



Market Surveillance Committee Monthly Market Assessment Report

26 February to 25 March 2021

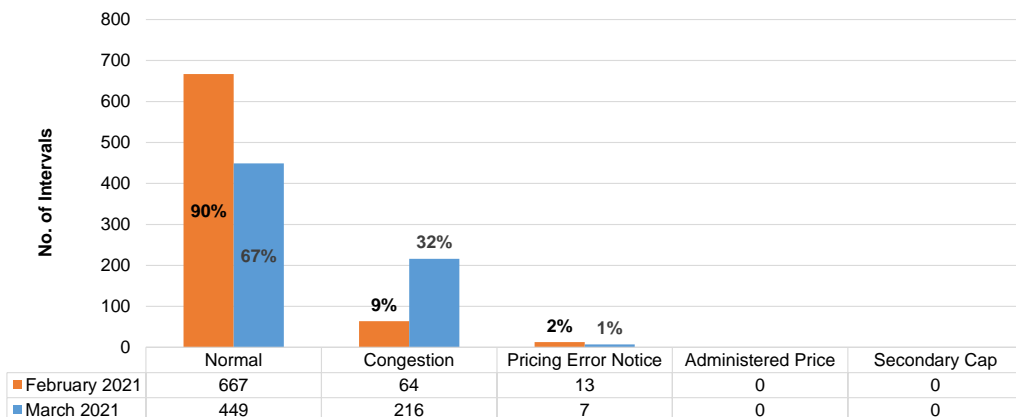
APRIL 2021

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

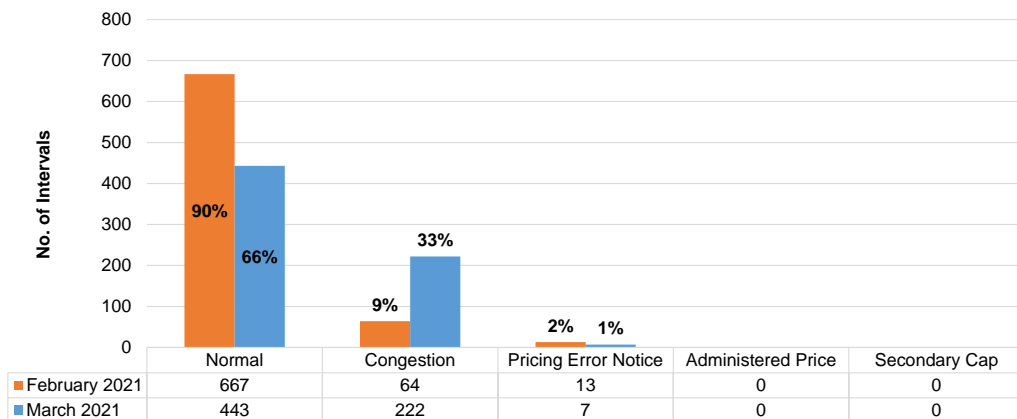
ASSESSMENT OF THE MARKET

SUMMARY OF PRICING CONDITIONS

LUZON



VISAYAS



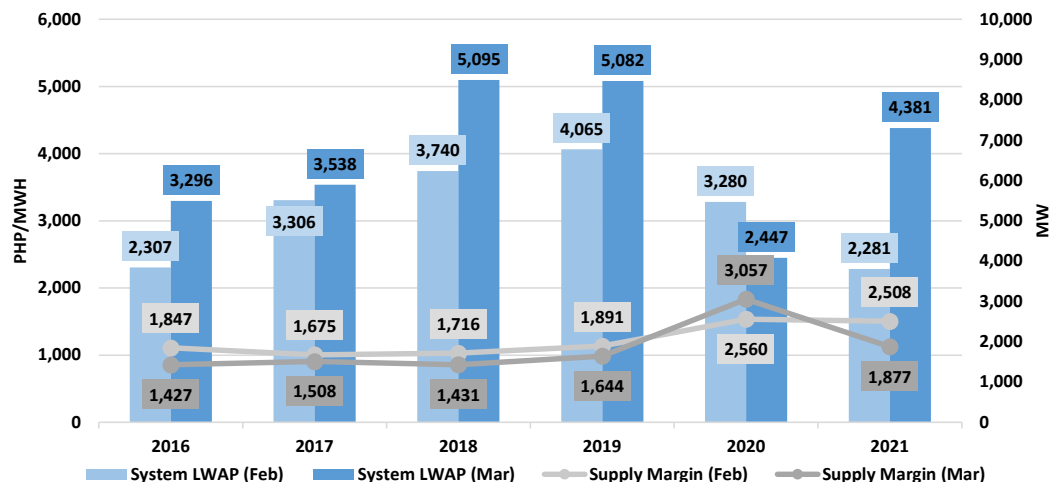
- Significant decline in the number of intervals without pricing errors for Luzon and Visayas as intervals imposed with Price Substitution Methodology (PSM) increased due to the constraint in the following lines:
 - Samboan – Amlan line
 - Sucat – Biñan line
 - Bacolod – Barotac line
 - Quezon – Doña Imelda line
- Intervals with error notices not caused by congestion remained at a low count as a result of:
 - Inappropriate input data affecting Luzon and Visayas prices and schedules
- None of the intervals were imposed with administered prices and secondary price caps this month

Notable Highlight:

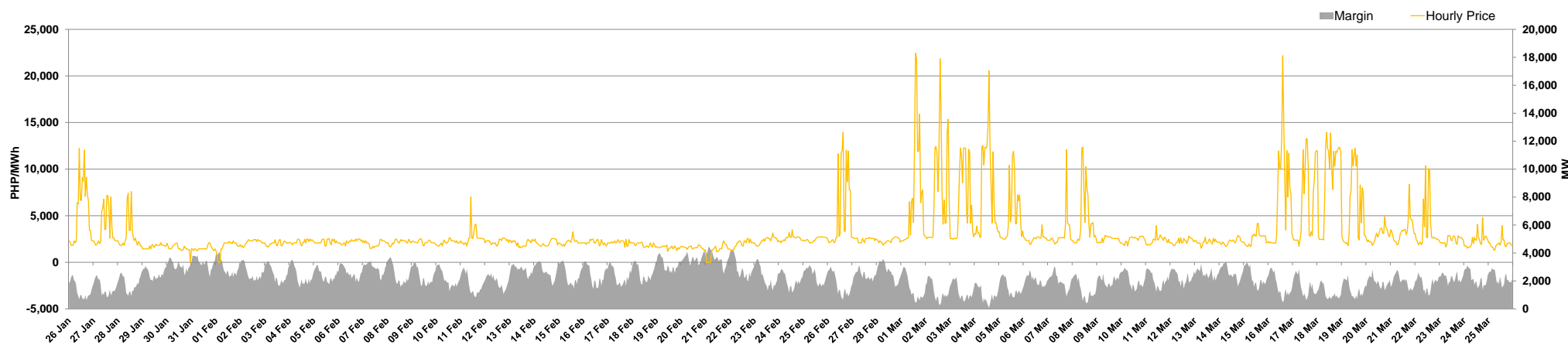
- High level of outage capacity on the onset of hot dry season
 - Despite having a lower average than last month, average outage capacity remained relatively elevated
- Deration in available capacity of natural gas plants
 - SPEX Malampaya gas supply restriction effective 22 March 2021, 2200H
- Occurrence of interesting pricing events
 - 01 March 2021, 1600H
 - 16 March 2021, 1500H

MARKET OUTCOME

PRICE AND SUPPLY MARGIN

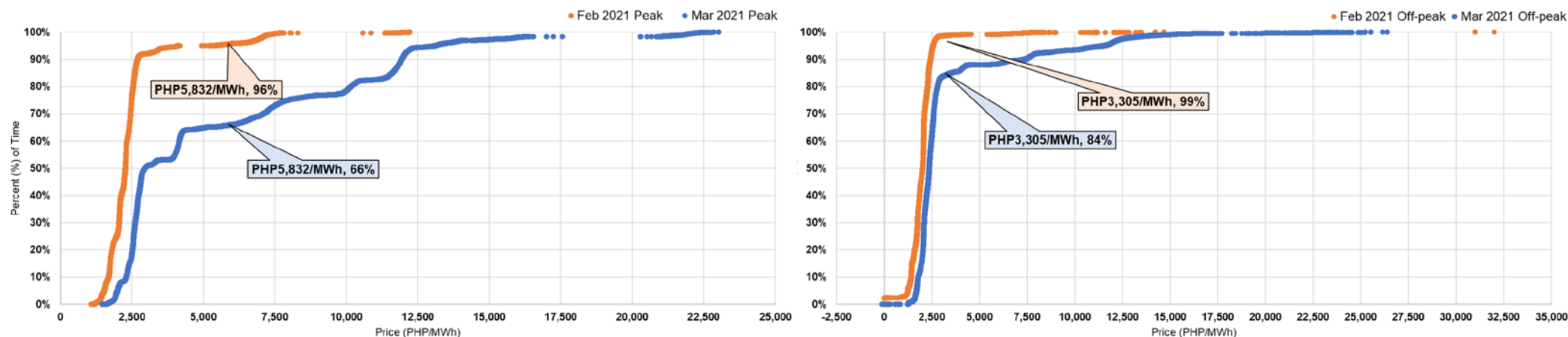


- Monthly load weighted average price (LWAP) rose by 92 percent from February to March 2021
- The average supply margin narrowed by a quarter or 25 percent
- Comparing the years, the transition of supply margin from February to March in 2020 deviated from the trend owing to the start of implementation of the community quarantine in March.



- In March billing month, the highest level of supply margin reached 3,469 MW on 28 March 2021 at 0700H and, its lowest, 74 MW on 04 March 2021 at 1500H.
- Hourly resolution of LWAP saw the highest level at PHP22,433/MWh on 01 March 2021 at 1500H due to one of the highest levels of demand plus reserve schedule at 12,913 MW with the effective supply only at 13,351 MW. This interval recorded one of the lowest supply margins for March 2021 at 437 MW.
- Two (2) interesting pricing events were recorded during the peak hours of the March billing month.

NODAL PRICE DURATION CURVE



- Nodal prices without pricing errors during peak hours averaged at PHP5,832/MWh while it was PHP3,305/MWh for off-peak hours in March
- Most of the prices during peak hours this month were seen below the peak hours average at around 66 percent of the time, lower than last month's 96 percent with the same price reference, which denotes increase in prices
- The same pattern was noted for off-peak hours where prices below the off-peak average this month occurred at around 84 percent of the time from 99 percent last month

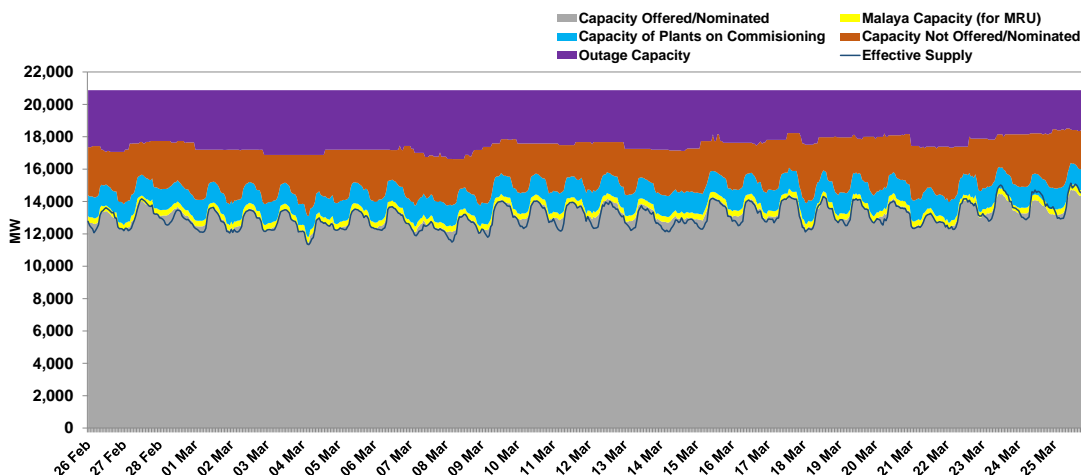
SUPPLY MARGIN-PRICE INDEX

Event	Hour Type	Generator Unit	Price Setter (Y/N)	Offer Pattern (Inc/Dec)	Bid Splitting Behavior (Y/N)
Event 1	Peak	Oil A U1	Y	Dec	N
		Oil B	Y	Dec	Y
Event 2	Peak	Oil A U1	Y	Dec	N
		Oil A U2	Y	Dec	N
		Oil B	Y	Dec	Y

Plant Type	Offer Pattern (Inc/Dec)	
	Event 1	Event 2
Battery	Inc (1.7%)	Inc (1.7%)
Coal	Dec (-0.4%)	Dec (-13.2%)
Geothermal	Inc (27.6%)	Inc (34.9%)
Hydro	Dec (-30.0%)	Inc (8.4%)
Natural Gas	Dec (-43.8%)	Inc (2.4%)
Oil	Inc (1.8%)	Inc (5.8%)

- The upper price threshold for the hot dry season was breached on 2 peak intervals
- All the interesting pricing events occurred during a thin supply margin of around 500 MW
- A total of 3 oil-based generator units set the price in which 2 units recurred in both interesting pricing events
- All 3 units were observed to have a decreasing price offer pattern during the subject intervals when compared to their respective price offers during intervals with no breach in threshold
- Oil B exhibited bid splitting behavior for both interesting pricing events despite the decline in price offer pattern
- Geothermal and oil-based plants collectively registered increases in price offer patterns for both interesting pricing events

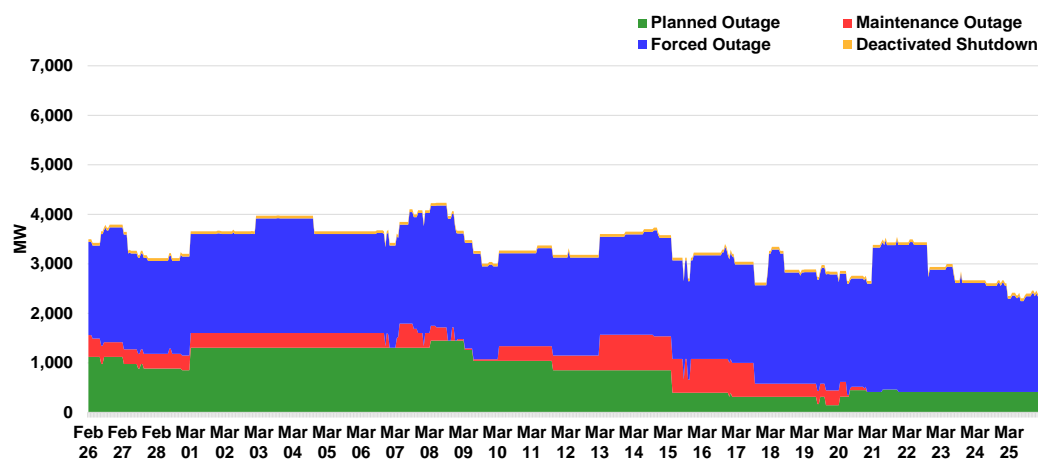
CAPACITY PROFILE



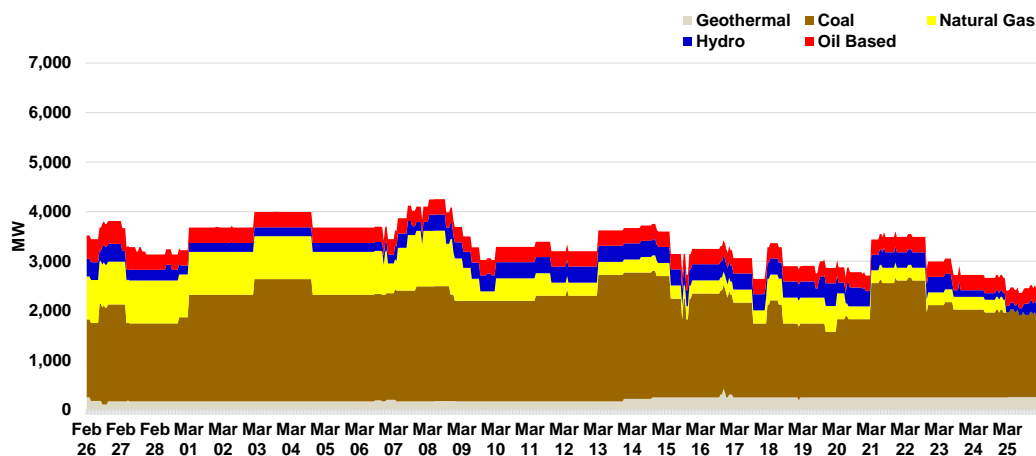
- A minimal 0.1 MW decline was recorded in the WESM registered capacity which stood at 20,871.27 at the end of the month
 - Decrease in maximum capacity of Therma Power-Visayas, Inc. from 6.8 MW to 6.7 MW
- Available capacity constituted an average of 14,825 MW or 71 percent of the total registered capacity
- Capacity not offered comprised an average of 2,691 MW or 13 percent
- Outage capacity accounted for an average 3,355 MW or 16 percent
- SPEX Malampaya gas supply restriction, effective 22 March 2021 2200H, resulted to the deration of Ilijan NGPP (1,200 MW to 855 MW) and San Gabriel NGPP (420 MW to 211 MW)

OUTAGE CAPACITY BY OUTAGE CATEGORY

- Around 80 percent of the time, hourly outage capacity for the month remained high at above 3,000 MW and averaged at 3,355 MW despite a 12 percent improvement from last month's 3,803 MW
- Forced outages still dominated the outage mix, ending the month with an average of 2,299 MW or 65 percent of the total
- Maintenance outages ended with a low level at 32 MW
- Likewise, planned outages continued to decline towards the end of the month
- The hourly outage reached the highest of 4,252 MW on 08 March at 0600H
- High level of outage capacity was observed throughout the month which opened at 3,517 MW and closed 1,000-MW lower at 2,516 MW

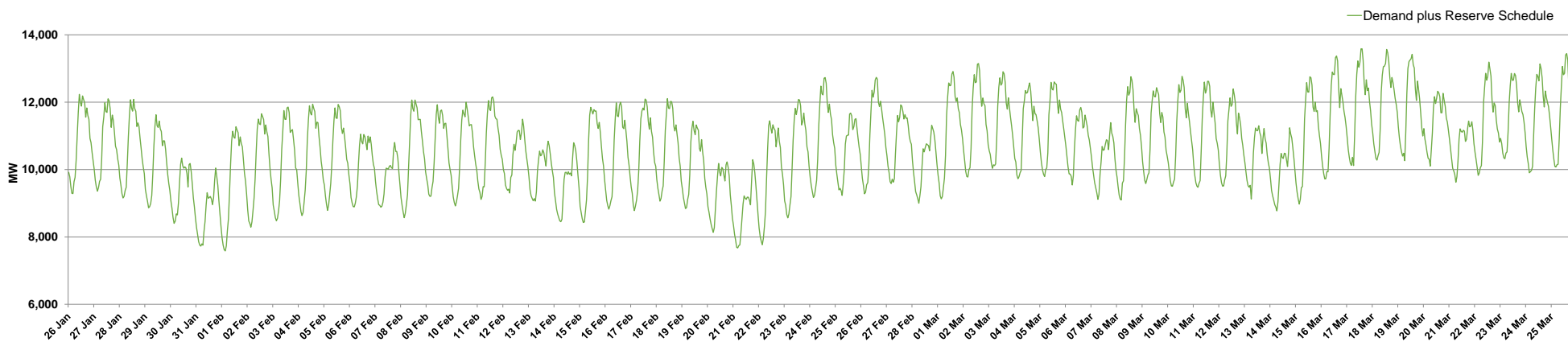


OUTAGE CAPACITY BY PLANT TYPE



- Coal plants significantly contributed to the level of planned and forced outages while natural gas plants dominated the level of maintenance outages. For deactivated shutdown, geothermal plants remained to be the only plant type accounted
- Aside from coal plants, natural gas plants also posted high level of outage on the onset of the month, reaching as high as 1,121 MW on 07 Mar at 1100H

SYSTEM DEMAND

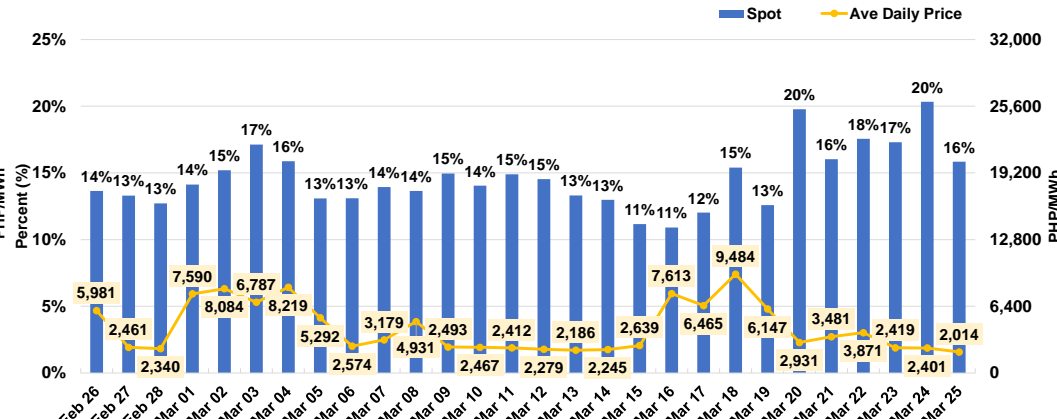
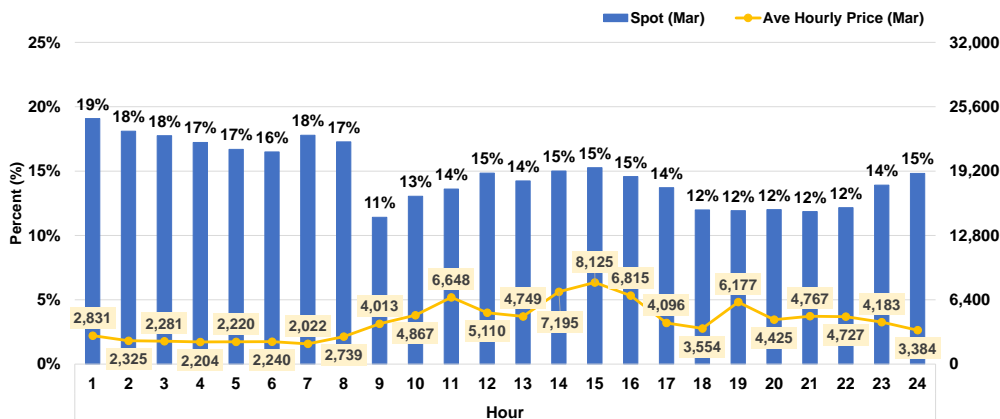


- Monthly system demand plus reserve schedule grew to an average of 11,191 MW, a 9 percent rise from last month's average of 10,233 MW, indicating the onset of the hot dry season
- System demand plus reserve schedule peaked at 13,584 MW on 17 March, 1400H (Wednesday)
- System demand peaked at 12,572 MW on 18 March, 1400H (Thursday)
- On a yearly comparison, the demand plus reserve schedule was up by 4 percent from 10,800 MW in 2020 to 11,191 in 2021. This month was the second time to record a yearly growth despite the implementation of community quarantine
- The all-time highest hourly system demand plus reserve schedule was still on 10 March 2020, 1400H at 14,502 MW

GENERATOR SPOT MARKET EXPOSURE

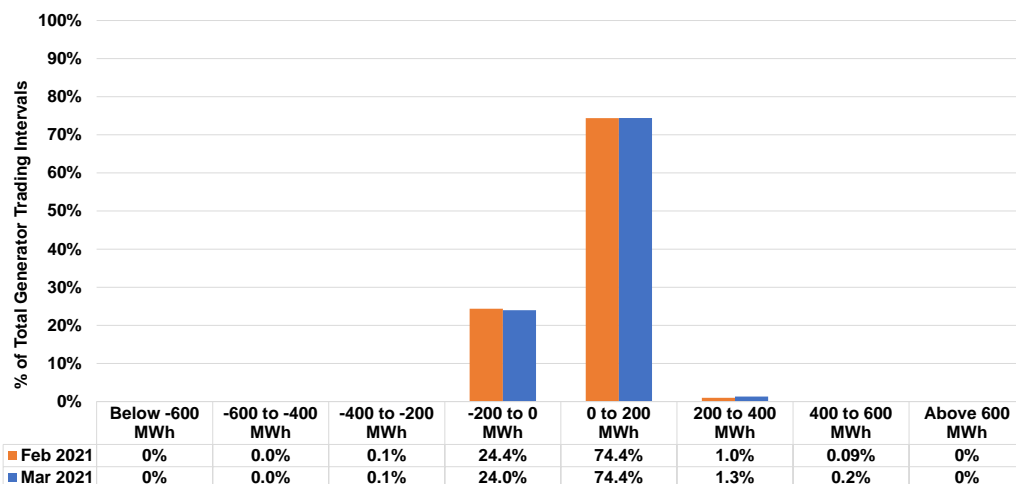
HOURLY

DAILY



- Total spot quantities of generator participants in March stood at 14.7 percent of the total metered quantities, a slight increase from last month's 13.6 percent spot exposure
- Spot exposure in off-peak hours averaged at 15.9 percent, from previous month's 15.0 percent, while it was 13.5 percent, from previous month's 12.5 percent, during peak hours
- Higher spot shares were evident during the latter days where the market resulted to generally lower prices

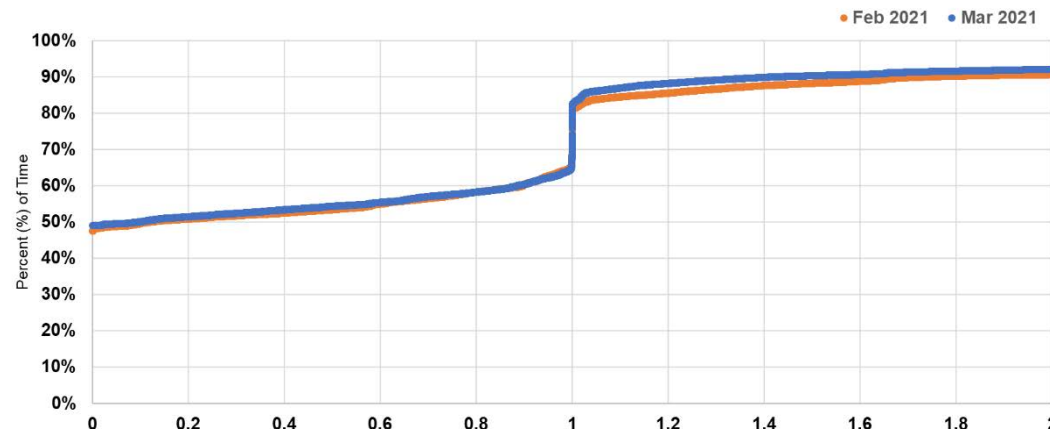
FREQUENCY DISTRIBUTION



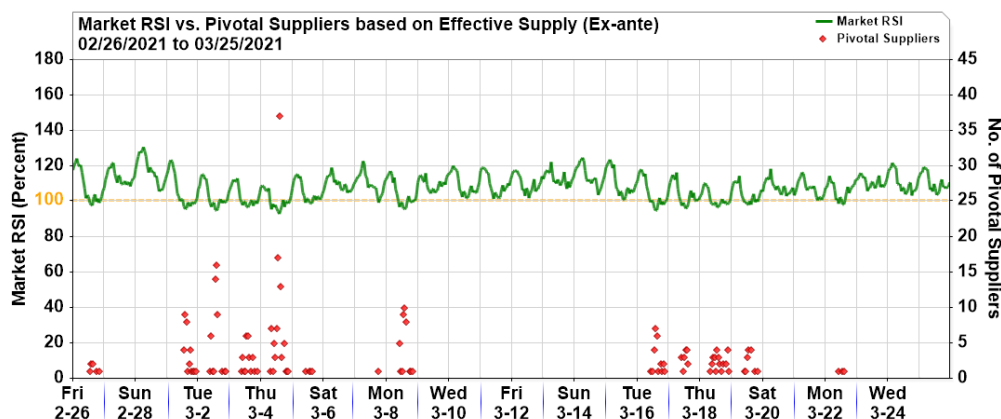
- Generator spot quantities for February and March 2021 billing months were much more concentrated within the -200 MWh to 200 MWh range
- About 75.9 percent of the total generator spot transactions in March, a slight uptick from February, was on the account of energy being sold in the market (positive MWh quantity)

- The resulting BCQ to MQ ratio of 0 demonstrates that the entire capacity of generators was being fully sold in the market at almost half of the time or 49 percent
- Meanwhile, roughly 20 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 4 percent were accounted for by generators which fully bought energy in the market to serve their bilateral contract obligations because of no generated MQ

BCQ-MQ RATIO

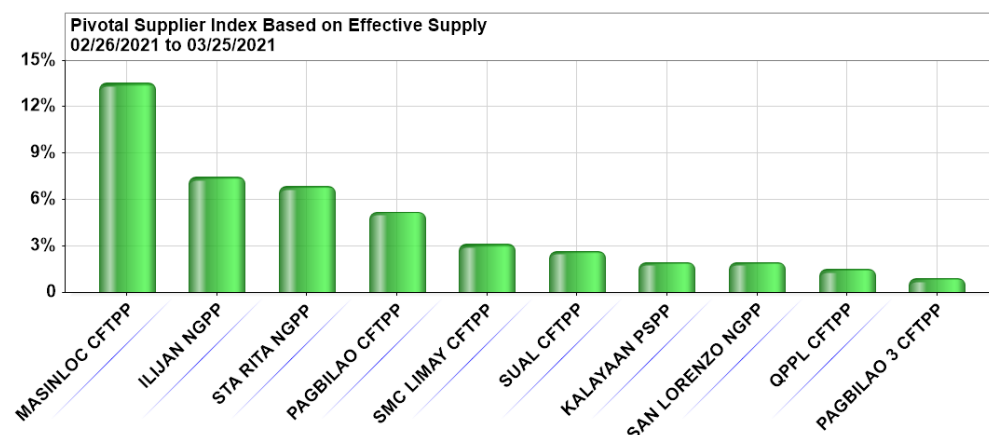


MARKET RSI



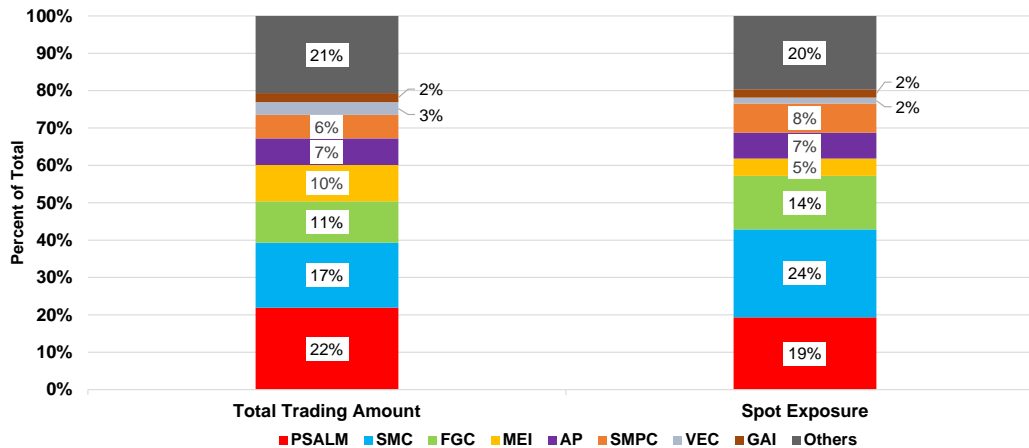
- Out of the 672 trading intervals in March 2021 billing month, 103 intervals had a Residual Supply Index (RSI) below the 100 percent mark from 34 intervals in February, indicating the more frequent presence of pivotal suppliers
- The average market prices for intervals with RSI below 100 percent was PHP11,090/MWh while those with RSI above 100 was PHP2,983/MWh

PIVOTAL PLANTS



- A total of 37 power plants were pivotal during the period with 28 coming from Luzon and 9 from Visayas

TTA AND SPOT SHARE



- Power Sector Assets and Liabilities and Management (PSALM) maintained its top spot this month, recording the highest TTA share of sellers in the market with approximately 22 percent
- San Miguel Corporation (SMC) placed second, with 17 percent of TTA share, from third last month
- First Gen Corporation (FGC) dropped to third with an 11 percent TTA share.
- The top 3 highest TTA shares also had incurred the highest spot shares

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
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 8-05CB08MAL	Aug 1975
VISAYAS	COAL	TPC Sangi 1	60	12/17/2019 6:05			Forced Outage	Generator differential trip	Dec 2013
VISAYAS	GEO	Upper Mahiao 3	32	07/22/2020 17:01			Maintenance Outage	Trip with Loss of Excitation. Economic Shutdown	Jul 1997
LUZON	COAL	Sual 2	647	09/16/2020 14:45			Forced Outage	Tripped due to high turbine vibration	Oct 1999
LUZON	HYD	Kalayaan 4	180	11/27/2020 22:01	03/23/2021 14:09	115.67	Forced Outage	Excessive Oil Leak at Pothead conductors.	May 2004
LUZON	COAL	Calaca 2	300	12/03/2020 9:01			Forced Outage	Generator stator earth fault	Sep 1984
LUZON	OIL	Limay 8	90	01/04/2021 0:01	02/27/2021 14:43	54.61	Planned Outage	Maintenance Outage until 03 February 2021	Dec 1994
LUZON	NATG	GN Power 1	316	01/08/2021 18:26			Forced Outage	Boiler tube leak.	May 2013
LUZON	NATG	Sta. Rita 3	265.5	01/19/2021 4:39	03/06/2021 19:46	46.63	Maintenance Outage	Maintenance Outage	Oct 2001
VISAYAS	OIL	TPVI 2	6.7	01/26/2021 14:50	02/26/2021 10:35	30.82	Forced Outage	EMERGENCY CUT-OUT DUE TO INJECTION PUMP PROBLEM	Aug 1977
VISAYAS	COAL	TPC Sangi 2	85	01/29/2021 21:08	03/19/2021 19:31	48.93	Forced Outage	EMERGENCY CUT-OUT DUE TO OIL LEAK at BEARING 4	Dec 2013
VISAYAS	OIL	TPC Carmen 4	10	02/12/2021 9:47			Forced Outage	TRIPPED DUE TO LOW ENGINE LO PRESSURE	Mar 1979
LUZON	HYD	San Roque 2	145	02/15/2021 0:01	02/27/2021 0:01	12.00	Planned Outage	Maintenance Outage until 26 February 2021	May 2003
LUZON	GEO	Makban 1	63.2	02/17/2021 23:11	02/26/2021 12:21	8.55	Forced Outage	Steam supply diverted to Unit 2.	Apr 1979
VISAYAS	GEO	Malitbog 3	72	02/20/2021 0:22	02/26/2021 10:46	6.43	Maintenance Outage	EDC-Leyte A MBPP Unit 3 plant shutdown for PMS	Jul 1997
VISAYAS	GEO	Malitbog 1	72	02/20/2021 0:25	02/26/2021 2:34	6.09	Maintenance Outage	EDC-Leyte A MBPP Unit 1 plant shutdown for PMS	Jul 1997
VISAYAS	COAL	CEDC 3	82	02/21/2021 0:29			Forced Outage	TO CONDUCT REPAIR OF COAL FEEDER	Jan 2011
LUZON	NATG	Ilijan B1	190	02/21/2021 0:32	03/09/2021 1:55	16.06	Planned Outage	Maintenance Outage until 09 March 2021	Jun 2002
LUZON	OIL	Limay 3	60	02/23/2021 6:42	02/27/2021 17:20	4.44	Forced Outage	Failed start-up. Blow-off valve air leak.	May 1993
LUZON	NATG	Ilijan B3	220	02/24/2021 0:34	03/09/2021 6:43	13.26	Planned Outage	Planned Outage (GOP)	Jun 2002
LUZON	NATG	Ilijan B2	190	02/24/2021 0:47	03/11/2021 14:56	15.59	Planned Outage	Planned Outage (GOP)	Jun 2002
VISAYAS	COAL	CEDC 1	82	02/24/2021 0:52			Planned Outage	UNIT SHUTDOWN TO FACILITATE ANNUAL PMS UNTIL 17 MARCH 2021	Apr 2010
VISAYAS	COAL	THVI 1	169	02/24/2021 23:32	03/19/2021 14:39	22.63	Planned Outage	UNIT TRIPPED DURING RAMPING DOWN TO ZERO LOAD (RTD is 0) WITH INDICATION. TURBINE HP EXHAUST TEMPERATURE HIGH HIGH. SCHEDULE FOR PMS PER GOP FROM 25 FEBRUARY 2021 (0001H) TO 21 MARCH 2021 (2400H)	Dec 2017
LUZON	HYD	Binga 4	35	02/25/2021 8:01	02/28/2021 17:29	3.39	Planned Outage	Planned outage(GOP).	Jan 1960
LUZON	COAL	Pagbilao 2	382	02/26/2021 8:12	02/27/2021 3:15	0.79	Forced Outage	Tripped at 313MW load. Root cause is still being investigated.	Mar 1996
LUZON	HYD	Kalayaan 3	180	02/26/2021 9:45	02/26/2021 10:07	0.02	Forced Outage	Tripped from 170MW load due to cooling water system failure	May 2004
VISAYAS	OIL	TPVI 3	6.8	02/26/2021 10:32	02/26/2021 13:11	0.11	Forced Outage	DUE TO LOW STEAM PRSSURE	Aug 1977
LUZON	COAL	APEC 1	52	02/26/2021 11:22	02/26/2021 12:10	0.03	Forced Outage	Affected by the tripping of Mexico-Clark 69kV line 1.	Jul 2006
LUZON	GEO	Makban 2	63.2	02/26/2021 14:50	03/18/2021 20:12	20.22	Forced Outage	Steam supply diverted to Unit 1	Apr 1979
LUZON	HYD	Ambuklao 2	35	02/26/2021 15:06	02/26/2021 16:22	0.05	Forced Outage	Tripped due to broken shear pin.	Dec 1956
VISAYAS	GEO	PGP2 Unit 3	20	02/27/2021 2:40	02/27/2021 5:27	0.12	Forced Outage	Auto-tripped due to Hot Well Pump problem.	Aug 1983
LUZON	HYD	Ambuklao 1	35	02/27/2021 6:38	02/27/2021 7:31	0.04	Forced Outage	Failed start-up due to broken shear pin.	Dec 1956
LUZON	HYD	Ambuklao 3	35	02/27/2021 22:11	02/27/2021 23:01	0.03	Forced Outage	Broken shear pin.	Dec 1956
LUZON	HYD	Binga 1	35	02/28/2021 8:03	02/28/2021 10:23	0.10	Maintenance Outage	Maintenance Outage	Jan 1960
LUZON	HYD	Binga 2	35	02/28/2021 8:03	02/28/2021 10:23	0.10	Maintenance Outage	Maintenance Outage	Jan 1960
LUZON	HYD	Binga 3	35	02/28/2021 8:03	02/28/2021 10:23	0.10	Maintenance Outage	Maintenance Outage	Jan 1960
LUZON	COAL	SLTEC 2	122.9	02/28/2021 16:52	03/08/2021 19:31	8.11	Forced Outage	Emergency shutdown due to boiler tube leak.	Aug 2015
LUZON	COAL	SBPL	455	02/28/2021 23:46	03/15/2021 2:31	14.11	Planned Outage	Maintenance Outage.	Apr 2019
VISAYAS	OIL	TPVI 1	6.8	03/01/2021 15:28	03/01/2021 22:12	0.28	Forced Outage	TRIPPED DUE TO GEN. PROBLEM	Aug 1977
VISAYAS	OIL	TPVI 3	6.8	03/01/2021 18:45	03/01/2021 21:10	0.10	Forced Outage	TRIPPED. GEN. PROBLEM	Aug 1977
LUZON	COAL	GN Power 2	316	03/02/2021 0:11	03/04/2021 14:03	2.58	Forced Outage	Emergency shutdown due to hotspot at generator transformer.	May 2013
LUZON	HYD	Ambuklao 1	35	03/02/2021 4:16	03/02/2021 6:17	0.08	Forced Outage	Tripped due to broken shear pin.	Dec 1956
VISAYAS	OIL	TPVI 6	6.8	03/02/2021 11:38	03/02/2021 12:53	0.05	Forced Outage	TRIPPED. GEN. PROBLEM	Aug 1977
VISAYAS	OIL	PB101 Unit 4	6	03/02/2021 18:40	03/02/2021 19:40	0.04	Forced Outage	Internal trouble	Jan 1978
VISAYAS	OIL	TPVI 4	6.8	03/02/2021 21:58	03/02/2021 22:14	0.01	Forced Outage	TRIPPED	Aug 1977
VISAYAS	OIL	Bohol 3	4.2	03/03/2021 12:47	03/03/2021 14:22	0.07	Forced Outage	Emergency out due to fuel leak at cylinder 5	Sep 1978
VISAYAS	OIL	TPVI 1	6.7	03/03/2021 13:30	03/03/2021 19:14	0.24	Forced Outage	TRPPED GEN. PROBLEM WITH RTD	Aug 1977
LUZON	HYD	Ambuklao 2	35	03/03/2021 16:25	03/03/2021 17:24	0.04	Forced Outage	Tripped due to broken shear pin	Dec 1956
VISAYAS	COAL	PALM 1	135	03/05/2021 8:50	03/05/2021 10:00	0.05	Forced Outage	Due to internal trouble	Mar 2016
LUZON	HYD	Bakun 1	37	03/06/2021 6:08			Maintenance Outage	Total Plant shutdown due to facilitate APM and other protection related activities.(RECLASSIFIED FROM FORCE. OMC OUTAGE)	Feb 2001
LUZON	GEO	Bacman 3	20	03/06/2021 10:07	03/06/2021 15:20	0.22	Forced Outage	On house-load to facilitate correction of arcing that was observed along Bacman-Cawayan 230kV tie line.	Sep 1993
VISAYAS	GEO	Upper Mahiao 1	32	03/06/2021 18:28	03/07/2021 1:42	0.30	Forced Outage	Emergency shutdown to rectify excessive steam leak on ruptured disc	Jul 1997
LUZON	HYD	Ambuklao 1	35	03/07/2021 0:10	03/07/2021 12:01	0.49	Maintenance Outage	Maintenance Outage	Dec 1956
LUZON	HYD	Ambuklao 2	35	03/07/2021 0:11	03/07/2021 12:01	0.49	Maintenance Outage	Maintenance Outage	Dec 1956
LUZON	HYD	Ambuklao 3	35	03/07/2021 0:11	03/07/2021 12:01	0.49	Maintenance Outage	Maintenance Outage	Dec 1956
VISAYAS	COAL	PEDC 1	83.7	03/07/2021 0:53	03/07/2021 15:13	0.60	Maintenance Outage	Maintenance on Boiler Pump.	Nov 2010
LUZON	NATG	Sta. Rita 3	265.5	03/07/2021 2:15	03/08/2021 12:59	1.45	Maintenance Outage	Commissioning activities from scheduled shutdown.	Oct 2001
LUZON	NATG	Sta. Rita 2	255.7	03/07/2021 9:18	03/09/2021 12:56	2.15	Forced Outage	Boiler trouble	Jun 2000
VISAYAS	COAL	THVI 2	169	03/07/2021 15:18	03/08/2021 15:37	1.01	Forced Outage	Unit Tripped with IDF problem	Dec 2017
LUZON	HYD	San Roque 3	145	03/08/2021 0:01	03/20/2021 0:01	12.00	Planned Outage	Maintenance Outage until March 19 2021	May 2003
VISAYAS	GEO	Mahanagdong B1	5	03/08/2021 4:10	03/08/2021 19:42	0.65	Forced Outage	generator speed channel failure	Jul 1997
LUZON	OIL	Limay 1	60	03/08/2021 12:56	03/08/2021 14:19	0.06	Forced Outage	Tripped due to flame-off while on performance test(Capability Test).	May 1993
LUZON	NATG	Sta. Rita 3	265.5	03/08/2021 15:26	03/08/2021 18:15	0.12	Maintenance Outage	Commissioning on Fuel-oil after major maintenance.	Oct 2001
LUZON	HYD	Binga 1	35	03/09/2021 15:01	03/09/2021 20:46	0.24	Forced Outage	Generator circuit breaker trouble	Jan 1960
LUZON	HYD	Ambuklao 1	35	03/09/2021 15:35	03/09/2021 16:18	0.03	Forced Outage	Broken Shear Pin	Dec 1956
LUZON	NATG	San Lorenzo 1	264.8	03/10/2021 0:53	03/20/2021 5:27	10.19	Maintenance Outage	Maintenance Outage until 16 March 2021.	Sep 2002
LUZON	OIL	Limay 7	60	03/10/2021 12:43	03/10/2021 13:59	0.05	Forced Outage	Flame-off trouble	Dec 1994
LUZON	HYD	Ambuklao 2	35	03/10/2021 20:43	03/10/2021 22:13	0.06	Forced Outage	Broken shearpin.	Dec 1956
VISAYAS	COAL	Kepco Salcon 1	103	03/11/2021 3:15	03/14/2021 16:38	3.56	Forced Outage	Boiler Tube Leak	Nov 2010
LUZON	OIL	Limay 4	90	03/11/2021 11:52	03/11/2021 12:43	0.04	Forced Outage	ST Protection activation due to turbo turn hardware failure	May 1993
LUZON	OIL	Limay 4	90	03/11/2021 12:57	03/11/2021 13:59	0.04	Forced Outage	ST Protection activation due to turbo turn hardware failure	May 1993
LUZON	HYD	Ambuklao 2	35	03/11/2021 16:27	03/11/2021 17:33	0.05	Forced Outage	Broken shearpin.	Dec 1956
LUZON	OIL	Limay 1	60	03/11/2021 17:42	03/11/2021 18:52	0.05	Forced Outage	Tripped due to flame-off trouble	May 1993
VISAYAS	COAL	PALM 1	135	03/12/2021 1:01	03/12/2021 2:19	0.05	Forced Outage	High Vibration at 2nd Fan	Mar 2016
LUZON	COAL	Pagbilao 3	420	03/13/2021 0:57	03/17/2021 12:17	4.47	Maintenance Outage	Inspection and repair of main turbine governor valve 3	Jul 2017
VISAYAS	GEO	Nasulo	48.3	03/13/2021 15:53			Forced Outage	Auto-tripped. affected by tripping of Main Transformer due to Tap Changer trouble	Apr 2014
LUZON	NATG	Avion 1	50.3	03/14/2021 6:04	03/14/2021 18:13	0.51	Forced Outage	Observed loss of real-time monitoring for Avion 1 and 2	Aug 2015
VISAYAS	GEO	Upper Mahiao 1	32	03/14/2021 13:04	03/14/2021 16:50	0.16	Forced Outage	Emergency cut-out from the system	Jul 1997

Region	Plant Type	Plant/ Unit Name	Capacity (MW)	Date Out	Date In	Duration (Days)	Outage Type	Remarks	Date Commissioned/ Commercial Operation
VISAYAS	GEO	Upper Mahiao 1	32	03/14/2021 16:51	03/14/2021 18:45	0.08	Forced Outage	Control valve of RVD transformer linkage rectification	Jul 1997
VISAYAS	GEO	Upper Mahiao 1	32	03/14/2021 18:46	03/14/2021 20:50	0.09	Forced Outage	Under assessment. Load is 18.0mw	Jul 1997
VISAYAS	GEO	Upper Mahiao 1	32	03/14/2021 20:51	03/25/2021 14:02	10.72	Forced Outage	Due to Generator bearing high temperature	Jul 1997
VISAYAS	COAL	Kepto Salcon 1	103	03/15/2021 17:40	03/16/2021 22:09	1.19	Forced Outage	EMERGENCY CUT-OUT FROM THE SYSTEM DUE TO POSSIBLE TUBE LEAK PROBLEM	Nov 2010
LUZON	GEO	Tiwi 2	60	03/16/2021 13:57	03/16/2021 16:51	0.12	Forced Outage	Affected by Tripping of Tiwi A-Daraga 230kV Line and Naga-Tiwi C 230kV L2	Jan 1979
LUZON	GEO	Tiwi 5	57	03/16/2021 15:05	03/16/2021 17:01	0.08	Forced Outage	Affected by tripping of Tiwi A when Daraga-Tiwi A 230kV Line synchronized in Daraga	Jan 1979
LUZON	GEO	Tiwi 6	57	03/16/2021 15:05	03/16/2021 22:45	0.32	Forced Outage	Affected by tripping of Tiwi A when Daraga-Tiwi A 230kV Line synchronized in Daraga Side	Jan 1979
LUZON	NATG	Sta. Rita 1	257.3	03/17/2021 21:36	03/24/2021 22:08	7.02	Forced Outage	Emergency shutdown due to gas turbine cooling air leak	Jun 2000
LUZON	COAL	Pagbilao 2	382	03/17/2021 22:33	03/18/2021 9:08	0.44	Forced Outage	Tripped due to Controller of air and gas drop 4-54.	Mar 1996
VISAYAS	COAL	PEDC 2	83.7	03/18/2021 0:46	03/18/2021 6:44	0.25	Forced Outage	Due to Steam leak at steam drum	Apr 2011
VISAYAS	OIL	TPVI 1	6.7	03/18/2021 9:17	03/18/2021 13:37	0.18	Forced Outage	GOV PROBLEM	Aug 1977
VISAYAS	OIL	TPVI 6	6.8	03/18/2021 9:47	03/18/2021 13:09	0.14	Forced Outage	GOV PROBLEM. GAS LEAK	Aug 1977
LUZON	HYD	Ambuklao 2	35	03/18/2021 13:14	03/18/2021 14:06	0.04	Forced Outage	Broken Shear Pin	Dec 1956
VISAYAS	OIL	TPVI 1	6.7	03/18/2021 16:14	03/18/2021 17:46	0.06	Forced Outage	FUEL LEAK	Aug 1977
VISAYAS	OIL	TPVI 6	6.8	03/18/2021 16:14	03/18/2021 18:01	0.07	Forced Outage	GOV PROBLEM	Aug 1977
VISAYAS	OIL	TPVI 3	6.8	03/18/2021 17:09	03/18/2021 18:20	0.05	Forced Outage	GEN BREAKER PROBLEM	Aug 1977
VISAYAS	OIL	TPVI 3	6.8	03/18/2021 19:51	03/18/2021 20:18	0.02	Forced Outage	UNIT TRIPPED DUE TO SUDDEN OPENING OF GENERATOR BREAKER. ONGOING TROUBLESHOOTING	Aug 1977
VISAYAS	OIL	TPVI 1	6.7	03/18/2021 20:25	03/19/2021 18:30	0.92	Forced Outage	EMERGENCY CUT-OUT DUE TO CYLINDER AS SUDDEN DROP OF EXHAUST GAS TEMPERATURE	Aug 1977
LUZON	GEO	Makban 1	63.2	03/18/2021 21:14			Forced Outage	Steam supply diverted to Unit 2	Apr 1979
LUZON	HYD	Magat 4	97	03/19/2021 11:01	03/19/2021 23:47	0.53	Forced Outage	Due to APM of Magat 3	Oct 1983
LUZON	HYD	Ambuklao 2	35	03/19/2021 14:10	03/20/2021 19:42	1.23	Maintenance Outage	Maintenance Outage	Dec 1956
LUZON	COAL	GN Power 2	316	03/20/2021 0:58			Planned Outage	Maintenance Outage	May 2013
LUZON	HYD	Magat 3	97	03/20/2021 7:01			Planned Outage	Maintenance Outage	Oct 1983
LUZON	HYD	Ambuklao 1	35	03/20/2021 7:57	03/20/2021 19:42	0.49	Planned Outage	Maintenance outage.	Dec 1956
LUZON	HYD	Ambuklao 3	35	03/20/2021 8:03	03/20/2021 19:48	0.49	Maintenance Outage	Maintenance Outage	Dec 1956
VISAYAS	GEO	PGPP1 Unit 3	37.5	03/20/2021 21:05	03/21/2021 1:17	0.18	Forced Outage	Auto-tripped due to trouble at hot well pump 3A.	Aug 1983
LUZON	COAL	Sual 1	647	03/20/2021 23:40	03/22/2021 14:35	1.62	Forced Outage	Boiler tube leak.	Oct 1999
LUZON	NATG	Avion 2	50.3	03/21/2021 6:01	03/21/2021 17:40	0.49	Planned Outage	Planned outage.	Aug 2015
LUZON	HYD	Magat 2	97	03/21/2021 7:01	03/21/2021 9:32	0.10	Forced Outage	Tripped simultaneously with the outage Santiago 69kV Bus 1.	Aug 1983
LUZON	HYD	Maris 1	4.3	03/21/2021 7:01	03/21/2021 8:57	0.08	Forced Outage	Affected by the outage of Santiago 69kV Bus 1.	Oct 2017
LUZON	COAL	APEC 1	52	03/21/2021 15:30			Forced Outage	Reported tube leak.	Jul 2006
LUZON	COAL	SMC 3	150	03/22/2021 15:52	03/23/2021 9:08	0.72	Forced Outage	Back flow of fuel gas in feeder C.	Nov 2017
VISAYAS	COAL	TPC Sangi 2	85	03/23/2021 2:40	03/23/2021 21:29	0.78	Forced Outage	TG4 AUTO-TRIPPED DUE TO TRUSS BEARING HIGH VIBRATION	Dec 2013
VISAYAS	GEO	Mahanagdong B1	5	03/25/2021 0:27			Forced Outage	Emergency cut out from the system	Jul 1997
LUZON	HYD	Magat 4	97	03/25/2021 10:03			Forced Outage	Emergency shutdown due to oil leak at servo motor	Oct 1983
VISAYAS	COAL	TPC Sangi 2	85	03/25/2021 12:27	03/25/2021 13:04	0.03	Forced Outage	TG 4 - AUTO TRIPPED DUE TO DRUM LEVEL LOW	Dec 2013
VISAYAS	GEO	Upper Mahiao 1	32	03/25/2021 14:03			Forced Outage	Emergency stop indication. Root cause under investigation. Load is 23.95MW	Jul 1997