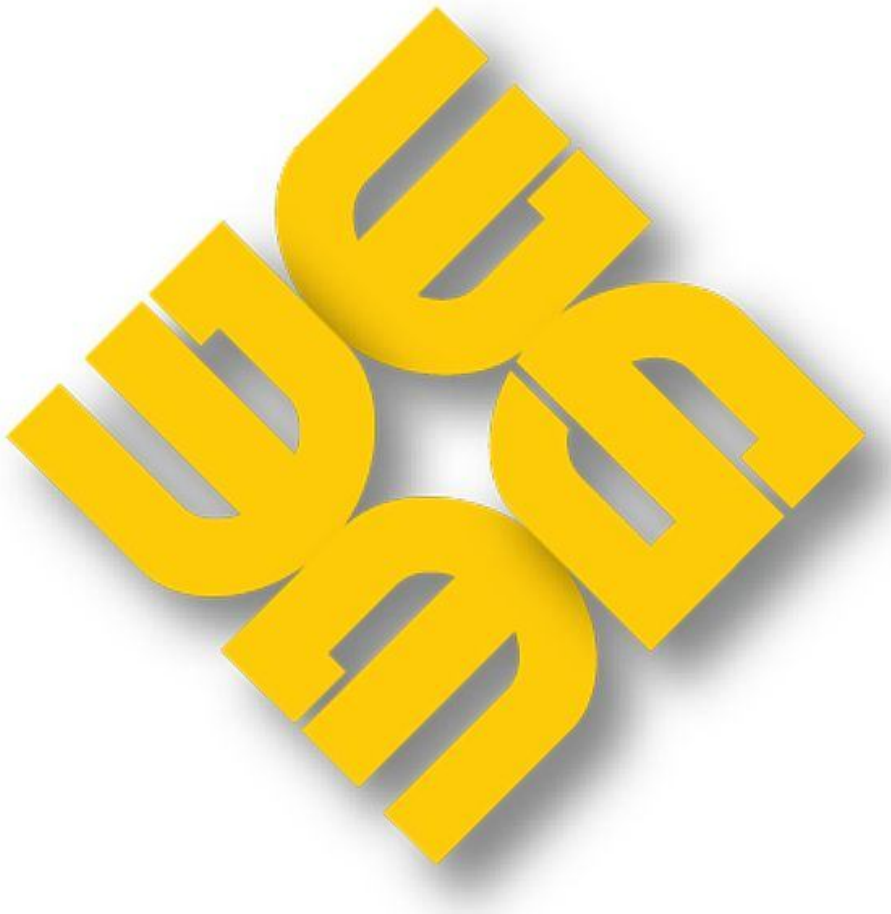
MAG-MMAR-2012-07

MONTHLY MARKET ASSESSMENT REPORT

For the Billing Period 26 June to 25 July 2012



PHILIPPINE ELECTRICITY MARKET CORPORATION

MARKET ASSESSMENT GROUP (MAG)

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Monthly Market Assessment Report

This report assesses the results of the integrated Luzon and Visayas market operation for the period 26 June to 25 July 2012 and how the market performed compared with the previous billing period and the same billing period last year.

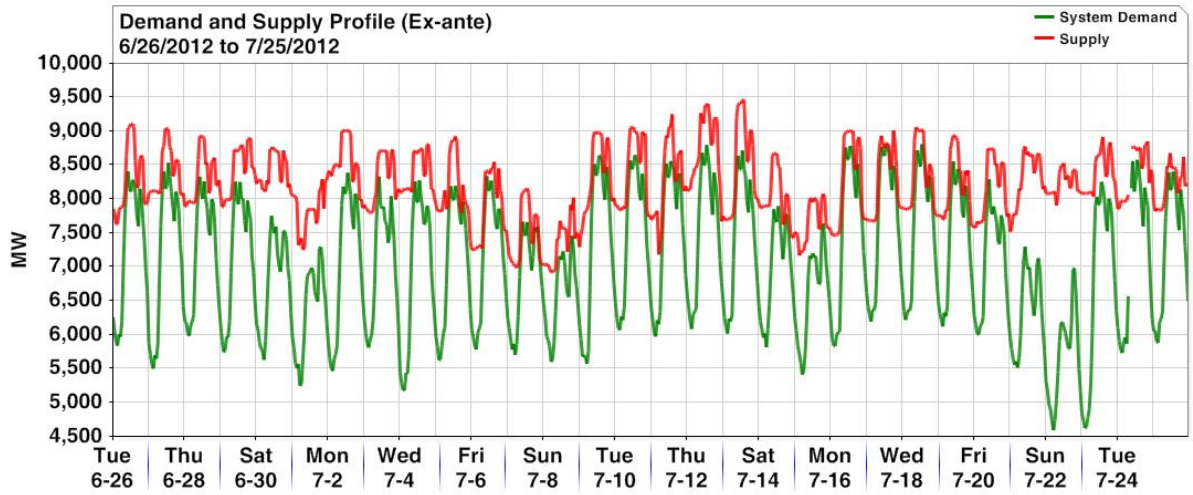
I. Supply and Demand Situation

The monthly average system demand[1] (ex-ante) decreased by 3.6 percent to 7,081 MW from the previous billing month's 7,342 MW but increased by 2.6 percent from last year's 6,904 MW *(Table 1)*. Also, the maximum demand of 8,810 MW, which occurred on 18 July 2012 at trading interval 1400H, was lesser by 1 percent than the previous billing month's 8,896 MW. On a regional basis, average demand significantly decreased by 3.9 percent (6,225 MW to 5,981 MW) in Luzon and 1.7 percent (1,119 MW to 1,100 MW) in Visayas *(Table 3).* Wet weather conditions experienced during the month is seen as one of the factors that contributed to the decline in demand. Meanwhile, economic growth may have influenced the increase in demand for the year-on-year growth.

Similarly, the monthly average system supply[2] posted a 2.3 percent decline from 8,407 MW of the previous billing period to 8,211 MW, ranging from 6,921 MW to 9,464 MW. The Visayas grid registered a higher percentage reduction in average supply at 6.1 percent brought about by the higher level of capacity on outage. Meanwhile, the average supply in Luzon decreased by 1.4 percent (6,790 MW to 6,692 MW) largely due to the non-availability of Ilijan plant brought about by the Malampaya gas facility maintenance. Year-on-year, the system supply decreased slightly by 0.9 percent to 8,221 MW from 8,228 MW.

Overall, the demand and supply condition in the current month has improved slightly as indicated by the resulting wider margin between supply and demand from an average of 1,065 MW in the previous month, the margin widened by 6.1 percent to 1,130 MW in July.

Figure 1. Demand and Supply (Ex-ante), July 2012



[1] The system demand is equal to the total scheduled MW of all load resources in Luzon and Visayas plus losses.
[2] The supply is equal to the total offered capacity of all generator resources in Luzon and Visayas adjusted for any security limit provided by the System Operator. Other constraints considered during MMS simulation such as generator offered ramp rates may result to lower supply.

Table 1. Demand and Supply Summary (Ex-ante), July 2012, June 2012, and July 2011

	July 2012 (In MW)			June 2012 (In MW)			July 2011 (In MW)			% M-on-M Change (Jun - Jul 2012)			% Y-on-Y Change (Jul 2011 - Jul 2012)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Demand	8,810	4,594	7,081	8,896	5,348	7,342	8,773	4,951	6,904	(1.0)	(14.1)	(3.6)	0.4	(7.2)	2.6
Supply	9,464	6,921	8,211	9,497	6,485	8,407	9,468	6,362	8,288	(0.3)	6.7	(2.3)	(0.0)	8.8	(0.9)
Supply/Demand Variance	3,499	-177	1,130	3,332	-846	1,065	3,048	(155)	1,384	5.0	(79.1)	6.2	14.8	14.5	(18.3)

Note: The derived values were non-coincident.

Table 2. Regional Temperature[3], July 2012, June 2012, and July 2011

Mean Temperature	July 2012 (°C)			June 2012 (°C)			July 2011 (°C)			% M-on-M Change (Jun - Jul 2012)			% Y-on-Y Change (Jul 2011 - Jul 2012)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Luzon	30	24	28	30	27	29	30	24	28	0.0	(11.1)	(5.2)	0.0	0.0	(0.7)
Visayas	30	26	28	30	26	29	29	26	28	0.0	0.0	(2.9)	3.4	0.0	1.0

Table 3. Regional Demand Summary (Ex-ante), July 2012, June 2012, and July 2011

	July 2012 (In MW)			June 2012 (In MW)			July 2011 (In MW)			% M-on-M Change (Jun - Jul 2012)			% Y-on-Y Change (Jul 2011 - Jul 2012)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Luzon	7,472	3,766	5,981	7,614	4,506	6,225	7,403	4,105	5,825	(1.9)	(16.4)	(3.9)	0.9	(8.2)	2.7
Visayas	1,420	806	1,100	1,403	753	1,119	1,419	712	1,075	1.2	7.0	(1.7)	0.1	13.2	2.4

Note: The derived values were non-coincident.

Table 4. Regional Supply Summary (Ex-ante), July 2012, June 2012, and July 2011

	July 2012 (In MW)			June 2012 (In MW)			July 2011 (In MW)			% M-on-M Change (Jun - Jul 2012)			% Y-on-Y Change (Jul 2011 - Jul 2012)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Luzon	7,955	5,377	6,692	7,801	4,993	6,790	7,882	4,923	6,740	2.0	7.7	(1.4)	0.9	9.2	(0.7)
Visayas	1,622	1,363	1,519	1,736	1,198	1,617	1,681	1,339	1,541	(6.6)	13.9	(6.1)	(3.5)	1.9	(1.4)

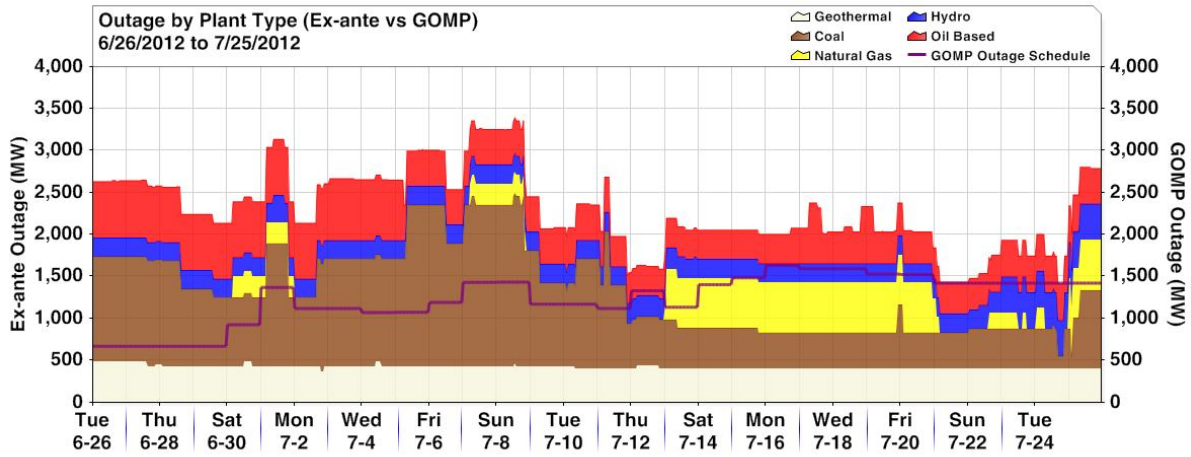
Note: The derived values were non-coincident.

II. Plant Outages

Figure 2 shows the system capacity on outage by plant type vis-a-vis the outage schedule indicated in NGCP-SO's CY 2012 Grid Operating and Maintenance Program (GOMP). On the average, the capacity on outage went down to 2,294 MW in July from 2,516 MW in June. The capacity on outage reached a maximum of 3,392 MW on 08 July 2012, trading interval 1400H, with the simultaneous outages of major power plants such as Pagbilao 2, Sual 2, QPPL and Sta. Rita unit 1 in Luzon as well as Kepco Salcon 1 and 2 in Visayas. Meanwhile, the minimum capacity on outage of 1,414 MW occurred on 24 July 2012.

[3] Regional temperature (Average Mean Temperature) is based on Weather Underground website. Luzon temperature is based on Manila station while Visayas temperature is based on Cebu station.

Figure 2. Plant Capacity on Outage, July 2012

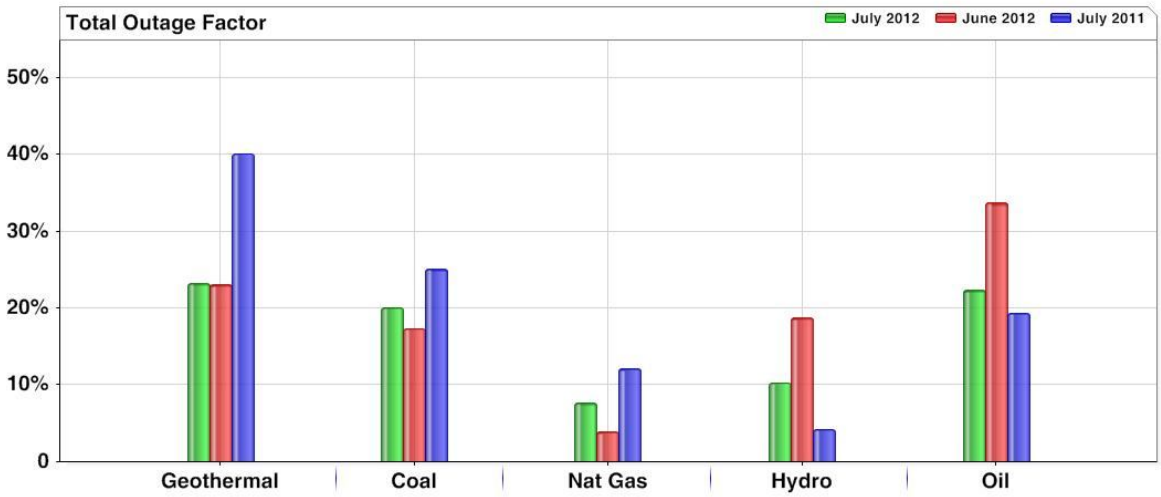


Among all plant types, geothermal plants posted the highest outage factor at 23.3 percent in July 2012. This was followed by oil plants with 22.3 percent, coal plants with 20.1 percent, and hydro plants with 10.3 percent. The natural gas plant qualified as the most efficient plant type with a low outage factor of 7.7 percent *(Table 5).*

When compared with the previous billing period, the outage factor[4] of coal and natural gas plants increased while the outage factor of hydro and oil plants decreased.

It was noted that geothermal, coal and natural gas plants performed fairly this year than last year as evident in the decrease in their respective outage factor. Specifically, geothermal plants' outage factor improved to 23.2 percent from last year's 40.2 percent, which was attributed to the completion of the rehabilitation of the 110 MW Bacman G01, as well as fewer occurrences of outages of Makban GPP and Tiwi GPP units.

Figure 3. Total Outage Factor, July 2012, June 2012, and July 2011



[4] Outage factor is the ratio of the product of the capacity on outage and total outage days of plant type to the product of total capacity and period days covered, expressed in percent.

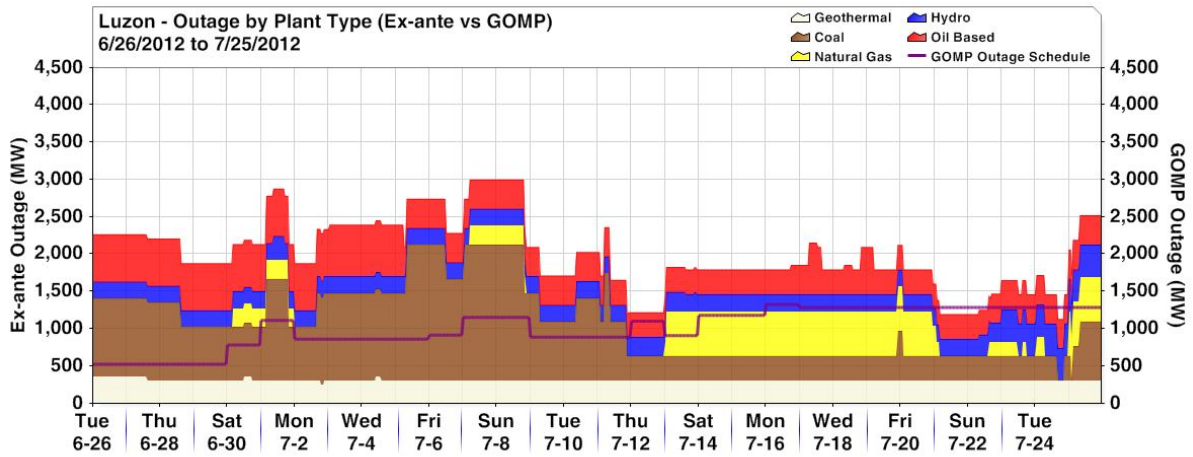
Table 5. Total Outage Factor, July 2012, June 2012, and July 2011

Plant Type	Total Outage Factor			Forced Outage Factor			Scheduled Outage Factor		
	July 2012	June 2012	July 2011	July 2012	June 2012	July 2011	July 2012	June 2012	July 2011*
Geothermal	23.2%	23.0%	40.2%	7.9%	7.5%	19.5%	6.7%	6.0%	11.9%
Coal	20.1%	17.4%	25.1%	14.9%	14.0%	8.4%	5.3%	3.0%	15.4%
Nat Gas	7.7%	3.9%	12.1%	0.3%	0.1%	0.4%	1.0%	2.4%	11.6%
Hydro	10.3%	18.7%	4.2%	0.1%	0.0%	0.0%	6.2%	14.2%	4.2%
Oil	22.3%	33.7%	19.4%	9.6%	20.2%	5.8%	1.7%	0.7%	0.0%

** Calculation was based from SO's old outage classification (Scheduled Outage = Planned Outage + Maintenance Outage)*

The monthly average capacity on outage in Luzon during the billing period decreased significantly by 13.3 percent to 2,005 MW from the previous billing period *(Table 6)*, ranging from 1,127 MW to 2,996 MW. Coal plants posted the highest average outage capacity with 772 MW, which was higher by 2.9 percent from last month's billing period. Meanwhile, the average capacity outage capacity of natural gas plant increased significantly by 104.4 percent due to the eight-day shutdown of the Malampaya natural gas facility (13-20 July 2012) resulting in the outage of Ilijan Block A.

Figure 4. Plant Outage Capacity, July 2012 - Luzon



As shown in Figure 4 and detailed further in Tables 6 and 7, the current billing period showed a higher level of capacity on outage in Luzon vis-a-vis the planned capacity on outage based on the NGCP-SO's CY2012 GOMP, which registered an average of 1,021 MW.

Table 6. Luzon Regional Outage Summary (Ex-ante), July 2012, June 2012, and July 2011

Resource Type	July 2012 (In MW)			June 2012 (In MW)			July 2011 (In MW)			% M-on-M Change (Jun - Jul 2012)			% Y-on-Y Change (Jul 2011 - Jul 2012)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Coal	1,818	0	772	1,624	330	750	1,223	0	408	11.9	(100.0)	2.9	48.7		88.9
Natural Gas	600	0	219	907	0	107	863	0	335	(33.9)		104.4	(30.5)		(34.5)
Geothermal	364.7	249	310	364.7	196	280	544	308	325	0.0	27.1	10.6	(32.9)	(19.2)	(4.7)
Hydro	429	223	247	874	223	448	241	76	110	(50.9)	0.0	(44.8)	77.9	193.2	124.0
Oil Based	692	332	457	812	632	726	682	332	353	(14.8)	(47.5)	(37.0)	1.5	0.0	29.6
TOTAL	2,996	1,127	2,005	3,997	1,496	2,312	3,182	906	1,532	(25.0)	(24.7)	(13.3)	(5.8)	24.4	30.9

Note: The derived values by resource type were non-coincident. The total values were derived based on aggregate hourly outage.

Table 7. Luzon Regional Outage Summary (GOMP), July 2012, June 2012, and July 2011

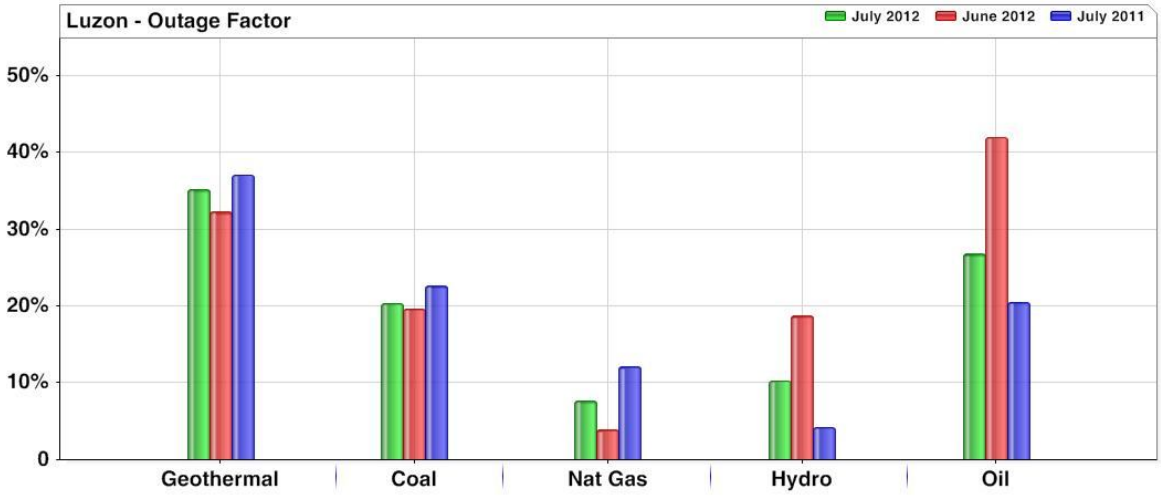
Resource Type	July 2012 (In MW)			June 2012 (In MW)			July 2011 (In MW)			% M-on-M Change (Jun - Jul 2012)			% Y-on-Y Change (Jul 2011 - Jul 2012)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Coal	712	330	491	712	0	394	712	382	531	0.0		24.8	0.0		(25.8)
Natural Gas	600	0	271	266	0	101	263	0	59				0.9		71.5
Geothermal	119	119	119	119	64	94	176	174	175	0.0	86.3	26.5	(32.4)	(63.3)	(46.5)
Hydro	277	26	139	320	26	158	230	171	183	(13.4)	0.0	(11.9)	39.1	(84.8)	(13.9)
Oil Based	0	0	0	0	0	0	70	0	15				(100.0)		(100.0)
TOTAL	1,326	527	1,021	1,021	470	747	1,328	735	964	29.9	12.1	36.7	(23.1)	(36.1)	(22.5)

Note: The derived values by resource type were non-coincident. The total values were derived based on aggregate hourly outage.

The geothermal plants in Luzon registered an outage factor of 35.3 percent, which was higher than that of the Visayas, due to the outages of Tiwi B (43.7 MW), Bacman G02 (40MW) and Makban 6 (55 MW). It should be noted that Tiwi B and Bacman G02 have been on outage since the start of WESM commercial operation.

A month-on-month comparison shows increases in the outage factor of geothermal, coal and natural gas plants in Luzon. The outage factor of natural gas plants went up to 7.7 percent from 3.9 percent in the previous month brought about by the shutdown of Ilijan in line with the Malampaya gas facility maintenance (13-20 July 2012). Meanwhile, the resumption of the Malaya 1 operations on 05 July 2012 after almost a year of shutdown contributed to the marked improvement of the oil-based plants' outage factor for the billing month.

Figure 5. Total Outage Factor (Luzon Plants), July 2012, June 2012, and July 2011



Figures 6 and 7 show the planned and forced outage factors per plant type in Luzon. It can be observed that total outage factor of coal and oil-based plants was largely influenced by forced outages; while geothermal plants' was influenced by forced and planned outages

Figure 6. Planned Outage Factor[5] (Luzon Plants), July 2012, June 2012, and July 2011

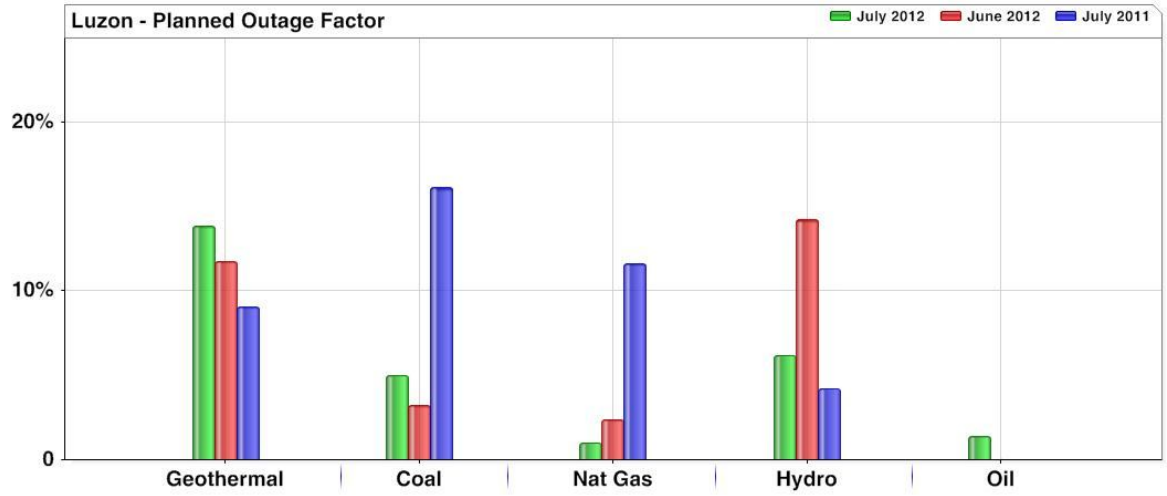


Figure 7. Forced Outage Factor[6] (Luzon Plants), July 2012, June 2012, and July 2011

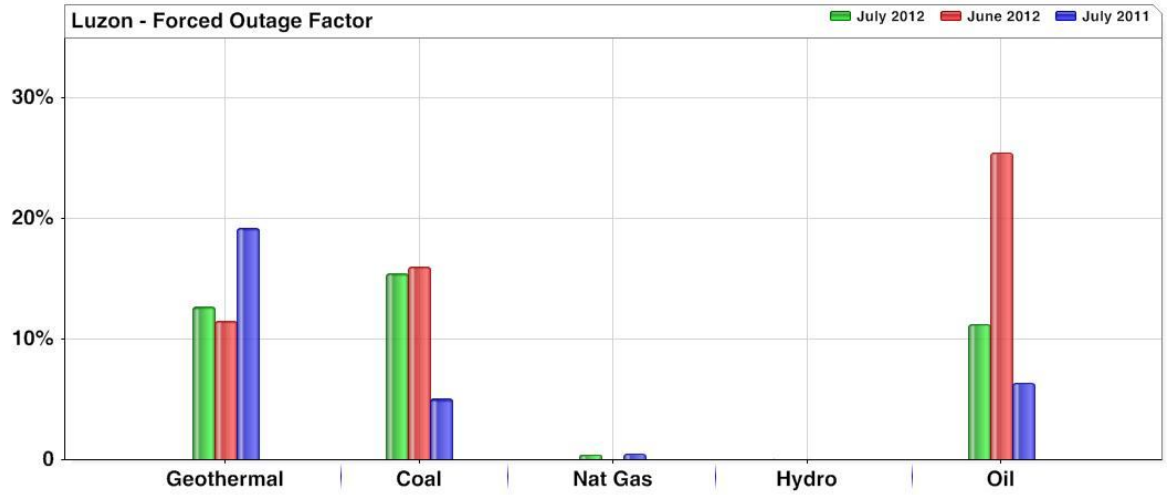


Table 8. Outage Factor (Luzon Plants), July 2012, June 2012, and July 2011

Plant Type	Luzon Total Outage Factor			Luzon Forced Outage Factor			Luzon Planned Outage Factor		
	July 2012	June 2012	July 2011	July 2012	June 2012	July 2011	July 2012	June 2012	July 2011*
Geothermal	35.3%	32.3%	37.1%	12.6%	11.5%	19.2%	13.9%	11.8%	9.1%
Coal	20.4%	19.7%	22.6%	15.4%	16.0%	5.0%	5.0%	3.2%	16.1%
Nat Gas	7.7%	3.9%	12.1%	0.3%	0%	0%	1.0%	2%	12%
Hydro	10.3%	18.7%	4.2%	0.1%	0.0%	0.0%	6%	14.2%	4.2%
Oil	26.8%	42.0%	20.5%	11%	25%	6%	1.4%	0.0%	0.0%

** Calculation was based from SO's old outage classification (Scheduled Outage = Planned Outage + Maintenance Outage)*

Table 9 lists the outages of coal, natural gas, hydro, geothermal, and oil based plants in Luzon during the billing period. Coal plants accounted for 38 percent of the average total capacity on outage due to equipment-related concern. Masinloc 1, QPPL, Calaca 2 and Sual 1 and 2 encountered forced outages on separate occasions during the billing period. Calaca Unit 1, which went back online on 25 July 2012 at 0102H after a long shutdown that started

[5] Planned Outage factor is the ratio of the product of the capacity on outage and total planned outage days of plant type to the product of total capacity and period days covered, expressed in percent.
[6] Forced Outage factor is the ratio of the product of the capacity on outage and total forced outage days of plant type to the product of total capacity and period days covered, expressed in percent.

on 29 August 2011, went on outage again on the same date at 0703H while undergoing commissioning test. Pagbilao unit 2, which was placed on outage on 16 June 2012, went back online on 09 July 2012.

In line with the maintenance of Malampaya gas facility, Ilijan Block A (600 MW) was shutdown on July 13 (effective 0016H).

Binga 2 went on forced outage on 11-13 July 2012 while Binga unit 3 was placed on planned outage starting 22 July 2012 for refurbishment activities. Kalayaan unit 1 was also placed on maintenance outage starting 23 July 2012.

Geothermal plants Tiwi 1 which was on outage since 24 June 2012 resumed operations on 02 July 2012 while Tiwi unit 5 started its annual maintenance on 02 July 2012.

Oil-based plant Malaya Unit 1 went back online on 5 July 2012 after being on outage since 15 August 2011 while the three units of Limay went on outage on separate occasions during the period.

Table 9. Major Plant Outages, July 2012 – Luzon

Plant/Unit Name	Capacity (MW)	Date Out	Date In	Duration (Days)	Remarks
Coal					
Masinloc 1	315	7/10/2012 8:18	7/11/2012 4:37	0.8	Condenser tube leak
Sual 1	647	7/1/2012 2:50	7/1/2012 19:21	0.7	Leak at governor valve flexible hose
Sual 1	647	7/11/2012 4:23	7/11/2012 8:25	0.2	Tripping of boiler feed pump
Sual 2	647	7/5/2012 5:56	7/8/2012 19:03	3.5	On emergency shutdown due to boiler tube leak
Calaca 1	330	8/29/2011 22:15	7/25/2012 1:02	330.1	Emergency shutdown due to suspected reheater leak.
Calaca 2	330	7/19/2012 21:24	7/20/2012 1:30	0.2	Inadequate waterwall recirculation
Pagbilao 2	382	6/16/2012 0:07	7/9/2012 5:57	23.2	On scheduled outage
QPPL	459	7/2/2012 15:28	7/6/2012 11:46	3.8	Condenser tube leak
QPPL	459	7/7/2012 0:02	7/11/2012 20:48	4.9	Air heater Trouble
Calaca 1	330	7/25/2012 7:03			Tripped with 10MW and still on commissioning test.
QPPL	459	7/25/2012 3:02			Repair of Reheat Line leak
Nat Gas					
Ilijan A1	190	7/12/2012 23:50	7/21/2012 3:37	8.2	Maintenance of Malampaya gas facility
Ilijan A2	190	7/13/2012 0:16	7/20/2012 23:11	8.0	Maintenance of Malampaya gas facility
Ilijan A2	190	7/22/2012 14:04	7/23/2012 11:58	0.9	Trouble at inlet guide vane.
Ilijan A2	190	7/23/2012 13:13	7/23/2012 17:04	0.2	Forced outage
Ilijan A3	190	7/13/2012 0:01	7/21/2012 2:13	8.1	Maintenance of Malampaya gas facility
Sta. Rita 1	257.3	7/7/2012 5:14	7/8/2012 20:35	1.6	Off line GT Compressor washing
Sta. Rita 1	257.3	7/24/2012 0:01	7/24/2012 6:45	0.3	Leak at IP sampling line
Sta. Rita 2	255.7	6/30/2012 4:36	7/1/2012 23:04	1.8	Offline GT compressor washing and inspection of GT
Ilijan B1	190	7/25/2012 0:01			Planned outage as per GOMP. (July 25 2012)
Ilijan B2	190	7/25/2012 0:01			Planned outage as per GOMP. (July 25 2012)
Hydro					
Binga 2	26	7/11/2012 21:54	7/13/2012 14:30	1.7	Tripped due to outage of 37MVA unit transformer.
Binga 3	26	7/22/2012 7:05			Refurbishment activities of Binga Unit 3.
Kalayaan 1	180	7/23/2012 0:01			Preventive maintenance
Geothermal					
Tiwi 1	59	6/24/2012 15:38	7/2/2012 18:36	8.1	Low steam supply
Makban 5	55	6/11/2012 0:08			Hotwell pump maintenance
Tiwi 5	57	7/2/2012 20:14			Annual overhauling
Oil					
Limay 1	60	7/4/2012 16:24	7/11/2012 8:25	6.7	Replace close cooling water heat exchanger.
Limay 2	60	7/3/2012 0:01	7/4/2012 16:24	1.7	Replace close cooling water heat exchanger.
Malaya 1	300	8/15/2011 13:19	7/5/2012 5:44	324.7	High furnace pressure
Limay 6	60	7/22/2012 16:25			On maintenance outage

Visayas capacity on outage, as shown in figure 8, was dominated mainly by coal plants with an average capacity on outage of 144 MW and geothermal plants with 110 MW. The average capacity on outage in Visayas during the billing period was higher by 41.7 percent from the previous billing period and by 174 percent from the same billing period last year. The highest capacity on outage was registered on 12 July 2012.

Figure 8. Plant Capacity on Outage, July 2012 - Visayas

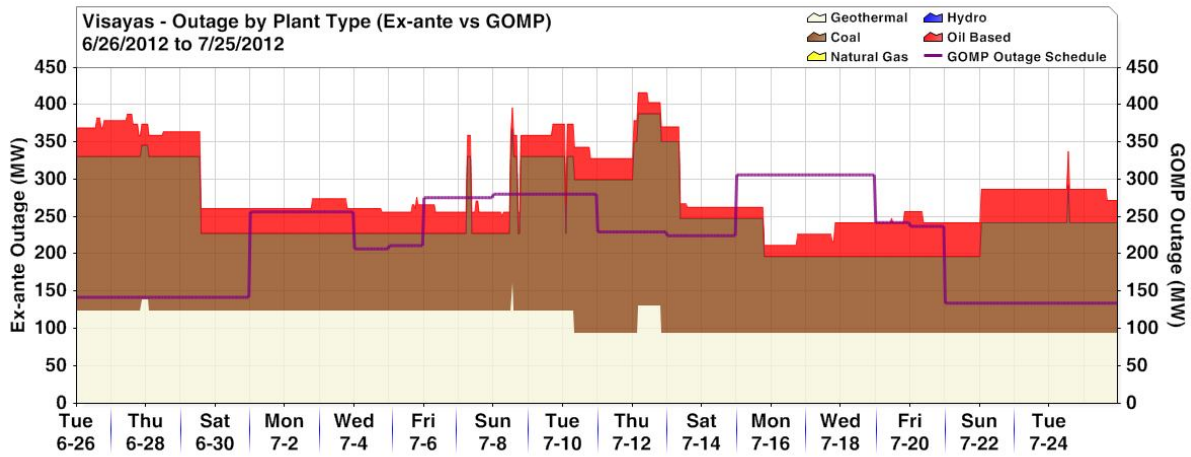


Table 10. Visayas Regional Outage Summary (Ex-ante), July 2012, June 2012, and July 2011

Resource Type	July 2012 (In MW)			June 2012 (In MW)			July 2011 (In MW)			% M-on-M Change (Jun - Jul 2012)			% Y-on-Y Change (Jul 2011 - Jul 2012)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Coal	257	103	144	206	0	48	51	0	3	24.7		202.5	405.5		5,334.2
Geothermal	162	94	110	235	125	131	160	35	91	(31.1)	(24.8)	(16.4)	1.5		21
Hydro	0	0	0	0	0	0	0	0	0						
Oil Based	60	15	35	50	10	25	44	11	12	20.0	50.0	39.5	37.9	36.4	184.1
TOTAL	417	212	289	369	135	204	171	46	105	12.8	57.0	41.7	144.2	360.0	174.0

Note: The derived values by resource type were non-coincident. The total values were derived based on aggregate hourly outage.

Table 11. Visayas Regional Outage Summary (GOMP), July 2012, June 2012, and July 2011

Resource Type	July 2012 (In MW)			June 2012 (In MW)			July 2011 (In MW)			% M-on-M Change (Jun - Jul 2012)			% Y-on-Y Change (Jul 2011 - Jul 2012)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Coal	218	45	138	51	0	26	51	0	46	328.7		427.5	328.7		
Geothermal	85	35	48	81	0	62	38	0	6	5.1		(23.7)	125.6		687.1
Hydro	0	0	0	0	0	0	0	0	0				#DIV/0!		(100.0)
Oil Based	59	11	33	56	6	26	11	6	7	5.9	83.3	26.3	439.1	100.0	383.4
TOTAL	306	134	219	152	36	115	99	6	59	101.2	273.3	90.6	208.5	2,343.5	273.0

Note: The derived values by resource type were non-coincident. The total values were derived based on aggregate hourly outage.

Figure 9 shows increases in the outage factor of coal and oil-based plants due to forced outages of several plants. Among the plant type, coal plants registered the highest outage factor of 18.7 percent in July 2012. This was followed by geothermal plants with 11.8 percent. It was noted that geothermal plants had a consistent outage factor of above 10 percent in all three billing periods (June and July 2012, July 2011). This is attributable to the Northern Negros Geothermal Power Plant (NNGP) which was placed on outage since 01 July 2011 for the conduct of plant rectification program.

Figure 9. Total Outage Factor (Visayas Plants), July 2012, June 2012, and July 2011

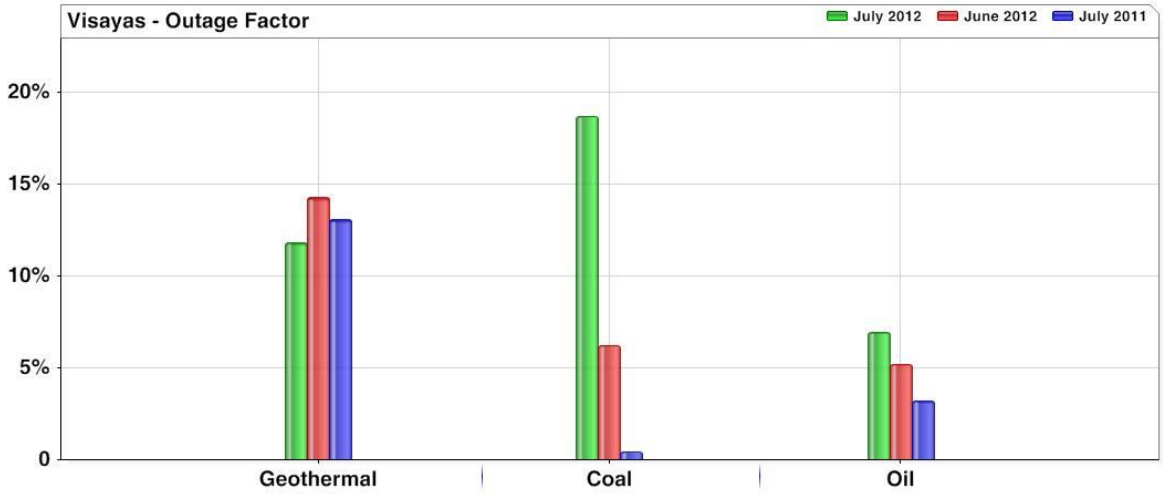


Figure 10. Planned Outage Factor (Visayas Plants), July 2012, June 2012, and July 2011

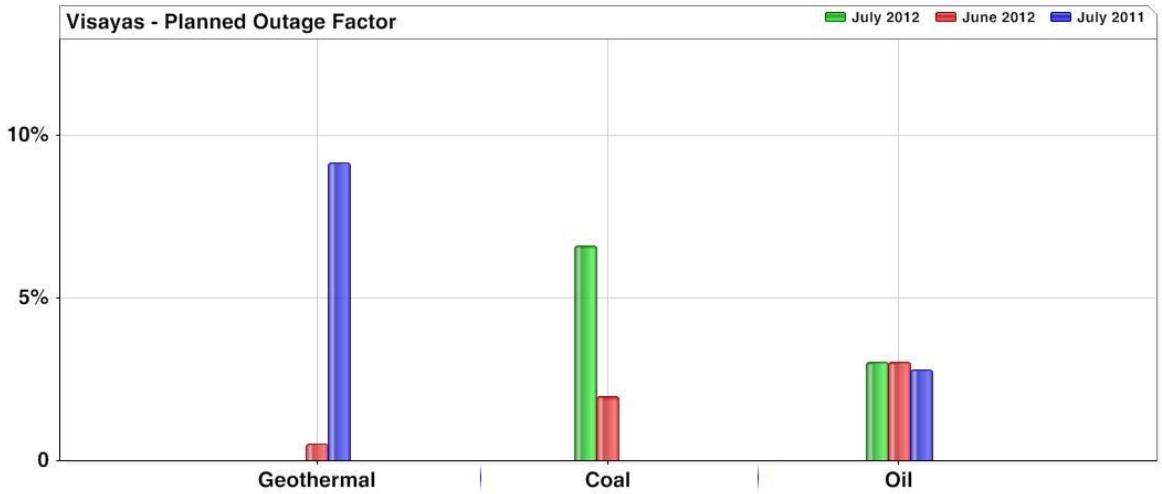
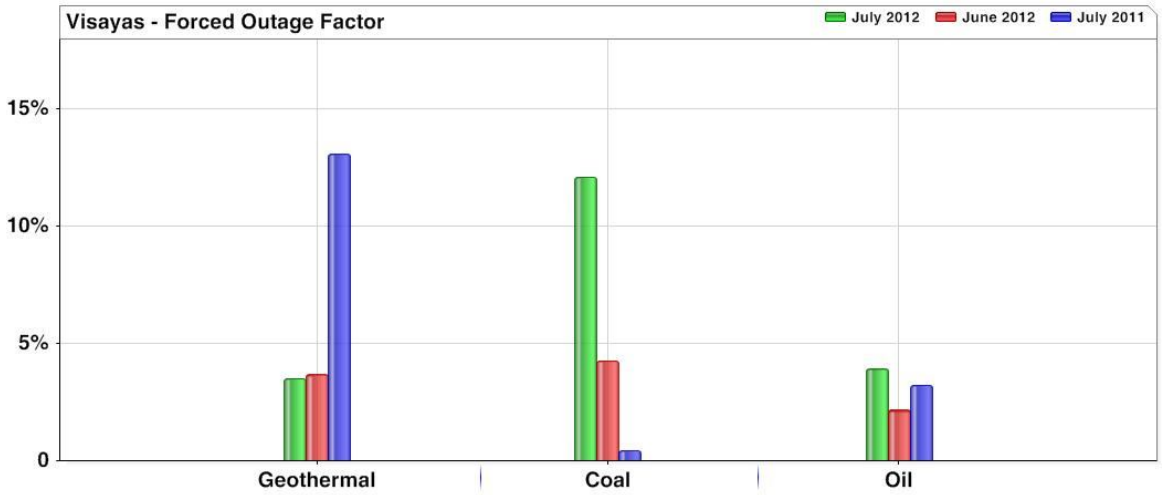


Figure 11. Forced Outage Factor (Visayas Plants), July 2012, June 2012, and July 2011



Several coal plants and oil based plants in Visayas went on outage during the period *(Table 12)*. Kepco Salcon 1 was placed on forced outages due to boiler tube leak while Kepco Salcon 2 went back on line on 08 July 2012 after undergoing annual preventive maintenance from 21 June to 07 July 2012. Cebu TPP1 and TPP2 likewise went on outage during the billing period.

Table 12. Major Plant Outages, June 2012 - Visayas

Plant/Unit Name	Capacity (MW)	Date Out	Date In	Duration (Days)	Remarks
Coal					
Cebu TPP2	50.8	7/12/2012 0:03	7/15/2012 17:13	3.7	Scheduled shutdown
Kepco Salcon 1	103	6/25/2012 7:01	6/29/2012 14:35	4.3	Emergency shutdown due to boiler tube leak
Kepco Salcon 1	103	7/7/2012 6:58	7/13/2012 8:56	6.1	Boiler tube leak
Kepco Salcon 2	103	6/21/2012 9:06	7/7/2012 9:07	16.0	Annual PMS
Cebu TPP1	45	7/22/2012 0:27			Repair of vacuum
Kepco Salcon 2	103	7/8/2012 9:35			Turbine protection problem
Oil					
PDPP3 C	13.3	6/23/2012 11:12	7/12/2012 10:47	19.0	Water leak
PDPP3 F	15	7/17/2012 14:35	7/25/2012 15:46	8.0	Excessive leak at turbo charger cooling A bank.
PDPP3 G	15	7/17/2012 19:36			Excessive fuel leak at cylinder B8
Geothermal					
Upper Mahiao 2	37.5	7/12/2012 4:11			Due to voltage regulator failure

III. Market Price Outcome

Although market prices[7] were relatively high during the month, on the whole, the prices were still lower than the previous billing period. The average price dropped by 12.2 percent to PhP8,032/MWh from the previous billing period's PhP9,145/MWh *(Table 13)*. Incidentally, the highest price recorded was PhP58,048/MWh on 08 July 2012 at trading interval 1200H, which fell on a weekend. Conversely, this month's average price was significantly higher by 79.1 percent than last year's PhP4,485/MWh.

High market prices were attributed to the tight supply situations that were observed during the period. In particular, as shown in figure 12, high prices occurred on 6-12 July 2012 (prior to the Malampaya gas facility maintenance) due to high system capacity on outage reaching as high as 3,392 MW brought about by concurrent outages from major coal plants in Luzon.

The impact of the Malampaya gas facility maintenance was felt on 16-18 July 2012 when market prices reached as high as PhP54,458/MWh (16 July 2012 at 1500H) and PhP51,237/MWh (17 July 2012 at 1200H) with the entire Ilijan plant not available. As discussed earlier, Ilijan Block A was shutdown on July 13 (effective 0016H) in line with the maintenance of Malampaya gas facility. Meanwhile, Ilijan Block B shifted to fuel oil operation and remained online with limited capability of 420 MW to 450 MW until the block was shutdown on 14 July 2012 (1605H). It was verified that the shutdown was due to the non-submission of offers for Ilijan Block B starting trading interval 1600H (14 July 2012).

[7] 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, (iv) administered price for loads for trading intervals under market intervention, and (v) estimated load reference price (ELRP) for trading intervals where the ERC-approved Price Substitution Mechanism (PSM) was applied.

Figure 12. Market Price Trend, July 2012

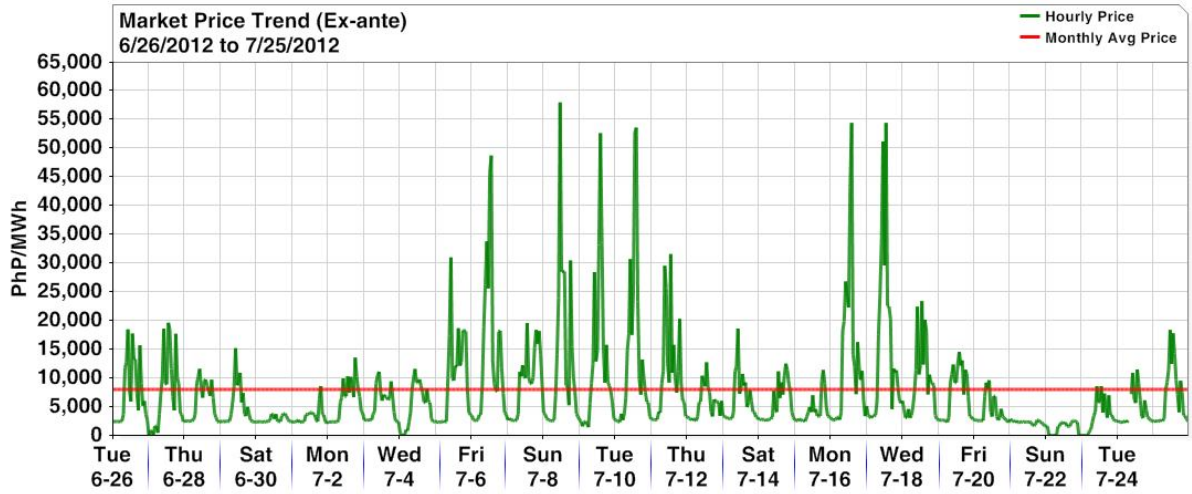


Figure 13. Market Price Trend - Luzon, July 2012

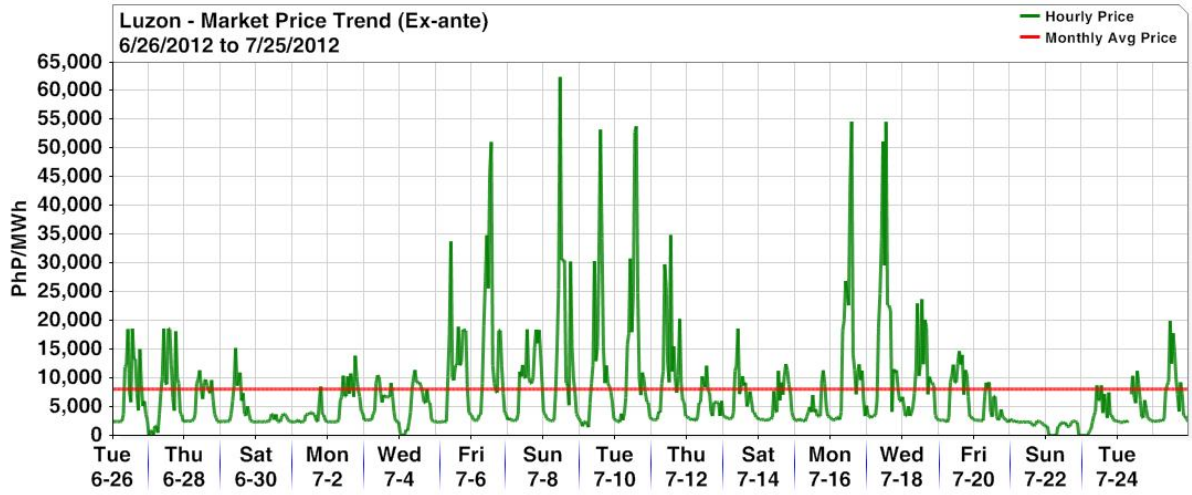
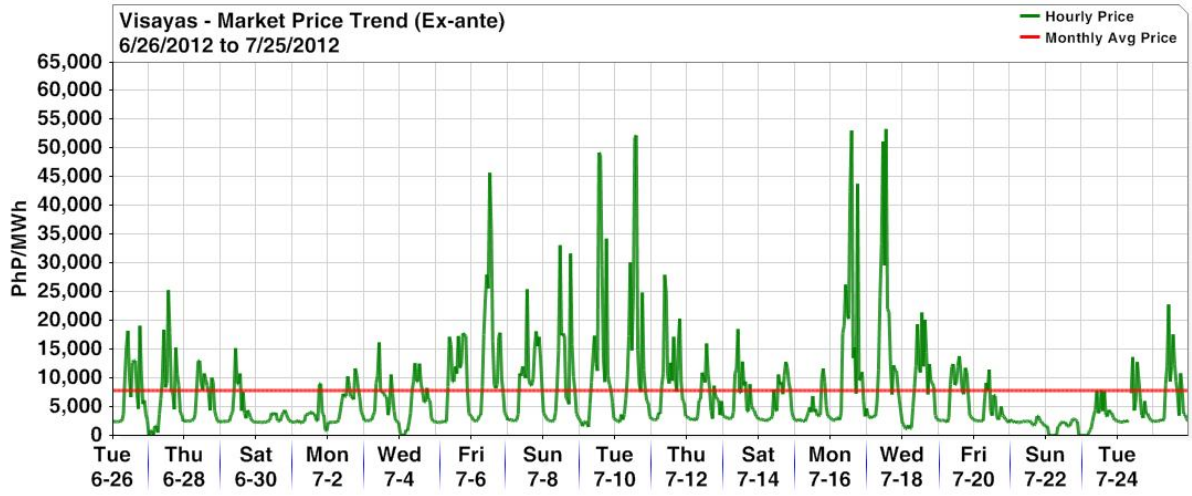


Figure 14. Market Price Trend - Visayas, July 2012



Month-on-month comparison of regional prices shows that average price notably decreased by 11.7 percent (PhP9,141/MWh to PhP8,068/MWh) in Luzon and 14.6 percent (PhP9,171/MWh to PhP7,836/MWh) in Visayas *(Table 13)*.

Table 13. Market Price Summary, July 2012, June 2012, and July 2011

	July 2012 (In PhP/MWh)			June 2012 (In PhP/MWh)			July 2011 (In PhP/MWh)			% M-on-M Change (Jun - Jul 2012)			% Y-on-Y Change (Jul 2011 - Jul 2012)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Luz-Vis	58,048	0	8,032	56,979	951	9,145	34,841	0	4,485	1.9	(100.0)	(12.2)	66.6		79.1
Luzon	62,463	0	8,068	62,859	954	9,141	34,841	0	4,480	(0.6)	(100.0)	(11.7)	79.3		80.1
Visayas	53,386	0	7,836	56,979	0	9,171	59,083	0	4,513	(6.3)		(14.6)	(9.6)		73.7

The price distribution in figure 15 shows the price movements during the billing period compared with the previous billing period and same billing period last year. Noteworthy is the decrease in the occurrences of prices above PhP16,000/MWh from last month, as manifested in the decrease in the monthly average price.

Majority of the prices in the billing period were still within the range of PhP2,000/MWh to PhP4,000/MWh, although the frequency of the same dropped to 44.5 percent from last month's 52.2 percent.

Figure 15. Market Price Distribution, July 2012, June 2012, and July 2011

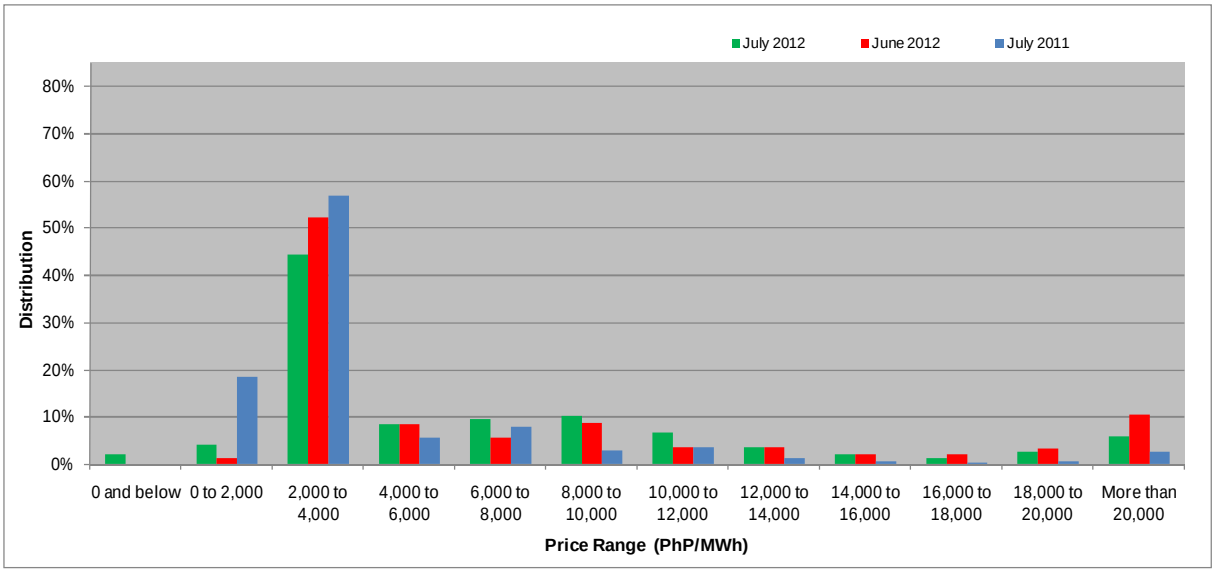


Table 14. Market Price Distribution, July 2012, June 2012, and July 2011

Price Range (PhP/MWh)	% Distribution		
	July 2012	June 2012	July 2011
0 and below	1.9	0.0	0.0
0 to 2,000	3.9	1.2	18.5
2,000 to 4,000	44.5	52.2	56.8
4,000 to 6,000	8.5	8.4	5.4
6,000 to 8,000	9.6	5.4	7.8
8,000 to 10,000	10.0	8.6	2.8
10,000 to 12,000	6.5	3.4	3.5
12,000 to 14,000	3.5	3.4	1.1
14,000 to 16,000	2.1	2.0	0.7
16,000 to 18,000	1.1	2.2	0.3
18,000 to 20,000	2.6	3.1	0.6
More than 20,000	5.7	10.2	2.5

The average price in Luzon was 3.0 percent higher than the average price in Visayas.

Table 15. Regional Price Summary, July 2012, June 2012, and July 2011

	Luzon (In PhP/MWh)			Visayas (In PhP/MWh)			% Difference		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
July 2012	62,463	0	8,068	53,386	0	7,836	17.0		3.0
June 2012	62,859	954	9,141	56,979	0	9,171	10.3		(0.3)
July 2011	34,841	0	4,480	59,083	0	4,513	(41.0)		(0.7)

IV. Pricing Errors and Market Intervention

The frequency of the issuance of PEN, PSM application, and market intervention events is shown in Table 16.

Market runs during the billing period show better efficiency than last month, as indicated in the reduction of occurrences of total pricing errors in ex-ante from last month's 44.6 percent (corresponding to 332 trading intervals) to 37.9 percent (273 trading intervals). The pricing errors were attributed to the constraints at MERALCO interchange substations (Araneta, Balintawak, Dolores and Zapote), undergeneration condition, and MMS input data concerns.

The ex-post market results, on the other hand, indicated system-wide pricing errors in 36 trading intervals due to undergeneration conditions and MMS input data concerns.

System-wide application of the PSM was noted to have occurred in 19 trading intervals during ex-ante. The same was mainly due to the (I) constraints at New Naga - Quiot line 1, (II) constraint on Amadeo - Calaca line 1 as a result of N - 1 contingency applied to Sta. Rosa - Calaca line. (III) constraint on Amadeo - Calaca line 1 as a result of N - 1 contingency applied to Amadeo - Calaca line 2.

During the billing month, system wide market intervention was declared on 24 July 2012 affecting trading interval 0900H. The said market intervention was due to MMS workflow stoppage caused by unavailability of EMS Snapshot data from Visayas.

Table 16. PEN, PSM and MI Summary, July 2012

	Luz-Vis		Luzon		Visayas		Total	
	Freq.	% of Time	Freq.	% of Time	Freq.	% of Time	Freq.	% of Time
PEN (RTD)	38	5.3	235	32.6	2	0.3	273	37.9
PEN (RTX)	36	5.0	2	0.3	1	0.1	39	5.4
PSM (RTD)	19	2.6		-		-	19	2.6
PSM (RTX)		-		-		-		-
MI	1	0.1		-		-	1	0.1

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

Figure 16 and Table 17 show the correlation of the hourly prices and demand during the billing period, the previous billing period and the same billing period last year. The current billing period's results showed a positive and relatively significant relationship between price and demand for all prices. Results showed no significant relationship between prices above PhP10,000/MWh and demand, which supports the discussions in the preceding sections that high market prices in the billing period were driven by tight supply conditions.

Figure 16. Price and Demand Relationship, July 2012, June 2012, and July 2011

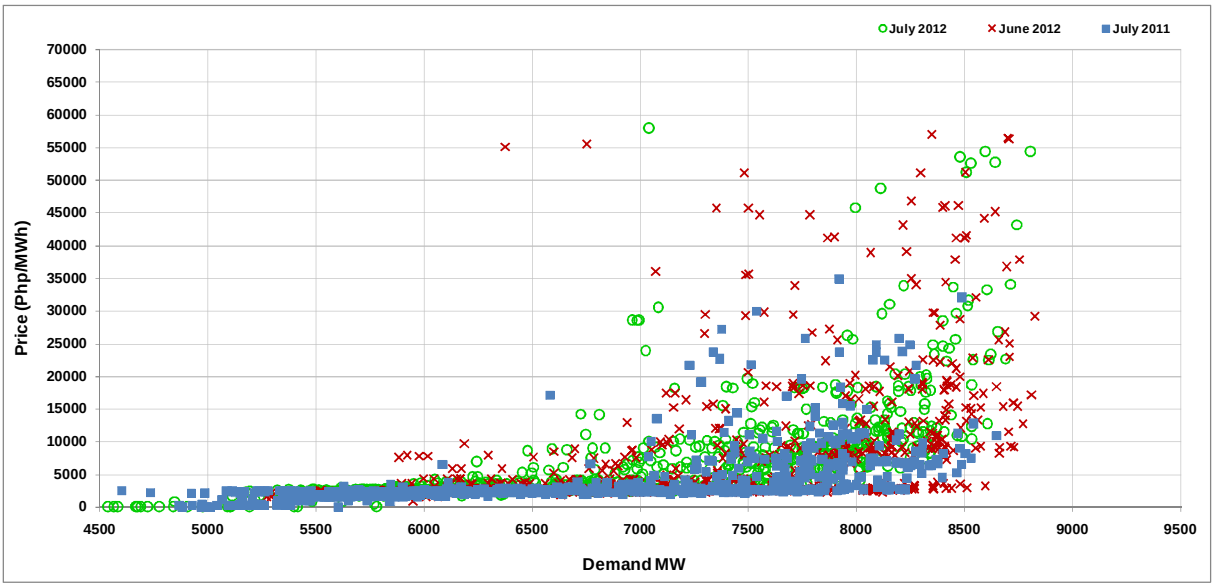


Table 17. Price and Demand Relationship, July 2012, June 2012, and July 2011

	July 2012	June 2012	July 2011	% M-on-M Change	% Y-on-Y Change
All Prices	0.6268	0.3408	0.4957	83.9	26.4
Prices >= PhP10,000	0.2498	-0.0397	0.0319	(729.2)	683.1

V. HVDC Scheduling

Comparing the three billing periods, Table 18 suggests improvement in the HVDC performance during the current billing period as only one and three occurrences of constraints were noted to have occurred in ex-ante and ex-post runs, respectively, when the transfer capability of the HVDC going to Luzon was set by NGCP-SO to 200 MW during trading intervals 0900H-1200H on 25 July 2012.

Table 18. Summary of HVDC Limits Imposed by NGCP-SO and Results of HVDC Schedules (Ex-ante and Ex-post), July 2012

Results of HVDC Scheduling	HVDC Limit during Ex-ante (Visayas/Luzon) (No. of Trading Intervals)				HVDC Limit during Ex-post (Visayas/Luzon) (No. of Trading Intervals)			
	150/200	150/440	440/440	Total	150/200	150/440	440/440	Total
Visayas to Luzon	**4**	**680**	**11**	**695**	**4**	**677**	**10**	**691**
Limit Not Maximized	*3*	*680*	*11*	*694*	*1*	*677*	*10*	*688*
Limit Maximized [1\]	*1*			*1*	*3*			*3*
Luzon to Visayas		**24**		**24**		**27**		**27**
Limit Not Maximized		*24*		*24*		*27*		*27*
Limit Maximized [1\]				-				-
No Flow [1\]				**-**				**-**
TOTAL	**4**	**704**	**11**	**719**	**4**	**704**	**10**	**718**

Notes: 1\ with price separation

Table 19. Summary of HVDC Limits Imposed by NGCP-SO and Results of HVDC Schedules (Ex-ante and Ex-post), June 2012

Results of HVDC Scheduling	HVDC Limit during Ex-ante (Visayas/Luzon) (No. of Trading Intervals)						HVDC Limit during Ex-post (Visayas/Luzon) (No. of Trading Intervals)					
	0/0	150/100	150/150	150/440	440/440	Total	0/0	150/100	150/150	150/440	440/440	Total
Visayas to Luzon	**-**	**4**	**1**	**721**	**2**	**728**	**-**	**4**	**1**	**722**	**1**	**728**
Limit Not Maximized				717	2	719				715	1	**716**
Limit Maximized 1\		4	1	4		9		4	1	7		**12**
Luzon to Visayas	**-**			**4**		**4**				**3**		**3**
Limit Not Maximized				2		2				3		**3**
Limit Maximized 1\				2		2						**-**
No Flow 1\	**3**					**3**	3					**3**
TOTAL	**3**	**4**	**1**	**725**	**2**	**735**	**3**	**4**	**1**	**725**	**1**	**734**

Notes: 1\ with price separation

Table 20. Summary of HVDC Limits Imposed by NGCP-SO and Results of HVDC Schedules (Ex-ante and Ex-post), July 2011

Results of HVDC Scheduling	HVDC Limit during Ex-ante (Visayas/Luzon) (No. of Trading Intervals)				HVDC Limit during Ex-post (Visayas/Luzon) (No. of Trading Intervals)				
	0/0	150/100	150/440	Total	0/0	150/100	150/440	440/440	Total
Visayas to Luzon		**20**	**648**	**668**		**13**	**639**	**1**	**653**
Limit Not Maximized		*14*	*648*	*662*		*10*	*639*	*1*	*650*
Limit Maximized 1\		*6*		*6*		*3*			*3*
Luzon to Visayas		**1**	**37**	**38**		**6**	**47**		**53**
Limit Not Maximized		*1*	*37*	*38*		*6*	*46*		*52*
Limit Maximized 1\							*1*		*1*
No Flow 1\	**12**			**12**	**12**				**12**
TOTAL	**12**	**21**	**685**	**718**	**12**	**19**	**686**	**1**	**718**

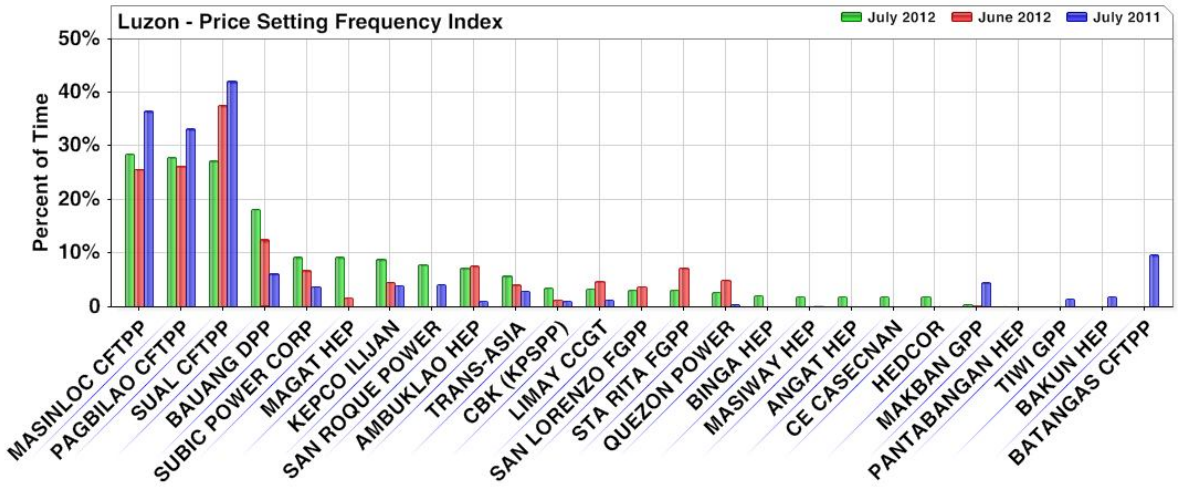
Notes: 1\ with price separation

VI. Price Setting Plants[8]

As shown in Figure 17, 22 plants from Luzon have been considered as price setters across all price levels during the billing period. As with the previous billing period and same billing period last year, the coal plants Masinloc FTPP (at 28.6%), Pagbilao CFTPP (at 27.9%) and Sual CFTPP (at 27.2%) remained the top three frequent price setters. In general, the current billing period saw an increase in the PSFI of almost all the plants, except for Sual plant in particular which PSFI significantly decreased from last month's 38%.

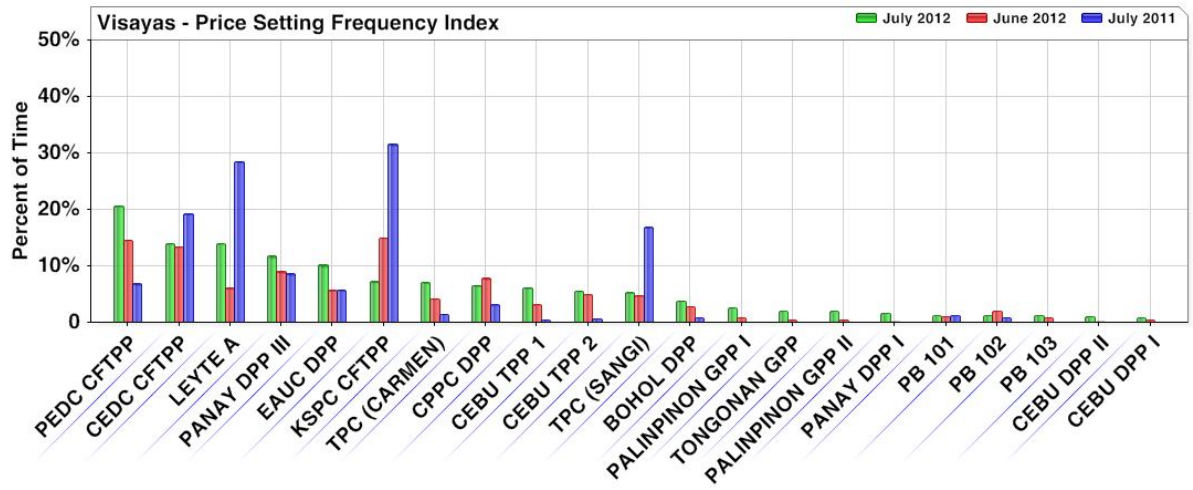
[8] A generator trading node is considered as a price setter when its last accepted offer price is between 95% to 100% of its nodal price. A generating plant is considered as price setter if at least one of its trading nodes was price setter in a given trading hour. The percentages stated in the price setting discussion represent the percent of time that a given plant was considered as price setter during the billing month.

Figure 17. Price Setting Frequency Index (Luzon Plants), July 2012, June 2012, and July 2011



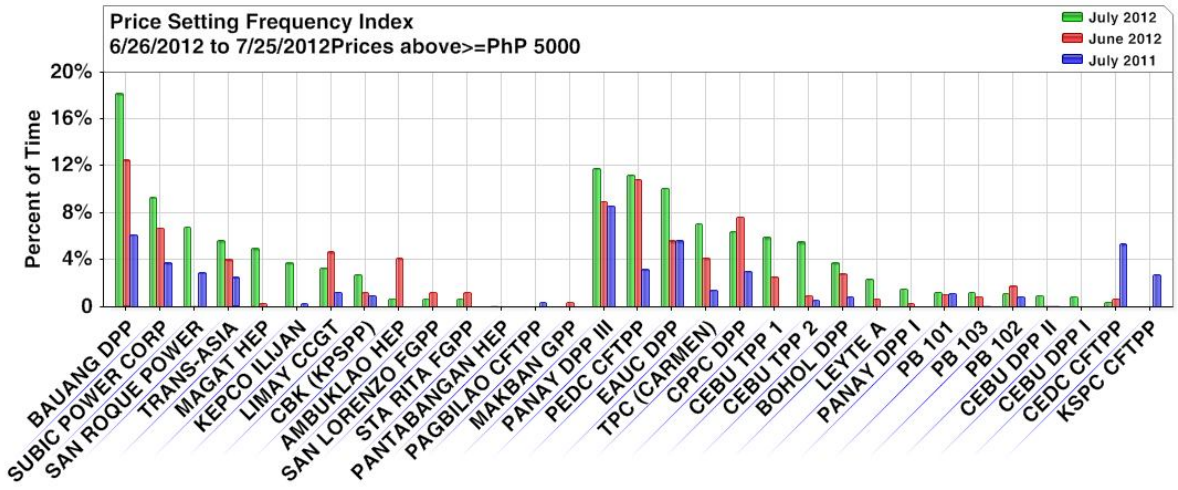
In Visayas *(Figure 18),* 21 plants have been considered as price setters across all price levels with coal plants PEDC CFTPP (at 20.5%), CEDC CFTPP (at 13.8%) and geothermal plant Leyte A (at13.8) as the most frequent price setters.

Figure 18. Price Setting Frequency Index (Visayas Plants), July 2012, June 2012, and July 2011



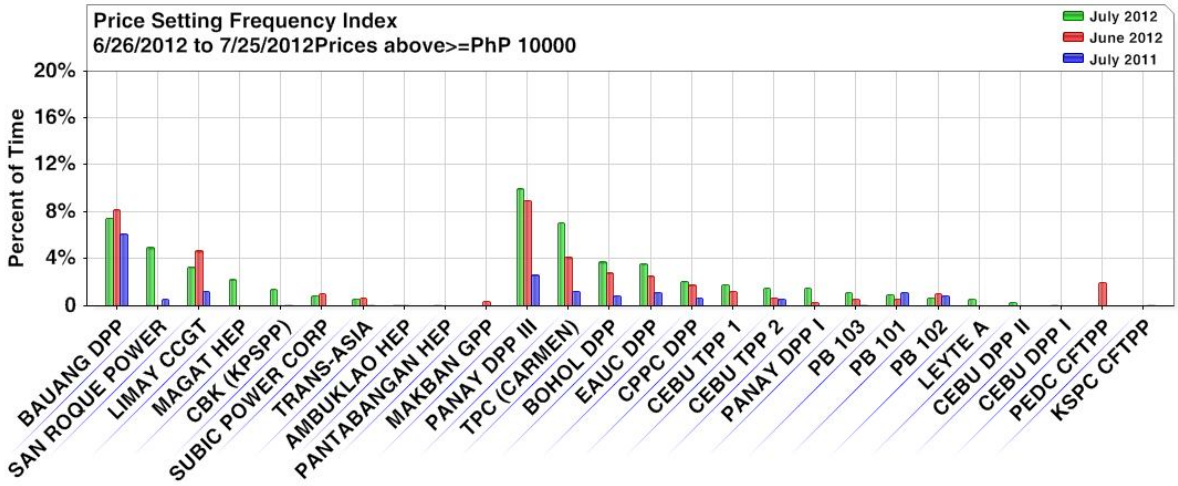
For prices above PhP5,000/MWh, the number of price setters increased to 28 plants compared with previous billing period, composed of 12 plants from Luzon and 16 plants from Visayas *(Figure 19).* The oil-based plants Bauang DPP (at 18.1%), Subic Power (at 9.3%) and hydro plant San Roque (at 6.8%) topped the price setting plants from Luzon. The coal plant PEDC CFTPP (at 11.25%), and oil-based plants Panay DPP III (at 11.8%), CPPC DPP (at 8%), and EAUC DPP (at 10.13%) were the top price setting plants from Visayas.

Figure 19. Price Setting Frequency Index (PhP5,000 and Above), July 2012, June 2012, and July 2011



The number of price setters at the price level of PhP10,000/MWh and above, compared with the previous billing period, also increased to 23 plants, with 9 plants coming from Luzon and 14 plants coming from Visayas. The top price setters include the oil-based plants Bauang and Limay CCGT and hydro plant San Roque from Luzon and oil-based plants Panay III and TPC (Carmen) from Visayas.

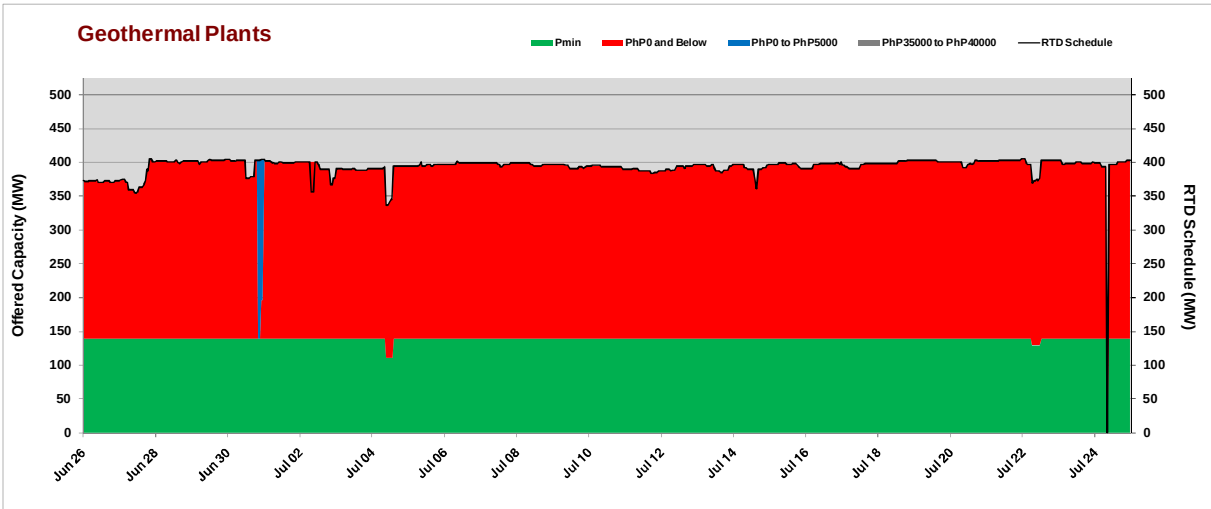
Figure 20. Price Setting Frequency Index (PhP10,000 and Above), July 2012, June 2012, and July 2011



VII. Generator Offer Pattern

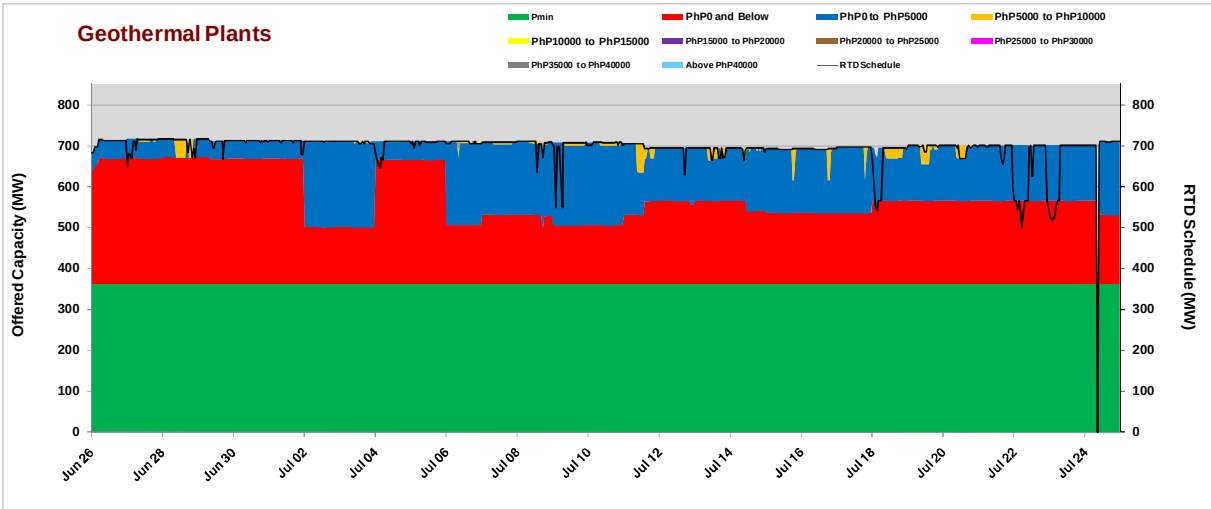
Geothermal plants in Luzon had the lowest price offer among the plant resources with offer prices below PhP5,000/MW *(Figure 21)*. The capacity offer started to increase on 28 June 2012, coinciding with the resumption of Tiwi 6 operations after being on outage since 10 April 2012.

Figure 21. Geothermal Plants Offer Pattern (Luzon), July 2012



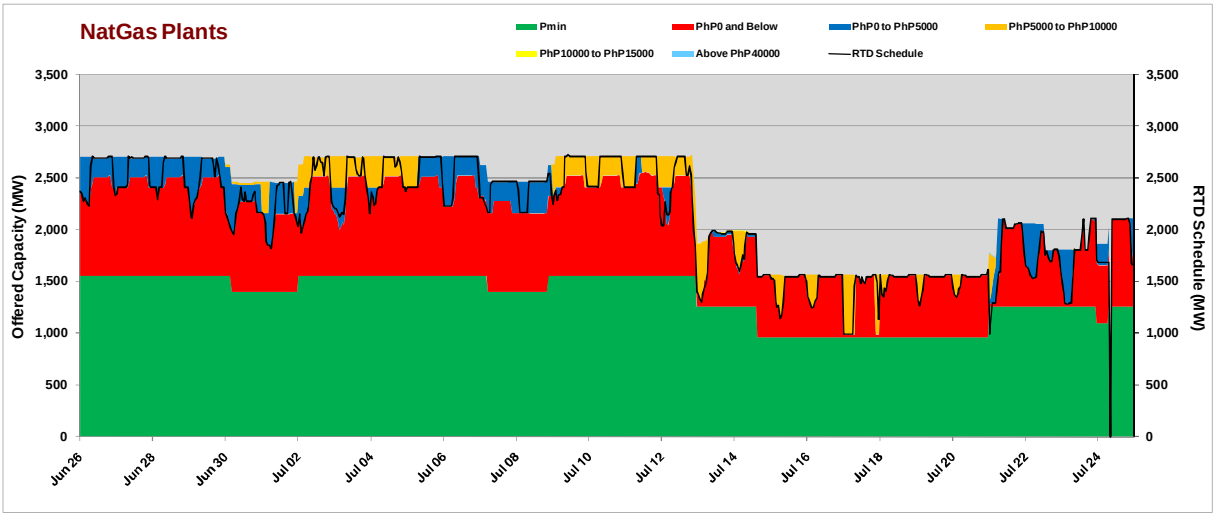
Similarly, 99.83 percent of the offered capacity from Visayas geothermal plants was priced at PhP5,000/MW and below, except for certain trading dates when offer prices exceeded PhP5,000/MW reaching as high as PhP62,000/MW for a 5MW capacity offer on 26 June 2012 and 06 July 2012 *(Figure 22).*

Figure 22. Geothermal Plants Offer Pattern (Visayas), July 2012



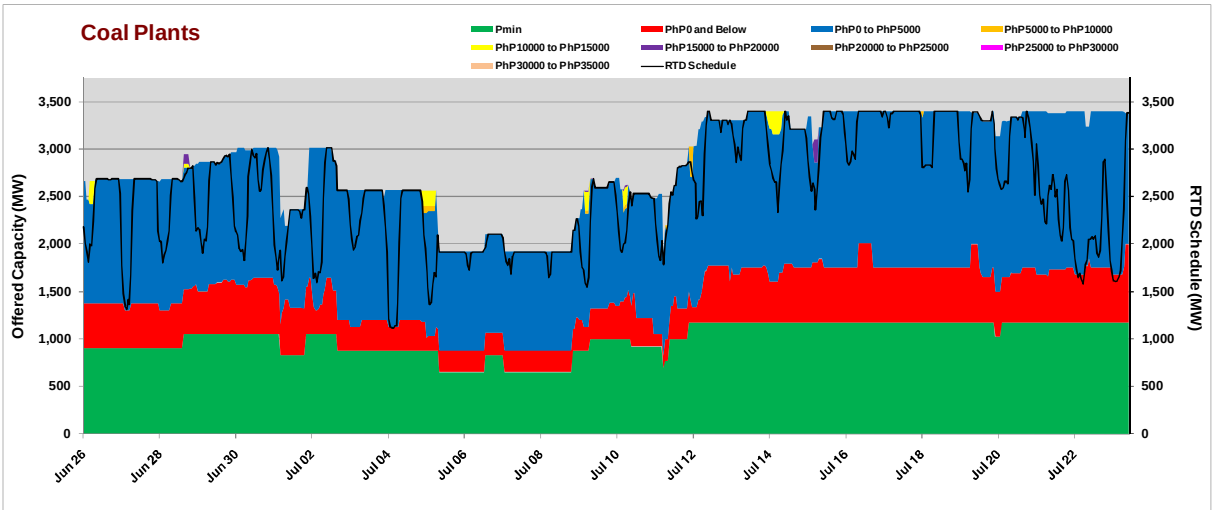
Unlike in the previous billing month, the offer prices of Luzon natural gas plants in July exceeded PhP5,000/MW particularly during the period 21 July 2012 and 23 July 2012 when offer prices reached as high as PhP50,000/MW. It was also noted that the offer capacity decreased starting July 13 with the shutdown of Ilijan plant in line with the Malampaya gas facility maintenance.

Figure 23. Natural Gas Plants Offer Pattern (Luzon), July 2012



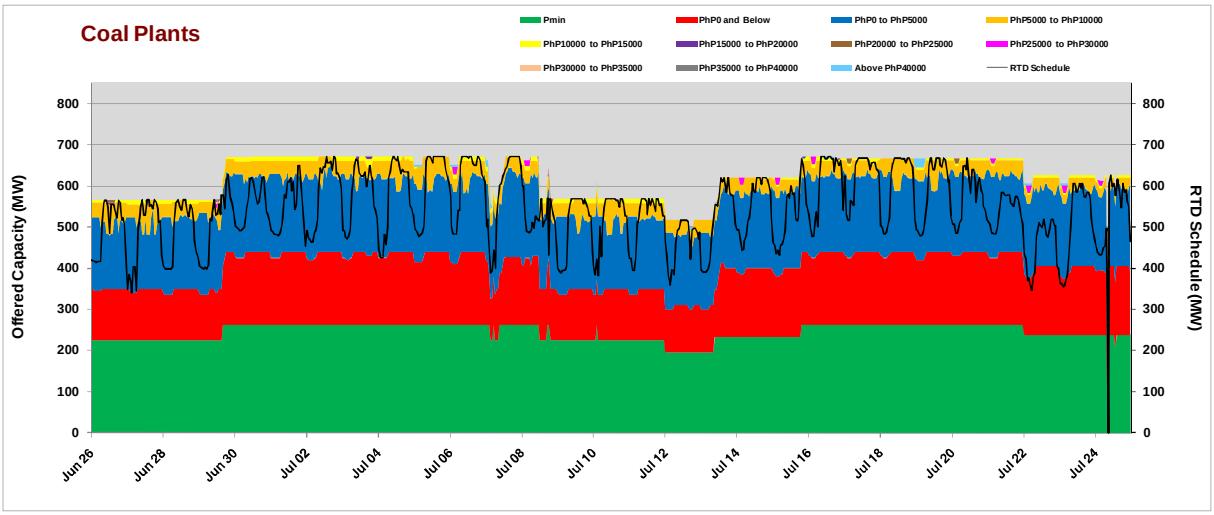
About 99.8 percent of the offered capacities of coal plants in Luzon (average of 2,853 MW) were priced at PhP5,000/MW and below *(Figure 24)*. The remaining 0.2 percent of the offered capacities (offered capacity ranging from 5 MW to 214 MW) were priced above PhP5,000/MW. The capacity offer of the coal plants notably decreased during 2-11 July 2012 of the billing month due to the forced outages of major coal plants.

Figure 24. Coal Plants Offer Pattern (Luzon), July 2012



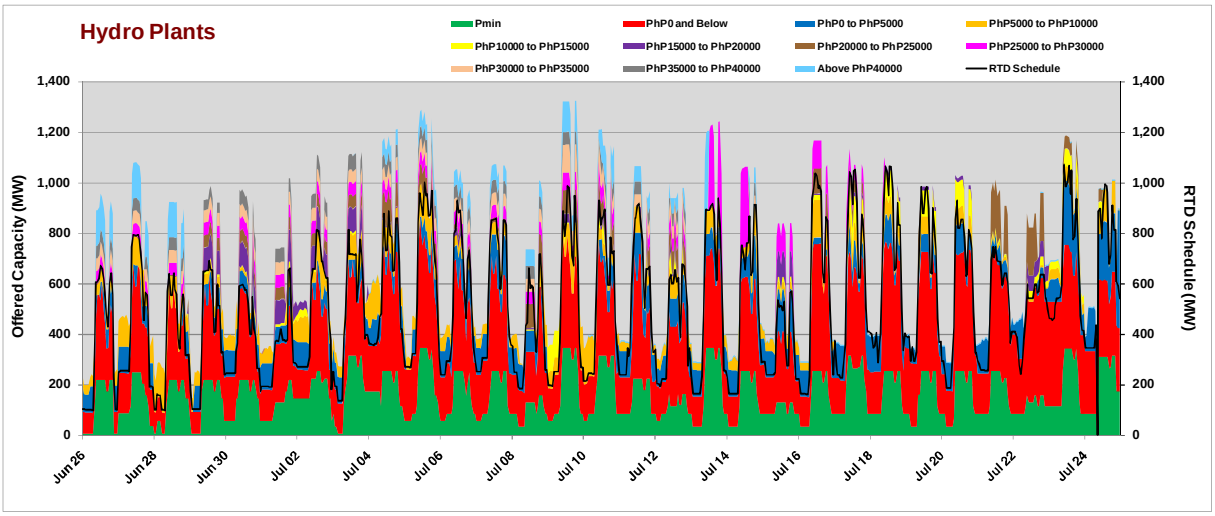
In Visayas, about 93 percent of the offered capacity of coal plants (average of 579 MW) were priced at PhP5,000/MW and below. The other 7 percent of the offered capacities (average of 47 MW) were priced above PhP5,000/MW, reaching as high as PhP62,000/MW *(Figure 25)*.

Figure 25. Coal Plants Offer Pattern (Visayas), July 2012



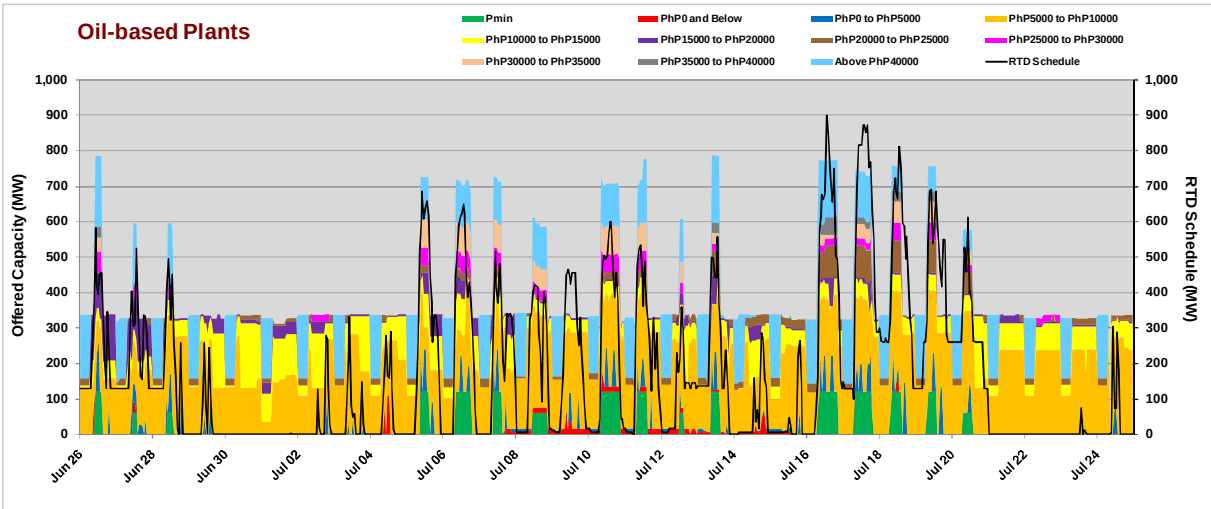
The aggregate hourly offer pattern of hydro plants in Luzon remained highly volatile in terms of capacity and price *(Figure 26).* The capacity offers range from 144 MW to 1,323 MW while the offer prices ranged from negative PhP250/MW to PhP62,000/MW. The limited or non-submission of offers from hydro plants still comprised about 49% of the capacity gap in Luzon.

Figure 26. Hydro Plants Offer Pattern (Luzon), July 2012



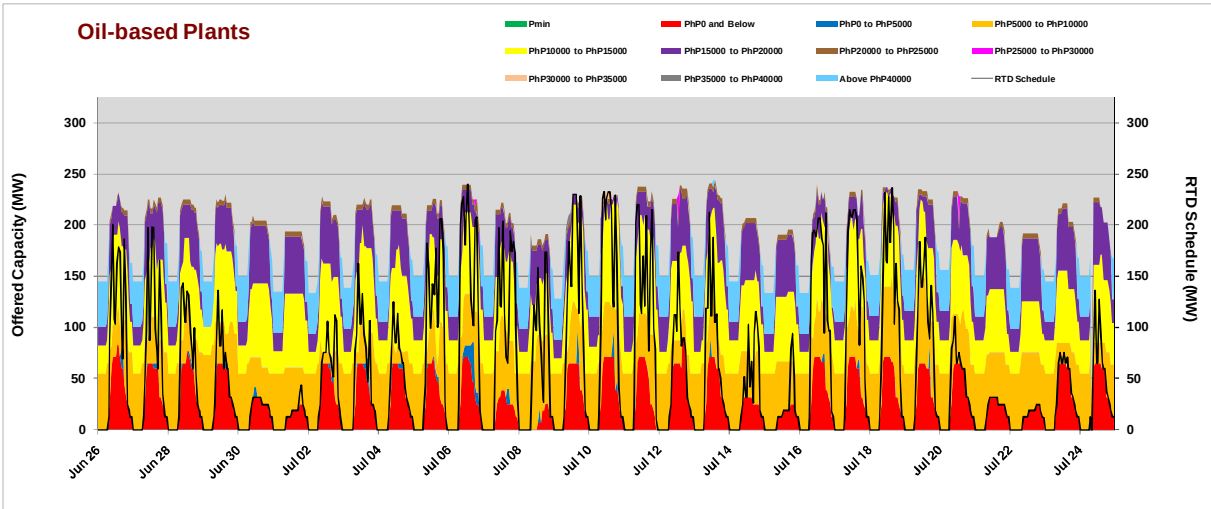
The oil-based plants accounted for 32% of the capacity gap in the region due to the limited or non-submission of offers. Limay A and B submitted offers during periods of tight supply conditions while Malaya did not submit any offer for the entire period. Notwithstanding Malaya's non-submission of offers, it was called to run as MRU by the NGCP-SO at about 32% of the time during the billing period particularly during the period of the Malampaya shutdown. Thus, it can be noted that there were certain trading intervals during the covered period where the RTD schedule is greater than the offered capacity.

Figure 27. Oil-based Plants Offer Pattern (Luzon), July 2012



The capacity and price offers from oil-based plants in Visayas ranged from 128 MW to 244 MW and PhP0.00/MW to PhP60,000/MW, respectively. The Visayas oil-based plants accounted for 66 percent of the capacity gap in the Visayas.

Figure 28. Oil-based Plants Offer Pattern (Visayas), July 2012



VIII. Capacity Factor

In July, oil-based and hydro plants showed higher capacity factor based on registered capacity due to higher dispatch during the period. In terms of offered capacity, geothermal plants showed 100 percent capacity factor. This is due to the fact that the Luzon geothermal plants' offered capacities were scheduled for dispatch most of the time, as earlier discussed in the preceding sections *(Figure 29 and Table 21).*

Figure 29. Capacity Factor (Luzon Plants), July 2012

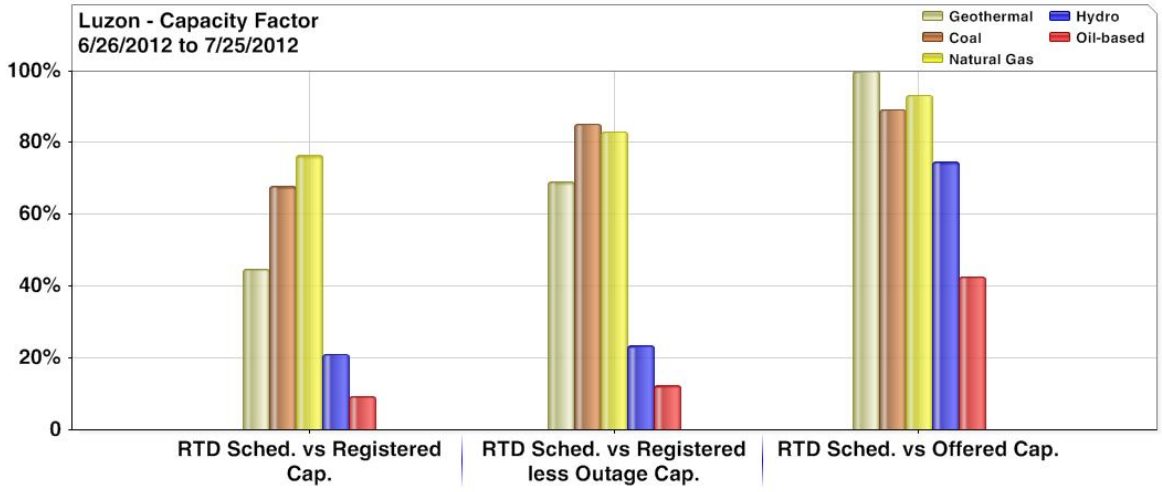


Table 21. Summary of Capacity Factor by Plant Type in Luzon, July 2012, June 2012, and July 2011

Plant Type	RTD Sched. vs Registered Cap.				
	July 2012	June 2012	July 2011	%M-on-M Change	%Y-on-Y Change
Coal	68%	66%	64%	3.2	3.0
Natural Gas	76%	88%	82%	(13.2)	8.0
Geothermal	45%	45%	47%	(1.0)	(2.8)
Hydro	21%	13%	20%	64.1	(36.1)
Oil-based	9%	3%	6%	207.0	(50.2)
Plant Type	**RTD Sched. vs Registered less Outage Cap.**				
	July 2012	**June 2012**	**July 2011**	**%M-on-M Change**	**%Y-on-Y Change**
Coal	85%	72%	71%	18.0	1.0
Natural Gas	83%	91%	93%	(8.3)	(2.4)
Geothermal	69%	78%	74%	(11.7)	6.1
Hydro	23%	15%	21%	53.5	(27.4)
Oil-based	12%	4%	8%	203.2	(45.9)
Plant Type	**RTD Sched. vs Offered Cap.**				
	July 2012	**June 2012**	**July 2011**	**%M-on-M Change**	**%Y-on-Y Change**
Coal	89%	77%	79%	15.5	(2.4)
Natural Gas	93%	92%	96%	1.1	(4.0)
Geothermal	100%	98%	98%	2.5	(0.4)
Hydro	75%	94%	94%	(20.1)	(0.3)
Oil-based	43%	20%	34%	111.8	(40.3)

Table 22. Capacity Factor by Plant Type in Luzon, July 2012

Plant Type	Total RTD Sched. (MW-Hr)	Total Registered Cap. (MW-Hr)	Total Registered less Outage Cap. (MW-Hr)	Total Offered Cap. (MW-Hr)	Capacity Factors		
					Registered Cap.	Registered less Outage Cap.	Offered Cap.
	(A)	(B)	(C)	(D)	(A / B)	(A / C)	(A / D)
Coal	1,858,337	2,737,233	2,181,871	2,081,642	68%	85%	89%
Natural Gas	1,523,023	1,990,983	1,833,136	1,631,956	76%	83%	93%
Geothermal	283,265	632,504	409,701	283,402	45%	69%	100%
Hydro	368,419	1,755,806	1,578,332	492,485	21%	23%	75%
Oil-based	122,561	1,325,836	996,948	286,916	9%	12%	43%

Capacity factor of oil-based and geothermal plants in Visayas increased when compared with the previous billing month. On the other hand, calculations showed a decrease in the capacity factor of coal plants *(Figure 30 and Table 23).*

Figure 30. Capacity Factor (Visayas Plants), July 2012

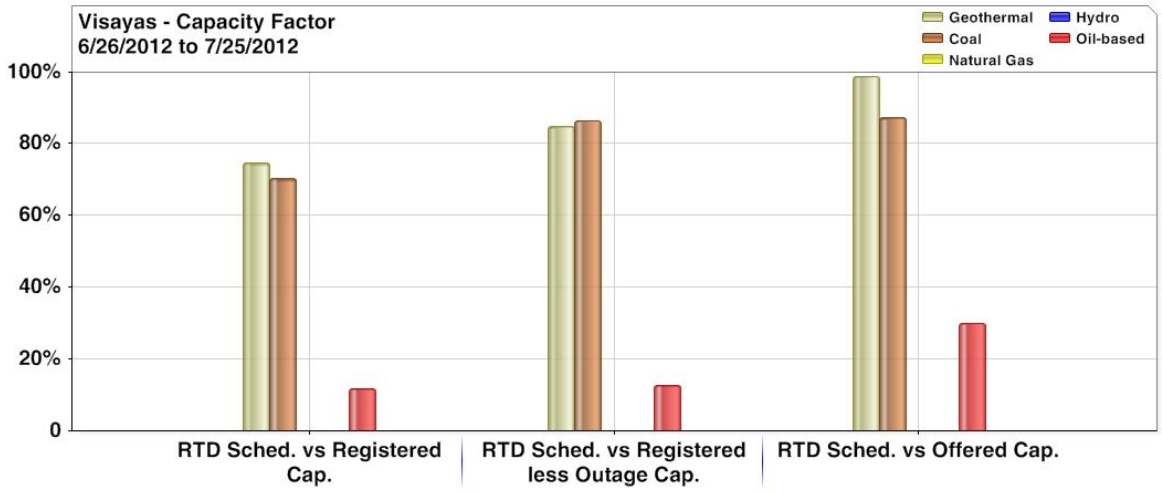


Table 23. Summary of Capacity Factor by Plant Type in Visayas, July 2012, June 2012, and July 2011

Plant Type	RTD Sched. vs Registered Cap.				
	July 2012	June 2012	July 2011	%M-on-M Change	%Y-on-Y Change
Coal	70%	81%	81%	(13.1)	0.3
Geothermal	75%	67%	66%	12.0	0.7
Oil-based	12%	4%	5%	197.5	(15.8)
Plant Type	**RTD Sched. vs Registered less Outage Cap.**				
	July 2012	June 2012	July 2011	%M-on-M Change	%Y-on-Y Change
Coal	86%	86%	81%	0.1	6.7
Geothermal	85%	69%	73%	22.9	15.5
Oil-based	13%	4%	5%	213.7	163.4
Plant Type	**RTD Sched. vs Offered Cap.**				
	July 2012	May 2012	July 2011	%M-on-M Change	%Y-on-Y Change
Coal	87%	91%	87%	(4.7)	5.6
Geothermal	99%	96%	97%	3.1	(0.8)
Oil-based	30%	10%	12%	203.9	(14.2)

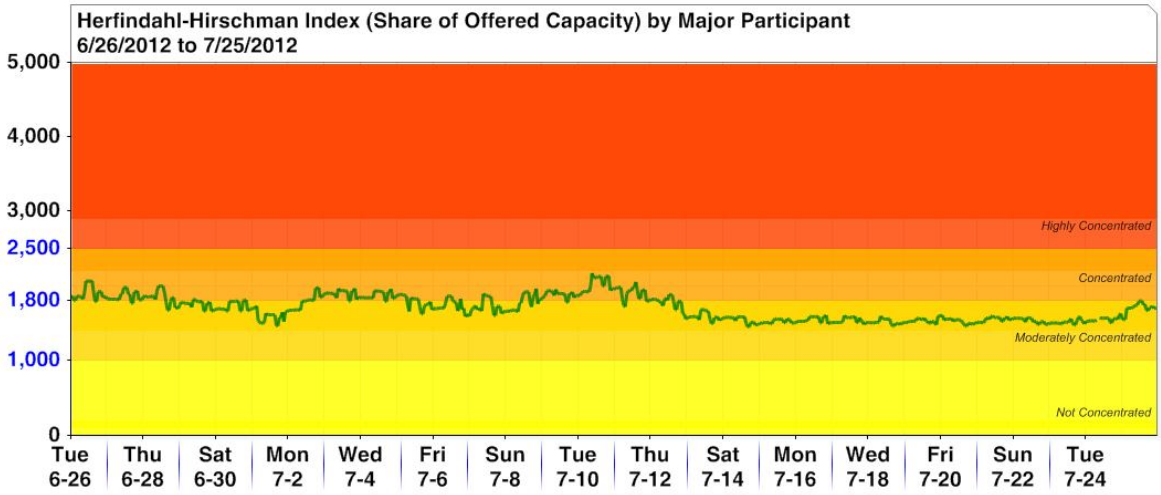
Table 24. Capacity Factor by Plant Type in Visayas, July 2012

Plant Type	Total RTD Sched. (MW-Hr)	Total Registered Cap. (MW-Hr)	Total Registered less Outage Cap. (MW-Hr)	Total Offered Cap. (MW-Hr)	Capacity Factors		
					Registered Cap.	Registered less Outage Cap.	Offered Cap.
	(A)	(B)	(C)	(D)	(A / B)	(A / C)	(A / D)
Coal	392,151	557,369	453,550	449,759	70%	86%	87%
Geothermal	500,898	669,964	591,002	507,102	75%	85%	99%
Oil-based	40,613	342,603	317,797	135,094	12%	13%	30%

IX. Market Concentration

The Herfindahl-Hirschman Index (HHI) calculated based on offered capacity by major participants' grouping shows indication of a concentrated market during the first half of the billing period but progressively becomes moderately concentrated market in the latter part (*Figure 32)*.

Figure 31. Hourly HHI based on Offered Capacity by Major Participant Grouping, July 2012



X. Compliance Monitoring

Compliance to Must Offer Rule

Several generator trading participants continued to submit less than their maximum available capacity during the covered billing period as indicated by the large percentage of generator-trading intervals with capacity gap. About 58 percent and 57 percent of the total generator-trading intervals[9] in Luzon and Visayas, respectively, had capacity gap[10] during the billing period. Figure 32 and Table 25 show the breakdown of generator-trading intervals with capacity gap by resource type. In Luzon, hydro plants had the most capacity gap occurrences at 41.2 percent, consistent with the data on capacity gap (in MW) in Table 27 which shows that hydro plants had the highest level of capacity gap during the billing period. In Visayas, oil-based plants had the highest share at 68 percent followed by geothermal plants at 22.6 percent.

[9] Total generator resource-trading intervals - calculated as the number of registered generator resource nodes multiplied by the total trading intervals in the billing month.
[10] Capacity gap - registered capacity less outage capacity less offered capacity, calculated for each generator resource node per trading interval.

Figure 32. Generator-Trading Intervals with Capacity Gap by Resource, July 2012

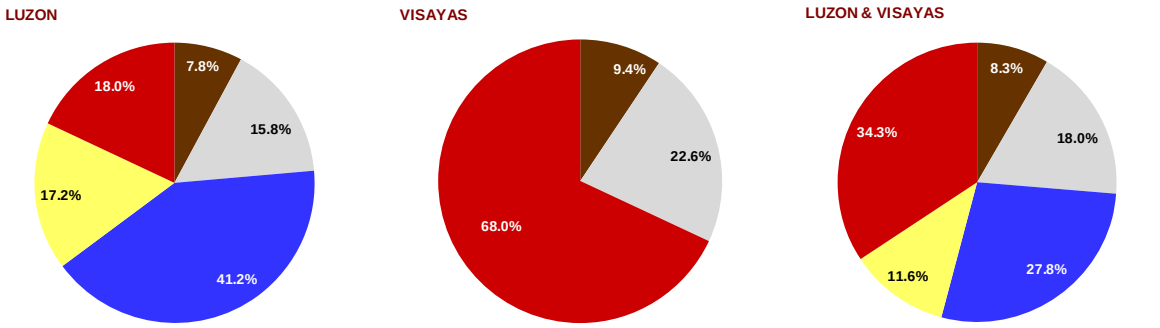
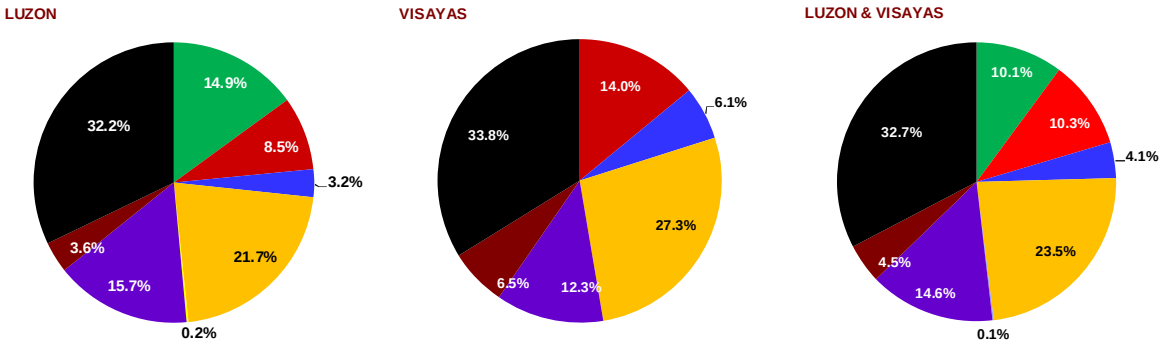


Table 25. Generator-Trading Intervals with Capacity Gap by Resource, July 2012

	Luzon		Visayas		Luzon and Visayas	
	Generator-Trading Intervals	% of Total	Generator-Trading Intervals	% of Total	Generator-Trading Intervals	% of Total
Coal	1,786	7.8%	1,032	9.4%	2,818	8.3%
Geothermal	3,594	15.8%	2,483	22.6%	6,077	18.0%
Hydro	9,386	41.2%	-	-	9,386	27.8%
Natural Gas	3,907	17.2%	-	-	3,907	11.6%
Oil-based	4,101	18.0%	7,477	68.0%	11,578	34.3%
Total	**22,774**	**100.0%**	**10,992**	**100.0%**	**33,766**	**100.0%**

Figure 33 and Table 26 show the breakdown of the generator-trading intervals with capacity gap based on the category of reasons[11] provided by the generator trading participants as part of their offer submission. 23.5 percent of these capacity gaps were attributed by the generator trading participants to equipment-related concerns. Steam supply concerns likewise figured in the list at 14.6 percent. It was observed, however, that reasons for the 32.7 percent of these gaps had not been properly accounted for.

Figure 33. Generator-Trading Intervals with Capacity Gap by Reason, July 2012



[11] Gathered from the reasons provided in the generator trading participants' offers.

Table 26. Generator-Trading Intervals with Capacity Gap by Reason, July 2012

	Luzon		Visayas		Luzon and Visayas	
	Generator-Trading Intervals	% of Total	Generator-Trading Intervals	% of Total	Generator-Trading Intervals	% of Total
Limitation on Water Elevation	3,404	14.9%			3,404	10.1%
Ancillary Services	1,945	8.5%	1,542	14.0%	3,487	10.3%
Start-up/Shutdown	732	3.2%	668	6.1%	1,400	4.1%
Equipment-related Failure	4,936	21.7%	2,996	27.3%	7,932	23.5%
Commercial Test	41	0.2%			41	0.1%
Steam Supply	3,577	15.7%	1,351	12.3%	4,928	14.6%
Others	817	3.6%	719	6.5%	1,536	4.5%
No Reason	7,322	32.2%	3,716	33.8%	11,038	32.7%
Total	**22,774**	**100.0%**	**10,992**	**100.0%**	**33,766**	**100.0%**

Table 27 compares the system capacity gap in July 2012 with the previous month and same month of the previous year. During the three billing periods, hydro and oil-based plants consistently had the highest level of capacity gap. On the average, the current billing period's capacity gap increased by 11.8 percent from the previous month's 3,109 MW but is lower by 21.7 percent compared with the previous year's 3,971 MW.

Table 27. Summary of Capacity Gap by Plant Type (MW), June 2012, May 2012 and June 2011

Resource Type	July 2012 (In MW)			June 2012 (In MW)			July 2011 (In MW)			% M-on-M Change (Jun - Jul 2012)			% Y-on-Y Change (Jul 2011 - Jul 2012)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Coal	592	15	145	850	11	158	1,060	177	376	(30.3)	35.5	(8.7)	(19.8)	(93.8)	(57.9)
Natural Gas	1,034	44	280	564	47	109	620	21	84	83.3	(5.4)	156.3	(9.1)	127.3	30.2
Geothermal	360	360	292	736	237	319	419	233	339	(51.0)	52.1	(8.4)	75.6	1.5	(5.8)
Hydro	2,079	703	1,517	1,997	993	1,542	2,202	1,275	1,796	4.1	(29.3)	(1.6)	(9.3)	(22.1)	(14.1)
Oil Based	1,516	620	1,242	1,186	629	979	1,651	601	1,423	27.8	(1.5)	26.8	(28.2)	4.8	(31.2)
TOTAL	**4,737**	**2,309**	**3,477**	**4,091**	**2,167**	**3,109**	**5,114**	**2,818**	**3,971**	15.8	6.6	11.8	(20.0)	(23.1)	(21.7)

Compliance to RTD Schedule

During the billing period, about 15 percent and 8 percent of the total generator-trading intervals in Luzon and Visayas, respectively, have observed deviations between the real time ex-ante dispatch (RTD) schedule[12] and actual dispatch[13], exceeding the +/-3% tolerance limit[14]. As indicated in Figure 34 and Table 28, the hydro recorded the highest occurrences of deviations at 37.1 percent in Luzon. On the other hand, oil-based plants registered the highest occurrences of deviations at 45 percent in Visayas, although coal plants' was not so far off at 40.2 percent.

[12] RTD schedule – target loading level of each generator resource node at the end of the trading interval.
[13] Actual dispatch – actual loading of each generator resource node at the end of the trading interval (based on minute 59 snapshot data).
[14] +/-3% tolerance limit – initial dispatch tolerance limits adopted per PEM Board Resolution No. 2005-15.

Figure 34. Generator-Trading Intervals with RTD Deviation by Resource, July 2012

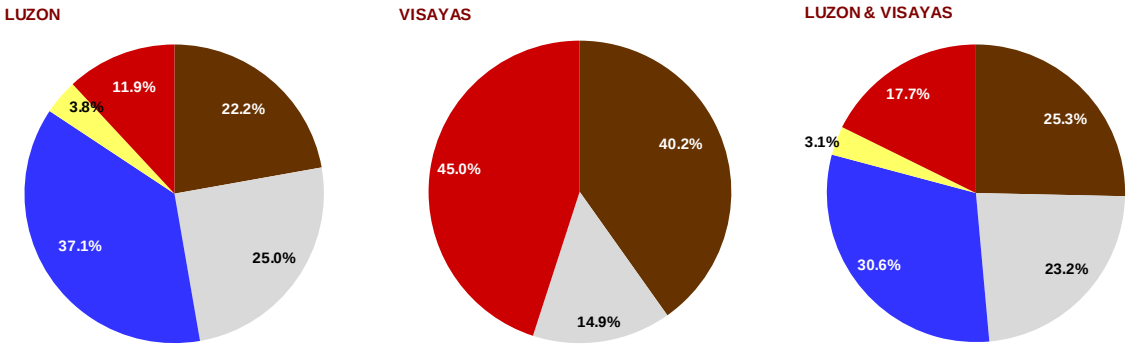


Table 28. Generator-Trading Intervals with RTD Deviation by Resource, July 2012

	Luzon		Visayas		Luzon and Visayas	
	Generator-Trading Intervals	% of Total	Generator-Trading Intervals	% of Total	Generator-Trading Intervals	% of Total
Coal	1,351	22.2%	519	40.2%	1,870	25.3%
Geothermal	1,523	25.0%	192	14.9%	1,715	23.2%
Hydro	2,257	37.1%	-	-	2,257	30.6%
Natural Gas	232	3.8%	-	-	232	3.1%
Oil-based	724	11.9%	581	45.0%	1,305	17.7%
Total	**6,087**	**100.0%**	**1,292**	**100.0%**	**7,379**	**100.0%**

Illustrated in Figure 35 and Table 29 are the summary of the generator-trading intervals with deviations classified according to the reasons provided by NGCP-SO. In Luzon, 17.8 percent and 14.4 percent of the total generator-trading intervals with deviations were due to reserve utilization and intra-hour variation in demand, respectively. In the case of Visayas, intra-hour variation topped the list at 7 percent, closely followed by non-compliance to dispatch instruction at 6.6 percent. However, reasons for the observed deviations in 55.1 percent and 76.2 percent of the total generator-trading intervals in Luzon and Visayas, respectively, have not been provided.

Figure 35. Generator-Trading Intervals with RTD Deviation by Reason, July 2012

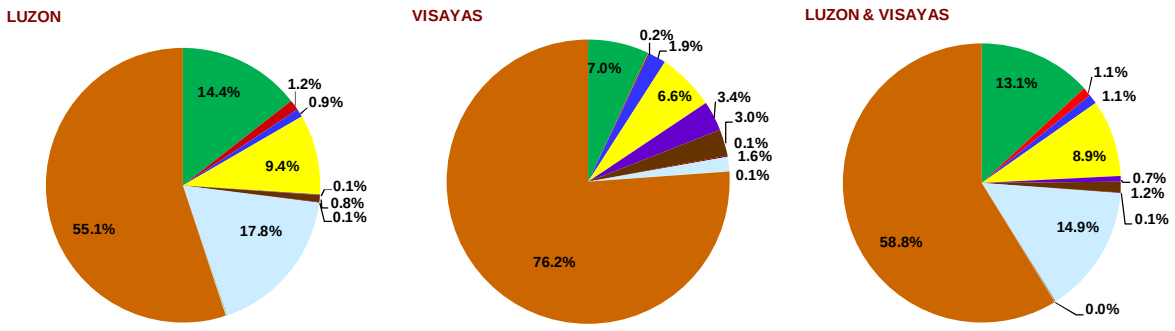


Table 29. Generator-Trading Intervals with RTD Deviation by Reason, July 2012

	Luzon		Visayas		Luzon and Visayas	
	Generator-Trading Intervals	% of Total	Generator-Trading Intervals	% of Total	Generator-Trading Intervals	% of Total
Intra-hour Variation	879	14.4%	90	7.0%	969	13.1%
Affected by Non-Compliance of Other Generators	76	1.2%	2	0.2%	78	1.1%
Start-up/Shutdown, Generator/Load Tripping	57	0.9%	25	1.9%	82	1.1%
Generator Problem	574	9.4%	85	6.6%	659	8.9%
Non-Compliance to Dispatch Instruction	4	0.1%	44	3.4%	48	0.7%
Must Run Units	51	0.8%	39	3.0%	90	1.2%
Line Limitation	6	0.1%	1	0.1%	7	0.1%
Reserve Utilization	1,082	17.8%	21	1.6%	1,103	14.9%
RTD Discrepancy	4	0.1%		0.0%	4	0.1%
Island Grid	2	0.0%	1	0.1%	3	0.0%
Sub - Total	**2,735**	**44.9%**	**308**	**23.8%**	**3,043**	**41.2%**
No Report from SO	3,352	55.1%	984	76.2%	4,336	58.8%
Total	**6,087**	**100.0%**	**1,292**	**100.0%**	**7,379**	**100.0%**