MONTHLY MARKET ASSESSMENT REPORT

For the Billing Period 26 August to 25 September 2011

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Market Assessment Highlights

This Report highlights the results of the integrated Luzon and Visayas market operation for the period 26 August to 25 September 2011 and how the market performed compared with the previous billing month.

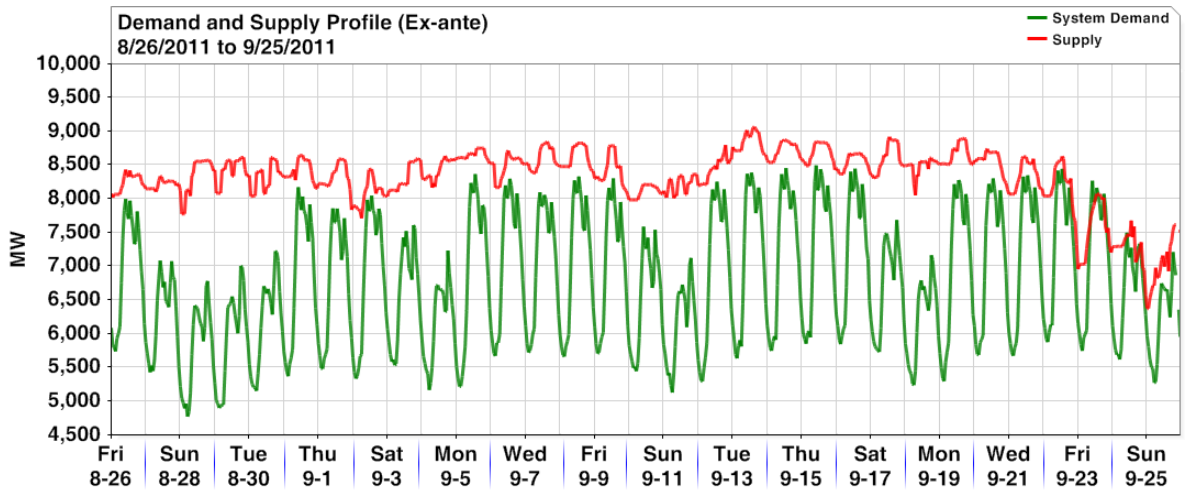
Supply and Demand Situation

The monthly average system demand[1] (ex-ante) in September 2011 slightly increased by 0.2 percent to 6,777 MW with the hourly demand ranging from a minimum of 4,775 MW to a maximum of 8,498 MW *(Table 1)*. The regional average demand in Luzon decreased by 0.3 percent from 5,711 MW to 5,692 MW, while the average demand in Visayas increased by 2.9 percent from 1,054 MW to 1,085 MW. *(Table 2)*.

The monthly average supply[2] during the period range from 6,375 MW to 9,069 MW. The monthly average supply was lower from the previous billing month by 1.3 percent (8,438 MW to 8,332 MW) *(Table 1).* The average supply in Luzon region decreased by 1.6 percent (6,887 MW to 6,773 MW) while the average supply in Visayas increased by 0.4 percent (1,551 MW to 1,558 MW) *(Table 3).*

The resulting margin between the supply and demand in September was calculated at an average of 1,554 MW (minimum of negative 437 MW and maximum at 3,492 MW). This was lower by 7.1 percent from the previous billing month's average margin of 1,674 MW *(Table 1)*.

Figure 1. Demand and Supply (Ex-ante), September 2011



[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), August and September 2011

	August 2011 (In MW)			September 2011 (In MW)			% M-on-M Change (Aug 2011 - Sep 2011)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Demand	8,462	4,756	6,765	8,498	4,775	6,777	0.4	0.4	0.2
Supply	9,156	6,926	8,438	9,069	6,375	8,332	(1.0)	(7.9)	(1.3)
Supply/Demand Variance	3,407	67	1,674	3,492	(437)	1,554	2.5	(749.1)	(7.1)

Note: The derived values were non-coincident.

Table 2. Regional Demand Summary (Ex-ante), August and September 2011

	August 2011 (In MW)			September 2011 (In MW)			% M-on-M Change (Aug 2011 - Sep 2011)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Luzon	7,169	3,984	5,711	7,152	3,967	5,692	(0.2)	(0.4)	(0.3)
Visayas	1,365	767	1,054	1,426	767	1,085	4.4	0.0	2.9

Note: The derived values were non-coincident.

Table 3. Regional Supply Summary (Ex-ante), August and September

	August 2011 (In MW)			September 2011 (In MW)			% M-on-M Change (Aug 2011 - Sep 2011)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Luzon	7,624	5,347	6,887	7,418	4,949	6,773	(2.7)	(7.4)	(1.6)
Visayas	1,705	1,242	1,551	1,693	1,354	1,558	(0.7)	9.0	0.4

Note: The derived values were non-coincident.

Plant Outages

Figures 2 and 4 below show the outage capacity *(forced and scheduled)* by plant type considered during the ex-ante scheduling process (left Y-Axis) compared with the outage schedule based on NGCP-SO's CY2011 Grid Operating and Maintenance Program (GOMP).

In Luzon, one unit of coal plant Sual was on maintenance outage during the month consistent with the GOMP. The outages of the other major plants were forced outages, thus, were not consistent with the GOMP.

The capacity on outage in Luzon (during ex-ante) averaged 2,248 MW ranging from 2,054 MW to 3,721 MW. The monthly average outage capacity in September was higher by 12 percent than the previous billing month. *(Figure 2 and Table 4)*

Figure 2. Plant Outage Capacity, September 2011 - Luzon

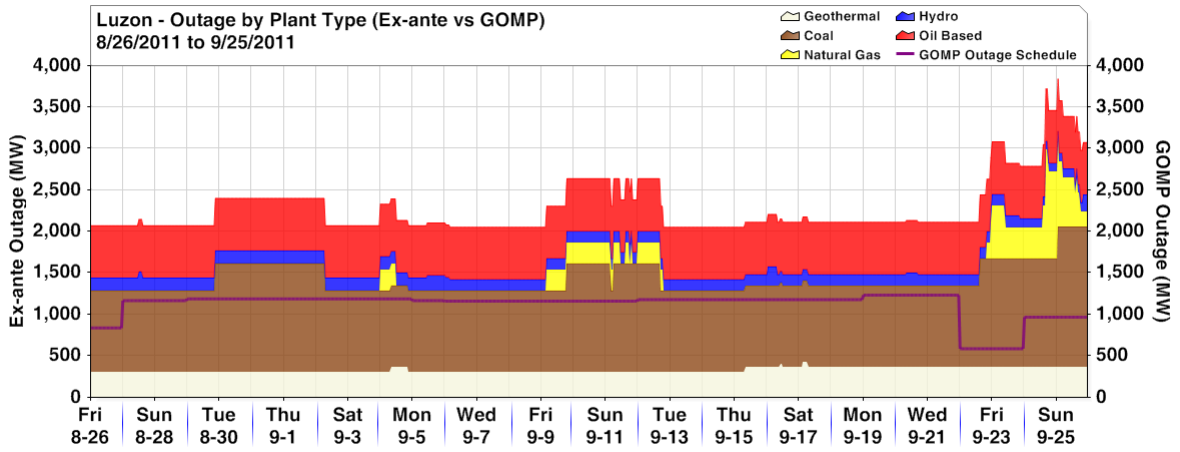


Table 4. Luzon Regional Outage Summary (Ex-ante), August and September 2011 (Non Coincident)

Resource Type	August 2011 (In MW)			September 2011 (In MW)			% M-on-M Change (Aug 2011 - Sep 2011)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Coal	2,083	330	1,020	1,689	977	1,091	(18.9)		6.9
Natural Gas	903	0	25	1,313	0	86	45.5		238.8
Geothermal	434	308	310	430	308	330	(0.9)	0.0	6.2
Hydro	354	76	215	232	102	143	(34.4)	34.2	(33.2)
Oil Based	632	242	432	632	632	632	0.0	161.2	46.2
TOTAL	3,272	1,519	1,998	3,721	2,054	2,248	13.7	35.2	12.5

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

Table 5 below lists the outages of coal and natural gas plants in Luzon for the billing of month of September 2011.

Table 5. Major Plant Outages, Luzon, September 2011

Plant/Unit Name	Date/Time Out	Date/Time In	Outage Type	Reason
Coal				
Sual 1	2011-08-20 23:33:00		Maintenance Outage	Maintenance outage
Calaca 1	2011-08-29 22:15:00		Forced Outage	Emergency shutdown due to suspected reheater leak.
Calaca 2	2011-07-18 12:11:00	2011-09-02 06:17:00	Forced Outage	Tripped due to defective switch of auxiliary transformer number 1
Calaca 2	2011-09-09 18:45:00	2011-09-12 16:12:00	Forced Outage	Loss of excitation voltage
Calaca 2	2011-09-22 14:26:00		Forced Outage	Emergency shutddown due to suspected boiler tube leak
Pagbilao 1	2011-09-25 00:09:00		Forced Outage	Repair of submerege flight conveyor
Natural Gas				
Ilijan A2	2011-09-22 20:05:00	2011-09-25 04:51:00	Forced Outage	Emergency shutdown due to natural gas fuel supply restriction from SPEX Malampaya onshore gas plant
Ilijan A2	2011-09-25 14:15:00	2011-09-25 16:44:00	Forced Outage	Tripped by protection blade path temperature.
Ilijan B1	2011-09-24 15:46:00		Forced Outage	Natural gas fuel supply restriction from SPEX Malampaya onshore gas plant.
Ilijan B2	2011-09-22 23:43:00		Forced Outage	Natural gas supply restrictionfrom SPEX
Ilijan B3	2011-09-24 15:27:00	2011-09-24 17:47:00	Forced Outage	Natural gas fuel supply restriction from SPEX Malampaya onshore gas plant.
Sta. Rita 1	2011-09-09 04:30:00	2011-09-11 11:42:00	Maintenance Outage	Compressor washing and balancing of steam turbine
Sta. Rita 1	2011-09-11 15:20:00	2011-09-11 19:19:00	Forced Outage	High steam turbine vibration
Sta. Rita 1	2011-09-11 22:58:00	2011-09-12 18:27:00	Forced Outage	High steam turbine vibration
Sta. Rita 3	2011-09-04 00:43:00	2011-09-04 11:46:00	Maintenance Outage	Offline compressor washing
Sta. Rita 3	2011-09-24 14:56:00	2011-09-24 17:38:00	Forced Outage	High diff. pressure due to clogged filter
Sta. Rita 4	2011-09-22 22:28:00	2011-09-23 09:38:00	Forced Outage	Tripped during changeover from diffusion to premix oil
San Lorenzo 1	2011-09-24 16:18:00	2011-09-25 01:52:00	Forced Outage	Natural gas fuel supply restriction from SPEX Malampaya onshore gas plant.

In Visayas, the capacity on outage averaged at 183 MW (minimum of 95 MW and maximum of 283 MW) *(Figure 3, Table 6)*.

Figure 3. Plant Outage Capacity, September 2011 - Visayas

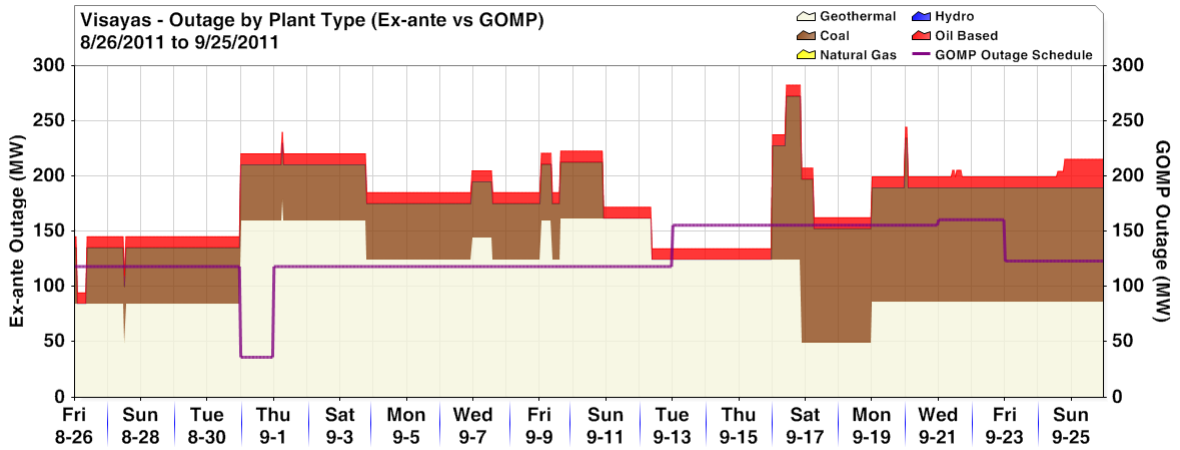


Table 6. TaVisayas Regional Outage Summary (Ex-ante), August and September 2011

Resource Type	August 2011 (In MW)			September 2011 (In MW)			% M-on-M Change (Aug 2011 - Sep 2011)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Coal	82	0	5	148	0	60	80.5		1,168.0
Geothermal	105	85	89	179	50	113	70.5		27.2
Hydro	0	0	0	0	0	0			
Oil Based	107	10	12	26	10	11	(75.7)	0.0	(7.8)
TOTAL	274	95	105	283	95	183	3.3	0.0	73.5

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

Table 7 below lists the outages of coal and geothermal plants in Visayas for the billing of month of September 2011.

Table 7. Major Plant Outages, Visayas, September 2011

Plant/Unit Name	Date/Time Out	Date/Time In	Outage Type	Reason
Coal				
Cebu TPP1	2011-09-16 08:54:00	2011-09-17 05:07:00	Forced Outage	deaerator steam line leak
Cebu TPP1	2011-09-19 23:12:00	2011-09-20 01:35:00	Forced Outage	FDF and IDF trip interlock activated.
Cebu TPP2	2011-08-25 22:29:00	2011-08-26 01:03:00	Forced Outage	Tripped due to boiler super heater temperature high.
Cebu TPP2	2011-08-26 08:26:00	2011-09-10 21:47:00	Forced Outage	Steam leakages at turbine
Kepco Salcon 1	2011-09-16 00:04:00		Maintenance Outage	Annual PMS
Geothermal				
NNGPP	2011-07-01 00:11:00		Maintenance Outage	To conduct plant rectification
PGPP1 Unit 1	2011-09-19 00:01:00		Maintenance Outage	To conduct majro rehab of the unit.
PGPP1 Unit 2	2011-06-10 10:38:00	2011-09-03 18:17:00	Forced Outage	Affected by the lightning strike
PGPP1 Unit 3	2011-09-09 09:05:00	2011-09-12 08:01:00	Maintenance Outage	Replacement of turbine rotor
PGPP2 Unit 3	2011-09-01 02:40:00	2011-09-01 06:10:00	Forced Outage	Tripped withGenerator overfluxindication.
PGPP2 Unit 1	2011-09-06 22:15:00	2011-09-07 13:04:00	Forced Outage	Recalibration of erratic LV200 (Hotwell level controller)

Market Price Outcome

The monthly average price[3] in September increased by 2.9 percent to PhP3,796/MWh from PhP3,688/MWh in August with the highest price posted at PhP45,667/MWh on September 24th and lowest at PhP0.00/MWh. High prices were observed in the last week of the billing month.

[3] 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.

Looking at regional prices, the calculations also showed an increase in the price outcomes for Luzon and Visayas. The average price in Luzon increased by 2.7 percent from PhP3,672/MWh to PhP3,772/MWh, while the average price in Visayas increased by 4.2 percent from PhP3,780/MWh to PhP3,937/MWh *(Table 8)*. Regional prices reached a high of PhP46,679/MWh in Luzon and PhP40,470/MWh in Visayas on (September 24, 2200H).

Figure 4. Market Price Trend, September 2011

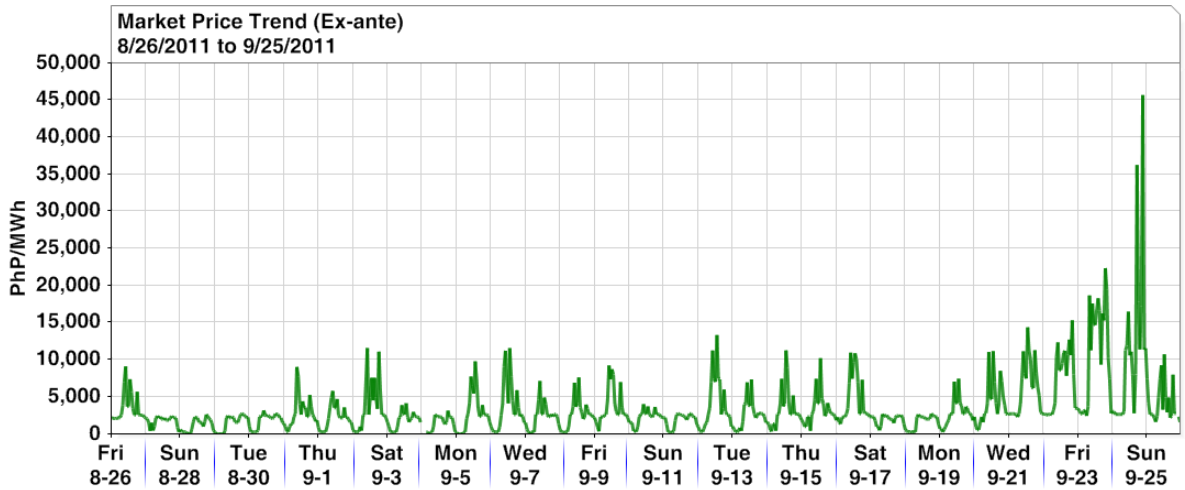


Table 8. Market Price Summary, August and September 2011

	August 2011 (In PhP/MWh)			September 2011 (In PhP/MWh)			% M-on-M Change (Aug 2011 - Sep 2011)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Luz-Viz	62,552	0	3,688	45,667	0	3,798	(27.0)		3.0
Luzon	62,686	0	3,672	46,679	0	3,772	(25.5)		2.7
Visayas	61,808	0	3,780	40,470	0	3,938	(34.5)		4.2

The frequency of market prices falling within the price levels of PhP2,000/MWh and below increased from 22.6 percent of the time in August to 28.8 percent in September. On the other hand, the frequency of prices falling within the price level of PhP2,000/MWh to PhP4,000/MWh decreased from 60.4 percent to 48.7 percent.

Prices falling within the price levels of PhP4,000/MWh to PhP10,000/MWh, and Php10,000/MWh and above also increased from 11.6 percent to 15.5 percent, and 4.6 percent to 6.6 percent, respectively. *(Figure 5 and Table 9)*

Figure 5. Market Price Distribution, August and September 2011

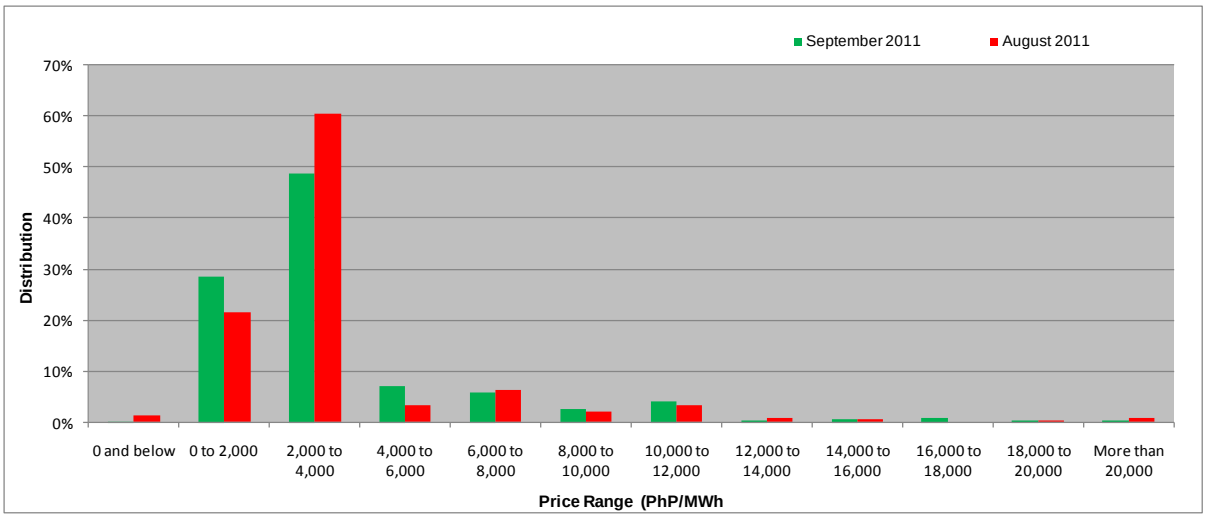


Table 9. Market Price Distribution, August and September 2011

Price Range (PhP/MWh)	% Distribution	
	August. 2011	September. 2011
0 and below	1.2	0.1
0 to 2,000	21.4	28.7
2,000 to 4,000	60.4	48.7
4,000 to 6,000	3.4	7.0
6,000 to 8,000	6.3	5.8
8,000 to 10,000	1.9	2.7
10,000 to 12,000	3.2	4.2
12,000 to 14,000	0.7	0.4
14,000 to 16,000	0.4	0.7
16,000 to 18,000	-	0.9
18,000 to 20,000	0.3	0.4
More than 20,000	0.8	0.4

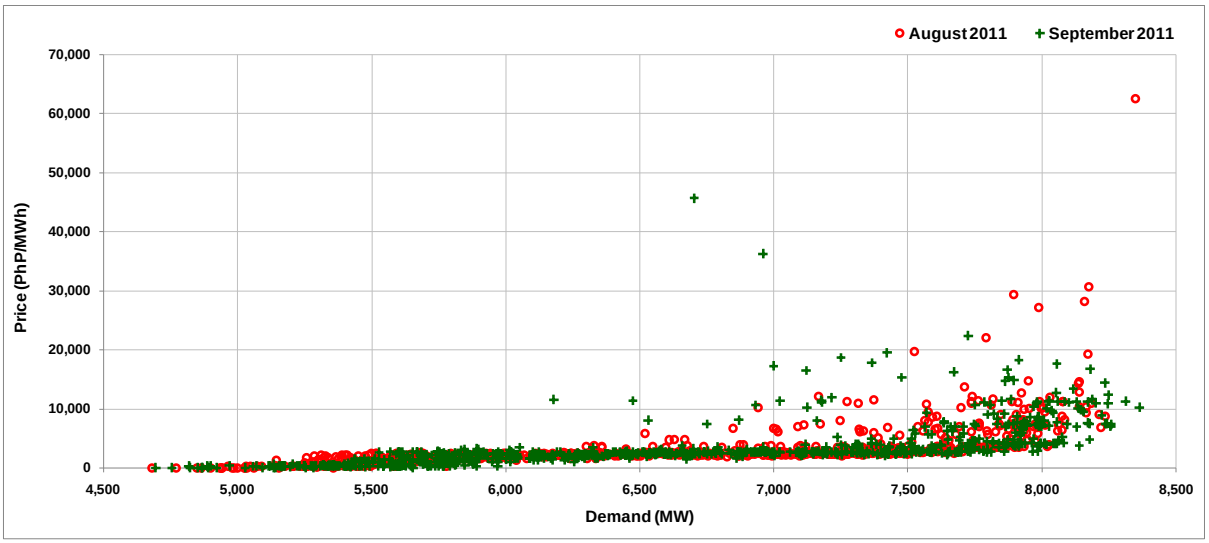
Similar with the previous month's results, the average price in Luzon was 4.4 percent lower than the average price in Visayas *(Table 10)*.

Table 10. Regional Price Summary, August and September 2011

	Luzon (In PhP/MWh)			Visayas (In PhP/MWh)			% Difference		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
September 2011	46,679	0	3,772	40,470	0	3,938	(13.3)		4.4
August 2011	62,686	0	3,672	61,808	0	3,780	(1.4)		2.9

Figure 6 shows the correlation of the hourly prices and demand in September 2011 and the previous billing month of August. In general, both periods showed significant positive relationship between price and demand, however, the correlation was higher in August.

Figure 6. Price versus Demand, August and September 2011



Fouth Week High Prices

High market prices were observed in the fourth week of the billing month reaching as high as PhP45,667/MWh on September 24 at 2200H.

The decreasing trend in supply during the week had driven the increase in the market prices. Several factors have contributed to the decrease in supply including the limited capability and forced outages of major coal plants in Luzon and the natural gas supply restriction from SPEX that greatly affected the operations of the Ilijan, Sta. Rita and San Lorenzo natural gas plants.

The generating capacity of coal plant QPPL *(with registered capacity of 459 MW)* was reduced to about 188 MW starting September 20 due to equipment-related concern. Meanwhile, coal plant Calaca Unit 2 *(with registered capacity of 330 MW)* went on force outage on September 22 (at 1426H) due to suspected boiler tube leak. On September 25, coal plant Pagbilao Unit 1 *(with registered capacity of 382 MW)* went on emergency shutdown due also to equipment-related concern.

The supply decreased further on the eve of September 22 brought about by the natural gas supply restriction from SPEX Malampaya on-shore gas plant. One gas turbine from each block of the Ilijan natural gas plant was shutdown, which effectively reduced the plant's generating capacity to 600 MW *(from registered capacity of 1,200 MW)*. Meanwhile, Sta. Rita Unit 4 *(with registered capacity of 259.1 MW)* tripped (at 2228H) during changeover from natural gas to alternate fuel *(the unit went back online at 0938H of the following day)*.

The impact of the natural gas restriction was felt further on Saturday, September 24 as the remaining two units of Ilijan Block B were shutdown at 1527H and 1902H, respectively. The San Lorenzo Unit 1 *(with registered capacity of 261.5 MW)* was likewise shutdown on same day (at 1618H) until the early morning of the following day. The natural gas supply from SPEX normalized early Monday, September 26.

Fortunately, during the period of gas supply restrictions, the other Sta. Rita units have changed over to alternate fuel, thus, have continuously provided the needed generation. Meanwhile, the oil-based Malaya Unit 2 was operated as must run unit to augment the supply starting September 23.

It was noted that no negative reactionary bidding behavior was observed from the other trading participants during the periods of tight supply condition. The resulting prices were then the product of the interaction between supply and demand. Notwithstanding, it was noted that high offer prices were present prior to and during the tight supply condition.

Pricing Errors and Market Intervention

The summary of the issuance of pricing error notice (PEN), application of the price substitution methodology (PSM) and initiation of market intervention (MI) is shown in Table 11.

The market results showed pricing errors occurring in Luzon at about 38 percent of the time or 286 trading intervals during the ex-ante process, which was primarily due to the violation of the contingency (N-1) requirement at MERALCO interchange substations in Zapote, Duhat and Araneta. Meanwhile, system-wide pricing errors were issued in 18 trading intervals due to undergeneration *(generation deficiency)* conditions and base case *(transformer limit)* constraint violations.

The ex-post market results, on the other hand, indicated system-wide pricing errors in 18 trading intervals due to base case constraint violation and undergeneration conditions. Luzon had seven trading intervals with PEN due to undergeneration conditions. Also, Visayas had seven trading intervals with pricing error due to basecase constraint violations.

During ex-ante, the PSM was applied for the whole system (Luzon and Visayas) in 99 trading intervals. Luzon had one trading interval with PSM application during ex-ante. Majority of the PSM applications were brought about by the constraint at Calauan – Makban A 230kV Line due to the N-1 contingency applied at the Araneta – Sucat 230 kV Lines. The other causes of the PSM applications were the constraint at Amadeo – Calaca 230 kV Line 1 due to the contingency trip of Binan-Calaca 230 kV line, and constraint at the New San Manuel – Pantabangan 230kV and Pantabangan – Cabanatuan 230 kV lines due to the N-1 contingency applied at San Manuel 600 MVA transformers.

Table 11. PEN, PSM and MI Summary, September 2011

	Luz-Viz		Luzon		Visayas		Total	
	Freq.	% of Time	Freq.	% of Time	Freq.	% of Time	Freq.	% of Time
PEN (RTD)	18	2.4	286	38.4	7	0.9	304	40.9
PEN (RTX)	18	2.4	7	0.9	7	0.9	32	4.3
PSM (RTD)	99	13.3	1	0.1		-	100	13.4
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)

HVDC Scheduling and Price Separations

A constraint in the Leyte-Luzon HVDC occurs if the actual or restricted capability of the submarine cable is not enough to accommodate the resulting power transfer between Luzon and Visayas based on the trading participants’ offers and demand conditions in the regions. The constraint will result to the occurrence of price separation between Luzon and Visayas.

In September, constraint in the Leyte-Luzon HVDC occurred in 23 trading intervals during ex-ante and 20 trading intervals during ex-post. The constraints occurred in relevant trading intervals where the transfer capability of the HVDC was restricted by the NGCP-SO due

maintenance activities. The occurrence of constraints in the Leyte-Luzon HVDC was lower compared with the previous billing month *(Tables 12 and 13).*

Table 12. Summary of HVDC Limits Imposed by NGCP-SO and Results of HVDC Schedules (Ex-ante and Ex-post), September 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	150/200	150/220	150/440	Total	0/0	150/200	150/220	150/440	Total
Visayas to Luzon	**-**	**76**	**20**	**593**	**689**	**-**	**66**	**20**	**578**	**664**
Limit Not Maximized		*73*	*3*	*593*	*669*		*66*	*2*	*578*	*646*
Limit Maximized [1\]		*3*	*17*		*20*			*18*		*18*
Luzon to Visayas	**-**	**9**	**-**	**42**	**51**	**-**	**19**	**-**	**58**	**77**
Limit Not Maximized		*9*		*42*	*51*		*19*		*58*	*77*
No Flow [1\]	**3**				**3**	**2**				**2**
TOTAL	**3**	**85**	**20**	**635**	**743**	**2**	**85**	**20**	**636**	**743**

Notes: 1\ with price separation

Table 13. Summary of HVDC Limits Imposed by NGCP-SO and Results of HVDC Schedules (Ex-ante and Ex-post), August 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)			
	150/100	150/200	150/440	Total	150/100	150/200	150/440	Total
Visayas to Luzon	**22**	**61**	**626**	**709**	**21**	**61**	**628**	**710**
Limit Not Maximized	*3*	*45*	*626*	*674*	*3*	*45*	*628*	*676*
Limit Maximized [1\]	*19*	*16*		*35*	*18*	*16*		*34*
Luzon to Visayas	**3**	**-**	**32**	**35**	**3**		**31**	**34**
Limit Not Maximized	*3*		*32*	*35*	*3*		*31*	*34*
TOTAL	**25**	**61**	**658**	**744**	**24**	**61**	**659**	**744**

Notes: 1\ with price separation

Price Setting Plants[4]

As shown in Figure 7, 24 plants from Luzon have been considered as price setters across all price levels in September. The frequent price setters during the month include the coal plants Pagbilao (at 33%), Sual (at 27%) and Masinloc (at 27%). These coal plants were also the most frequent price setters in August. One significant observation was the decrease in the price setting frequency of hydro plant San Roque in September.

In Visayas *(Figure 8),* 20 plants have been considered as price setters across all price levels with the coal plants PEDC (at 25%) and KSPC (at 22%), and geothermal plant Leyte A (at 17%) as most frequent price setters.

Figure 7. Price Setting Frequency Index (Luzon Plants), August and September 2011

[4] 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.

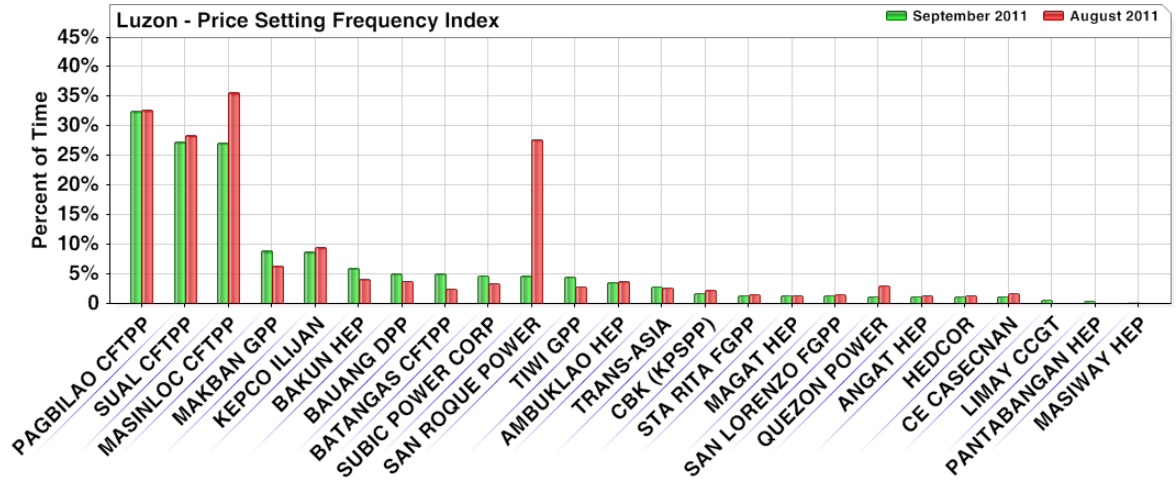
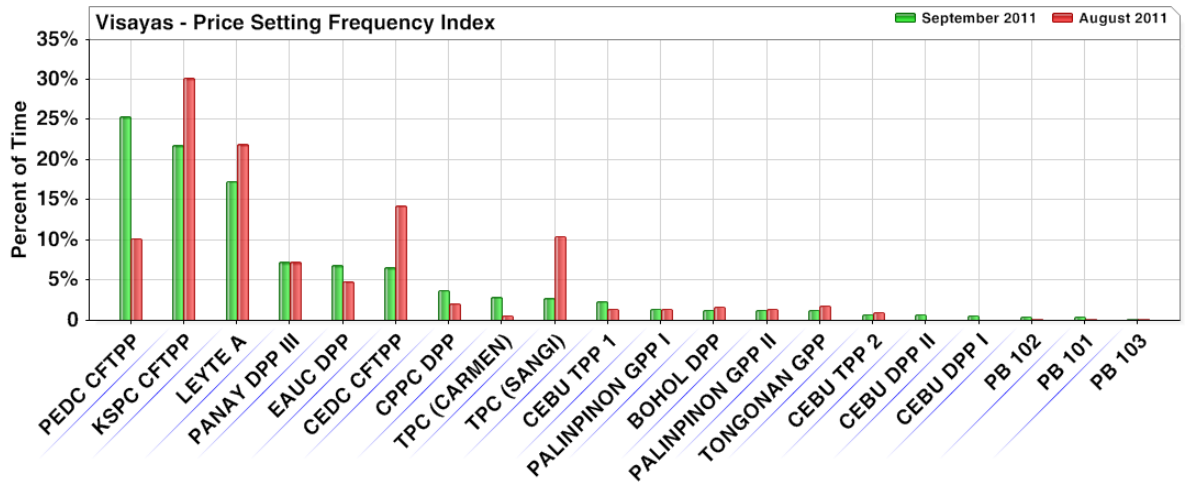
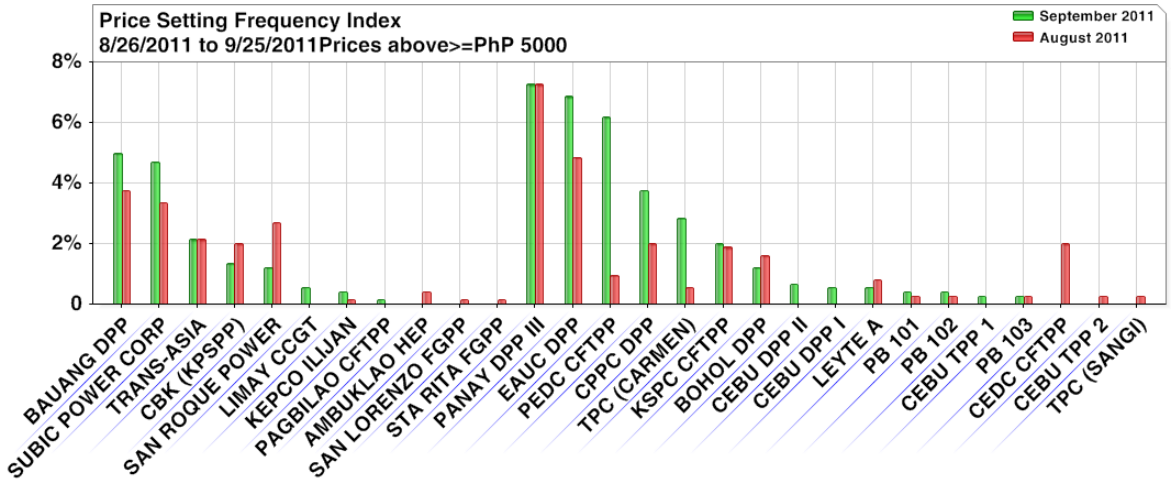


Figure 8. Price Setting Frequency Index (Visayas Plants), August and September 2011



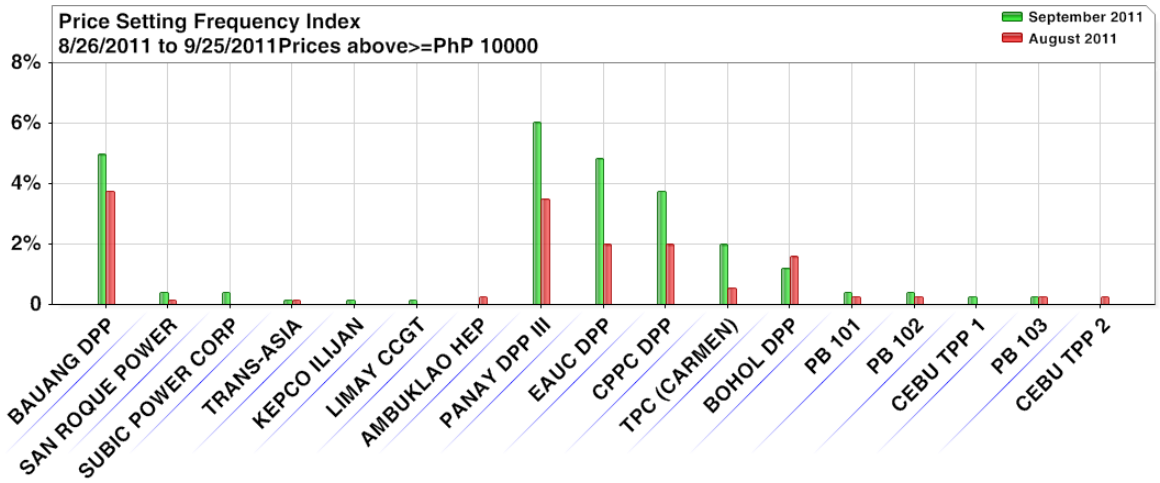
Looking at the PhP5,000/MWh and above price range, the number of price setters were reduced to twenty-two (22) plants, composed of nine (8) plants from Luzon and fourteen (14) plants from Visayas *(Figure 9)*. The oil-based plants Bauang (at 4.9%), Subic-Enron (at 4.7%), and Trans-Asia (at 2.1 %) topped the price setting plants from Luzon. Meanwhile, the oil-based plants Panay III (at 7.2%), EAUC (at 6.8%), CPPC (at 3.7%) and coal plant CEDC (at 6.1%) were the top price setting plants from Visayas.

Figure 9. Price Setting Frequency Index (PhP5,000 and Above), August and September 2011



The number of price setters at the price level of PhP10,000/MWh and above decreased to 15 plants, six plants from Luzon and 9 from Visayas *(Figure 10)*.

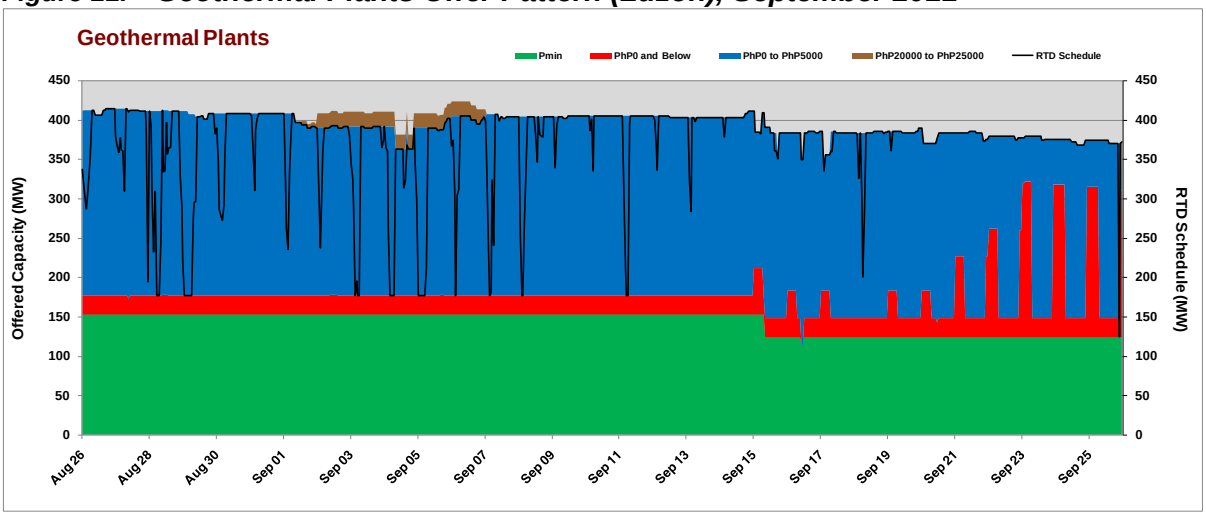
Figure 10. Price Setting Frequency Index (PhP10,000 and Above), August and September 2011



Generator Offer Pattern

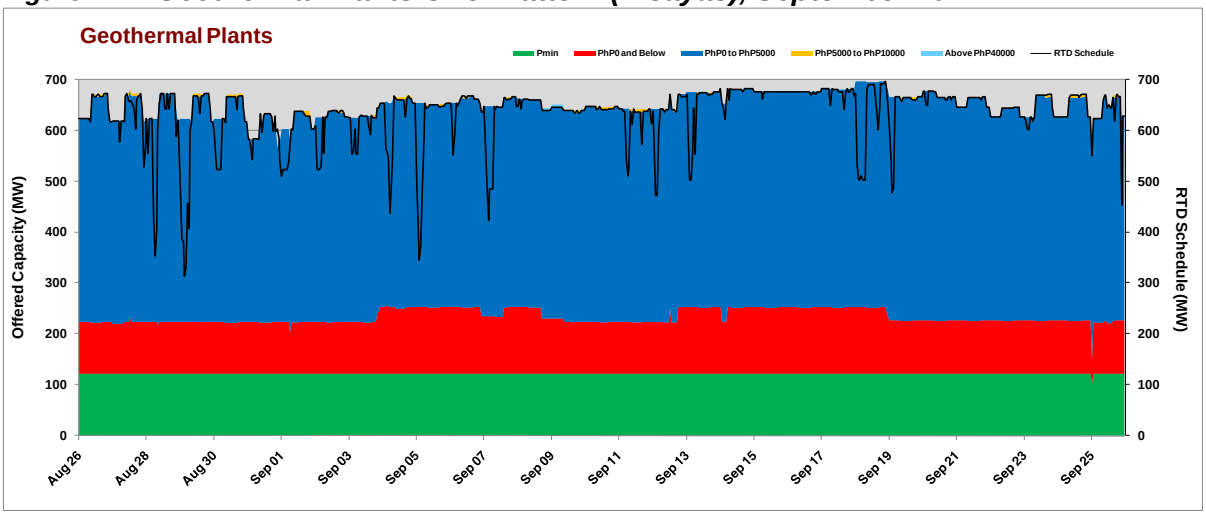
The offer prices of the geothermal plants in Luzon generally remained below PhP5,000/MW, except on September 2-8 where offer prices reached PhP20,000/MW to PhP25,000/MW for a 17 MW offered capacity. *(Figure 11)*.

Figure 11. Geothermal Plants Offer Pattern (Luzon), September 2011



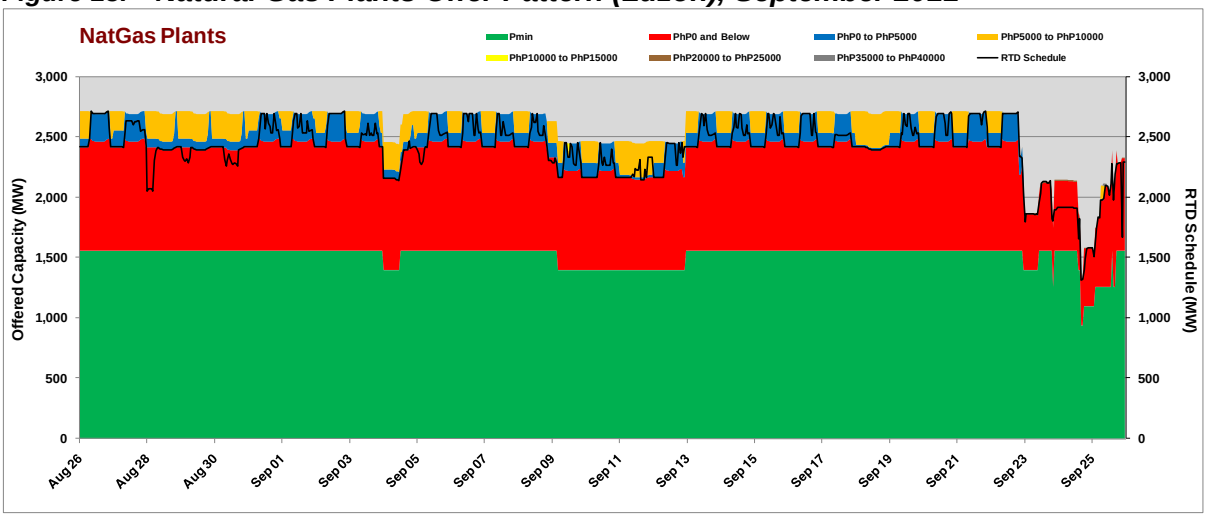
The offer pattern of the geothermal plants in Visayas showed consistency in the offer prices (below PhP5,000/MW), however, showed volatility in the offered capacity. *(Figure 12)*.

Figure 12. Geothermal Plants Offer Pattern (Visayas), September 2011



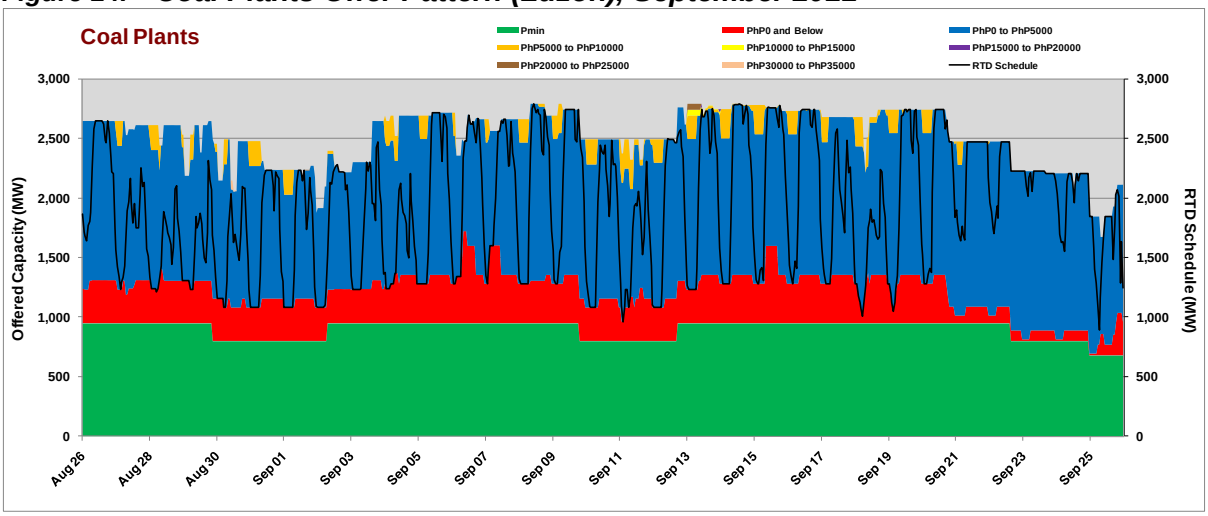
An increase in the offer prices of the natural gas plants was observed during the month compared with the previous month. About 4% of the offered capacities (average of 102 MW, maximum of 280 MW) were priced at the higher price range of PhP5,000/MW and PhP10,000/MW. The capacity offer of the natural gas plants notably decreased in the last four days of the billing period due to forced outages brought about by the gas supply restriction from SPEX *(Figure 13).*

Figure 13. Natural Gas Plants Offer Pattern (Luzon), September 2011



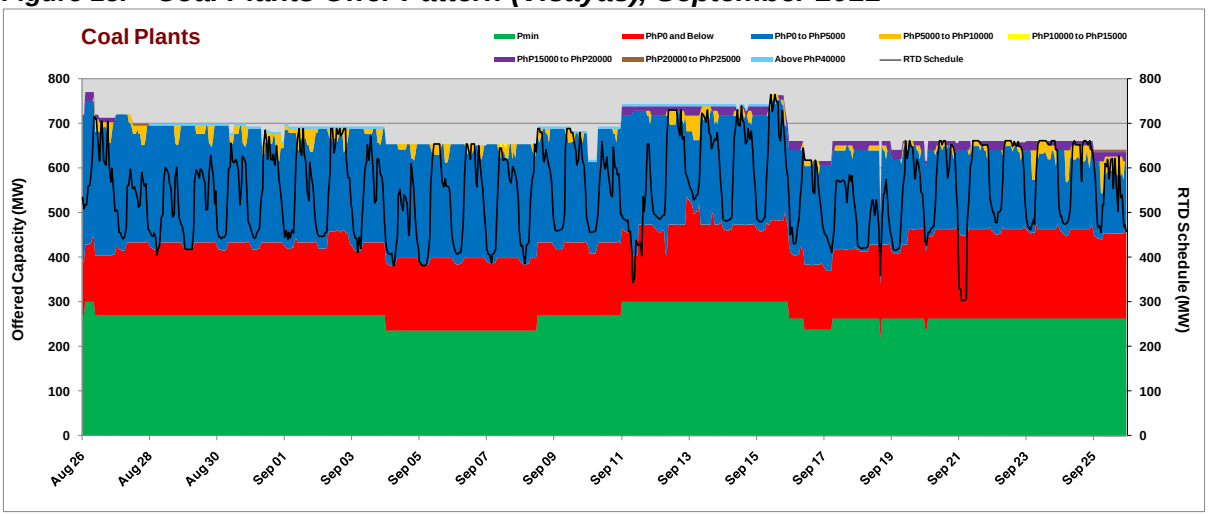
Similarly, an increase in the offer prices of coal plants in Luzon was observed during the month compared with the previous month. About 2% of the offered capacities (average of 46 MW, maximum of 297 MW) were priced at the higher price levels of PhP5,000/MW and PhP35,000/MW *(Figure 14).*

Figure 14. Coal Plants Offer Pattern (Luzon), September 2011



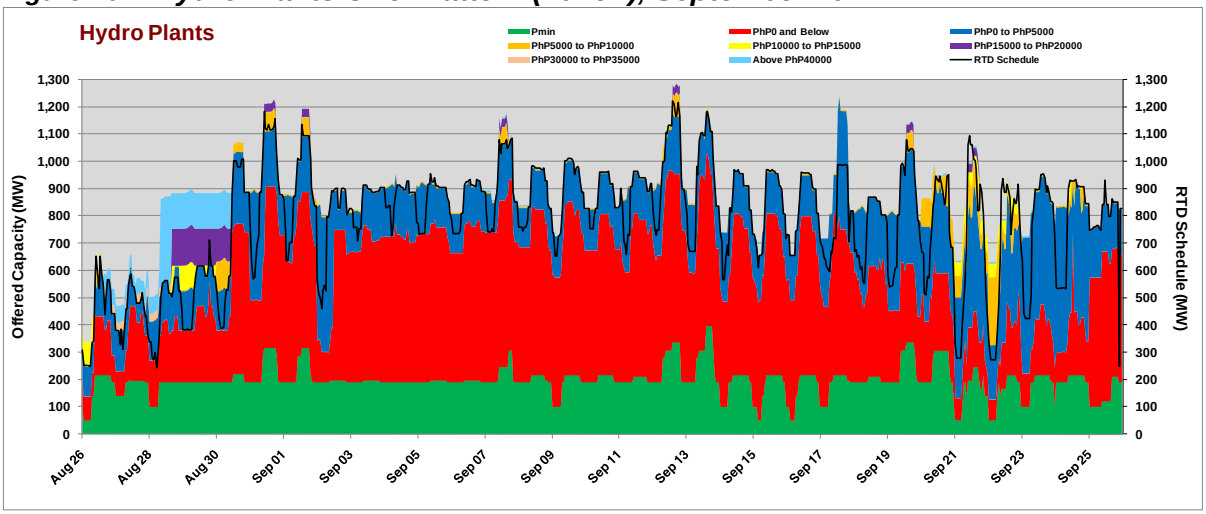
About 97% of the offered capacity of coal plants in Visayas (average of 663 MW) were priced below PhP5,000/MW. The other 3% of the offered capacities (average of 19 MW) were priced above PhP5,000/MW, reaching as high as PhP60,000/MW *(Figure 15)*.

Figure 15. Coal Plants Offer Pattern (Visayas), September 2011



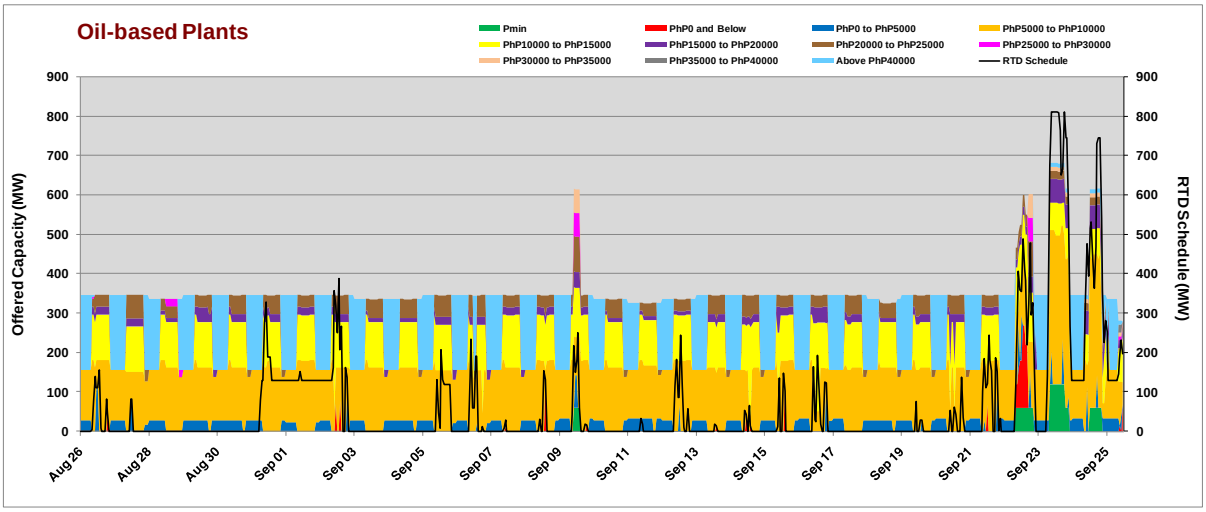
The aggregate hourly offer pattern of hydro plants in Luzon remained highly volatile in terms of capacity and price *(Figure 16)*. The capacity offers ranged from 337 MW to 1,284 MW while the offer prices ranged from negative PhP99,999.0/MW to PhP62,000/MW. In general, however, a decrease in the offer prices of the hydro plant in Luzon was observed during the month compared with the previous month.

Figure 16. Hydro Plants Offer Pattern (Luzon), September 2011



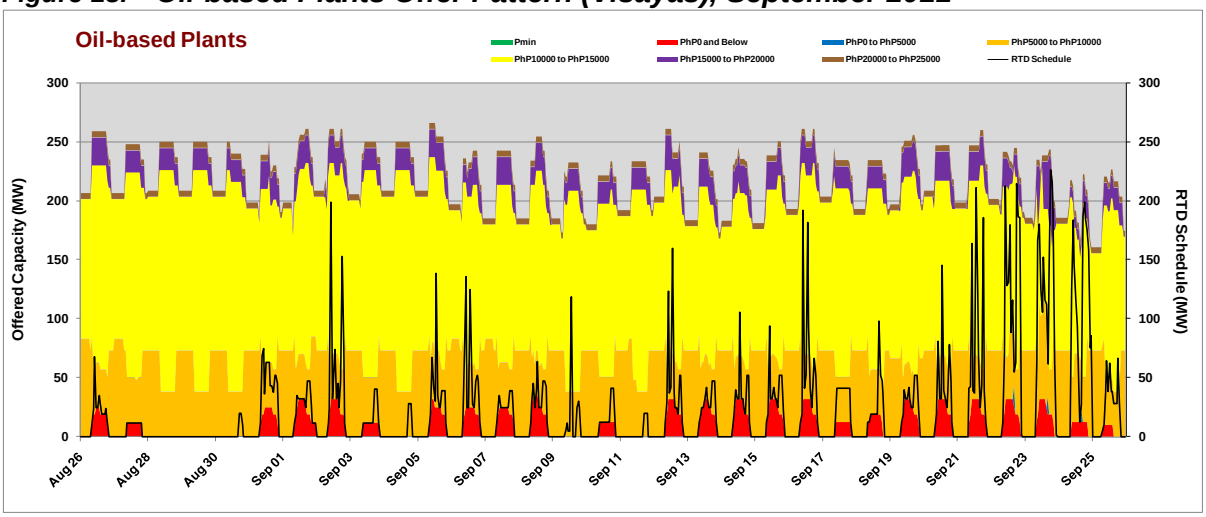
The oil-based plants Bauang DPP, Subic DPP, and Trans-Aisa have consistently submitted offers during the billing month. On the other hand, Limay CCGT occasionally submitted offers, while, Malaya TPP have not offered in the market *(Figure 17).*

Figure 17. Oil-based Plants Offer Pattern (Luzon), September 2011



The capacity and price offers from oil-based plants in Visayas ranged from 160 MW to 266 MW and PhP0.00/MW to PhP20,543/MW, respectively *(Figure 18)*.

Figure 18. Oil-based Plants Offer Pattern (Visayas), September 2011



Capacity Factor

The calculations showed a significant increase in the capacity factor of hydro plants in Luzon during the month brought about, among others, by the higher capacity offer at relatively lower prices resulting to higher RTD schedule. *(Figure 19 and table 14).*

Figure 19. Capacity Factor (Luzon Plants), September 2011

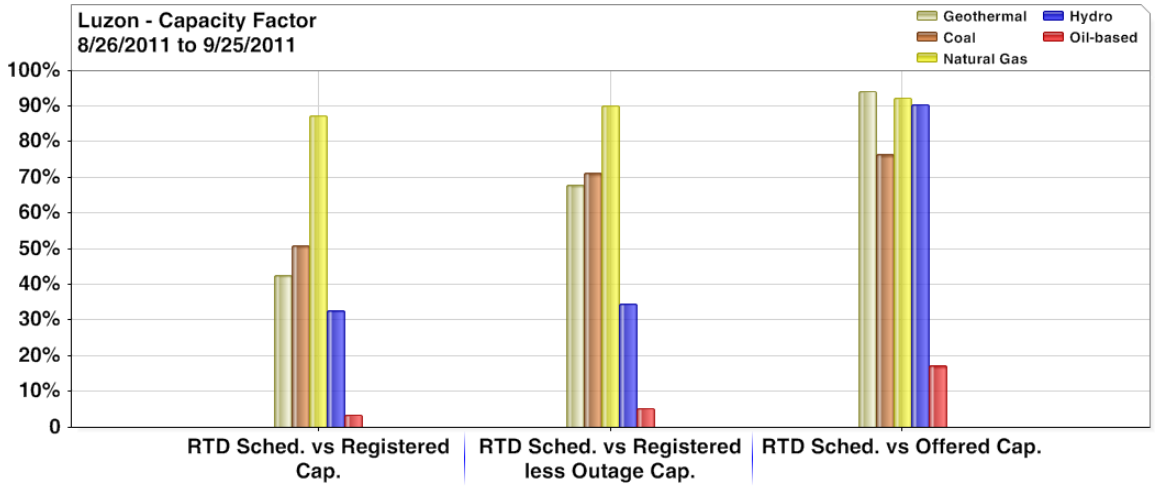


Table 14. Summary of Capacity Factor by Plant Type in Luzon, August and September 2011

Plant Type	RTD Sched. vs Registered Cap.			RTD Sched. vs Registered less Outage Cap.			RTD Sched. vs Offered Cap.		
	August 2011	September 2011	%Change	August 2011	September 2011	%Change	August 2011	September 2011	%Change
Coal	52%	51%	-2%	71%	71%	0%	78%	77%	-2%
Natural Gas	90%	87%	-3%	90%	90%	0%	93%	92%	0%
Geothermal	46%	43%	-8%	71%	68%	-5%	96%	94%	-2%
Hydro	25%	33%	33%	27%	35%	29%	74%	90%	22%
Oil-based	7%	3%	-48%	9%	5%	-39%	33%	17%	-48%

Table 15. Capacity Factor by Plant Type in Luzon, September 2011

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	1,438,404	2,828,601	2,018,386	1,880,182	51%	71%	77%
Natural Gas	1,785,749	2,045,553	1,981,667	1,932,995	87%	90%	92%
Geothermal	277,928	653,617	408,800	295,011	43%	68%	94%
Hydro	584,833	1,794,939	1,688,432	646,504	33%	35%	90%
Oil-based	45,969	1,348,256	878,680	265,654	3%	5%	17%

The calculations showed improvement in the capacity factors of the oil-based and geothermal plants in Visayas. On the other hand, calculations showed a decrease in the capacity factor of coal plants *(Figure 20 and Table 16).*

Figure 20. Capacity Factor (Visayas Plants), September 2011

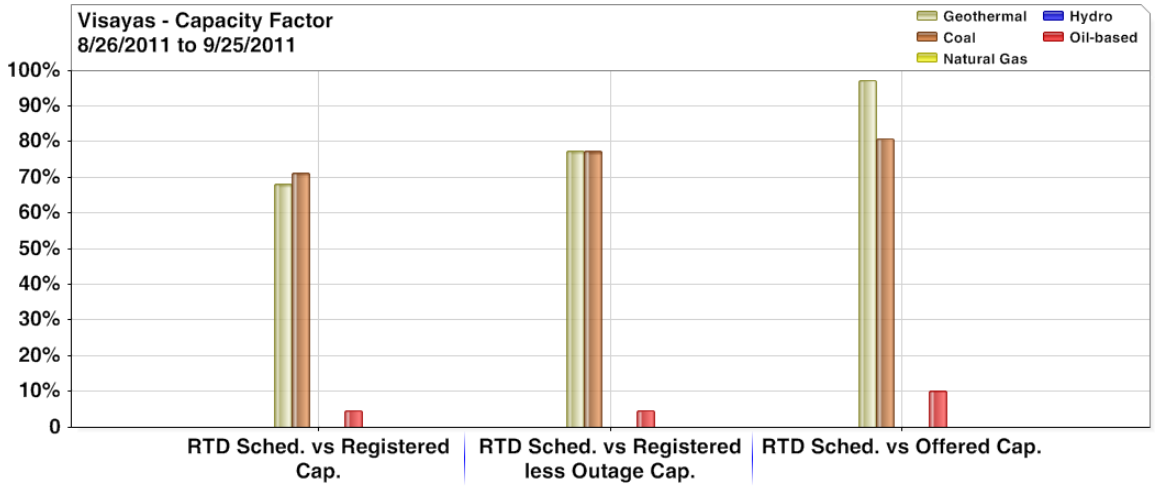


Table 16. Summary of Capacity Factor by Plant Type in Visayas, August and September 2011

Plant Type	RTD Sched. vs Registered Cap.			RTD Sched. vs Registered less Outage Cap.			RTD Sched. vs Offered Cap.		
	August 2011	September 2011	%Change	August 2011	September 2011	%Change	August 2011	September 2011	%Change
Coal	80%	71%	-11%	81%	77%	-4%	85%	81%	-5%
Geothermal	65%	68%	5%	72%	78%	8%	96%	97%	1%
Oil-based	4%	5%	30%	4%	5%	30%	8%	10%	26%

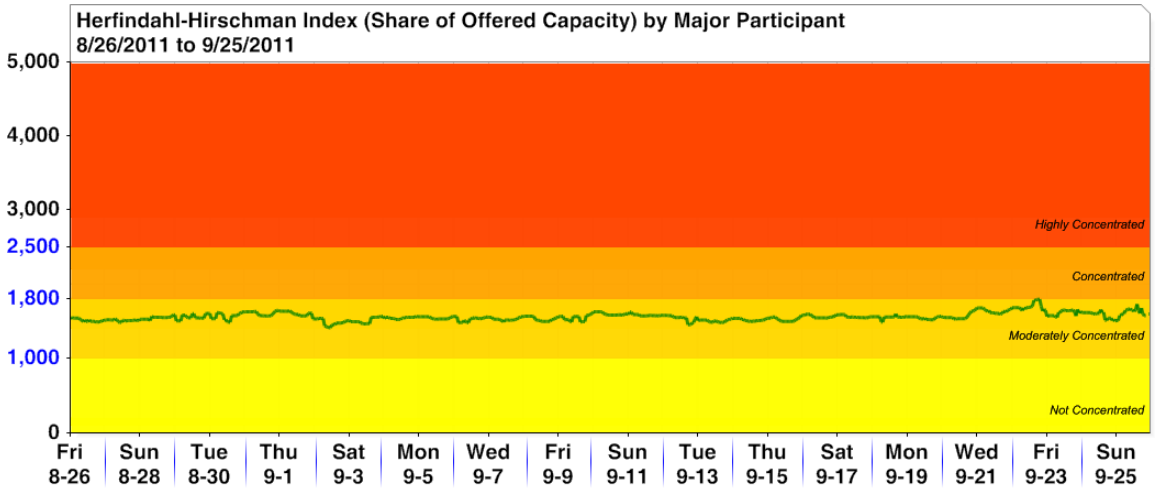
Table 17. Capacity Factor by Plant Type in Visayas, September 2011

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	411,802	576,749	531,989	509,324	71%	77%	81%
Geothermal	472,891	693,259	609,399	486,311	68%	78%	97%
Oil-based	16,776	367,685	359,720	164,080	5%	5%	10%

Market Concentration

The Herfindahl-Hirschman Index (HHI) calculated based on offered capacity by Major participants' grouping indicated a moderately concentrated market condition during the period *(Figure 21)*.

Figure 21. Hourly HHI based on Offered Capacity by Major Participant Grouping, September 2011



Compliance Monitoring

Compliance to Must Offer Rule

Continued non-compliance with the must-offer rule by generator trading participants was observed throughout the covered period. Figure 22 shows a high percentage of capacity gap[5] at around 64 percent and 70 percent of the total generator resource-trading intervals[6] in Luzon and Visayas, respectively.

Figure 22. Summary of Compliance Monitoring to Must Offer Rule, September 2011

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

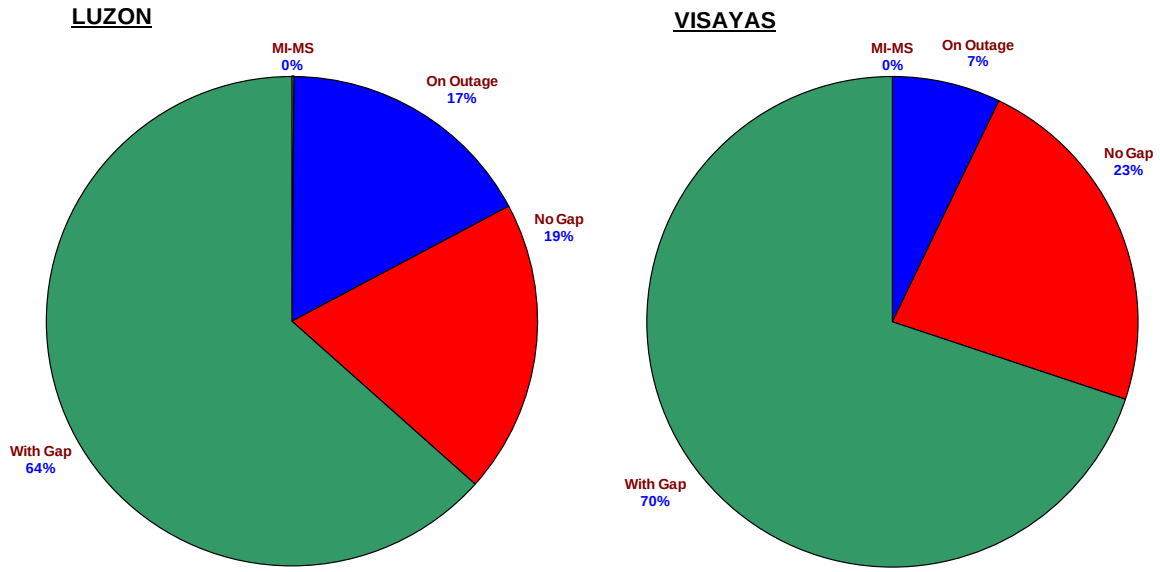
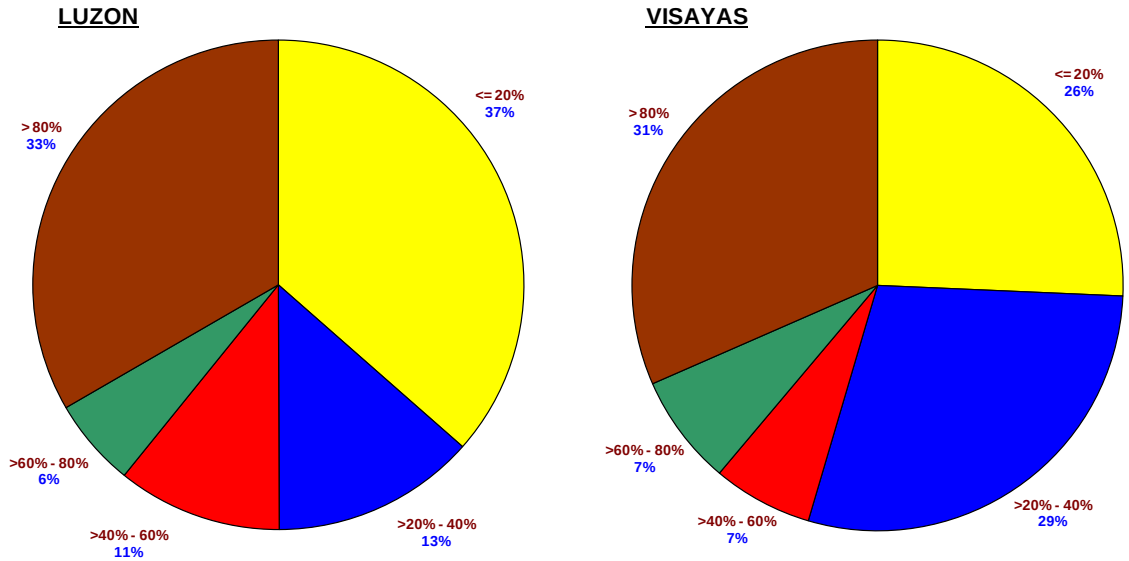


Figure 23 shows the proportion of the capacity gap to the registered capacity[7] net of outage capacity[8] and the corresponding frequency distribution of the generator resource-trading intervals with capacity gap. It shows that the proportion of the capacity gap above 80% constitute about 33% and 31% of the relevant generator resource-trading intervals in Luzon and Visayas, respectively.

Figure 23. Distribution of Observed Capacity Gap, September 2011



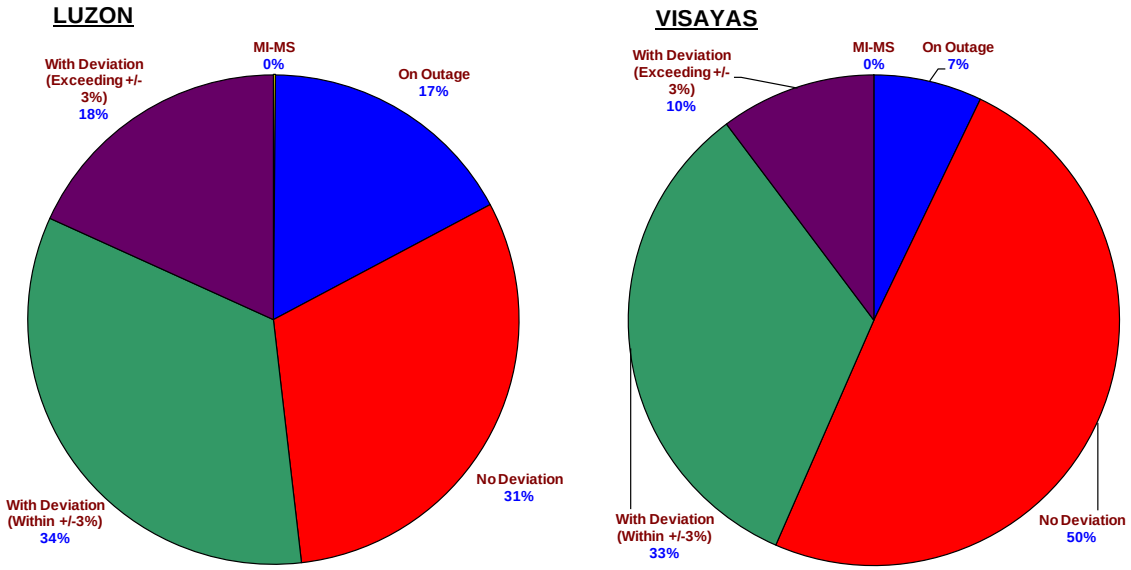
Compliance to RTD Schedule

Figure 24 shows that around 18 percent and 10 percent of the total generator resource-trading intervals in Luzon and Visayas, respectively, have deviations between the RTD

[7] Registered capacity - capacity of each generator resource node registered with the market.
[8] Outage capacity - validated outage capacity of each generator resource node per trading interval.

schedule[9] and actual dispatch[10] exceeding the +/-3% tolerance limit[11] in the billing month of September 2011.

Figure 24. Summary of Compliance Monitoring to RTD Schedule, September 2011



[9] RTD schedule - target loading level of each generator resource node at the end of the trading interval.
[10] Actual dispatch - actual loading of each generator resource node at the end of the trading interval (based on minute 59 snapshot data.
[11] +/-3% tolerance limit - initial dispatch tolerance limits adopted per PEM Board Resolution No. 2005-15.

The summary of dispatch deviations exceeding the +/-3% in terms of percent deviation and frequency distribution is shown in Figure 25. Majority of the dispatch deviations were within +/-20% at about 68 percent and 66 percent of the relevant generator resource-trading intervals in Luzon and Visayas, respectively. Likewise noted was the frequency of dispatch deviations exceeding 80 percent at 17 percent and 18 percent in Luzon and Visayas, respectively.

Figure 25. Distribution of Observed Deviation, September 2011