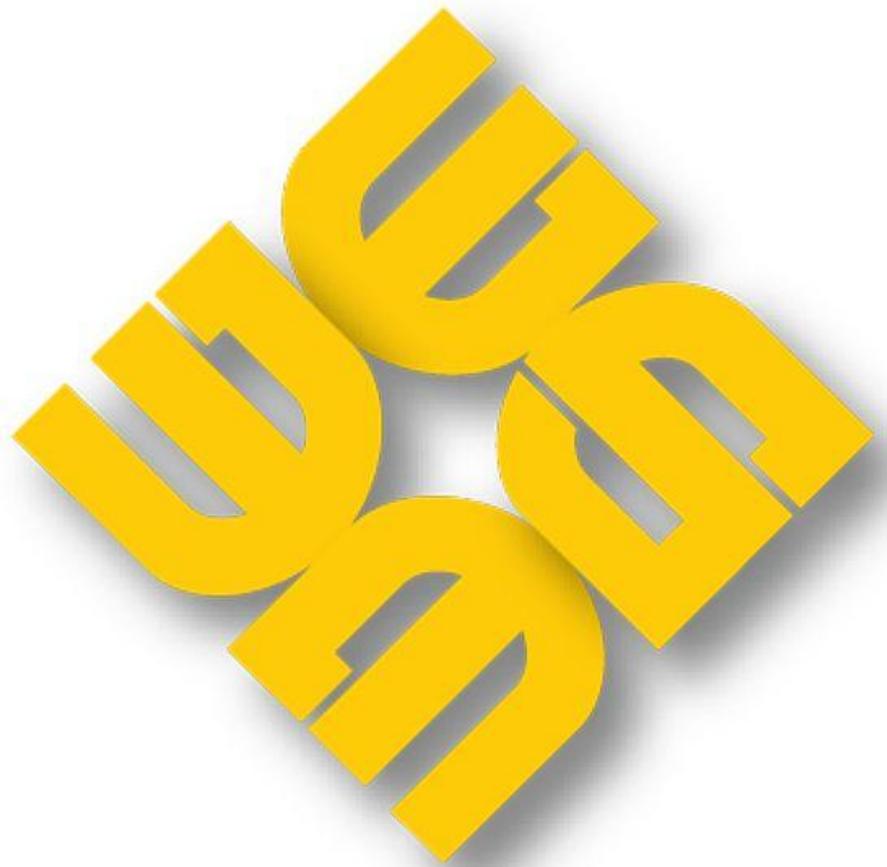


MAG-MMAR-2019-08

MONTHLY MARKET ASSESSMENT REPORT

For the Billing Period 26 July to 25 August 2019



**PHILIPPINE
ELECTRICITY
MARKET
CORPORATION**

**MARKET ASSESSMENT GROUP
(MAG)**

Monthly Market Assessment Report for August 2019 Billing Month

1. Summary

The August billing month was observed to have a wider supply margin driven by the decrease in demand as cooler temperatures were sustained during the period brought about by the rainy season. Furthermore, the decrease in capacity not offered offset the slight increase in outage capacity. As a result, average effective supply was consistent with last month's supply.

Consequently, the market prices for August billing period decreased further by 35.5 percent at PhP3,004/MWh compared to PhP4,657/MWh in July.

2. Market Outcomes

2.1. Capacity Profile

The WESM registered capacity slightly increased to 19,967 MW following the registration of 2.2 MW Majayjay Hydropower Company, Inc. hydro plant.

Of the said total WESM registered capacity, only about 63 percent or an average of 12,654 MW was offered in the market.

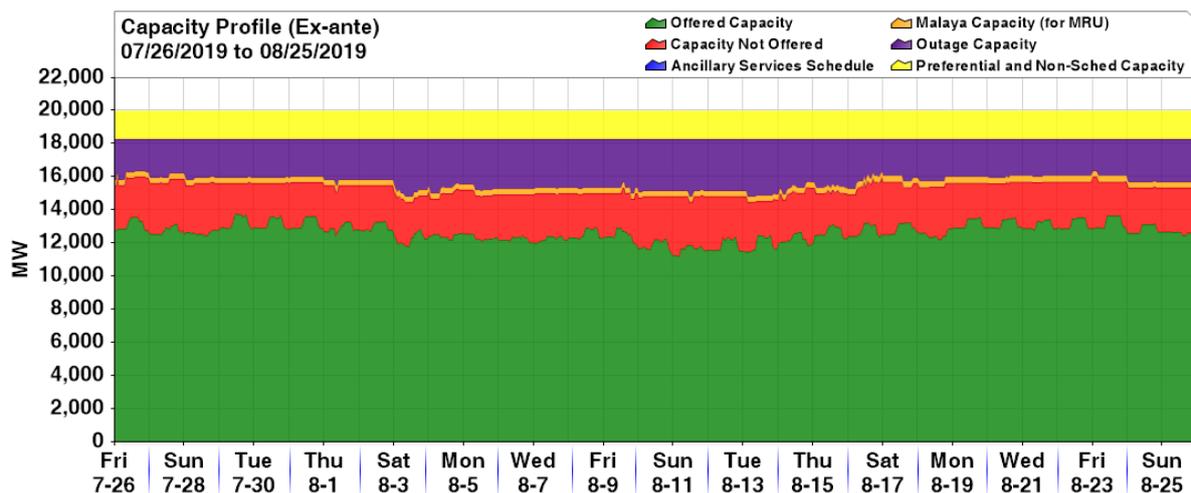


Figure 1. Capacity Profile

	August 2019		July 2019	
	Average (in MW)	% of RegCap	Average (in MW)	% of RegCap
Preferential and Non-Sched Capacity	1,662	8%	1,650	8%
Outage Capacity	2,652	13%	2,596	13%
Malaya Capacity (for MRU)	350	2%	350	2%
Capacity Not Offered	2,648	13%	2,956	15%
Offered Capacity	12,654	63%	12,427	62%
Registered Capacity (by the end of the billing month)	19,967		19,964	

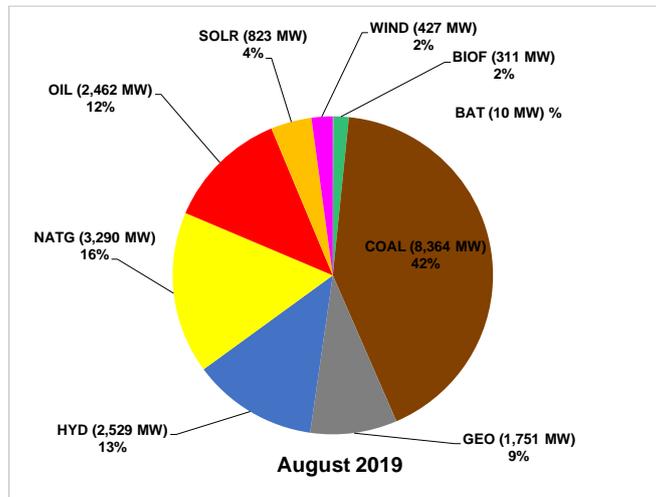


Figure 2. Registered Capacity Mix, August 2019

2.2. Outage Capacity

About 13 percent of the total registered capacity or an average of 2,652 MW were on outage. Bulk of which, at 50 percent, were related to forced outages, averaging at 1,295 MW, while maintenance outages, averaging at 287 MW, accounted for 11 percent of the total outage capacity.

On the other hand, based on type of resource, coal plants contributed 40 percent or an average of 1,062 MW of the total outage capacity this month attributable to the forced outage of Calaca 1 and Masinloc 3 and maintenance outage of SLTEC 1.

This month’s average outage capacity was 2 percent slightly higher than previous month’s average posted at 2,596 MW.

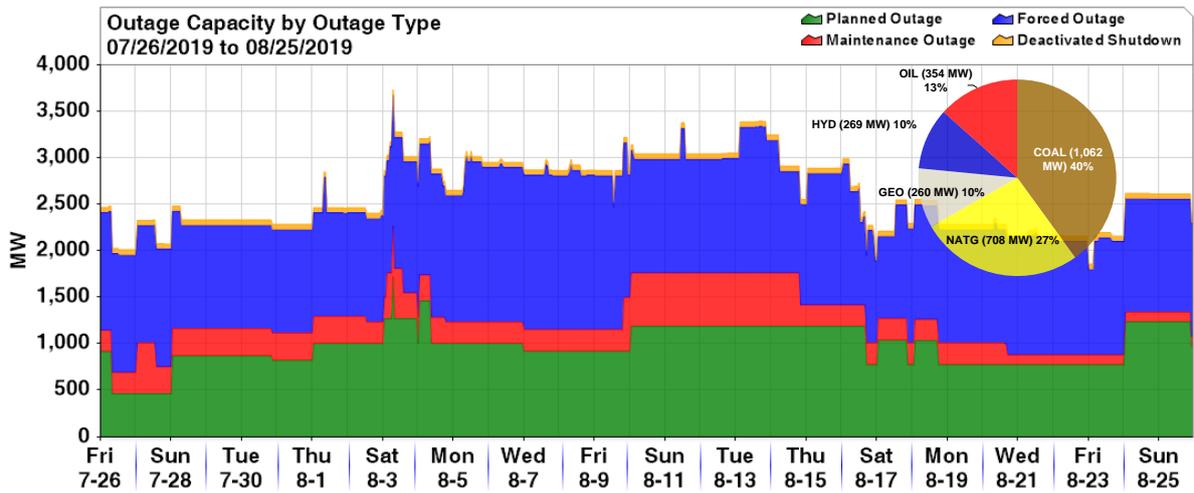


Figure 3. Outage Capacity by Outage Category

2.3. Supply and Demand

Average effective supply increased by 0.1 percent from previous month's 13,167 MW to current month's 13,187 MW level driven by the lower level of capacity on outage. Meanwhile, demand plus reserve schedule decreased by 3.2 percent to an average of 11,205 MW from last month's 11,572 MW as cooler temperatures were sustained this month due to the rainy season. As a result, supply margin significantly widened to an average of 1,982 MW from 1,596 MW in July.

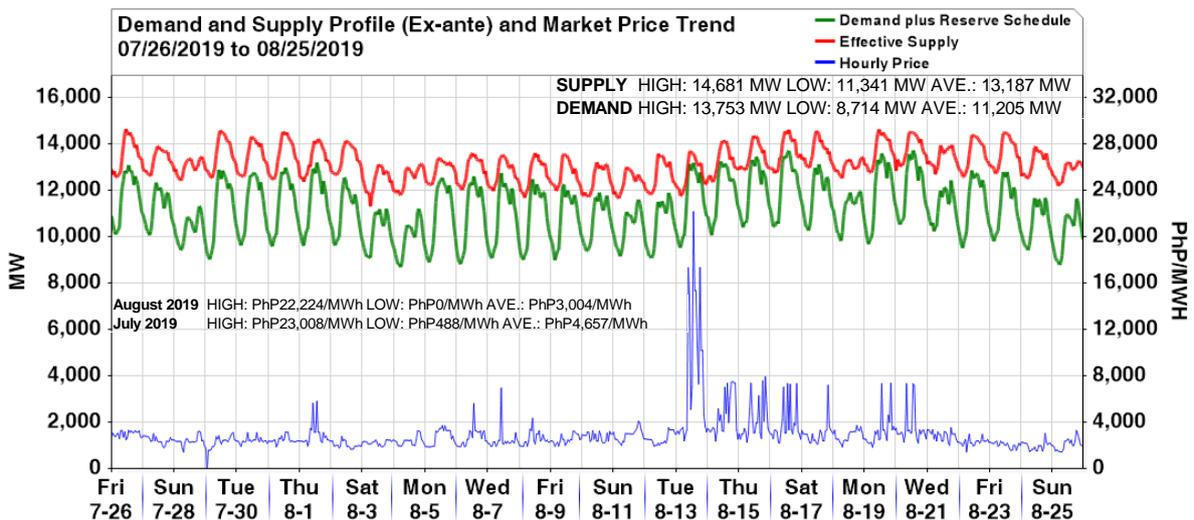


Figure 4. Demand and Supply Profile vs. Market Prices

2.4. Market Prices

Following the better supply and demand condition, market prices continued to decrease at an average of PhP3,004/MWh this month from previous month's

PhP4,657/MWh. The highest price reached during the August billing month was at PhP22,224/MWh, which was lower than previous month's maximum price at PhP23,008/MWh.

3. Structural Competition Indices

3.1. Pivotal Plants

The market RSI fell below the 100-percent mark in 16.4 percent of the time in the August billing month from 37.9 percent in July, 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, Sta. Rita NGPP and Pagbilao CFTPP.

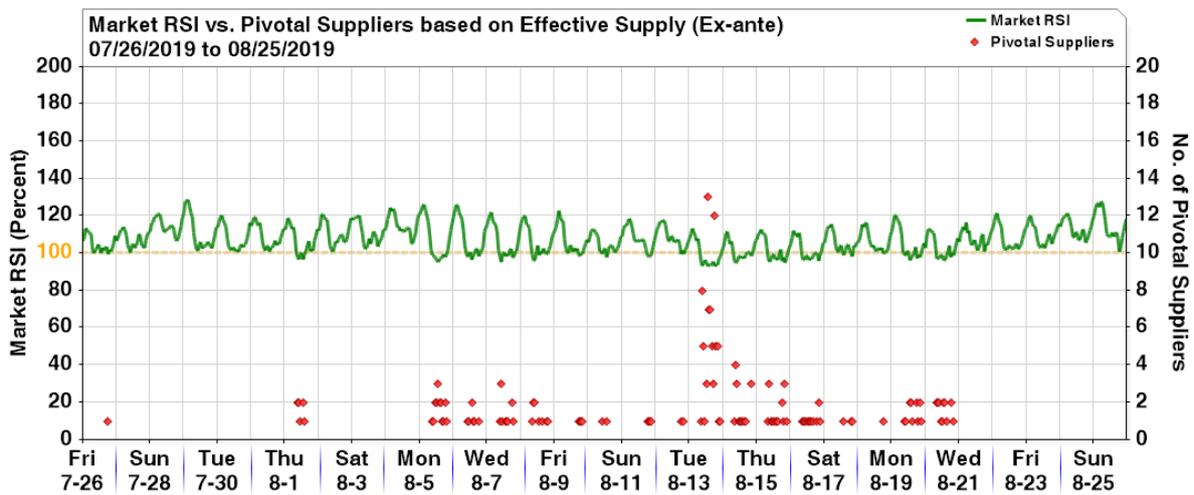


Figure 5. Market RSI vs. Pivotal Suppliers

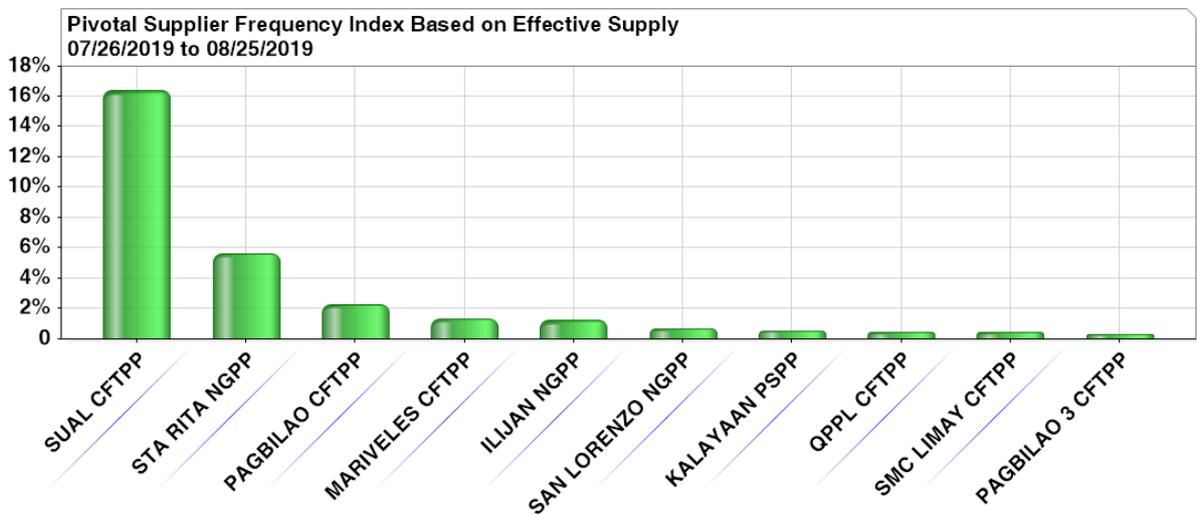


Figure 6. Top Pivotal Plants

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 24.1 percent followed by AP (19.9 percent), FGC (14.4 percent) and PSALM (10.6 percent).

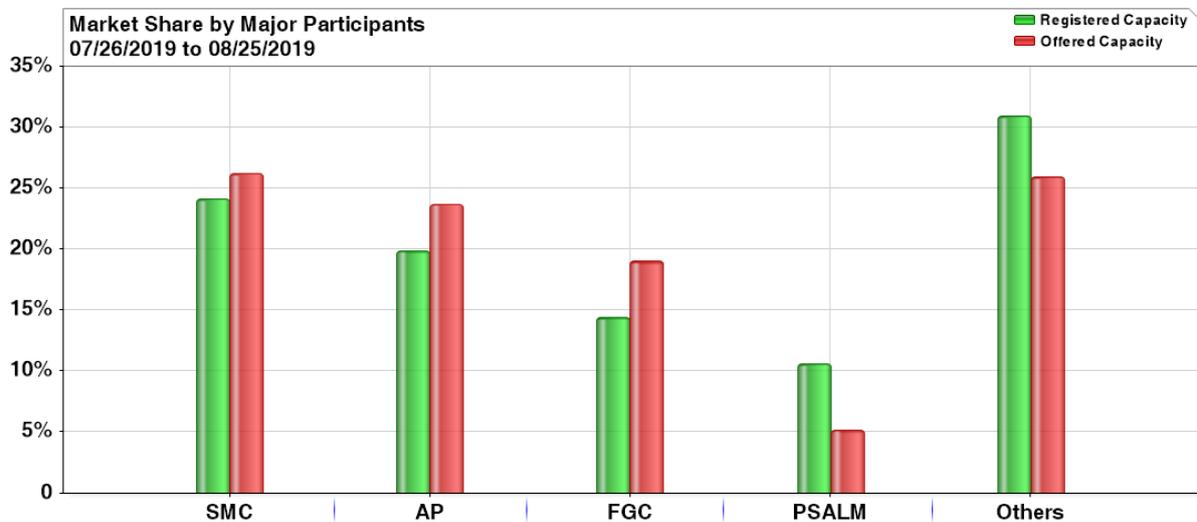


Figure 7. Market Share

Following the unavailability of some plants, the market shares of SMC based on offered capacity was recorded at 26.2 percent. Meanwhile, AP and FGC held market shares of 23.7 percent and 19 percent, respectively. Accordingly, the Herfindahl-Hirschman Index (HHI) calculated based on offered capacity by major participants' grouping indicated a concentrated market for 11 percent of the time and moderately concentrated market for 89 percent. The August billing month posted better competition in the market among participants comparing to July billing month which indicated a concentrated market at 41 percent and moderately concentrated market at 59 percent.

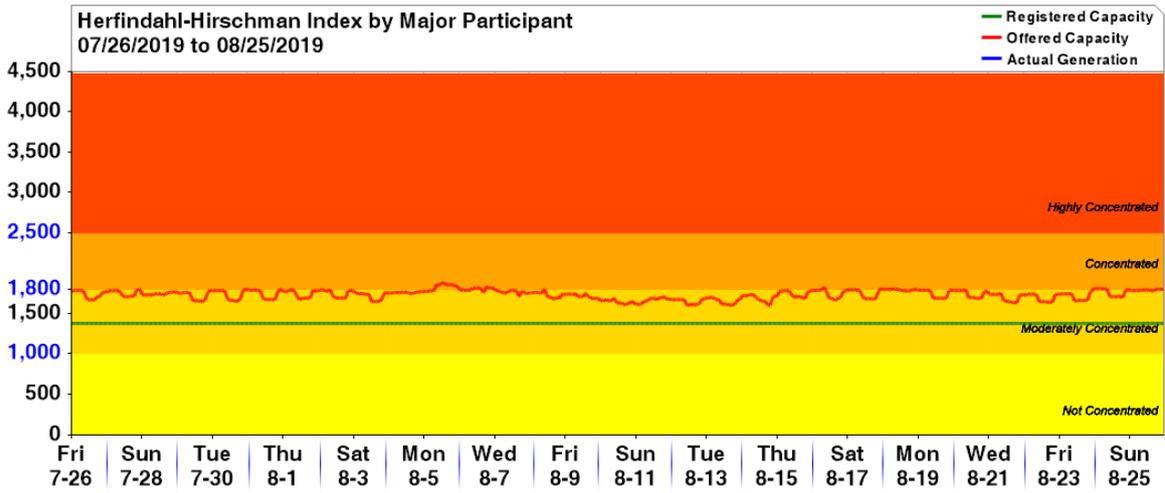


Figure 8. Hourly HHI based on Major Participant Grouping

4. Spot Exposure

Spot market transaction of generator-trading participants comprised about 12.2 percent of the total energy transaction in the WESM. Still, majority of the total energy injected into the grid was covered by bilateral contracts at about 85.8 percent.

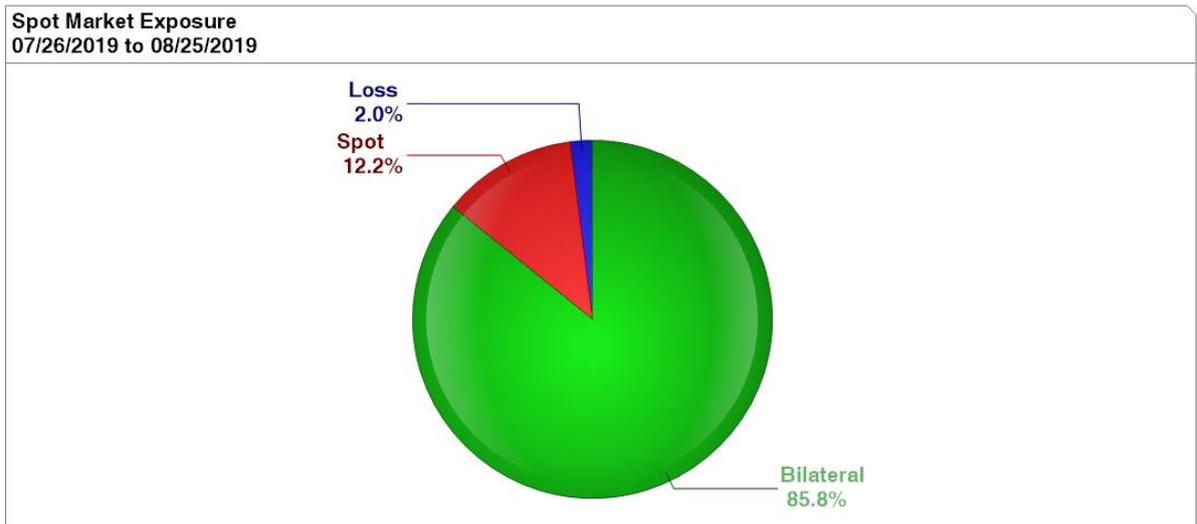


Figure 9. Spot Market Exposure

List of Major Plant Outages

Plant	resource	Plant/ Unit Name	Capacity (MW)	stage_type	Date Out	Date In	Duration (Days)	Outage Type	Remarks	Date Commissioned/ Commercial Operation
GEO	3MKBN_C	Makban 6	55	Deactivat	04/11/2013 22:44			Deactivated Shutdown	Conducted gas compressor test	Apr 1979
GEO	6PALZA_U	PGPP2 Unit 4	20	Unplann	06/27/2014 6:07			Forced Outage	Steam being utilized by Nasulo plant	Aug 1983
GEO	4LEYTE_A	Upper Mahiao 2	32	Unplann	09/03/2018 6:01			Forced Outage	Tripped	Jul 1997
OIL	3SLPGC_G	SLPGC 4	25	Unplann	11/22/2018 11:56			Maintenance Outage	On extended maintenance shutdown until 24 April 2019	Mar 2018
GEO	3TIWI_A	Tiwi 1	59	Unplann	11/29/2018 13:31			Maintenance Outage	Maintenance Outage	Jan 1979
GEO	3MKBN_C	Makban 5	55	Unplann	02/08/2019 16:08			Forced Outage	Low Steam Supply. Divert Steam Supply to unit 3	Apr 1979
HYD	1SROQUE	San Roque 2	145	Planned	03/11/2019 15:01	08/16/2019 16:01	158.04	Planned Outage	Planned outage until September 11 2019	May 2003
BIOF	6URC_G0J	JURC 1	40	Unplann	04/28/2019 0:53			Forced Outage	Offline due to Boiler problem	Jan 2015
OIL	8STBAR_P	PB102 Unit 1	6	Unplann	04/28/2019 18:16			Forced Outage	Internal fault	Apr 1981
OIL	3MALAYA	Malaya 1	300	Unplann	05/03/2019 18:21			Forced Outage	Declared unavailable due to motorization of unit generator caused by the non-open	Aug 1975
GEO	4LEYTE_A	Mahangdong B1	5	Unplann	05/22/2019 12:45	08/01/2019 8:47	70.83	Forced Outage	AVR 240VDC power failure	Jul 1997
COAL	3CALACA	Calaca 1	300	Unplann	06/26/2019 0:01	08/22/2019 23:21	57.97	Forced Outage	Extended outage until 30 July 2019	Sep 1984
COAL	3SLTEC_G	SLTEC 1	121	Unplann	06/28/2019 5:35	08/20/2019 16:09	53.44	Maintenance Outage	Emergency Shutdown due to Boiler Tube Leak. On Maintenance Outage from 01 July	Apr 2015
GEO	3MKBN_C	Makban 7	20	Unplann	07/06/2019 6:12			Maintenance Outage	Maintenance Outage	Apr 1979
SOLR	6SACSUN	San Carlos Sun	46.8	Unplann	07/13/2019 6:24			Forced Outage	Affected by maintenance of 138KV Bacold-Cadiz TL and APMS of Cadiz 50MVA TR1	Mar 2016
COAL	1MSINLO	Masinloc 3	335	Unplann	07/17/2019 21:04	08/09/2019 12:34	22.65	Forced Outage	Tripped at 115MW. On Commissioning Test	
GEO	6NASULO	Nasulo	48.3	Planned	07/18/2019 0:14	07/30/2019 20:12	12.83	Planned Outage	Offline due to maintenance activities	Sep 2014
COAL	5CEDC_U	CEDC 2	82	Planned	07/18/2019 0:30	08/06/2019 23:59	19.98	Planned Outage	PMS	Jun 2010
GEO	4LEYTE_A	Mahangdong A1	5	Unplann	07/19/2019 0:12	08/20/2019 14:01	32.58	Maintenance Outage	scheduled until 30 July 2019	Jul 1997
COAL	1SMC_G0S	SMC 2	150	Unplann	07/19/2019 11:35	07/28/2019 6:15	8.78	Forced Outage	Tripped at 120MW. Turbine Vibration System Frequency is 59.53hz	Sep 2017
COAL	3SBPL_G0S	SBPL	455	Planned	07/20/2019 11:48	07/26/2019 1:40	5.58	Planned Outage	On Commissioning Test	
COAL	5TPC_G02	TPC Sangi 1	60	Unplann	07/21/2019 10:46			Forced Outage	Affected by Carcon L12 tripping	Oct 2015
NATG	3ILIJAN_G	Ilijan B1	190	Planned	07/25/2019 0:41			Planned Outage	Maintenance Outage till 28 August 2019	Jun 2002
COAL	3SBPL_G0S	SBPL	455	Planned	07/26/2019 1:54	07/26/2019 7:08	0.22	Planned Outage	Commissioning Test (RECLASSIFIED FROM FORCE. OMC OUTAGE)	
GEO	4LEYTE_A	Maibog BC	14	Unplann	07/26/2019 5:50	07/26/2019 12:09	0.26	Forced Outage	Tripped. Gen. load - 10 MW. Under assessment by Plant Personnel.	Jul 1997
BIOF	6SCBE_G	SCBE	8.3	Unplann	07/26/2019 19:28	07/28/2019 12:45	1.72	Forced Outage	Offline due to boiler problem	Feb 2009
OIL	1LUMAY_U	Lumay 3	60	Unplann	07/27/2019 0:01	08/02/2019 12:06	6.50	Maintenance Outage	Hot Gas path inspection	May 1993
NATG	3STA-RI_G	Rita 2	25.7	Unplann	07/27/2019 0:25	07/27/2019 13:37	0.55	Maintenance Outage	For compressor washing	Jun 2000
OIL	7BDPP_G	Bdohol 3	4.2	Unplann	07/27/2019 11:50	07/27/2019 19:05	0.30	Forced Outage	Emergency out due to severe water at TC A bank	Sep 1978
NATG	3ILIJAN_G	Ilijan B3	220	Planned	07/28/2019 0:24			Planned Outage	Maintenance Outage until 28 August 2019	Jun 2002
NATG	3ILIJAN_G	Ilijan B2	190	Planned	07/28/2019 0:37			Planned Outage	Maintenance Outage till 31 August 2019	Jun 2002
HYD	3KAL_G03	Kalayaan 3	180	Planned	08/01/2019 0:01			Planned Outage	Planned Outage until 19 October 2019(GOMP).	May 2004
COAL	3PAGBIL_G	Pagbilao 2	382	Unplann	08/01/2019 7:20	08/01/2019 9:59	0.11	Forced Outage	Boiler Feed Pump trouble	Mar 1996
GEO	4LEYTE_A	Mahangdong B1	5	Unplann	08/01/2019 8:47	08/01/2019 21:48	0.54	Forced Outage	Emergency shutdown	Jul 1997
GEO	4LEYTE_A	Mahangdong B1	5	Unplann	08/01/2019 23:20	08/07/2019 19:38	5.85	Forced Outage	Under assessment	Jul 1997
SOLR	6MANSOL	Isislat 3	40.5	Unplann	08/02/2019 17:19	08/03/2019 5:17	0.50	Forced Outage	Isolated due to tripping 69KV Cadiz-Manapla Solar Sub TL	Mar 2016
HYD	1AMBUK	Ambukiao 2	35	Unplann	08/02/2019 22:05	08/03/2019 0:27	0.10	Forced Outage	Broken shearpin	Dec 1956
HYD	1MAGAT	Magat 3	97	Unplann	08/03/2019 0:39	08/10/2019 2:40	7.08	Forced Outage	Suspected problem at generator transformer 3	Oct 1983
HYD	1MAGAT	Magat 4	97	Unplann	08/03/2019 0:39	08/03/2019 2:35	0.08	Forced Outage	Suspected problem at generator transformer 3	Oct 1983
NATG	3STA-RI_G	Rita 4	26.4	Planned	08/03/2019 0:54	08/03/2019 23:45	0.95	Planned Outage	GT offline compressor washing	Oct 2001
NATG	3STA-RI_G	San Lorenzo 2	264	Unplann	08/03/2019 2:30	08/03/2019 13:14	0.45	Maintenance Outage	Maintenance Outage	Sep 2002
COAL	1SMC_G0S	SMC 4	150	Unplann	08/03/2019 4:02	08/13/2019 20:18	10.68	Forced Outage	Boiler tube leak	
NATG	3AVION_U	Avion 1	50.3	Unplann	08/03/2019 6:01	08/04/2019 18:45	1.53	Maintenance Outage	Maintenance outage until 04 August 2019	Aug 2016
GEO	6NASULO	Nasulo	48.3	Unplann	08/03/2019 6:19	08/04/2019 18:20	1.50	Forced Outage	Emergency offline to conduct corrective works on high vibration of generator bearing	Sep 2014
COAL	3SBPL_G0S	SBPL	455	Planned	08/03/2019 6:24	08/03/2019 7:26	0.04	Planned Outage	Conducted Load Rejection Test (LRT) at 455MW. System Frequency is 59.35hz.	Sep 2014
SOLR	6SACSUN	San Carlos 1	19.8	Unplann	08/03/2019 11:46	08/03/2019 12:38	0.04	Forced Outage	Auto-tripped due to internal problem	Aug 2014
COAL	3SBPL_G0S	SBPL	455	Planned	08/04/2019 0:14	08/04/2019 8:25	0.34	Planned Outage	On Commissioning Test	
OIL	6CENPRI	CENPRI 1	4.2	Unplann	08/04/2019 7:10	08/04/2019 16:58	0.41	Forced Outage	Isolated due to PMS of 69KV Calumangan-San Enrique Line Section.	Jun 2016
OIL	6CENPRI	CENPRI 2	4.2	Unplann	08/04/2019 7:10	08/04/2019 16:58	0.41	Forced Outage	Isolated due to PMS of 69KV Calumangan-San Enrique Line Section.	Apr 2016
OIL	6CENPRI	CENPRI 3	4.2	Unplann	08/04/2019 7:10	08/04/2019 16:58	0.41	Forced Outage	Isolated due to PMS of 69KV Calumangan-San Enrique Line Section.	Jun 2016
OIL	6CENPRI	CENPRI 4	6.4	Unplann	08/04/2019 7:10	08/04/2019 16:58	0.41	Forced Outage	Isolated due to PMS of 69KV Calumangan-San Enrique Line Section.	May 2017
OIL	6CENPRI	CENPRI 5	6.4	Unplann	08/04/2019 7:10	08/04/2019 16:58	0.41	Forced Outage	Isolated due to PMS of 69KV Calumangan-San Enrique Line Section.	
SOLR	6CARSDOL	Isislat 2	27.2	Unplann	08/04/2019 7:30	08/04/2019 17:08	0.40	Forced Outage	Isolated due to PMS of 69KV Calumangan-San Enrique Line Section.	Mar 2016
HYD	1AMBUK	Ambukiao 1	35	Unplann	08/04/2019 8:07	08/04/2019 16:55	0.37	Forced Outage	Removal of accumulated debris in the trash rack	Dec 1956
HYD	1AMBUK	Ambukiao 2	35	Unplann	08/04/2019 8:07	08/04/2019 16:55	0.37	Forced Outage	Removal of accumulated debris in the trash rack	Dec 1956
HYD	1AMBUK	Ambukiao 3	35	Unplann	08/04/2019 8:07	08/04/2019 16:55	0.37	Forced Outage	Removal of accumulated debris in the trash rack	Dec 1956
OIL	1LUMAY_U	Lumay 2	60	Unplann	08/05/2019 6:52	08/05/2019 19:19	0.52	Forced Outage	Main fuel oil pump excessive leak.	May 1993
COAL	3CALACA	Calaca 2	300	Unplann	08/05/2019 7:12	08/16/2019 5:15	10.92	Forced Outage	Suspected boiler tube leak	Sep 1984
OIL	1LUMAY_U	Lumay 1	60	Unplann	08/05/2019 8:55	08/05/2019 9:09	0.01	Forced Outage	Flame off during start-up. Declared available at 0909H	May 1993
OIL	1LUMAY_U	Lumay 6	60	Unplann	08/05/2019 11:17	08/05/2019 12:45	0.06	Forced Outage	Main fuel oil pump drive-end side pressure leak	Dec 1994
SOLR	6CARSDOL	Isislat 2	27.2	Unplann	08/06/2019 1:38	08/07/2019 10:06	1.35	Forced Outage	Auto-tripped due to trouble of 13.8kV Main VCB for Plant B.	Mar 2016
HYD	1AMBUK	Ambukiao 1	35	Unplann	08/06/2019 7:58	08/06/2019 9:16	0.05	Forced Outage	Tripped due to broken shear pin	Dec 1956
SOLR	6SILYSOL	Silay	29	Unplann	08/07/2019 13:17	08/07/2019 17:34	0.18	Forced Outage	Isolated. Affected by tripping of 69KV Cadiz-Isislat III Sub TL	Apr 2016
GEO	3MGPP_G	MGPP 1	20	Unplann	08/07/2019 13:59	08/07/2019 15:24	0.06	Forced Outage	Hotwell pump trouble	Feb 2014
HYD	1MAGAT	Magat 2	97	Unplann	08/07/2019 14:18	08/07/2019 16:40	0.10	Forced Outage	Tripped by generator differential protection	Aug 1983
GEO	3TIWI_A	Tiwi 2	59	Unplann	08/08/2019 6:09	08/08/2019 14:01	0.33	Forced Outage	Steam leak at bottom drain line	Jan 1979
OIL	1LUMAY_U	Lumay 5	60	Unplann	08/08/2019 7:19	08/08/2019 8:55	0.07	Forced Outage	Turning equipment failure	Dec 1994
SOLR	6MNTSOL	Montesol 1	14.4	Unplann	08/08/2019 11:53	08/08/2019 13:23	0.06	Forced Outage	Isolated due to tripping of 69KV Amlan-Guihulnagn Sub TL	Mar 2016
OIL	7BDPP_G	Bdohol 3	4.2	Unplann	08/08/2019 18:27	08/08/2019 22:12	0.16	Forced Outage	Turbocharger surging	Sep 1978
OIL	7BDPP_G	Bdohol 3	4.2	Unplann	08/08/2019 22:43	08/09/2019 0:29	0.07	Forced Outage	Heavy vibration at Turbo Charger	Sep 1978
COAL	1MSINLO	Masinloc 3	335	Unplann	08/09/2019 13:56	08/09/2019 22:01	0.34	Forced Outage	Tripped. On commissioning test	
OIL	8PDP3_G	PDP3 C	12	Unplann	08/09/2019 19:03	08/09/2019 22:08	0.13	Forced Outage	Tripped due to HT Cooling Water leak at detached fitting of surge pipe A-bank.	Mar 2005
COAL	1MSINLO	Masinloc 2	344	Unplann	08/09/2019 19:41	08/14/2019 19:15	4.98	Maintenance Outage	Maintenance Outage	Jun 1998
NATG	3STA-RI_G	Rita 3	26.5	Planned	08/10/2019 0:47	08/16/2019 16:35	6.66	Planned Outage	Maintenance Outage till 14 August 2019	Oct 2001
COAL	1MSINLO	Masinloc 3	335	Unplann	08/11/2019 10:04	08/11/2019 13:34	0.15	Forced Outage	Tripped at 160MW load. Turbine trip actuation. System Frequency is 59.54hz	
OIL	7BDPP_G	Bdohol 3	4.2	Unplann	08/12/2019 14:42	08/13/2019 14:10	0.98	Forced Outage	High bearing temperature	Sep 1978
OIL	8STBAR_P	PB101 Unit 1	6	Unplann	08/12/2019 18:59	08/23/2019 18:23	10.97	Forced Outage	Excessive gas leak at manifold 2L	1978
COAL	1MSINLO	Masinloc 3	335	Unplann	08/13/2019 2:22	08/14/2019 5:39	1.14	Forced Outage	Unit on commissioning test	
OIL	6CENPRI	CENPRI 1	4.2	Unplann	08/13/2019 13:25	08/13/2019 15:08	0.07	Forced Outage	Offline due to Exhaust Gas leakage	Jun 2016
SOLR	6MANSOL	Isislat 3	40.5	Unplann	08/13/2019 13:55	08/13/2019 14:02	0.00	Forced Outage	Affected by tripping of 69KV Cadiz-Isislat III Sub TL	Mar 2016
OIL	8PDP3_G	PDP3 H	13	Unplann	08/13/2019 15:05	08/13/2019 18:01	0.12	Forced Outage	Offline due to HT water leak at HT header Cyl. A1	Mar 2005
OIL	8PDP3_G	PDP3 H	13	Unplann	08/13/2019 19:46	08/14/2019 20:51	1.05	Forced Outage	Emergency shutdown due to water leak at HT header Cyl. A9	Mar 2005
COAL	1MSINLO	Masinloc 3	335	Unplann	08/15/2019 0:37	08/16/2019 12:57	1.51	Forced Outage	Unit on commissioning test	
NATG	3AVION_U	Avion 1	50.3	Unplann	08/16/2019 0:01			Forced Outage	Gas turbine trouble	Aug 2016
NATG	3AVION_U	Avion 2	50.3	Unplann	08/16/2019 0:01			Forced Outage	Gas turbine trouble	Aug 2016
GEO	4LEYTE_A	Mahangdong A2	5	Unplann	08/16/2019 8:22			Forced Outage	Emergency shutdown	Jul 1997
HYD	1BAKUN	Bakun 2	38	Unplann	08/16/2019 11:35	08/16/2019 12:38	0.04	Forced Outage	Erroneous governor signal on oil pressure	Feb 2001
GEO	3BACMAN	Bacman 1	60	Unplann	08/16/2019 14:49	08/16/2019 21:51	0.29	Forced Outage	High turbine vibration.	Sep 1993
OIL	7BDPP_G	Bdohol 4								