

Monthly Market Assessment Highlights for January 2019 Billing Month

1. Summary

The first month of the year was marked with a tight market supply situation. While electricity demand remained relatively low throughout the period due to cooler weather, the latter part of the month saw a decreasing level of supply brought about by the outages of major coal and natural gas plants. As a result, market price levels were unusually high, averaging at PhP4,727/MWh, the highest for a January billing month since 2013. Further, several plants became pivotal, some of which set the prices at the same time.

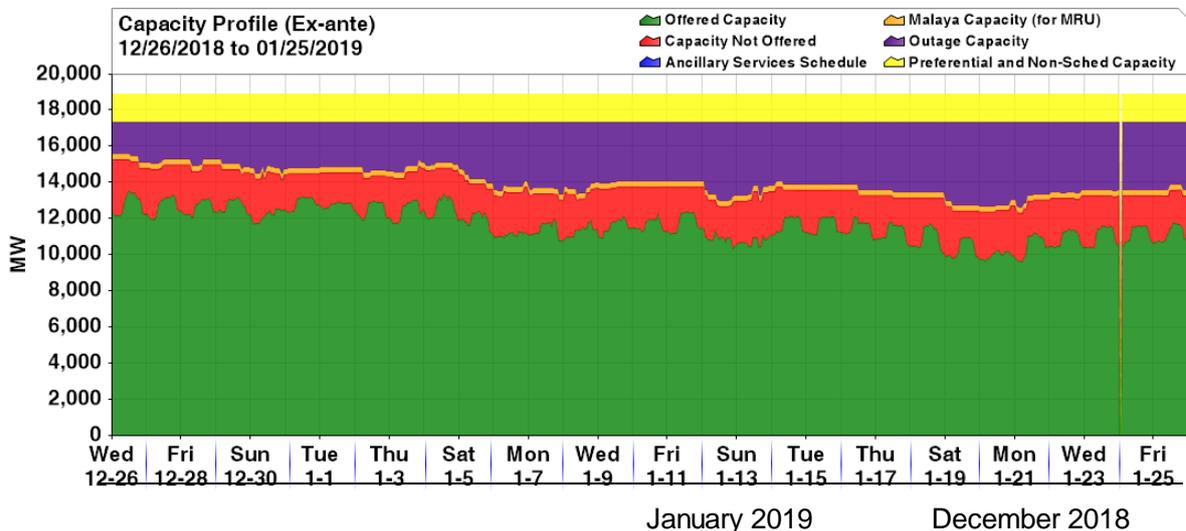
HHI calculation based on registered capacity indicated a moderately concentrated market. However, when based on offered capacity, the market was concentrated for the most part of the billing month.

2. Market Outcomes

2.1. Capacity Profile

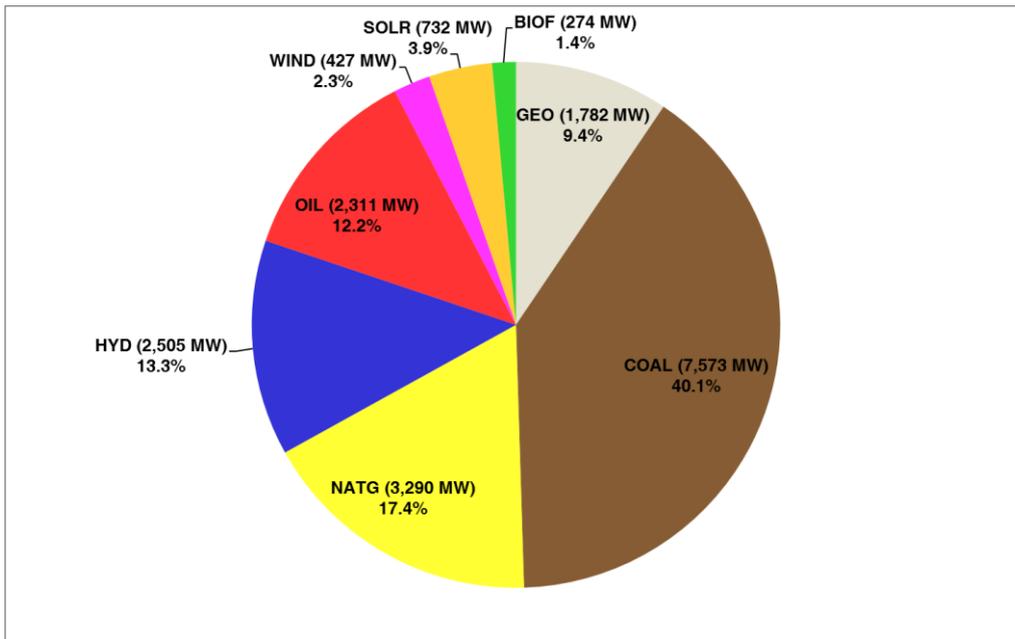
The total registered capacity in the WESM was pegged at 18,902 MW. Of which, only about 62% or an average of 11,649 MW was offered in the market, noting the capacity on outage at 18% and capacity not offered at 11%.

Figure 1. Capacity Profile



	Average (MW)	% of Reg. Cap.	Average (MW)	% of Reg. Cap.
Preferential and Non-Sched Capacity	1,520	8	1,504	8
Outage Capacity	3,331	18	1,899	10
Malaya Capacity (for MRU)	300	2	300	2
Capacity Not Offered	2,101	11	2,380	13
Offered Capacity	11,649	62	12,803	68
Reg. Cap. (End of Billing Month)	18,902		18,902	

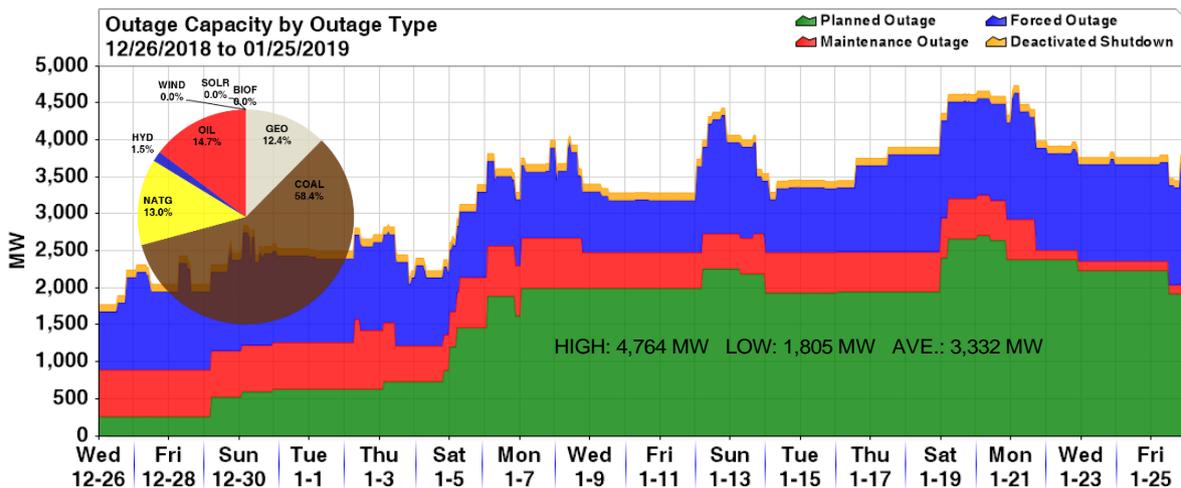
Figure 2. Registered Capacity Mix, January 2019



2.2. Outage Capacity

Bulk of the outages were planned, averaging 1,586 MW, comprising 48% of the total outage capacity. The series of forced outages of major coal plants, averaging 1,111 MW, corresponded to 34% of the total outage capacity. Overall, plant outages during the month posted an average of 3,332 MW, significantly higher by 75% from last month's 1,899 MW.

Figure 3. Outage Capacity by Outage Category

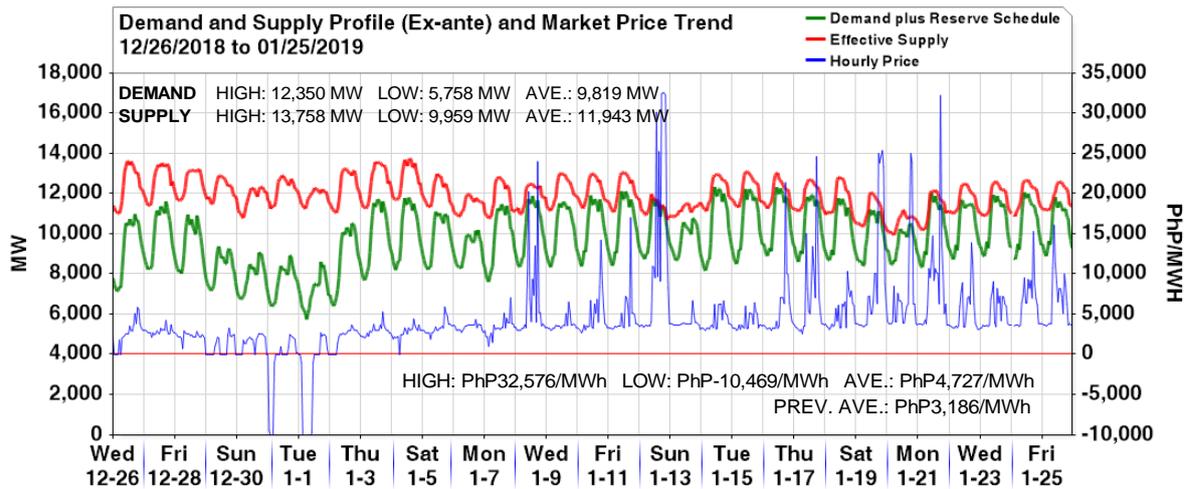


2.3. Supply and Demand

Effective supply level decreased to an average of 11,943 MW from 13,065 MW in the previous month, driven primarily by high outage incidents. Similarly, system demand declined by 7.6% to an average of 9,819 MW¹, attributed to the holiday season and cooler weather experienced during the month.

Consequently, supply-demand balance tightened to an average of 2,125 MW.

Figure 4. Demand and Supply Profile and Market Prices



2.4. Market Prices

The tight supply margin that prevailed during the month led to an increase in market price levels. Occurrences of price spikes were noted, reaching as high as PhP32,576/MWh. On the whole, market prices averaged PhP4,727/MWh, the highest for a January billing month since January 2013.

3. Structural Competition Indices

3.1. Pivotal Plants

The tight supply condition resulted in a number of plants becoming pivotal in certain trading intervals. Some of which set the prices at above PhP20,000/MWh level, which include Avion NGPP, Bauang DPP, Kalayaan PSPP, Limay CCGT, Navotas DPP, Pantabangan HEP, San Roque HEP, SLPGC GTPP, Subic DPP and Calumangan DPP.

¹ System demand including reserve requirement

Figure 5. Market RSI vs. PSI

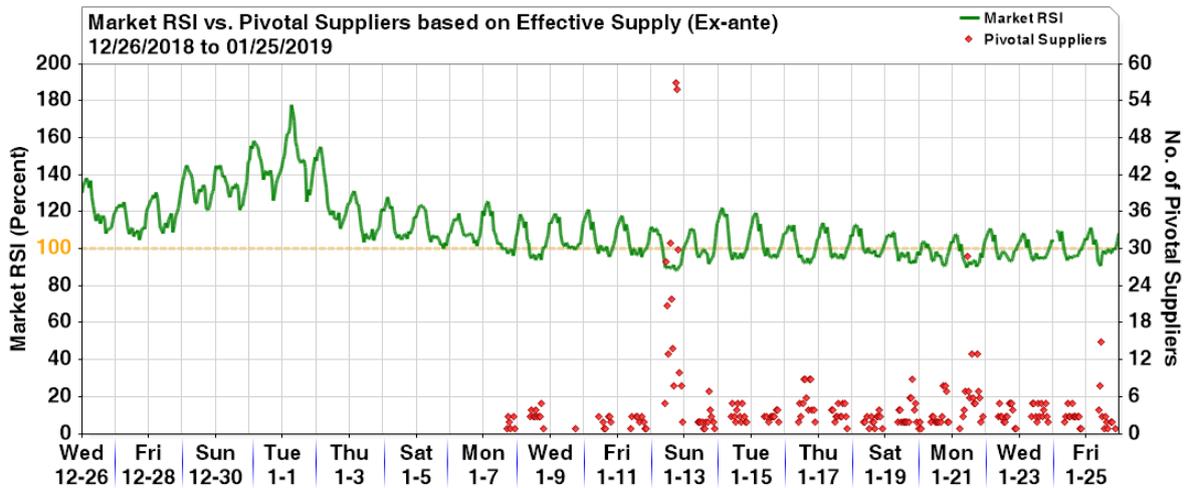
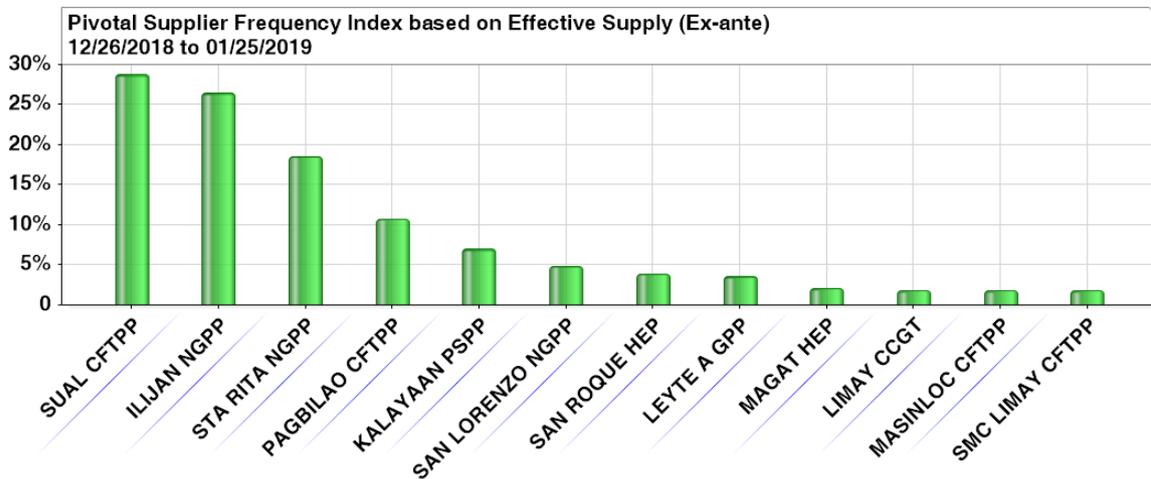


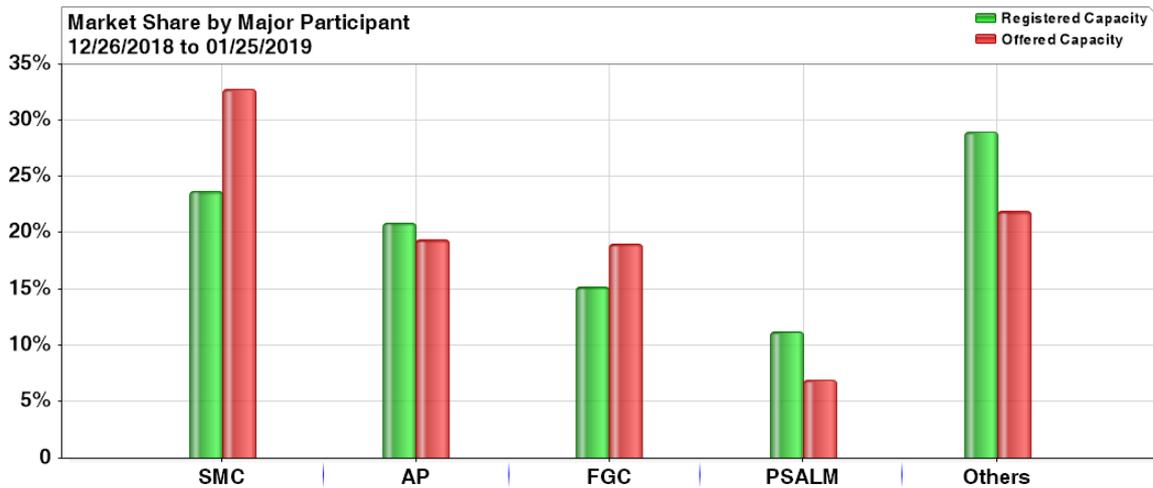
Figure 6. Top 12 Pivotal Plants



3.2. Market Concentration

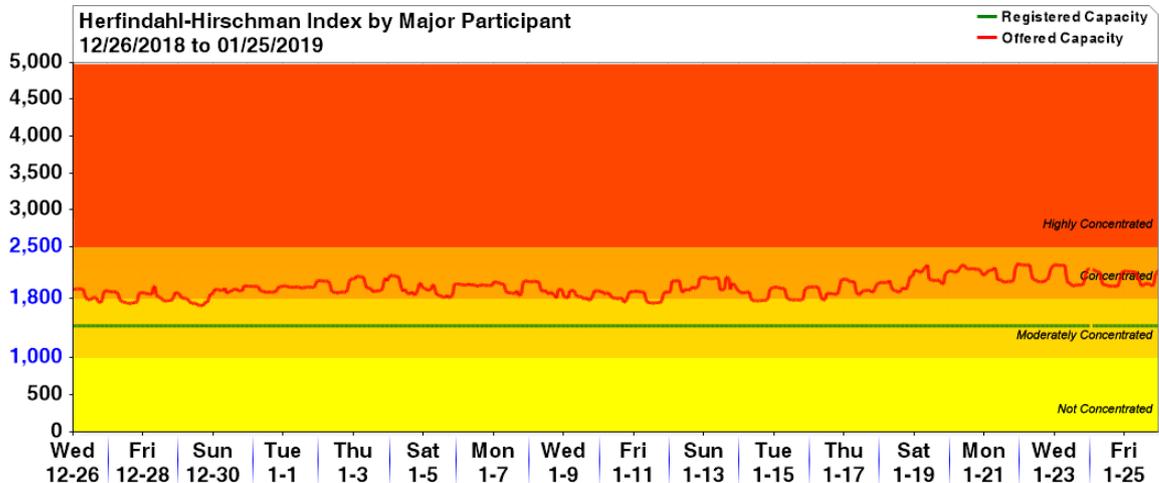
San Miguel Corporation (SMC), Aboitiz Power (AP), First Gen Corporation (FGC) and Power Sector Asset and Liabilities Management (PSALM) continued to dominate the market. Their combined market share comprised 71% of the total registered capacity in the WESM. SMC held the top spot at 23.7% followed by AP (20.9%), FGC (15.2%) and PSALM (11.2%).

Figure 7. Market Share



With the unavailability of some plants, the market shares of SMC, FGC and PSALM based on offered capacity increased to 32.8%, 19% and 7%, respectively. On the other hand, the share of AP decreased slightly to 19.4%. Accordingly, the Herfindahl-Hirschman Index (HHI) calculated based on offered capacity by major participants' grouping indicated a concentrated market for 89% of the time and moderately concentrated market for 11%.

Figure 8. Hourly HHI based on Major Participant Grouping



List of Major Plant Outages

Region	Plant Type	Plant/Unit Name	Capacity	Date Out	Date In	Duration (Days)	Outage Type	Remarks
LUZON	GEO	Tiwi 3	43.7	10/23/2005 13:26			Deactivated Shutdown	Tiwi 3 decommissioned since May 26 2009
LUZON	GEO	Makban 6	55	04/11/2013 22:44			Deactivated Shutdown	Conducted gas compressor test
VISAYAS	GEO	PGPP2 Unit 4	20	06/27/2014 6:07			Forced Outage	Steam being utilized by Nasulo plant
LUZON	HYD	Angat M 3	50	01/29/2018 0:01			Planned Outage	Annual overhauling until 29 July 2018
LUZON	OIL	Malaya 2	350	05/19/2018 13:01			Forced Outage	Burn air heater 2A
LUZON	COAL	SLTEC 2	122.9	06/18/2018 6:14			Forced Outage	Isolated due to tripping Calaca-Salong Line
LUZON	GEO	Makban 9	20	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	09/03/2018 6:01			Forced Outage	Tripped
LUZON	GEO	Makban 4	63	11/19/2018 21:35	01/13/2019 6:06	54.35	Planned Outage	Maintenance Outage until 13 December 2018
LUZON	OIL	TMO Unit 2	49	11/26/2018 13:01			Forced Outage	Unavailable due to cooling tower trouble
LUZON	GEO	Tiwi 1	59	11/29/2018 13:31			Maintenance Outage	Maintenance Outage
LUZON	GEO	Makban 5	55	12/06/2018 19:04	12/27/2018 11:05	20.67	Forced Outage	Turbine vibration
LUZON	NATG	San Gabriel	420	12/08/2018 0:36	01/21/2019 16:49	44.68	Maintenance Outage	Maintenance outage until 22 December 2018
VISAYAS	GEO	Mahanagdong B1	5	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	12/23/2018 18:19	12/27/2018 10:38	3.68	Forced Outage	Affected by the tripping
VISAYAS	COAL	PEDC 3	150	12/25/2018 0:39	01/22/2019 21:31	28.87	Planned Outage	For annual preventive maintenance schedule
LUZON	COAL	SLTEC 1	121	12/26/2018 12:18	01/08/2019 0:54	12.53	Forced Outage	Boiler tube leak
LUZON	COAL	Masinloc 2	344	12/26/2018 18:36	12/30/2018 7:43	3.55	Forced Outage	Drag chain conveyor trouble
LUZON	COAL	Calaca 2	300	12/28/2018 6:46	12/28/2018 14:18	0.31	Forced Outage	Turbine fault
VISAYAS	COAL	CEDC 3	82	12/28/2018 6:46	12/28/2018 12:03	0.22	Forced Outage	Unit tripped. Under assessment
LUZON	NATG	Sta. Rita 4	264	12/29/2018 4:33	12/30/2018 22:53	1.76	Planned Outage	GT offline compressor washing
LUZON	GEO	Makban 7	20	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	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	12/29/2018 17:02	12/29/2018 18:53	0.08	Forced Outage	Auto open with load of 51.53. Cause under investigation
LUZON	COAL	ANDA 1	72	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	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	12/30/2018 8:08	12/30/2018 9:09	0.04	Forced Outage	Tripped at 17 MW load
LUZON	COAL	Masinloc 2	344	12/30/2018 9:30	12/30/2018 10:29	0.04	Forced Outage	Tripped at 30 MW load
LUZON	GEO	Tiwi 2	59	12/30/2018 13:04			Forced Outage	Emergency shutdown due to oil leak at well site 13 of hot brine pipeline
LUZON	GEO	Tiwi 6	57	12/30/2018 16:07			Forced Outage	Emergency shutdown due to steam leak
LUZON	COAL	Calaca 1	300	12/30/2018 22:38			Planned Outage	APMT until 25 June 2019 (GOMP)
LUZON	COAL	GN Power 2	316	01/02/2019 6:19	01/03/2019 10:06	1.16	Maintenance Outage	Maintenance outage
VISAYAS	COAL	Keppo Salcon 2	103	01/03/2019 2:50			Planned Outage	For APMS
VISAYAS	COAL	TPC Sangi 2	85	01/03/2019 21:23	01/04/2019 22:21	1.04	Forced Outage	Unit tripped
VISAYAS	COAL	PEDC 1	83.7	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	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	01/04/2019 19:24			Planned Outage	Planned outage until 25 January 2019
LUZON	COAL	Masinloc 1	315	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	01/05/2019 1:43	01/06/2019 18:06	1.68	Forced Outage	Coal handling problem
LUZON	NATG	Sta. Rita 3	265.5	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	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	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	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	264.8	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	01/06/2019 1:22			Planned Outage	Planned outage until 4 February 2019. GOMP
VISAYAS	COAL	TPC Sangi 1	60	01/06/2019 7:22	01/09/2019 12:17	3.20	Forced Outage	Boiler tube leak
LUZON	OIL	Limay 5	60	01/07/2019 0:01			Planned Outage	Annual Overhauling until 2-21-2019
LUZON	COAL	GN Power 1	316	01/07/2019 0:03			Planned Outage	Maintenance Outage until 2-11-19
VISAYAS	COAL	TPC Sangi 2	85	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	01/07/2019 20:08	01/08/2019 0:34	0.18	Forced Outage	Tripped due to boiler trouble
LUZON	GEO	Makban 10	20	01/07/2019 23:40			Forced Outage	On reserve shutdown pending availability of steam supply (steam
LUZON	COAL	SLTEC 1	121	01/08/2019 1:58	01/08/2019 10:09	0.34	Forced Outage	Turbine trouble
LUZON	COAL	GN Power 2	316	01/08/2019 8:09	01/08/2019 15:20	0.30	Forced Outage	Exhaust high temperature at the turbine side. System Frequency 59.057hz
LUZON	COAL	QPPL	459	01/12/2019 0:26	01/13/2019 17:11	1.70	Forced Outage	Boiler tube leak
LUZON	NATG	Sta. Rita 1	257.3	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	01/12/2019 8:57	01/12/2019 20:54	0.50	Forced Outage	Circulating water pump tripping
LUZON	NATG	Avion 1	50.3	01/12/2019 17:00	01/12/2019 19:12	0.09	Forced Outage	Low liquid fuel supply
VISAYAS	OIL	CENPRI 2	4.2	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	01/12/2019 18:58	01/12/2019 21:24	0.10	Forced Outage	Low liquid fuel supply
LUZON	GEO	Makban 3	63	01/13/2019 15:07			Maintenance Outage	Maintenance outage
LUZON	NATG	Sta. Rita 1	257.3	01/13/2019 23:27	01/14/2019 2:18	0.12	Forced Outage	HP bypass station trouble
LUZON	COAL	SLPGC 2	150	01/14/2019 7:01			Forced Outage	Emergency shutdown due to boiler tube leak
VISAYAS	GEO	Malibog BC	14	01/16/2019 0:07			Planned Outage	Cut-out from the System. Annual PMS
LUZON	COAL	Calaca 2	300	01/16/2019 13:32			Forced Outage	Boiler Tube Leak
LUZON	COAL	SLPGC 1	150	01/17/2019 11:09			Forced Outage	No reason. still under investigation
LUZON	COAL	QPPL	459	01/18/2019 23:58			Planned Outage	Maintenance Outage until 02 February 2019
LUZON	NATG	Sta. Rita 2	255.7	01/19/2019 4:32	01/20/2019 20:01	1.65	Planned Outage	Offline washing
LUZON	NATG	Avion 2	50.3	01/20/2019 0:17			Planned Outage	Maintenance Outage until 04 February 2019
LUZON	NATG	Sta. Rita 1	257.3	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	01/25/2019 19:47			Forced Outage	Emergency shutdown due to IDF 1 and 2 inlet vane reaching their upper limits and positive furnace draft