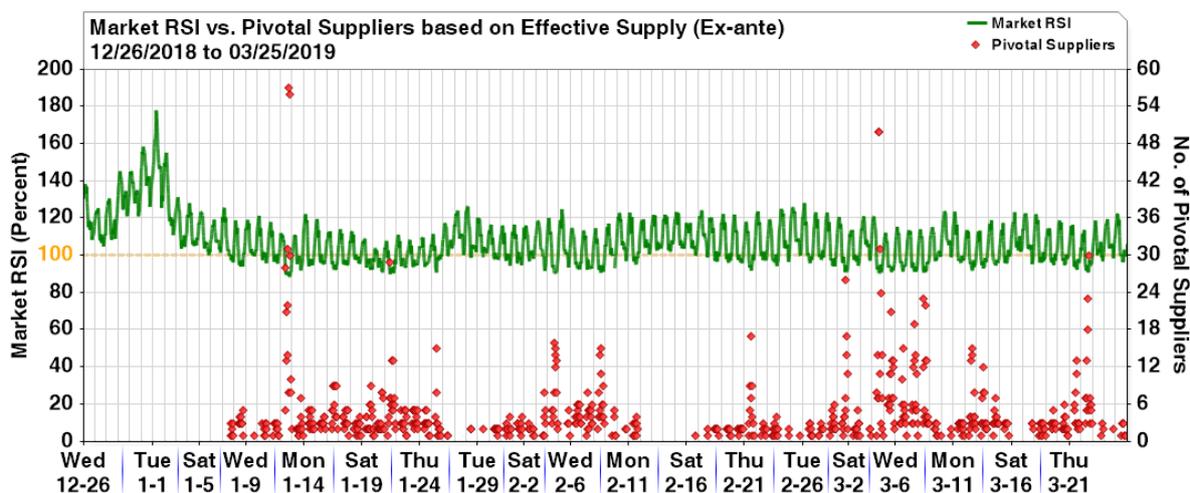
### VIII. Residual Supply

The succeeding figure below shows the hourly trend of the Market Residual Supply Index (Market RSI)<sup>9</sup> plotted against the number of pivotal supplier/s.

During the entire billing quarter, the market RSI was below the 100 percent mark for 31.3 percent of the time, indicating the presence of pivotal suppliers during said trading intervals.

It may be noted that market RSI was above 100 percent during the start of the January billing month consistent the wide supply margin observed during the period.

**Figure 15. Market RSI vs. Pivotal Suppliers (Ex-Ante), 1<sup>st</sup> Quarter 2019**



### IX. Pivotal Suppliers<sup>10</sup>

<sup>9</sup> For a generator, the Residual Supply Index (RSI) is a dynamic continuous index measured as ratio of the available generation without that generator to the total generation required to supply the demand. The Market RSI is measured as the lowest RSI among all generators in the market. A Market RSI less 100% indicates the presence of pivotal generator/s or supplier/s.

<sup>10</sup> The Pivotal Supply Index (PSI) measures how critical a particular generator is in meeting the total demand at a particular time. It is a binary variable (1 for pivotal and 0 for not pivotal) which measures the frequency that a generating is pivotal for a particular period.

Provided in Table 23 are the top 20 pivotal suppliers in the market during the billing quarter led by Sual CFTPP, Ilijan NGPP, Sta. Rita NGP, Pagbilao CFTPP, Masinloc CFTPP, and San Lorenzo NGPP.

**Table 23. Pivotal Supplier Frequency Index, 1<sup>st</sup> Quarter 2019**

Top Pivotal Suppliers		Frequency (Number of trading intervals)			
Rank	Plant Name	Jan	Feb	Mar	Total
1	SUAL CFTPP	214	177	249	640
2	ILIJAN NGPP	197	141	241	579
3	STA RITA NGPP	138	88	199	425
4	PAGBILAO CFTPP	80	57	105	242
5	MASINLOC CFTPP	13	37	75	125
6	SAN LORENZO NGPP	36	20	56	112
7	KALAYAAN PSPP	52	9	35	96
8	MARIVELES CFTPP	4	13	70	87
9	LEYTE A GPP	26	17	39	82
10	SAN ROQUE HEP	29	9	35	73
11	LIMAY CCGT	13	7	33	53
12	SAN GABRIEL NGPP	2	15	34	51
13	QPPL CFTPP	4	3	37	44
14	PEDC CFTPP	9	9	16	34
15	MAGAT HEP	15	12	5	32
16	SMC LIMAY CFTPP	13	5	13	31
17	CEDC CFTPP	11	1	16	28
18	BAUANG DPP	8	1	13	22
19	SLPGC CFTPP	9		12	21
20	ANGAT HEP	8		12	20

## X. Price-Setters and Pivotal Plants

Limay CCGT, San Roque HEP and Bauang DPP were considered the most frequent pivotal supplier at the same time that it set prices at above PhP10,000/MWh.

**Table 24. PSI vs PSFI, 1<sup>st</sup> Quarter 2019**

Pivotal Supplier and Price Setter at above PhP10,000/MWh		Frequency (Number of trading intervals)						Total
		Above PhP10,000/MWh to PhP15,000/MWh			Above PhP20,000/MWh to PhP32,000/MWh			
Rank	Plant Name	Jan	Feb	Mar	Jan	Feb	Mar	
1	LIMAY CCGT				3	3	15	21
2	SAN ROQUE HEP			1	2	1	2	6
3	BAUANG DPP				3		2	5
4	KALAYAAN PSPP				3			3
5	SLPGC GTPP				2			2
6	CALUMANGAN DPP				2			2
7	NAVOTAS DPP				2			2
8	SUBIC DPP				1			1
9	PANTABANGAN HEP				1			1
10	SAN GABRIEL NGPP					1		1
11	AVION NGPP				1			1

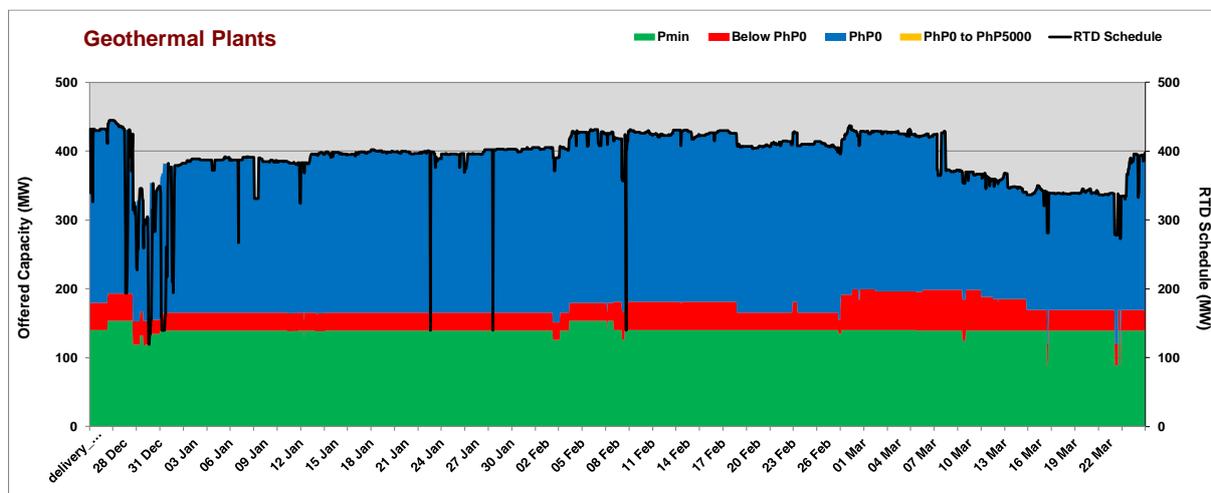
## XI. Generator Offer Pattern

Luzon geothermal plants offered almost its entire capacity (99.9 percent) at PhP0/MWh and below during the billing quarter. In particular, about 55.9 percent was priced at exactly

PhP0/MWh while the remaining 44 percent was priced below PhP0/MWh as seen in Figure 16. The remaining 0.1 percent was offered at PhP0/MWh to PhP5,000/MWh.

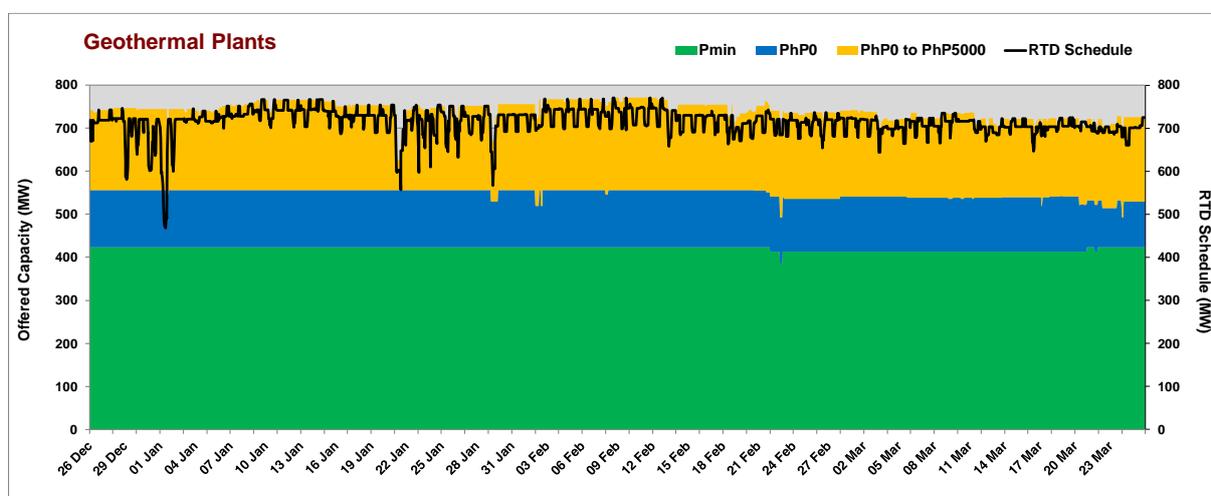
Accordingly, all of its submitted capacity offers, at 98.9 percent, were scheduled for dispatch in the market.

**Figure 16. Geothermal Plants Offer Pattern, Luzon – 1<sup>st</sup> Quarter 2019**



On the other hand, Visayas geothermal plants had slightly higher-priced offers compared to Luzon geothermal plants. It was noted that about 26 percent of Visayas geothermal plants' offered capacity was priced at above PhP0/MWh up to PhP5,000/MWh while the remaining 74 percent was priced at PhP0/MWh and below as seen in Figure 17. It was noted that about 96.3 percent of these capacity offers were scheduled for dispatch.

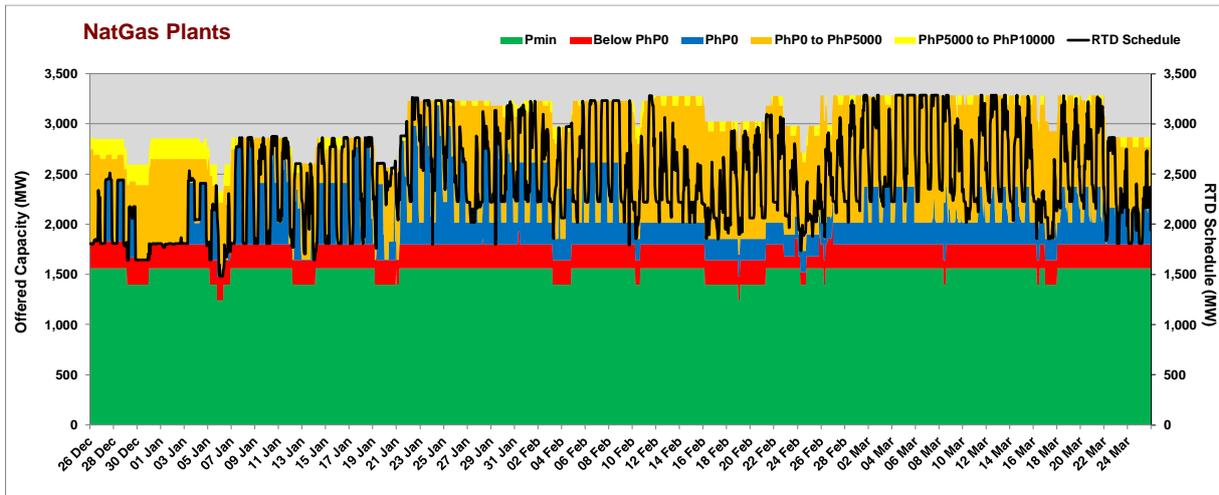
**Figure 17. Geothermal Plants Offer Pattern, Visayas – 1<sup>st</sup> Quarter 2019**



About 69 percent of the natural gas plants' capacity offers were priced at PhP0/MWh and below, 29 percent was priced above PhP0/MWh to PhP5,000/MWh and 1.9 percent was priced at above PhP5,000/MWh to PhP10,000/MWh. A small portion, at 0.1 percent, was offered at prices above PhP30,000/MWh up to PhP32,000/MWh as seen in Figure 18.

Accordingly, about 80.3 percent of the offers of natural gas plants were scheduled for dispatch within the quarter.

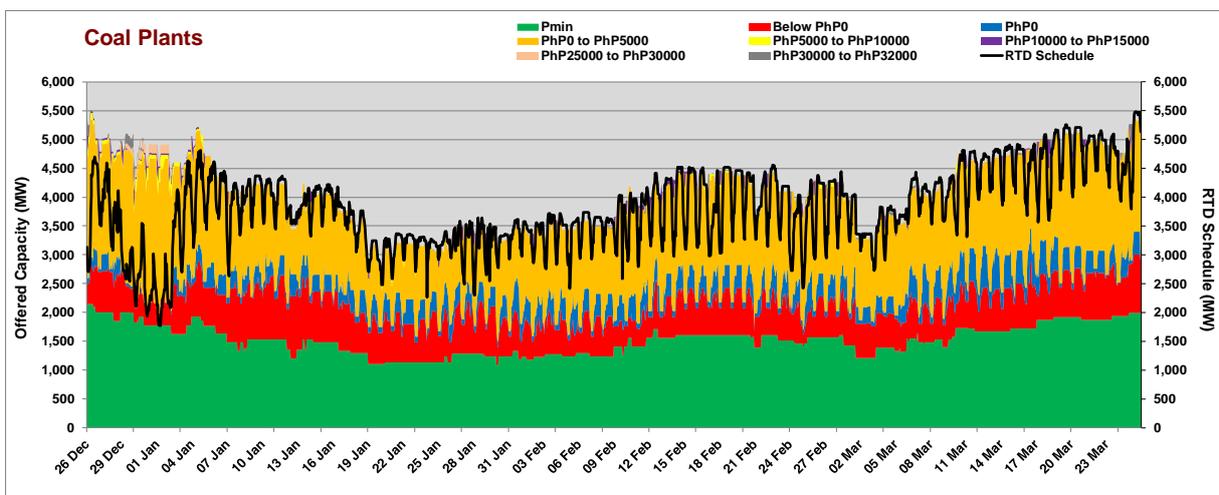
**Figure 18. Natural Gas Plants Offer Pattern, Luzon – 1<sup>st</sup> Quarter 2019**



Luzon coal plants submitted 59.8 percent of its capacity offers at prices ranging from PhP0/MWh and below while 38.3 percent was submitted at prices above PhP0/MWh to PhP5,000/MWh as seen in Figure 19. About 1.5 percent of their offered capacity were priced between PhP5,000/MWh to PhP15,000/MWh. The remaining 0.5 percent of the capacity offers were priced at PhP25,000/MWh to PhP32,000/MWh.

About 92.2 percent of the capacity offers of Luzon coal plants were scheduled for dispatch within the quarter.

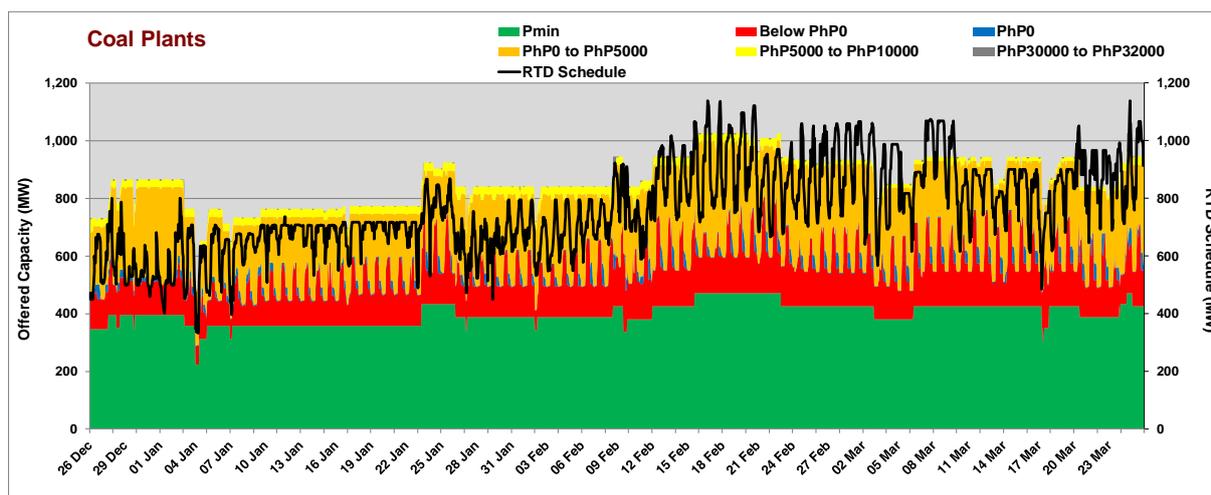
**Figure 19. Coal Plants Offer Pattern – Luzon, 1<sup>st</sup> Quarter 2019**



Meanwhile, 65.9 percent of Visayas coal plants' capacity offers were priced at PhP0/MWh and below, 35.7 percent at PhP0/MWh to PhP10,000/MWh. A minimal percentage, at 0.1 percent, was offered at prices ranging between PhP30,000/MWh and PhP32,000/MWh (Figure 20).

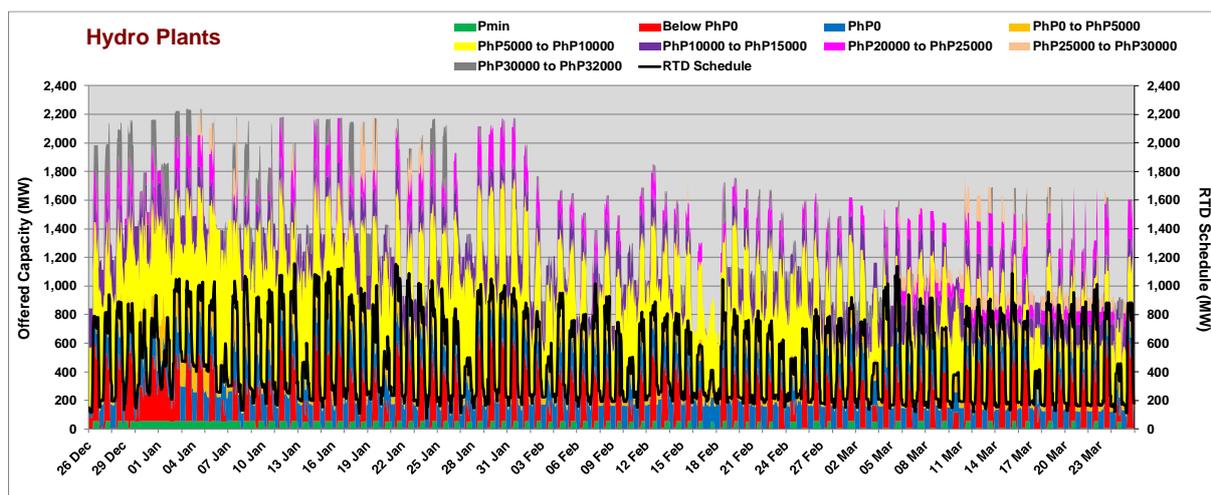
About 88.1 percent of the offered capacity from Visayas coal plants was scheduled for dispatch.

**Figure 20. Coal Plants Offer Pattern, Visayas – 1<sup>st</sup> Quarter 2019**



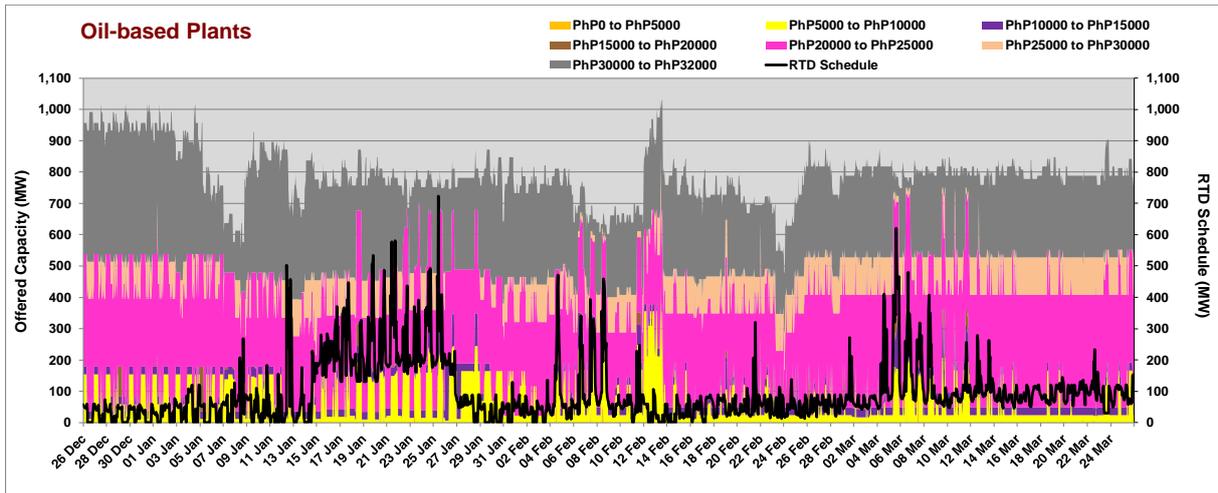
Luzon hydro plants priced 26.6 percent of their capacity at PhP0/MWh and below while 6.6 percent at PhP0/MWh up to PhP5,000/MWh. About 41.1 percent was priced at PhP5,000/MWh up to PhP10,000/MWh, 13.3 percent was priced at PhP10,000/MWh up to PhP20,000/MWh and 7.6 percent was priced at PhP20,000/MWh up to PhP30,000/MWh. The remaining 4.7 percent was priced at PhP30,000/MWh up to PhP32,000/MWh.

**Figure 21. Hydro Plants Offer Pattern, Luzon – 1<sup>st</sup> Quarter 2019**



Luzon oil-based plants submitted the highest offer prices with 40.5 percent priced at above PhP20,000/MWh up to PhP25,000/MWh and 36.1 percent at above PhP30,000/MWh up to PhP32,000/MWh. Moreover, 9 percent was offered at PhP25,000/MWh to PhP30,000/MWh while 4.3 percent at PhP10,000/MWh to PhP20,000/MWh (Figure 22). It was noted that only 10.1 percent of its capacity offers were priced at PhP10,000/MWh and below.

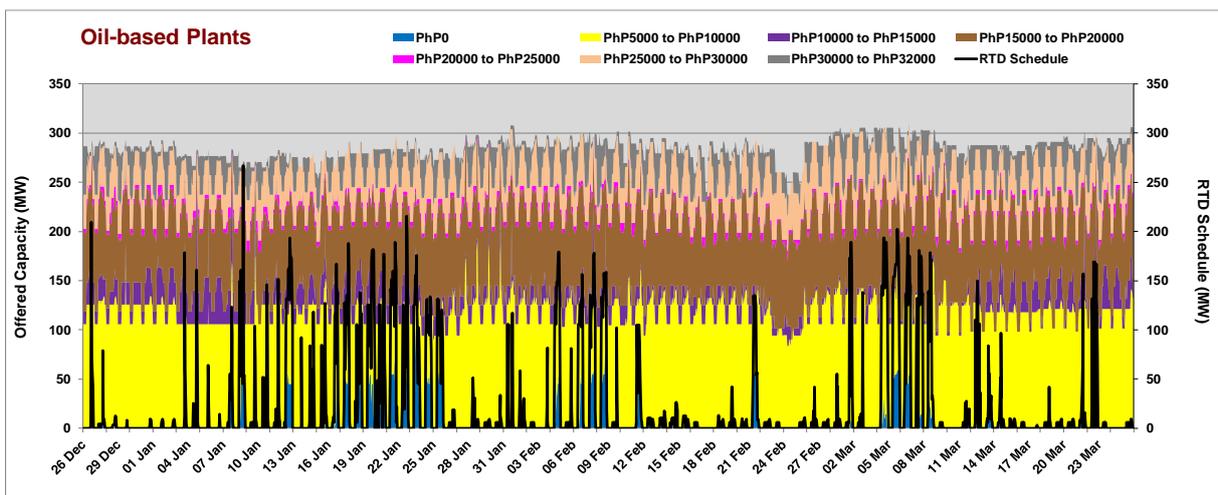
**Figure 22. Oil-based Plants Offer Pattern, Luzon – 1<sup>st</sup> Quarter 2019**



Similarly, Visayas oil-based plants offered their capacities at relatively higher prices when compared with other plant types with 22.3 percent priced above PhP20,000/MWh as seen in Figure 23. About 39.8 percent was offered at PhP5,000/MWh to PhP10,000/MWh, 5.8 percent at PhP10,000/MWh to PhP15,000/MWh and 29.5 percent at PhP15,000/MWh to PhP20,000/MWh. Only 2.5 percent of their capacity offers were priced at PhP0/MWh and below.

About 7.2 percent of Visayas oil-based plants' capacity offered were scheduled for dispatch during the billing quarter.

**Figure 23. Oil-based Plants Offer Pattern, Visayas – 1<sup>st</sup> Quarter 2019**



## XII. Capacity Factor

### Luzon

Natural gas plants observed the highest utilization during the quarter when measured in terms of registered capacity, among resource types with capacity factor at 74 percent. Coal and geothermal plants followed with capacity factors of 57 percent and 41 percent, respectively. Hydro and oil-based plants came next at 22 percent and 6 percent, respectively. On the other

hand, when measured in terms of registered capacity net of outage, natural gas and coal plants obtained the highest utilization at 79 percent and 78 percent, respectively. Geothermal plants followed with a capacity factor of 65 percent, hydro plants with 24 percent, and oil-based plants with 9 percent.

Utilization among lower-priced plants was highest when measured in terms of offered capacity, indicating that capacities, when offered, are generally scheduled for dispatch. Geothermal plants posted the highest capacity factor at 92 percent. Coal plants followed with 86 percent while natural gas and hydro plants recorded capacity factors at 80 and 37 percent each. Oil-based plants had lower capacity factor at 14 percent.

Meanwhile, preferential dispatch plants – biomass plants’ capacity factors were posted at 42 percent when measured based on registered capacity and 44 percent when based on registered less outage capacity while wind plants recorded the same capacity factors at 32 percent each. On the other hand, lower utilization level was noted for Luzon solar plants with their capacity factors based on registered capacity, and registered less outage capacity each at 20 percent.

On the other hand, sole battery energy storage facility in the WESM, Masinloc Battery, posted a capacity factor of 1 percent each when measured in terms of registered capacity, registered capacity net of outage, and offered capacity.

**Table 25. Capacity Factor – Luzon Plants, 1<sup>st</sup> Quarter 2019**

LUZON									
Plant Type	RTD Sched. vs Registered Cap.			RTD Sched. vs Registered less Outage Cap.			RTD Sched. vs Offered Cap.		
	Jan 2019	Feb 2019	Mar 2019	Jan 2019	Feb 2019	Mar 2019	Jan 2019	Feb 2019	Mar 2019
<b>Coal</b>	53%	55%	64%	74%	81%	80%	80%	89%	90%
<b>Natural Gas</b>	69%	75%	79%	80%	78%	81%	80%	79%	81%
<b>Geothermal</b>	39%	43%	39%	65%	68%	63%	90%	94%	92%
<b>Hydro</b>	25%	21%	19%	25%	24%	22%	36%	37%	39%
<b>Oil-based</b>	7%	4%	7%	9%	7%	11%	15%	10%	15%
<b>Wind</b>	48%	22%	24%	48%	22%	24%	0%	0%	0%
<b>Solar</b>	17%	21%	23%	17%	21%	23%	0%	0%	0%
<b>Biomass</b>	45%	41%	40%	46%	43%	43%	0%	0%	0%
<b>Battery</b>	2%	2%	1%	2%	2%	1%	2%	2%	1%

In Visayas, geothermal plants obtained the highest utilization among resource types in terms of registered capacity with capacity factors at 77 percent. Coal and hydro plants then followed with capacity factors at 42 percent and 29 percent, respectively. In terms of registered capacity net of outage, geothermal recorded its capacity factors at 83 percent, coal plants at 42 percent and hydro plants had 29 percent. Oil-based plants recorded the lowest utilization each at 5 percent when measured in terms of registered capacity and percent when measured in terms of registered capacity net of outage.

In terms of offered capacity, geothermal plants recorded a capacity factor at 92 percent while coal plants’ capacity factor was at 68 percent. Meanwhile, oil-based plants posted a capacity factor of 9 percent.

Wind plants’ capacity factors based on registered capacity and based on registered capacity net of outage in the region was recorded at 46 percent while biomass plants recorded the same at 22 percent and 23 percent, respectively. Solar plants recorded a capacity factor of 18

percent when measured in terms of registered capacity and in terms of registered capacity net of outage.

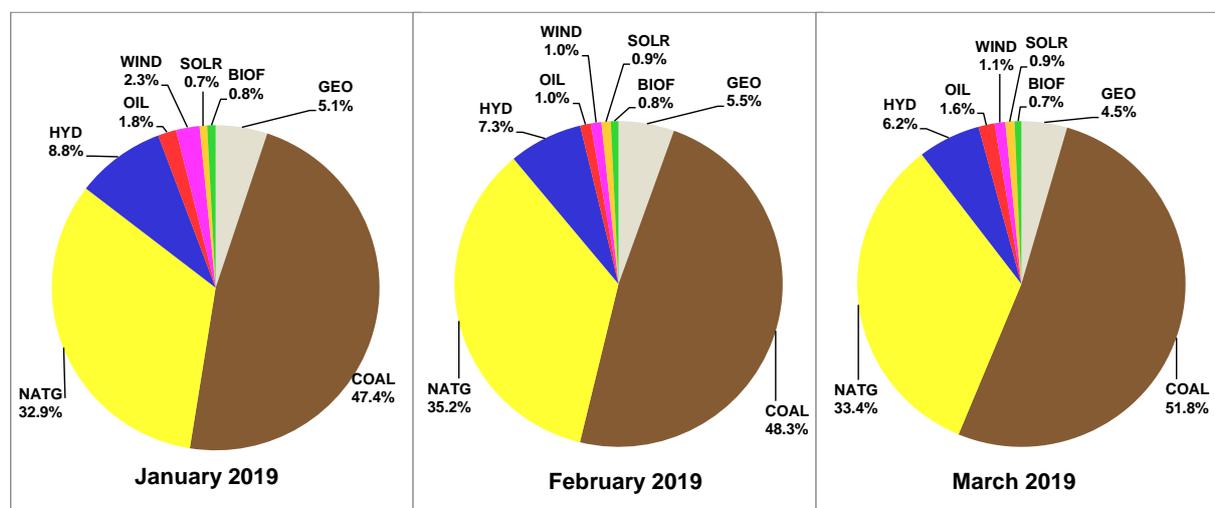
**Table 26. Capacity Factor, Visayas Plants – 1<sup>st</sup> Quarter 2019**

VISAYAS									
Plant Type	RTD Sched. vs Registered Cap.			RTD Sched. vs Registered less Out. Cap.			RTD Sched. vs Offered Cap.		
	Jan 2019	Feb 2019	Mar 2019	Jan 2019	Feb 2019	Mar 2019	Jan 2019	Feb 2019	Mar 2019
Coal	35%	42%	49%	42%	46%	53%	63%	65%	76%
Geothermal	77%	77%	76%	82%	83%	83%	91%	91%	93%
Hydro	43%	28%	14%	43%	28%	14%	0%	0%	0%
Oil-based	8%	3%	5%	8%	3%	5%	13%	6%	8%
Wind	51%	48%	38%	51%	48%	38%	0%	0%	0%
Solar	16%	20%	19%	16%	20%	19%	0%	0%	0%
Biofuel	17%	23%	26%	19%	24%	27%	0%	0%	0%

### XIII. Generation Mix

Coal plants consistently contributed the largest chunk of the metered quantity from January to March billing months, ranging from 47 to 52 percent. Natural gas plants followed with about 33 to 35 percent. Hydro and geothermal plants came next with about 6 to 9 percent and about 4 percent to 5 percent, respectively. Oil-based plants' contribution was the lowest at 1 to 2 percent. Meanwhile, the contribution of preferential and must-dispatch generating units ranged from 3 to 4 percent.

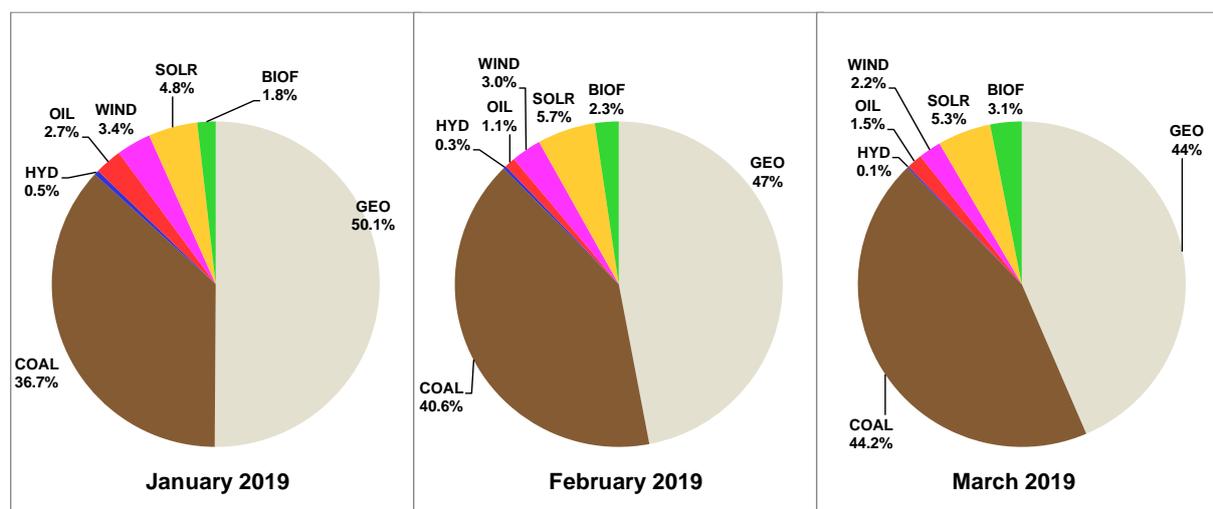
**Figure 24. Generation Mix (Based on Metered Quantity) – Luzon, 1<sup>st</sup> Quarter 2019**



In the Visayas region, coal and geothermal plants had the highest contribution during the quarter. Geothermals plants' contribution ranged from 44 to 50 percent while coal plants' contribution ranged from 37 to 44 percent. Meanwhile, oil-based plants' contribution ranged from 1 to percent while hydro had the least contribution at 1 to 3 percent.

On the other hand, preferential and must-dispatch generating units had higher contribution at about 10 to 11 percent in Visayas compared to 3 to 4 percent in Luzon.

**Figure 25. Generation Mix (Based on Metered Quantity), Visayas – 1<sup>st</sup> Quarter 2019**



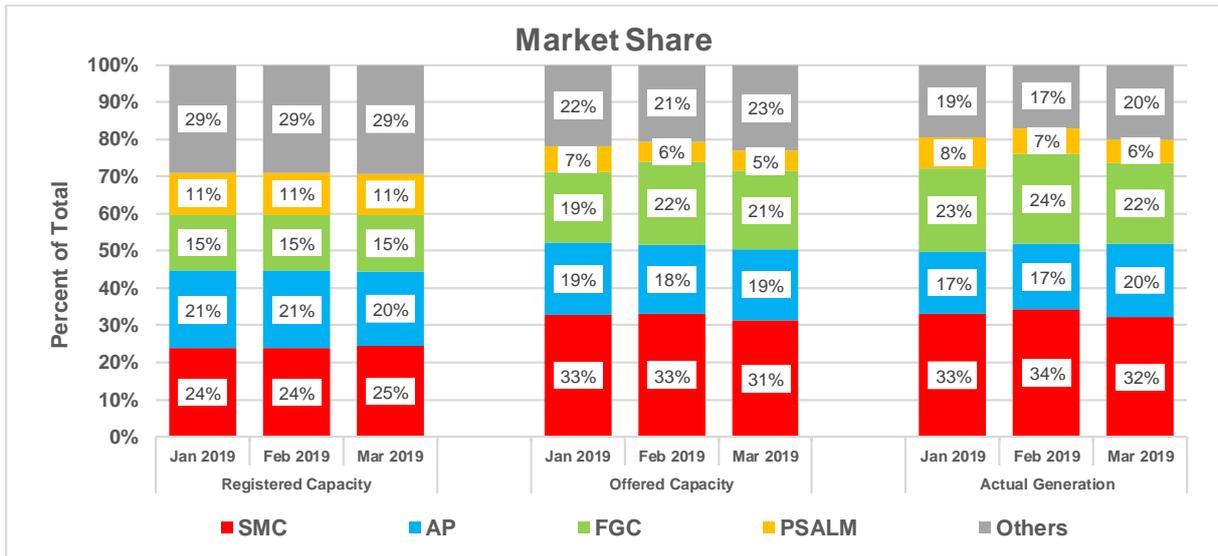
#### XIV. Market Concentration

##### a. Market Share

The integrated Luzon and Visayas market remained to be dominated by four (4) major participant groups based on registered capacity led by SMC with a market share of 25 percent by the end of the quarter, which was slightly higher from 24 percent in January, related to the registration of Masinloc CFTPP unit 3. AP came next with market share of about 20 to 21 percent. FGC and PSALM followed with 15 percent and 11 percent, respectively.

It may be noted that SMC's market shares grew to 31 percent when based on offered capacity and 32 percent when based on actual generation compared to 25 percent based on registered capacity during the March billing month. The market shares of AP were almost similar at 19 percent when based on offered capacity and 20 percent when based on actual generation. FGC's market share was likewise higher at 21 percent when based on offered capacity and 22 percent when based on actual generation. PSALM, on the other hand, recorded lower market shares at 5 percent based on offered capacity and 6 percent based on actual generation.

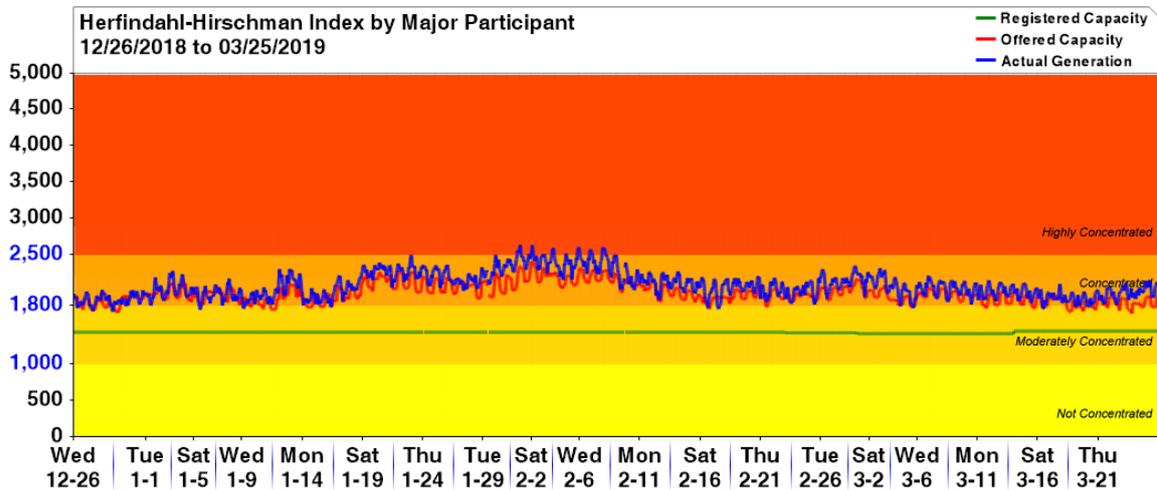
**Figure 26. Market Share by Major Participant Group based on Registered Capacity, Offered Capacity, and Actual Generation, 1<sup>st</sup> Quarter 2019**



**b. Herfindahl-Hirschman Index (HHI)**

The Herfindahl-Hirschman Index (HHI)<sup>11</sup> calculated based on registered capacity by major participant grouping indicated a moderately concentrated market throughout first billing quarter of 2019. Meanwhile, when measured in terms of offered capacity, only 9 percent of the time (191 trading intervals) showed a moderately concentrated market while the remaining 91 percent (1,966 trading intervals) showed a concentrated market. On the other hand, HHI calculation based on actual generation indicated a concentrated market more frequently at 2,067 trading intervals (95.8 percent) while 49 trading intervals (2.3 percent) showed a highly concentrated market. Only the remaining 41 trading intervals (1.9 percent) indicated a moderately concentrated market.

**Figure 27. Hourly HHI based by Major Participant Grouping, 1<sup>st</sup> Quarter 2019**



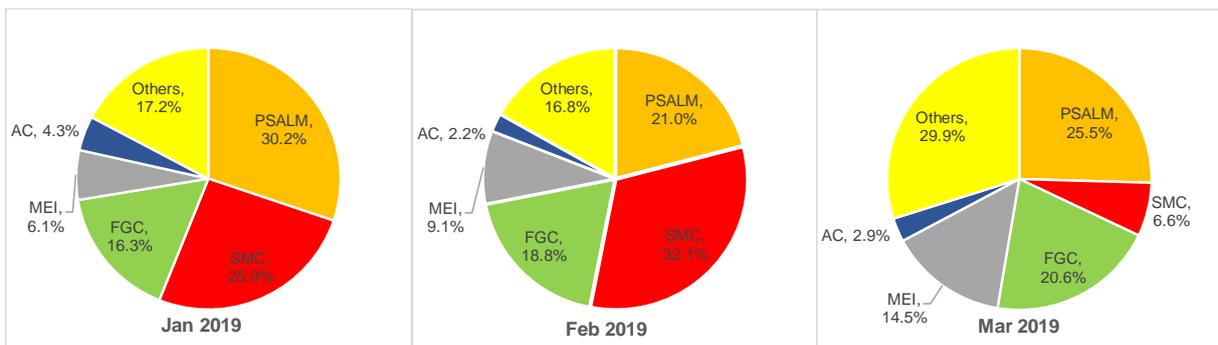
<sup>11</sup> The HHI measures the degree of market concentration, taking into account the relative size and distribution of participants in the monitored market. It is calculated as the sum of squares of the participant's market share. The following are the widely-used HHI screening numbers: the HHI approaches zero when the market has very large number of participants with each having a relatively small market share. In contrary, the HHI increases as the number of participants in the market decreases, and the disparity in the market shares among the participants increases. The following are the widely-used HHI screening numbers: (1) when HHI is less than 1,000 the market is not concentrated; (2) in the range of 1,000 to 1,800 the market is moderately concentrated; (3) greater than 1,800 to 2,500 the market is concentrated; and (4) greater than 2,500 the market is highly concentrated and signals lack of competition in the market.

**c. Total Trading Amount (TTA) Share**

The Total Trading Amounts (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. Meanwhile, the TTA share of a major participant group is measured as a percentage of its TTA over the TTA of all participants during the period.

Provided in Figure 28, PSALM held the highest TTA share with about 26 percent of the entire TTA during the quarter. SMC then followed with about 22 percent and FGC with 18 percent. Millennium Energy, Inc. (MEI) came next with 10 percent followed by Ayala Corporation (AC) with 3 percent.

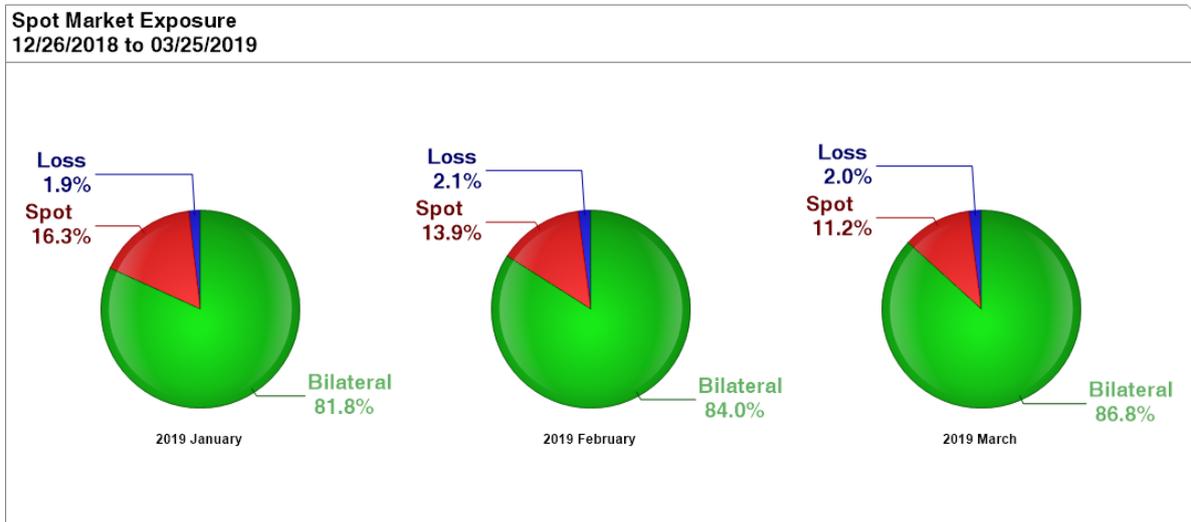
**Figure 28. Total Trading Amount Share by Major Participant Grouping, 1<sup>st</sup> Quarter 2019**



**XV. Spot Exposure**

Spot market transaction of generator-trading participants comprised about 11 percent (in March) to 16 percent (in January) of the total energy transaction in the WESM. Still, majority of the total energy injected into the grid was covered by bilateral contracts.

**Figure 29. Spot Market Exposure, 1<sup>st</sup> Quarter 2019**





## List of Plant Outages

Region	Plant Type	Plant/ Unit Name	Capacity (MW)	Commissioned/ Commercial Operation	Date Out	Date In	Duration (Days)	Outage Type	Remarks
LUZON	GEO	Tiwi 3	43.7	Jan 1979	10/23/2005 13:26			Deactivated Shutdown	Tiwi 3 decommissioned since May 26 2009
LUZON	GEO	Makban 6	55	Apr 1979	04/11/2013 22:44			Deactivated Shutdown	Conducted gas compressor test
VISAYAS	GEO	PGPP2 Unit 4	20	Aug 1983	06/27/2014 6:07			Forced Outage	Steam being utilized by Nasulo plant
LUZON	OIL	Malaya 1	300	Aug 1975	01/26/2018 21:25	03/04/2019 5:57	401.36	Planned Outage	Planned outage
LUZON	HYD	Angat M 3	50	Oct 1967	01/29/2018 0:01	02/07/2019 9:51	374.41	Planned Outage	Annual overhauling until 29 July 2018
LUZON	OIL	Malaya 2	350	Apr 1979	05/19/2018 13:01			Forced Outage	Burn air heater 2A
LUZON	COAL	SLTEC 2	122.9	Feb 2016	06/18/2018 6:14	03/04/2019 11:48	259.23	Forced Outage	Isolated due to tripping Calaca-Salong Line
LUZON	GEO	Makban 9	20	Apr 1979	08/30/2018 19:19	01/07/2019 23:32	130.18	Forced Outage	On reserve shutdown pending availability of steam supply
VISAYAS	GEO	Upper Mahiao 2	32	Jul 1997	09/03/2018 6:01			Forced Outage	Tripped
LUZON	GEO	Makban 4	63	Apr 1979	11/19/2018 21:35	01/13/2019 6:06	54.35	Planned Outage	Maintenance Outage until 13 December 2018
LUZON	OIL	SLPGC 4	25	Mar 2018	11/22/2018 11:56			Maintenance Outage	On extended maintenance shutdown until 24 April 2019
LUZON	OIL	TMO Unit 2	49	Nov 2013	11/26/2018 13:01			Deactivated Shutdown	Unavailable due to cooling tower trouble. RECLASSIFIED FROM FORCE. OMC OUTAGE. TMO ceased WESM participation effective 05 February 2019 at 1037H
LUZON	OIL	TMO Unit 1	49	Nov 2013	11/26/2018 13:01			Forced Outage	Unavailable due to cooling tower trouble
LUZON	GEO	Tiwi 1	59	Jan 1979	11/29/2018 13:31			Maintenance Outage	Maintenance Outage
LUZON	GEO	Makban 5	55	Apr 1979	12/06/2018 19:04	12/27/2018 11:05	20.67	Forced Outage	Turbine vibration
LUZON	NATG	San Gabriel	420	Jul 2016	12/08/2018 0:36	01/21/2019 16:49	44.68	Maintenance Outage	Maintenance outage until 22 December 2018
VISAYAS	GEO	Mahanadong B1	5	Jul 1997	12/22/2018 0:08	01/08/2019 10:12	17.42	Forced Outage	To facilitate turbine rotor replacement
LUZON	COAL	SMC 4	150		12/23/2018 13:40	01/02/2019 10:19	9.86	Maintenance Outage	Correction of punchlist in preparation for commercial operation
VISAYAS	COAL	PALM 1	135	Aug 2016	12/23/2018 18:19	12/27/2018 10:38	3.68	Forced Outage	Affected by the tripping
VISAYAS	COAL	PEDC 3	150	Dec 2016	12/25/2018 0:39	01/22/2019 21:31	28.87	Planned Outage	For annual preventive maintenance schedule
LUZON	COAL	SLTEC 1	121	Apr 2015	12/26/2018 12:18	01/08/2019 0:54	12.53	Forced Outage	Boiler tube leak
LUZON	COAL	Masinloc 2	344	Jun 1998	12/26/2018 18:36	12/30/2018 7:43	3.55	Forced Outage	Drag chain conveyor trouble
LUZON	COAL	Calaca 2	300	Sep 1984	12/28/2018 6:46	12/28/2018 14:18	0.31	Forced Outage	Turbine fault
VISAYAS	COAL	CEDC 3	82	Jan 2011	12/28/2018 6:46	12/28/2018 12:03	0.22	Forced Outage	Unit tripped. Under assessment
LUZON	NATG	Sta. Rita 4	264	Oct 2001	12/29/2018 4:33	12/30/2018 22:53	1.76	Planned Outage	GT offline compressor washing
LUZON	GEO	Makban 7	20	Apr 1979	12/29/2018 16:43	01/01/2019 4:50	2.50	Forced Outage	Isolated due to tripping of Bay-Makban B 230 kV Tie lines 1 and 2
LUZON	GEO	Makban 8	20	Apr 1979	12/29/2018 16:43	12/31/2018 23:29	2.28	Forced Outage	Isolated due to tripping of Bay-Makban B 230 kV Tie lines 1 and 2
VISAYAS	COAL	PALM 1	135	Aug 2016	12/29/2018 17:02	01/29/2019 18:53	0.08	Forced Outage	Auto open with load of 51.53. Cause under investigation
LUZON	COAL	ANDA 1	72	Sep 2016	12/30/2018 1:10	01/20/2019 9:29	21.35	Planned Outage	Maintenance outage until 22 January 2019
LUZON	COAL	Calaca 2	300	Sep 1984	12/30/2018 2:10	01/03/2019 19:39	4.73	Forced Outage	Emergency shutdown due to boiler tube leak
LUZON	COAL	Masinloc 2	344	Jun 1998	12/30/2018 8:08	12/30/2018 9:09	0.04	Forced Outage	Tripped at 17 MW load
LUZON	COAL	Masinloc 2	344	Jun 1998	12/30/2018 9:30	12/30/2018 10:29	0.04	Forced Outage	Tripped at 30 MW load
LUZON	GEO	Tiwi 2	59	Jan 1979	12/30/2018 13:04	02/04/2019 20:24	36.31	Forced Outage	Emergency shutdown due to oil leak at well site 13 of hot brine pipeline
LUZON	GEO	Tiwi 6	57	Jan 1979	12/30/2018 16:07	02/09/2019 7:00	40.62	Forced Outage	Emergency shutdown due to steam leak
LUZON	COAL	Calaca 1	300	Sep 1984	12/30/2018 22:38			Planned Outage	APMT until 25 June 2019 (GOMP)
LUZON	COAL	GN Power 2	316	May 2013	01/02/2019 6:19	01/03/2019 10:06	1.16	Maintenance Outage	Maintenance outage
VISAYAS	COAL	Kepeco Salcon 2	103	Mar 2011	01/03/2019 2:50	02/08/2019 14:51	36.50	Planned Outage	For APMS
VISAYAS	COAL	TPC Sangi 2	85	Oct 2015	01/03/2019 21:23	01/04/2019 22:21	1.04	Forced Outage	Unit tripped
VISAYAS	COAL	PEDC 1	83.7	Nov 2010	01/04/2019 0:09	01/04/2019 6:53	0.28	Forced Outage	Affected by tripping of 138 kV Btc Viejo-Dingle L1 L2 and 138 kV Dingle-Sta Barbara L1
VISAYAS	COAL	PEDC 2	83.7	Apr 2011	01/04/2019 0:09	01/04/2019 7:10	0.29	Forced Outage	Affected by tripping of 138 kV Btc Viejo-Dingle L1 L2 and 138 kV Dingle-Sta Barbara L1
LUZON	COAL	SMC 3	150	Mar 2018	01/04/2019 19:24	02/05/2019 10:37	31.63	Planned Outage	Planned outage until 25 January 2019
LUZON	COAL	Masinloc 1	315	Jun 1998	01/04/2019 23:20	01/25/2019 11:38	20.51	Planned Outage	Planned outage until 24 January 2019 (GOMP)
LUZON	COAL	APEC 1	52	Jul 2006	01/05/2019 1:43	01/06/2019 18:06	1.68	Forced Outage	Coal handling problem
LUZON	NATG	Sta. Rita 3	265.5	Oct 2001	01/05/2019 4:31	01/06/2019 20:04	1.65	Planned Outage	Offline compressor washing until 6 January 2019
LUZON	OIL	BPPC 1	65	Aug 1994	01/05/2019 6:01	01/08/2019 18:01	3.50	Maintenance Outage	Not available due to APMT of HVPE relay protections statistical meters and associated line equipment until 8 January 2019
LUZON	OIL	BPPC 2	65	Aug 1994	01/05/2019 6:01	01/08/2019 18:01	3.50	Maintenance Outage	Not available due to APMT of HVPE relay protections statistical meters and associated line equipment until 8 January 2019
LUZON	OIL	BPPC 3	70	Aug 1994	01/05/2019 6:01	01/08/2019 18:01	3.50	Maintenance Outage	Not available due to APMT of HVPE relay protections statistical meters and associated line equipment until 8 January 2019
LUZON	NATG	San Lorenzo 1	284.8	Sep 2002	01/05/2019 18:29	01/06/2019 6:26	0.50	Forced Outage	Fault reading on generator current transformer
LUZON	COAL	Pagbilao 3	420	Mar 2018	01/06/2019 1:22	03/06/2019 15:22	59.58	Planned Outage	Planned outage until 4 February 2019. GOMP
VISAYAS	COAL	TPC Sangi 1	60	Oct 2015	01/06/2019 7:22	01/09/2019 12:17	3.20	Forced Outage	Boiler tube leak
LUZON	OIL	Limay 5	60	Dec 1994	01/07/2019 0:01	02/25/2019 15:56	49.66	Planned Outage	Annual Overhauling until 2-21-2019
LUZON	COAL	GN Power 1	316	May 2013	01/07/2019 0:03	02/10/2019 0:55	34.04	Planned Outage	Maintenance Outage until 2-11-19
VISAYAS	COAL	TPC Sangi 2	85	Oct 2015	01/07/2019 0:50	01/07/2019 3:34	0.11	Forced Outage	De-synchronized from the grid to facilitate the pulling out of CT/PT phase C and installation of bypass cable
LUZON	COAL	GN Power 2	316	May 2013	01/07/2019 20:08	01/08/2019 0:34	0.18	Forced Outage	Tripped due to boiler trouble
LUZON	GEO	Makban 10	20	Apr 1979	01/07/2019 23:40			Forced Outage	On reserve shutdown pending availability of steam supply (steam optimization)
LUZON	COAL	SLTEC 1	121	Apr 2015	01/08/2019 1:58	01/08/2019 10:09	0.34	Forced Outage	Turbine trouble
LUZON	COAL	GN Power 2	316	May 2013	01/08/2019 8:09	01/08/2019 15:20	0.30	Forced Outage	Exhaust high temperature at the turbine side. System Frequency 59.07hz
LUZON	COAL	QPPL	459	May 2000	01/12/2019 0:26	01/13/2019 17:11	1.70	Forced Outage	Boiler tube leak
LUZON	NATG	Sta. Rita 1	257.3	Jun 2000	01/12/2019 4:40	01/13/2019 23:15	1.77	Planned Outage	Compressor offline washing until 2400H of 13 January 2019
LUZON	COAL	GN Power 2	316	May 2013	01/12/2019 8:57	01/12/2019 20:54	0.50	Forced Outage	Circulating water pump tripping
LUZON	NATG	Avion 1	50.3	Aug 2016	01/12/2019 17:00	01/12/2019 19:12	0.09	Forced Outage	Low liquid fuel supply
VISAYAS	OIL	CENPRI 2	4.2	Apr 2016	01/12/2019 17:25	01/19/2019 17:15	6.99	Forced Outage	Unable to cut in due to damaged liner lubricating tube
LUZON	NATG	Avion 1	50.3	Aug 2016	01/12/2019 18:58	01/12/2019 21:24	0.10	Forced Outage	Low liquid fuel supply
LUZON	GEO	Makban 3	63	Apr 1979	01/13/2019 15:07	02/08/2019 1:03	25.41	Maintenance Outage	Maintenance outage
LUZON	NATG	Sta. Rita 1	257.3	Jun 2000	01/13/2019 23:27	01/14/2019 2:18	0.12	Forced Outage	HP bypass station trouble
LUZON	COAL	SLPGC 2	150	Jul 2016	01/14/2019 7:01	03/08/2019 5:24	52.93	Forced Outage	Emergency shutdown due to boiler tube leak
VISAYAS	GEO	Malitbog BC	14	Jul 1997	01/16/2019 0:07	02/02/2019 10:57	17.45	Planned Outage	Cut-out from the System. Annual PMS
LUZON	COAL	Calaca 2	300	Sep 1984	01/16/2019 13:32	01/26/2019 0:44	9.47	Forced Outage	Boiler Tube Leak
LUZON	COAL	SLPGC 1	150	Jul 2016	01/17/2019 11:09	02/01/2019 22:13	15.46	Forced Outage	Boiler Tube Leak
LUZON	COAL	QPPL	459	May 2000	01/18/2019 23:58	02/08/2019 23:55	21.00	Planned Outage	Maintenance Outage until 02 February 2019
LUZON	NATG	Sta. Rita 2	255.7	Jun 2000	01/19/2019 4:32	01/20/2019 20:01	1.65	Planned Outage	Offline washing
LUZON	NATG	Avion 2	50.3	Aug 2016	01/20/2019 0:17	01/31/2019 18:00	11.74	Planned Outage	Maintenance Outage until 04 February 2019
LUZON	NATG	Sta. Rita 1	257.3	Jun 2000	01/21/2019 0:37	01/21/2019 5:07	0.19	Forced Outage	Steam Turbine HP control valve rectification
LUZON	COAL	Masinloc 2	344	Jun 1998	01/25/2019 19:47	01/31/2019 8:02	5.51	Forced Outage	Emergency shutdown due to IDF 1 and 2 inlet vane reaching their upper limits and positive furnace draft
VISAYAS	COAL	CEDC 3	82	Jan 2011	01/26/2019 4:35	02/15/2019 12:13	20.32	Forced Outage	Unit tripped
LUZON	OIL	Malaya 1	300	Aug 1975	01/26/2019 21:25			Planned Outage	Planned outage
VISAYAS	COAL	PALM 1	135	Aug 2016	01/27/2019 2:50	01/27/2019 4:28	0.07	Forced Outage	High vibration
LUZON	COAL	SLTEC 1	121	Apr 2015	01/29/2019 0:05	02/01/2019 1:24	3.05	Forced Outage	Lube Oil contamination
LUZON	OIL	SLPGC 3	25	Mar 2018	01/29/2019 19:56	02/03/2019 17:09	4.88	Forced Outage	Declared unavailable due to arcing at power cable at generator circuit breaker
LUZON	COAL	Calaca 2	300	Sep 1984	01/29/2019 21:54	01/30/2019 0:12	0.10	Forced Outage	Generator excitation trouble
LUZON	COAL	Calaca 2	300	Sep 1984	01/31/2019 20:22	02/12/2019 5:02	11.36	Forced Outage	Emergency shutdown due to boiler tube leak
LUZON	NATG	Avion 1	50.3	Aug 2016	02/01/2019 0:01	02/10/2019 17:36	9.73	Planned Outage	Planned Outage
LUZON	COAL	SLTEC 1	121	Apr 2015	02/01/2019 13:38	02/03/2019 0:46	1.46	Forced Outage	Boiler Tube Leak
VISAYAS	COAL	TPC Sangi 2	85	Oct 2015	02/02/2019 0:43	02/02/2019 8:26	0.32	Maintenance Outage	Rectification of seawater leak

Region	Plant Type	Plant/ Unit Name	Capacity (MW)	Date Commissioned/ Commercial Operation	Date Out	Date In	Duration (Days)	Outage Type	Remarks
LUZON	NATG	San Lorenzo 2	261.8	Sep 2002	02/03/2019 6:30	02/04/2019 19:23	1.54	Maintenance Outage	Compressor off-line washing
LUZON	HYD	Kalayaan 3	180	May 2004	02/04/2019 0:01	02/11/2019 23:21	7.97	Planned Outage	Planned outage until 11 February 2019
LUZON	HYD	Kalayaan 4	180	May 2004	02/04/2019 0:01	02/14/2019 21:50	10.91	Planned Outage	Planned outage until 11 February 2019
LUZON	HYD	San Roque 1	145	May 2003	02/04/2019 4:01	02/15/2019 21:00	11.71	Planned Outage	Planned outage until 16 February 2019
LUZON	COAL	SLPGC 1	150	Jul 2016	02/04/2019 13:38	02/13/2019 23:02	9.39	Forced Outage	Tripped at 104MW load
VISAYAS	OIL	Bohol 3	4.2	Sep 1978	02/04/2019 18:03	02/07/2019 8:44	2.61	Forced Outage	Surging observed at turbo charger
LUZON	COAL	SMC 1	150	May 2017	02/06/2019 23:14	03/23/2019 4:31	44.22	Planned Outage	Planned outage until 28 February 2019. RECLASSIFIED FROM FORCE. OMC OUTAGE. RECLASSIFIED FROM FORCE. OMC OUTAGE
LUZON	OIL	Limay 2	60	May 1993	02/06/2019 23:59	02/12/2019 14:38	5.61	Forced Outage	Blow-off valve failed to closed during synchronization. AS RR
LUZON	GEO	Makban 5	55	Apr 1979	02/08/2019 16:08			Forced Outage	Low Steam Supply. Divert Steam Supply to unit 3
LUZON	GEO	Tiwi 6	57	Jan 1979	02/09/2019 7:01			Planned Outage	Turbine generator overhauling until 29 March 2019
VISAYAS	COAL	CEDC 1	82	Apr 2010	02/09/2019 12:51	02/09/2019 17:32	0.20	Forced Outage	WATER CONTAMINATION
VISAYAS	COAL	CEDC 2	82	Jun 2010	02/09/2019 12:55	02/11/2019 22:03	2.38	Forced Outage	WATER CONTAMINATION
LUZON	COAL	GN Power 2	316	May 2013	02/09/2019 16:47	02/09/2019 19:08	0.10	Forced Outage	Tripped due to actuation of generator differential protection
LUZON	COAL	GN Power 1	316	May 2013	02/10/2019 2:12	02/10/2019 3:04	0.04	Forced Outage	Tripped
LUZON	NATG	Sta. Rita 4	264	Oct 2001	02/10/2019 6:38	02/10/2019 15:40	0.38	Maintenance Outage	GT off-line Compressor Washing
LUZON	COAL	GN Power 1	316	May 2013	02/10/2019 11:42	02/11/2019 16:35	1.20	Forced Outage	Induced Draft Fan. IDF trouble
LUZON	COAL	Calaca 2	300	Sep 1984	02/12/2019 17:39	03/16/2019 22:14	32.19	Forced Outage	Boiler tube leak
LUZON	HYD	Kalayaan 1	180	Aug 1982	02/13/2019 0:01	03/09/2019 19:53	24.83	Planned Outage	Maintenance Outage until 06 March 2019
LUZON	HYD	Ambuklao 3	35	Dec 1956	02/13/2019 8:01	02/18/2019 18:14	5.43	Planned Outage	Maintenance Outage until 18 February 2019
LUZON	HYD	San Roque 1	145	May 2003	02/15/2019 21:01	02/18/2019 15:37	2.77	Forced Outage	Tunnel inspection. repair of U1 inlet valve mechanical failure
LUZON	HYD	San Roque 2	145	May 2003	02/15/2019 21:01	02/18/2019 11:37	2.61	Forced Outage	Tunnel inspection. repair of U1 inlet valve mechanical failure
LUZON	HYD	San Roque 3	145	May 2003	02/15/2019 21:01	02/18/2019 11:37	2.61	Forced Outage	Tunnel inspection. repair of U1 inlet valve mechanical failure
LUZON	HYD	Kalayaan 2	180	Aug 1982	02/16/2019 4:15	02/23/2019 23:59	7.82	Forced Outage	Spherical valve leak
LUZON	NATG	Sta. Rita 1	257.3	Jun 2000	02/16/2019 4:59	02/21/2019 6:49	5.08	Maintenance Outage	Maintenance outage until 2400H of 2-20-2019
VISAYAS	GEO	Mahanagdong B1	5	Jul 1997	02/18/2019 18:09	02/20/2019 20:47	2.11	Forced Outage	Under assessment.
LUZON	NATG	Sta. Rita 3	265.5	Oct 2001	02/19/2019 0:36	02/19/2019 2:10	0.07	Forced Outage	Resetting of GT Automation processor communication fault
LUZON	GEO	Makban 3	63	Apr 1979	02/19/2019 4:20	02/22/2019 20:38	3.68	Maintenance Outage	Maintenance Outage until 22 February 2019
LUZON	HYD	Ambuklao 1	35	Dec 1956	02/20/2019 8:01	02/20/2019 22:41	4.61	Planned Outage	Planned Outage until 25 February 2019
LUZON	HYD	Botocan	20.8	1947	02/20/2019 8:01	02/24/2019 13:57	4.25	Planned Outage	Maintenance Outage until 24 February 2019
LUZON	HYD	Caliraya 1	14	Oct 2002	02/20/2019 8:01	02/24/2019 21:08	4.55	Planned Outage	Maintenance Outage until 24 February 2019
LUZON	HYD	Caliraya 2	14	Oct 2002	02/20/2019 8:01	02/24/2019 21:08	4.55	Planned Outage	Maintenance Outage until 24 February 2019
LUZON	OIL	Limay 4	90	May 1993	02/20/2019 8:04	02/25/2019 5:14	4.88	Maintenance Outage	NGCP works. dismantling of existing steel gantry column and beam structures.
LUZON	COAL	SLPGC 1	150	Jul 2016	02/20/2019 14:00	02/20/2019 18:36	0.19	Forced Outage	Tripped with 150MW load
VISAYAS	GEO	Mahanagdong B1	5	Jul 1997	02/20/2019 20:47	03/03/2019 3:08	10.26	Forced Outage	Replaced 125V DC battery charger
LUZON	COAL	Sual 2	647	Oct 1999	02/20/2019 22:30	02/21/2019 10:42	0.51	Forced Outage	High Furnace Pressure. System Frequency is 58.822hz.
LUZON	COAL	Sual 2	647	Oct 1999	02/21/2019 10:48	02/21/2019 11:49	0.04	Forced Outage	Tripped with 86MW load
LUZON	COAL	Sual 2	647	Oct 1999	02/21/2019 11:55	02/21/2019 12:24	0.02	Forced Outage	Tripped with 75MW load
VISAYAS	GEO	PGPP2 Unit 2	20	Aug 1983	02/22/2019 0:07	03/18/2019 21:01	24.87	Planned Outage	Offline due to scheduled preventive maintenance activities
LUZON	NATG	Ilijan A2	190	Jun 2002	02/22/2019 20:46	02/23/2019 21:08	1.02	Maintenance Outage	Maintenance Outage until 24 February 2019
LUZON	GEO	Makban 4	63	Apr 1979	02/22/2019 20:55	02/28/2019 13:00	5.67	Maintenance Outage	Maintenance Outage
LUZON	COAL	Masinloc 1	315	Jun 1998	02/22/2019 23:43	02/25/2019 11:03	2.47	Maintenance Outage	Maintenance Outage until 25 February 2019
VISAYAS	COAL	PEDC 1	83.7	Nov 2010	02/23/2019 0:49	03/23/2019 20:01	28.80	Planned Outage	Annual Preventive Maintenance shutdown as per GOP
LUZON	NATG	Ilijan A1	190	Jun 2002	02/23/2019 23:07	02/25/2019 20:28	1.89	Maintenance Outage	Maintenance Outage
LUZON	HYD	Kalayaan 2	180	Aug 1982	02/24/2019 0:00	03/09/2019 21:45	13.91	Maintenance Outage	Maintenance Outage
LUZON	NATG	San Lorenzo 1	264.8	Sep 2002	02/24/2019 6:34	02/24/2019 17:49	0.47	Planned Outage	GT off line compressor washing
LUZON	COAL	SLPGC 1	150	Jul 2016	02/24/2019 7:56	02/28/2019 0:17	3.68	Forced Outage	Tripped due to detached governor valve drain line
LUZON	COAL	SMC 3	150	Mar 2018	02/25/2019 2:12	02/25/2019 4:11	0.08	Forced Outage	Low furnace pressure
LUZON	HYD	Magat 1	95	Aug 1983	02/25/2019 7:01	03/01/2019 18:01	4.46	Maintenance Outage	Reprogramming of governor system. Until 28 February 2019
LUZON	NATG	Sta. Rita 2	255.7	Jun 2000	02/26/2019 4:34	02/26/2019 7:12	0.11	Forced Outage	Tripped at 161MW load
LUZON	NATG	Ilijan A1	190	Jun 2002	02/26/2019 11:53	02/26/2019 20:48	0.37	Forced Outage	Fuel gas pilot pressure control valve trouble
LUZON	HYD	Ambuklao 2	35	Dec 1956	02/27/2019 8:01	03/03/2019 23:03	4.63	Planned Outage	Planned Outage until 04 March 2019
LUZON	GEO	Makban 8	20	Apr 1979	02/27/2019 18:15	03/11/2019 22:39	12.18	Forced Outage	Shutdown due to hotspot correction at C to D 230kV tieline
LUZON	COAL	QPPL	459	May 2000	02/28/2019 13:53	03/03/2019 7:53	2.75	Forced Outage	hotspot correction on phase B high side bushing
LUZON	COAL	Sual 2	647	Oct 1999	03/01/2019 14:57	03/05/2019 19:08	4.17	Forced Outage	Boiler tube leak
VISAYAS	COAL	CEDC 2	82	Jun 2010	03/02/2019 21:37	03/06/2019 4:32	3.29	Forced Outage	Boiler problem
LUZON	OIL	Malaya 1	300	Aug 1975	03/04/2019 7:17	03/07/2019 14:45	3.31	Forced Outage	Motor boiler feed pump trouble
LUZON	COAL	SLTEC 2	122.9	Feb 2016	03/04/2019 18:33	03/05/2019 6:35	0.50	Forced Outage	Manual Turbine tripped
LUZON	COAL	SLTEC 1	121	Apr 2015	03/04/2019 22:20	03/14/2019 15:24	9.71	Forced Outage	Boiler Tube Leak
LUZON	COAL	SMC 2	150	Sep 2017	03/05/2019 9:47	03/24/2019 14:22	19.19	Forced Outage	Suspected boiler tube leak
LUZON	COAL	Sual 2	647	Oct 1999	03/05/2019 19:43	03/05/2019 22:44	0.13	Forced Outage	HP turbine bypass valve trouble
LUZON	COAL	Pagbilao 3	420	Mar 2018	03/06/2019 15:28	03/06/2019 17:05	0.07	Forced Outage	Tripped by reverse power
LUZON	COAL	SLTEC 2	122.9	Feb 2016	03/06/2019 18:35	03/09/2019 15:52	2.89	Maintenance Outage	Primary air fan problem
LUZON	COAL	GN Power 2	316	May 2013	03/07/2019 0:20	03/10/2019 1:18	3.04	Forced Outage	Boiler Tube Leak
LUZON	NATG	Sta. Rita 1	257.3	Jun 2000	03/08/2019 8:51	03/08/2019 12:49	0.17	Forced Outage	Gas line vent valve trouble
LUZON	GEO	Bacman 1	60	Sep 1993	03/08/2019 23:46	03/24/2019 7:53	15.34	Planned Outage	Maintenance Outage until 29 March 2019
LUZON	COAL	Pagbilao 3	420	Mar 2018	03/09/2019 0:40	03/09/2019 11:37	0.46	Forced Outage	Tripping of Induced Draft Fan A and B
LUZON	HYD	Magat 3	95	Oct 1983	03/09/2019 7:01	03/11/2019 18:46	2.49	Maintenance Outage	Reprogramming of governor system.
LUZON	HYD	Magat 1	95	Aug 1983	03/10/2019 6:01			Planned Outage	Annual preventive maintenance and testing (GOMP)
VISAYAS	OIL	Bohol 4	4	Sep 1978	03/11/2019 10:50	03/15/2019 17:20	4.27	Forced Outage	Emergency shutdown due to an observed sudden explosion and heavy smoke coming out frm B bank
LUZON	HYD	San Roque 2	145	May 2003	03/11/2019 15:01			Planned Outage	Planned outage until September 11 2019
LUZON	COAL	SLTEC 2	122.9	Feb 2016	03/11/2019 18:01	03/18/2019 6:20	6.51	Forced Outage	Tripped at 123 MW load. Commissioning Test
VISAYAS	COAL	TPC Sangi 2	85	Oct 2015	03/12/2019 22:00	03/14/2019 1:34	1.15	Forced Outage	Busted CT PT at switchyard
LUZON	HYD	Magat 4	95	Oct 1983	03/14/2019 7:01	03/16/2019 9:48	2.12	Maintenance Outage	Reprogramming of governor system.
VISAYAS	OIL	Bohol 1	4	Sep 1978	03/15/2019 11:02	03/21/2019 9:02	5.92	Forced Outage	High exhaust gas temperature on cyclinder 6
VISAYAS	OIL	Bohol 4	4	Sep 1978	03/15/2019 17:33	03/18/2019 9:50	2.68	Forced Outage	Maintenance outage
LUZON	NATG	Sta. Rita 2	255.7	Jun 2000	03/16/2019 6:22	03/16/2019 11:56	0.23	Forced Outage	Tripped due to GT power supply trouble
LUZON	NATG	San Lorenzo 2	261.8	Sep 2002	03/17/2019 0:29	03/17/2019 23:12	0.95	Maintenance Outage	Offline GT compressor washing
VISAYAS	COAL	PEDC 3	83.7	Dec 2016	03/17/2019 5:14	03/17/2019 19:05	0.58	Forced Outage	Affected by line fault
LUZON	NATG	Avion 1	50.3	Aug 2016	03/17/2019 8:17	03/17/2019 23:58	0.65	Maintenance Outage	Not available due to maintenance of Bay 2 PCB and gen step up xformer
LUZON	NATG	Avion 2	50.3	Aug 2016	03/17/2019 8:17	03/17/2019 23:58	0.65	Maintenance Outage	Not available due to maintenance of Bay 2 PCB and gen step up xformer
VISAYAS	COAL	Keppco Salcon 2	103	Mar 2011	03/20/2019 11:16	03/24/2019 11:25	4.01	Forced Outage	TRIPPING. BOILER TUBE LEAK
LUZON	COAL	SLTEC 1	121	Apr 2015	03/20/2019 20:30			Forced Outage	Boiler Tube Leak
VISAYAS	OIL	PDPPP C	12	Mar 2005	03/21/2019 19:05	03/25/2019 17:03	3.92	Forced Outage	Emergency stop
LUZON	NATG	San Gabriel	420	Jul 2016	03/22/2019 4:30			Maintenance Outage	Maintenance outage until 24 March 2019
VISAYAS	GEO	Leyte 1	35	Jun 1983	03/24/2019 0:29			Planned Outage	Annual PMS of TGPP unit 1. up to 29 March 2019
VISAYAS	COAL	CEDC 1	82	Apr 2010	03/25/2019 0:33			Planned Outage	APMS