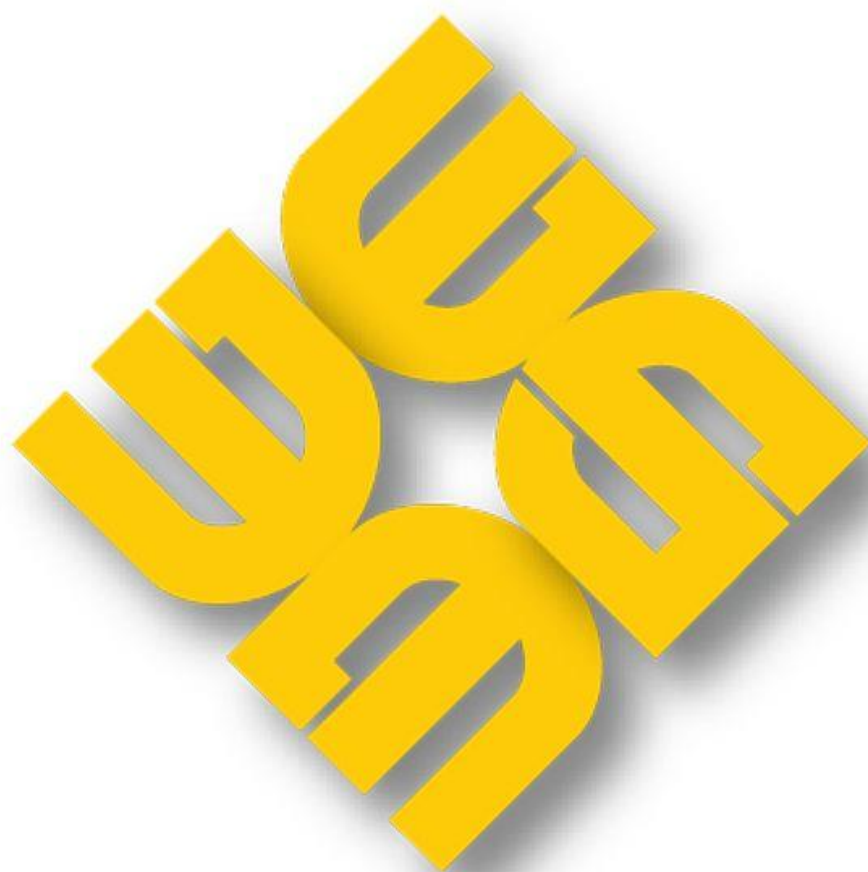


MAG-MMAR-2019-07

MONTHLY MARKET ASSESSMENT REPORT

For the Billing Period 26 June to 25 July 2019



**PHILIPPINE
ELECTRICITY
MARKET
CORPORATION**

**MARKET ASSESSMENT GROUP
(MAG)**

Monthly Market Assessment Report for July 2019 Billing Month

1. Summary

The July billing month observed a wider supply margin driven by the decrease in demand as cooler temperatures prevailed during the period brought about by the rainy season. In addition, average effective supply increased as lower outage capacity was noted this month.

As a result, the market prices for July billing period significantly decreased by 40.1 percent at PhP4,657/MWh compared to PhP7,770/MWh in June.

2. Market Outcomes

2.1. Capacity Profile

The WESM registered capacity increased to 19,964 MW following the registration of 19.2 MW hydro plant of HEDCOR, Inc. Also noted this month were the disaggregation and change in registered capacities of Panay Power Corporation's 72 MW PPC DPP to PPC 1 DPP units A and B (31.5 MW each) and PPC 2 DPP (16 MW) as well as HEDCOR, Inc.'s 30 MW HEDCOR HEP to 12.5 MW Ampohaw HEP and 12.4 MW La Trinidad HEP. PB 104 likewise recorded a change in registered capacity from 26 MW to 28 MW.

Of the said total WESM registered capacity, only about 62 percent or an average of 12,427 MW was offered in the market.

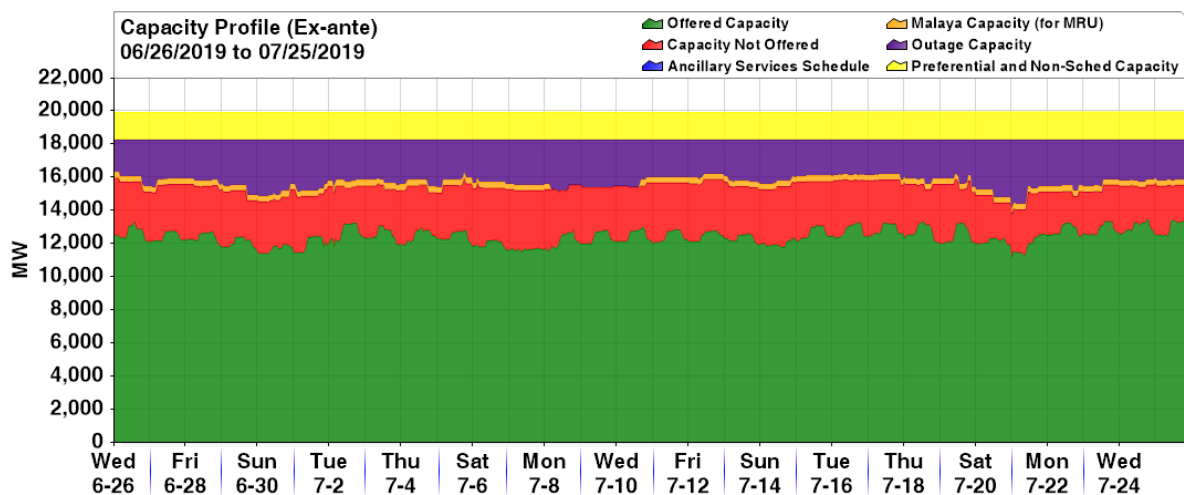


Figure 1. Capacity Profile

	July 2019		June 2019	
	Average (in MW)	% of RegCap	Average (in MW)	% of RegCap
Preferential and Non-Sched Capacity	1,650	8%	1,632	8%
Outage Capacity	2,596	13%	2,945	15%
Malaya Capacity (for MRU)	350	2%	350	0%
Capacity Not Offered	2,956	15%	2,775	14%
Offered Capacity	12,427	62%	12,564	63%
Registered Capacity (by the end of the billing month)	19,964		19,941	

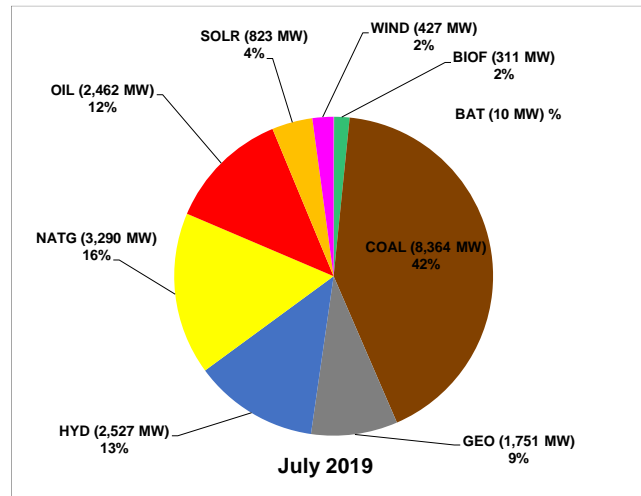


Figure 2. Registered Capacity Mix, July 2019

2.2. Outage Capacity

About 13 percent of the total registered capacity or an average of 2,592 MW were on outage. Bulk of which, at 53 percent, were related to forced outages, averaging at 1,397 MW, while maintenance outages, averaging at 679 MW, accounted for 26 percent of the total outage capacity.

On the other hand, based on type of resource, coal plants contributed 57 percent or an average of 1,493 MW of the total outage capacity this month attributable to the forced outage of Calaca 1 and Mariveles 2 and maintenance outage of Pagbilao 2.

This month's average outage capacity was 12 percent lower than previous month's average posted at 2,945 MW.

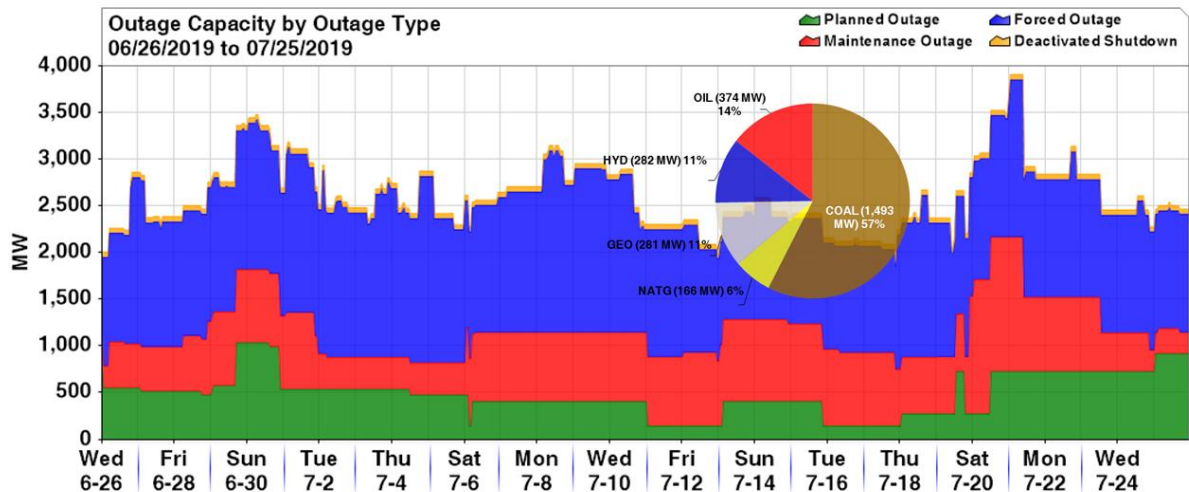


Figure 3. Outage Capacity by Outage Category

2.3. Supply and Demand

Average effective supply increased by 1.3 percent from previous month's 12,998 MW to current month's 13,167 MW level driven by the lower level of capacity on outage. Meanwhile, demand plus reserve schedule decreased by 3.8 percent to an average of 11,572 MW from last month's 12,030 MW as cooler temperatures prevailed this month due to the rainy season. As a result, supply margin significantly widened to an average of 1,596 MW from 955 MW in June.

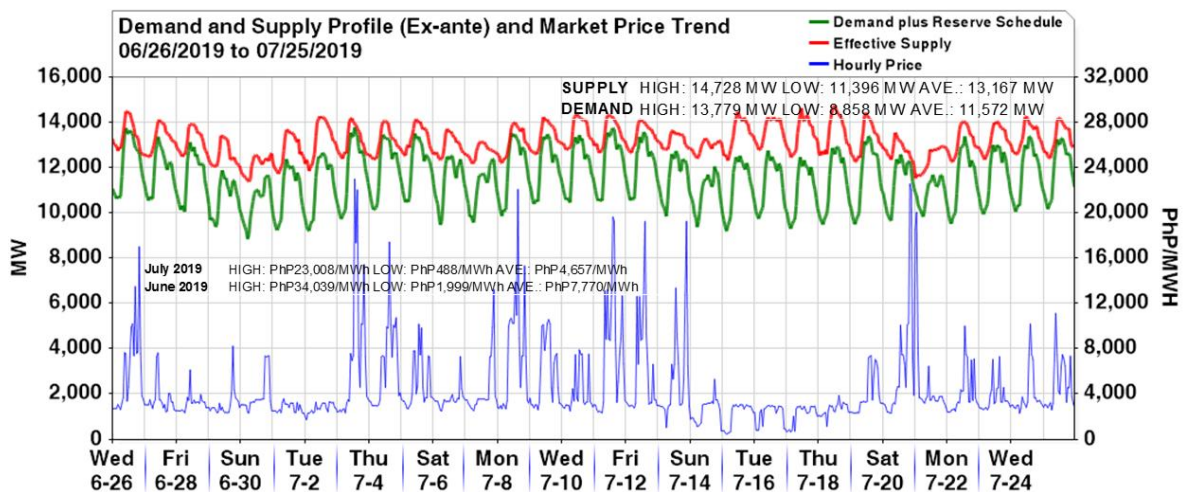


Figure 4. Demand and Supply Profile vs. Market Prices

2.4. Market Prices

Following the better supply and demand condition, market prices recorded a notably lower average at PhP4,657/MWh this month from previous month's PhP7,770/MWh. The highest price reached during the July billing month was at PhP23,008/MWh, which was likewise significantly lower than previous month's maximum price at PhP34,039/MWh.

3. Structural Competition Indices

3.1. Pivotal Plants

The market RSI fell below the 100-percent mark in 37.9 percent of the time in the July billing month from 70.6 percent in June, indicating the less frequent presence of pivotal suppliers during the period as a result of the wider supply margin this month. Most frequent pivotal suppliers during the billing month were Sual CFTPP, Ilijan NGPP and Sta. Rita NGPP.

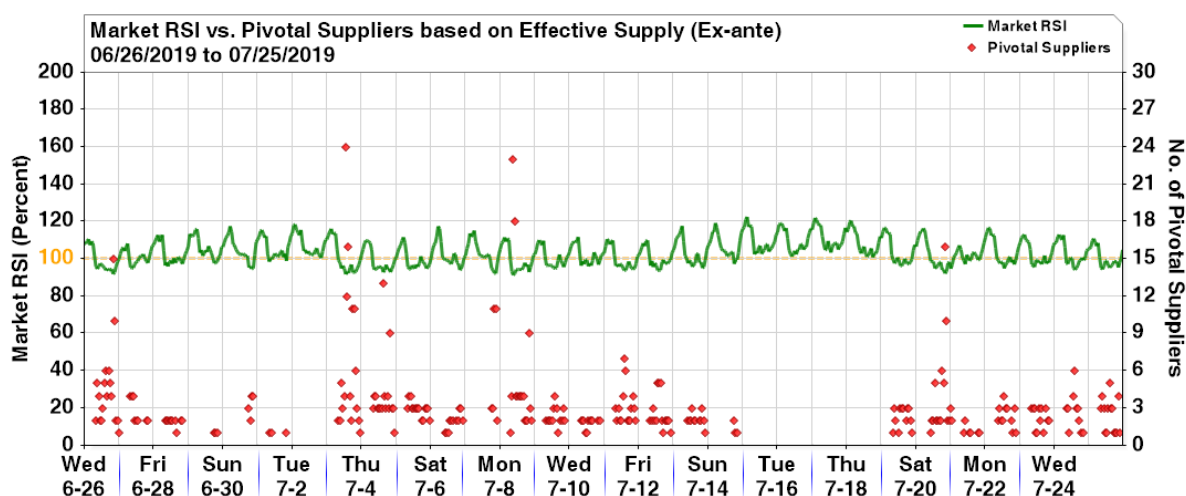


Figure 5. Market RSI vs. Pivotal Suppliers

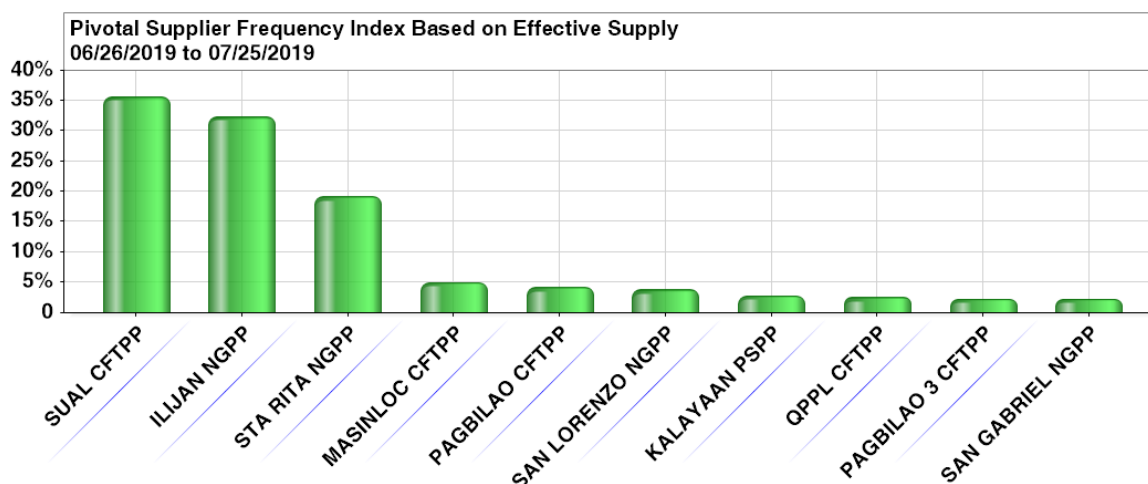


Figure 6. Top Pivotal Plants

3.2. Market Concentration

San Miguel Corporation (SMC), Aboitiz Power (AP), First Gen Corporation (FGC) and Power Sector Asset and Liabilities Management (PSALM) continued to dominate the market. Their combined market share comprised 69.1 percent of the total registered capacity in the WESM, with SMC holding the top spot at 24.2 percent followed by AP (19.9 percent), FGC (14.4 percent) and PSALM (10.6 percent).

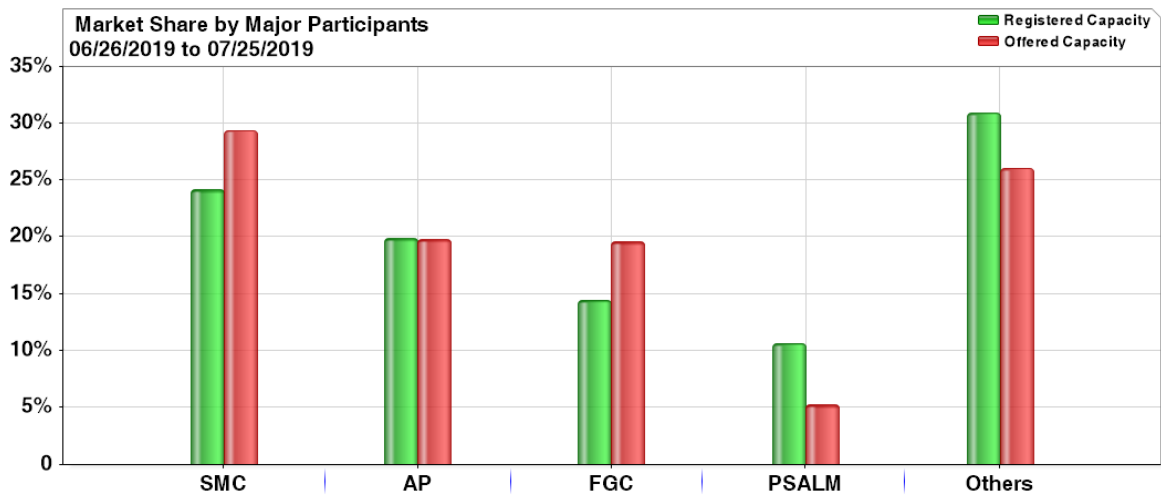


Figure 7. Market Share

Following the unavailability of some plants, the market shares of SMC based on offered capacity was recorded at 29.4 percent. Meanwhile, AP and FGC held market shares of 19.8 percent and 19.6 percent, respectively. Accordingly, the Herfindahl-Hirschman Index (HHI) calculated based on offered capacity by major participants' grouping indicated a concentrated market for 59 percent of the time and moderately concentrated market for 41 percent.

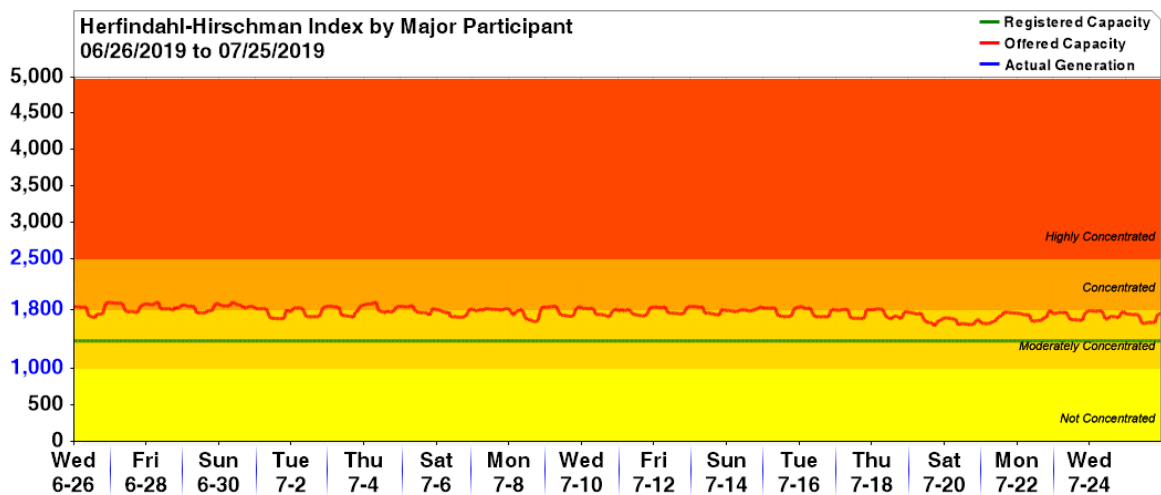


Figure 8. Hourly HHI based on Major Participant Grouping

List of Major Plant Outages

Region	Plant Type	Plant/ Unit Name	Capacity (MW)	Date Out	Date In	Duration (Days)	Outage Type	Remarks	Total
LUZON	GEO	Makban 6	55	04/11/2013 22:44			Deactivated Shutdown	Conducted gas compressor test	720
VISAYAS	GEO	PGPP2 Unit 4	20	06/27/2014 6:07			Forced Outage	Steam being utilized by Nasulo plant	720
VISAYAS	GEO	Upper Mahiao 2	32	09/03/2018 6:01			Forced Outage	Tripped	720
LUZON	OIL	SLPGC 4	25	11/22/2018 11:56			Maintenance Outage	On extended maintenance shutdown until 24 April 2019	720
LUZON	GEO	Tiwi 1	59	11/29/2018 13:31			Maintenance Outage	Maintenance Outage	720
LUZON	GEO	Makban 5	55	02/08/2019 16:08			Forced Outage	Low Steam Supply. Divert Steam Supply to unit 3	720
LUZON	HYD	San Roque 2	145	03/11/2019 15:01			Planned Outage	Planned outage until September 11 2019	720
VISAYAS	OIL	PB102 Unit 1	6	04/28/2019 18:16			Forced Outage	Internal fault	720
LUZON	OIL	Malaya 1	300	05/03/2019 18:21			Forced Outage	Declared unavailable due to motorization of unit generator caused by the non-open	720
LUZON	HYD	Magat 2	97	05/20/2019 6:01	07/12/2019 22:18	53.68	Maintenance Outage	Maintenance outage until 18 July 2019	406
VISAYAS	GEO	Mahanagdong A1	5	05/21/2019 7:08	07/19/2019 0:12	58.71	Forced Outage	Emergency shutdown	552
VISAYAS	GEO	Mahanagdong B1	5	05/22/2019 12:45			Forced Outage	AVR 24VDC power failure	720
VISAYAS	GEO	Malitbog 3	72	05/25/2019 0:36	06/27/2019 1:32	33.04	Planned Outage	Annual PMS	25
VISAYAS	GEO	PGPP1 Unit 1	37.5	05/25/2019 4:12	07/16/2019 7:51	52.15	Maintenance Outage	Offline to conduct repair of cooling tower leak at cooling tower hot distribution basin	487
LUZON	COAL	SLTEC 2	122.9	05/25/2019 8:22	07/03/2019 7:21	38.96	Forced Outage	On emergency shutdown due to boiler tube leak	175
VISAYAS	GEO	PGPP2 Unit 3	20	06/04/2019 0:06	06/26/2019 14:48	22.61	Maintenance Outage	Offline due to PMS	14
LUZON	COAL	GN Power 2	316	06/14/2019 20:02	07/19/2019 9:17	34.55	Forced Outage	Loss of power supply of coal feeder	561
LUZON	COAL	Masinloc 3	335	06/15/2019 1:35	07/06/2019 2:45	21.05	Planned Outage	On Commissioning Test	242
LUZON	COAL	Calaca 1	300	06/26/2019 0:01			Forced Outage	Extended outage until 30 July 2019	720
LUZON	NATG	Sta. Rita 2	255.7	06/26/2019 4:37	07/01/2019 20:14	5.65	Maintenance Outage	Maintenance Outage until 30 June 2019	136
LUZON	OIL	Limay 3	60	06/26/2019 18:15	06/27/2019 9:12	0.62	Forced Outage	Failed to start due to synchro tap problem	15
LUZON	COAL	SBPL	455	06/26/2019 18:18	06/27/2019 4:06	0.41	Forced Outage	Emergency Shutdown due to Tube Leak. On Commissioning Test	10
VISAYAS	COAL	Keppo Salcon 2	103	06/26/2019 19:36	06/30/2019 15:38	3.83	Forced Outage	Boiler tube leak	92
VISAYAS	GEO	Leyte 3	40.3	06/27/2019 1:21	06/28/2019 17:05	1.66	Planned Outage	PMS	40
VISAYAS	GEO	Malitbog 3	72	06/27/2019 9:43	06/27/2019 14:23	0.19	Forced Outage	Cut-out to facilitate vibration trimming	5
VISAYAS	GEO	Malitbog 3	72	06/27/2019 15:09	06/30/2019 15:52	3.03	Forced Outage	Cut-out from the System	72
LUZON	COAL	SLTEC 1	121	06/28/2019 5:35			Maintenance Outage	Emergency Shutdown due to Boiler Tube Leak. On Maintenance Outage from 01 July	667
VISAYAS	SOLR	Islasol 2	27.2	06/28/2019 9:56	06/28/2019 11:27	0.06	Forced Outage	Isolated due to tripping of their 69kV Lateral Line. customer owned and maintained	2
LUZON	HYD	Magat 3	97	06/28/2019 21:49	06/29/2019 5:57	0.34	Forced Outage	Tripped at 15MW load. As RR-firm.	8
LUZON	NATG	Ilijan B2	190	06/28/2019 21:53	07/01/2019 22:50	3.04	Maintenance Outage	Maintenance Outage until 06 July 2019	73
VISAYAS	OIL	Bohol 1	4	06/28/2019 22:44	06/29/2019 6:10	0.31	Forced Outage	Emergency out due to fuel oil leak	8
LUZON	OIL	Limay 6	60	06/29/2019 0:01	07/04/2019 11:27	5.48	Planned Outage	Planned Outage until 05 July 2019	131
VISAYAS	GEO	Leyte 1	41	06/29/2019 1:37	06/30/2019 14:03	1.52	Planned Outage	Annual PMS	37
VISAYAS	OIL	Bohol 2	4	06/29/2019 9:56	06/29/2019 11:12	0.05	Forced Outage	Due to air leak at air intake manifold in cylinder number 6.	2
VISAYAS	COAL	PEDC 3	150	06/29/2019 16:31	07/01/2019 16:56	2.02	Forced Outage	Debris filter problem	48
LUZON	COAL	SBPL	455	06/29/2019 16:33	06/30/2019 21:12	1.19	Planned Outage	On Commissioning Test	29
VISAYAS	GEO	PGPP2 Unit 3	20	06/29/2019 20:48	06/29/2019 22:56	0.09	Forced Outage	Offline. Under investigation	2
VISAYAS	COAL	CEDC 1	82	06/30/2019 0:41	06/30/2019 7:27	0.28	Forced Outage	TO CONDUCT REPAIR OF HIGH PRESSURE HEATER 1	7
LUZON	HYD	Ambuklao 2	35	06/30/2019 5:41	06/30/2019 8:37	0.12	Forced Outage	Broken Shear Pin. As RR-non firm.	3
VISAYAS	SOLR	Silay	20	06/30/2019 11:54	06/30/2019 14:16	0.10	Forced Outage	Affected by tripping of 69kV Bacolod-Silay Sub TL.	3
LUZON	COAL	Pagbilao 2	382	07/01/2019 1:10			Forced Outage	Boiler Tube Leak. On Maintenance outage from 06-30 July 2019.(RECLASSIFIED FROM	119
LUZON	COAL	Pagbilao 2	382	07/01/2019 1:10	07/23/2019 12:12	22.46	Maintenance Outage	Boiler Tube Leak. On Maintenance outage from 06-30 July 2019.(RECLASSIFIED FROM	420
VISAYAS	GEO	Leyte 2	39.3	07/01/2019 1:22	07/02/2019 4:36	1.13	Maintenance Outage	Cut-out from the System to effect installation of remodeled gearboxes and to comm	27
VISAYAS	GEO	Malitbog 3	72	07/01/2019 2:59	07/01/2019 4:23	0.06	Forced Outage	Tripped. Under assessment by Plant Personnel	2
LUZON	COAL	Pagbilao 3	420	07/02/2019 1:27	07/02/2019 3:45	0.10	Forced Outage	Tripped with 261MW load	2
LUZON	GEO	Makban 3	63	07/02/2019 9:16	07/02/2019 18:39	0.39	Forced Outage	Hotspot correction on Makban B Bay 81	9
LUZON	GEO	Makban 4	63	07/02/2019 10:20	07/02/2019 14:01	0.15	Forced Outage	Tripped due to power supply trouble	4
VISAYAS	OIL	Bohol 4	4	07/02/2019 11:47	07/03/2019 19:06	1.30	Forced Outage	Defective cooling tower fan	32
LUZON	GEO	Bacman 2	60	07/03/2019 9:09	07/03/2019 22:53	0.57	Forced Outage	Low condenser vacuum.	13
LUZON	NATG	Sta. Rita 4	264	07/03/2019 12:47	07/04/2019 3:49	0.63	Forced Outage	Tripped during changeover from gas to fuel oil	15
LUZON	GEO	Bacman 1	60	07/03/2019 16:12	07/03/2019 17:39	0.06	Forced Outage	Tripped due to station service trouble	1
LUZON	COAL	SLTEC 2	122.9	07/03/2019 20:36	07/05/2019 16:19	1.82	Forced Outage	Shutdown due to boiler water quality problem	44
LUZON	GEO	Tiwi 6	57	07/04/2019 6:44	07/04/2019 8:02	0.05	Forced Outage	Excitation trouble	2
LUZON	COAL	SBPL	455	07/04/2019 17:58	07/05/2019 3:06	0.38	Forced Outage	On commissioning test	10
VISAYAS	OIL	Bohol 2	4	07/05/2019 14:21	07/09/2019 18:35	4.18	Forced Outage	Emergency out due to cut off stud bolt at cylinder 11.	100
LUZON	COAL	Masinloc 1	315	07/05/2019 23:48	07/08/2019 17:34	2.74	Forced Outage	Repair of electrostatic precipitator. air preheater and induced-draft fan.	66
LUZON	NATG	Sta. Rita 4	264	07/06/2019 4:48	07/11/2019 0:01	4.80	Planned Outage	On maintenance outage until 10 July 2019(2400H)	116
LUZON	GEO	Makban 7	20	07/06/2019 6:12			Maintenance Outage	Maintenance Outage	474
VISAYAS	COAL	PEDC 2	83.7	07/06/2019 21:06	07/09/2019 21:33	3.02	Forced Outage	Tube leak	72
VISAYAS	COAL	TPC Sangi 1	60	07/07/2019 3:21	07/19/2019 22:15	12.79	Forced Outage	Boiler 6 tube leak	307
LUZON	OIL	Malaya 2	350	07/08/2019 3:04	07/10/2019 15:36	2.52	Forced Outage	Auxiliary steam line trouble	60
VISAYAS	GEO	Upper Mahiao 4	32	07/08/2019 6:07	07/09/2019 21:47	1.65	Forced Outage	Emergency cut-out to facilitate replacement of control valve assembly completed	39
LUZON	OIL	Limay 5	60	07/08/2019 7:15	07/08/2019 10:53	0.15	Forced Outage	Rotor barring problem	3
LUZON	OIL	Limay 1	60	07/08/2019 11:56	07/08/2019 14:31	0.11	Forced Outage	Tripped due to excessive oil leak	3
LUZON	HYD	Kalayaan 3	180	07/09/2019 0:01	07/10/2019 19:28	1.81	Forced Outage	Scheduled shutdown was deferred but plant proceed with their shutdown	43
LUZON	OIL	Limay 5	60	07/10/2019 6:11	07/10/2019 15:03	0.37	Forced Outage	Starting Device problem.As Regulating Unit	9
VISAYAS	OIL	Bohol 1	4	07/10/2019 11:15	07/10/2019 13:05	0.08	Forced Outage	Fault in racker gear lubricating oil motor	2
LUZON	HYD	Ambuklao 1	35	07/10/2019 20:55	07/10/2019 22:28	0.06	Forced Outage	Broken Shear Pin	2
LUZON	NATG	Sta. Rita 4	264	07/11/2019 0:01	07/12/2019 10:01	1.42	Forced Outage	Delayed completion of Maintenance activities	34
LUZON	NATG	Avion 2	50.3	07/12/2019 0:01	07/14/2019 21:20	2.89	Maintenance Outage	Maintenance outage until 15 July 2019	69
LUZON	HYD	Kalayaan 1	180	07/13/2019 0:01	07/17/2019 20:24	4.85	Maintenance Outage	Maintenance Outage until 17 July 2019	116
LUZON	NATG	Sta. Rita 3	265.5	07/13/2019 2:44	07/15/2019 20:24	2.74	Planned Outage	Maintenance Outage until 14 July 2019	66
VISAYAS	SOLR	Islasol 3	40.5	07/13/2019 6:16	07/13/2019 18:17	0.50	Forced Outage	Affected by maintenance of 138kV Bacolod-Cadiz TL And APMS of Cadiz 50MVA TR1	12
VISAYAS	SOLR	Cadiz	108.1	07/13/2019 6:18	07/13/2019 18:26	0.51	Forced Outage	Affected by maintenance of 138kV Bacolod-Cadiz TL per PANR-WRCC 2019-06-0084	12
VISAYAS	SOLR	San Carlos 1	19.8	07/13/2019 6:21	07/13/2019 19:31	0.55	Forced Outage	Affected by maintenance of 138kV Bacolod-Cadiz TL and APMS of Cadiz 50MVA TR1	13
VISAYAS	SOLR	San Carlos 2	19.8	07/13/2019 6:21	07/13/2019 19:40	0.55	Forced Outage	Affected by maintenance of 138kV Bacolod-Cadiz TL and APMS of Cadiz 50MVA TR1	13
VISAYAS	SOLR	San Carlos Sun	46.8	07/13/2019 6:24			Forced Outage	Affected by maintenance of 138kV Bacolod-Cadiz TL and APMS of Cadiz 50MVA TR1	306
LUZON	GEO	Bacman 1	60	07/13/2019 16:21	07/13/2019 21:07	0.20	Forced Outage	Tripped while conducting Ancillary Test(Turbine Bearing No.2 vibration).	5
LUZON	GEO	Bacman 1	60	07/13/2019 21:33	07/13/2019 22:30	0.04	Forced Outage	Drum level high	1
LUZON	COAL	SMC 1	150	07/13/2019 23:57	07/14/2019 10:51	0.45	Forced Outage	Rectification of stuck turbine	11
VISAYAS	SOLR	Islasol 2	27.2	07/14/2019 7:19	07/14/2019 18:00	0.45	Forced Outage	Isolated due to maintenance along 69kV Bacolod-San Enrique Sub TL	10
VISAYAS	GEO	PGPP1 Unit 2	37.5	07/15/2019 0:52	07/16/2019 4:56	1.17	Forced Outage	Auto tripped. On going investigation.	28
VISAYAS	GEO	PGPP1 Unit 1	37.5	07/16/2019 7:51	07/16/2019 20:48	0.54	Forced Outage	Cause of tripping under investigation.	13
VISAYAS	OIL	Bohol 2	4	07/16/2019 10:25	07/17/2019 23:34	1.55	Forced Outage	Smoke coming out from generator	37
VISAYAS	GEO	PGPP1 Unit 2	37.5	07/16/2019 17:51	07/16/2019 18:16	0.02	Forced Outage	Auto-tripped. Under investigation	1
VISAYAS	GEO	PGPP1 Unit 2	37.5	07/16/2019 19:21	07/17/2019 10:15	0.62	Forced Outage	Auto-tripped. Under investigation	15
VISAYAS	GEO	PGPP1 Unit 2	37.5	07/17/2019 10:15	07/17/2019 11:05	0.03	Forced Outage	Auto tripped. Under investigation.	1
VISAYAS	OIL	Bohol 4	4	07/17/2019 10:47	07/17/2019 11:04	0.01	Forced Outage	Mechanical and electrical fault	1
LUZON	COAL	Masinloc 3	335	07/17/2019 21:04			Forced Outage	Tripped at 115MW. On Commissioning Test	195
VISAYAS	GEO	Nasulo	48.3	07/18/2019 0:14			Planned Outage	Offline due to maintenance activities	192
VISAYAS	COAL	CEDC 2	82	07/18/2019 0:30			Planned Outage	PMS	192
LUZON	OIL	Limay 3	60	07/18/2019 8:06	07/18/2019 10:31	0.10	Forced Outage	Emergency shutdown due to smoke at combustor area.	2
LUZON	COAL	Calaca 2	300	07/18/2019 13:44	07/18/2019 18:05	0.18	Forced Outage	Tripped at 200MW load.	5
VISAYAS	GEO	Mahanagdong A1	5	07/19/2019 0:12			Maintenance Outage	scheduled until 30 July 2019	168
VISAYAS	GEO	Mahanagdong A2	5	07/19/2019 9:21	07/20/2019 4:49	0.81	Forced Outage	emergency shutdown due to steam leak in motorized valve of main steamline	19
LUZON	COAL	SMC 2	150	07/19/2019 11:35			Forced Outage	Tripped at 120MW. Turbine Vibration.System Frequency is 59.53hz	157
LUZON	COAL	SBPL	455	07/19/2019 12:59	07/19/2019 18:55	0.25	Planned Outage	On Commissioning Test	6
LUZON	COAL	Sual 2	647	07/19/2019 21:36	07/21/2019 9:58	1.52	Maintenance Outage	On maintenance outage until 21 July 2019	36
VISAYAS	COAL	TPC Sangi 1	60	07/19/2019 22:15	07/21/2019 10:46	1.52	Forced Outage	BOILER 7 TUBE LEAK	36
LUZON	HYD	Kalayaan 2	180	07/20/2019 0:01	07/24/2019 20:22	4.85	Maintenance Outage	Maintenance Outage until 24 July 2019	116
VISAYAS	GEO	PGPP1 Unit 2	37.5	07/20/2019 4:04	07/20/2019 21:05	0.71	Forced Outage	Auto-tripped. Under investigation	17
LUZON	COAL	SBPL	455	07/20/2019 11:48			Planned Outage	On Commissioning Test	133
LUZON	NATG	San Lorenzo 1	264.8	07/20/2019 23:50	07/21/2019 0:41	0.04	Forced Outage	Tripped during the process of fuel changed-ove from gas to oil.	1
LUZON	NATG	San Gabriel	420	07/21/2019 0:54	07/21/2019 9:17	0.35	Forced Outage	On emergency shutdown until 1000H of 21 July 2019	9
VISAYAS	COAL	TPC Sangi 1	60	07/21/2019 10:46			Forced Outage	Affected by Carcon L12 tripping	110
VISAYAS	COAL	TPC Sangi 2	85	07/21/2019 10:46	07/21/2019 17:19	0.27	Forced Outage	Affected by Carcon L12 tripping	7
LUZON	COAL	Calaca 2	300	07/22/2019 16:28	07/22/2019 20:01	0.15	Forced Out		