

## PEMCO MARKET ASSESSMENT HIGHLIGHTS

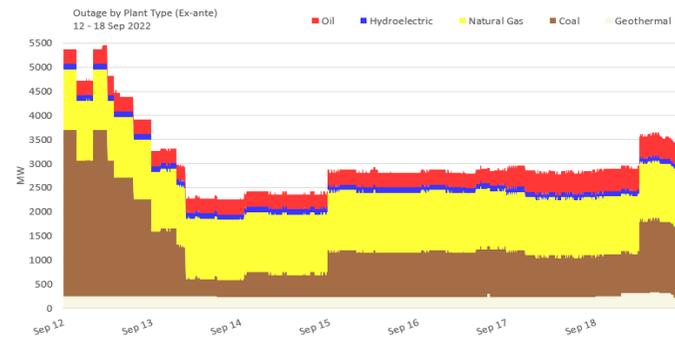
- The average demand and the reserve schedule, recorded at 12,003 MW during the week of 12 - 18 Sep 2022, was higher than both the previous week at 11,870 MW and the same week last year at 10,640 MW.
- The WESM registered capacity stood at 21,939 MW at the end of the week.
- An average supply margin of 400 MW was observed during the period, which is higher by about 16% relative to the previous and lower by about 35% in comparison with the same week last year. The supply margin plunged to -534.09 MW observed on 12 September 2022 10:55. The average supply margin only reached 355.11 MW at peak intervals but increased to 435.17 MW during off-peak.
- The outage capacity averaged at 3,066 MW, lower than last week's 3,364 MW. About 40% of the 3,066 MW involved Natural Gas plants, while in terms of category, about 66% were Forced Outages.
- The average effective supply at this time was 12,403 MW, higher than the 12,216 MW of the previous and the 11,252 MW during the same week last year. Ramping limitations in generators' offers persisted which contributed to the lower effective supply and at times load curtailment on the MMS' solution.
- Average GWAP was recorded at PHP 9,089/MWh from PHP 9,328/MWh last week. This is higher than the PHP 2,623/MWh during the same week last year.
- The secondary price cap was imposed at 912 intervals out of the 2016 intervals of the week (about 45% of the time).
- The top 5 participant groups accounted for about 82% of the offered capacity. The Herfindahl-Hirschman Index (HHI) by participant group indicated a concentrated and moderately concentrated market based on the offered and registered capacities respectively.
- Based on the effective supply, the top 5 pivotal plants during the week were –
  - GNP DINGININ CFTPP (about 100.% of the time)
  - STA RITA NGPP (about 99.95% of the time)
  - MASINLOC CFTPP (about 89.53% of the time)
  - SMC LIMAY CFTPP (about 83.63% of the time)
  - SUAL CFTPP (about 76.79% of the time)

Coal plants had more capacity offered in the market but less capacity offered at above PHP20,000/MWh. On the other hand, Oil-based plants had less capacity offered during the week. Hydro plants had a more prevalent decrease in offer prices than the increase in other portions. Similarly, natural gas plants recorded lower offer prices during the week.

### IEMOP MARKET SYSTEMS ADVISORY

- No IT-related issue was advised in IEMOP's market systems from 12 - 18 Sep 2022.

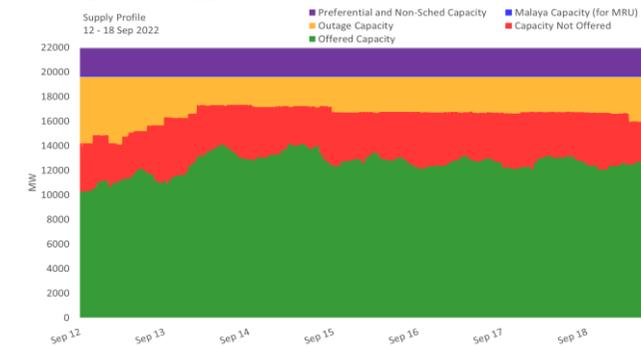
## OUTAGE CAPACITY BY PLANT TYPE



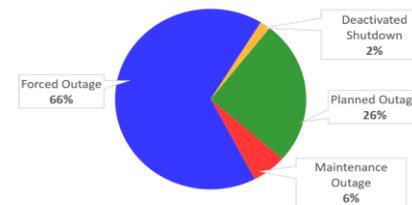
## SUMMARY (PRICE, SUPPLY, DEMAND AND RESERVE SCHEDULE)

Particulars		12 - 18 Sep 2022	Previous Week (05 - 11 Sep 2022 )	Same Week, Previous Year (06 - 12 Sep 2021)	Percent Change From	
					Previous Week	Same Week, Prev Year
GWAP (PHP/MWh)	max	35,365.56	35,068.50	32,154.81	0.85%	9.99%
	min.	0.00	87.50	-9,877.84	-100.00%	100.00%
	w. ave.	9,089.33	9,327.55	2,623.49	-2.55%	246.46%
Effective Supply (MW)	max	14,624.58	14,422.48	13,540.21	1.40%	8.01%
	min.	10,387.84	9,287.58	9,478.32	11.85%	9.60%
	ave.	12,402.97	12,216.76	11,252.37	1.53%	10.23%
System Demand (MW)	max	13,244.59	13,587.06	12,150.91	-2.52%	9.00%
	min.	8,837.71	7,944.72	7,676.53	11.24%	15.13%
	ave.	11,117.69	11,038.59	9,613.13	0.72%	15.65%
Demand + Reserve Schedule (MW)	max	14,311.68	14,400.17	13,187.94	-0.61%	8.52%
	min.	9,934.71	8,919.15	8,685.03	11.39%	14.39%
	ave.	12,003.07	11,870.05	10,640.15	1.12%	12.81%
Supply Margin (MW)	max	1,045.64	864.30	1,090.89	20.98%	-4.15%
	min.	-534.09	-566.19	51.49	5.67%	-1,137.32%
	ave.	399.91	345.70	612.22	15.68%	-34.68%

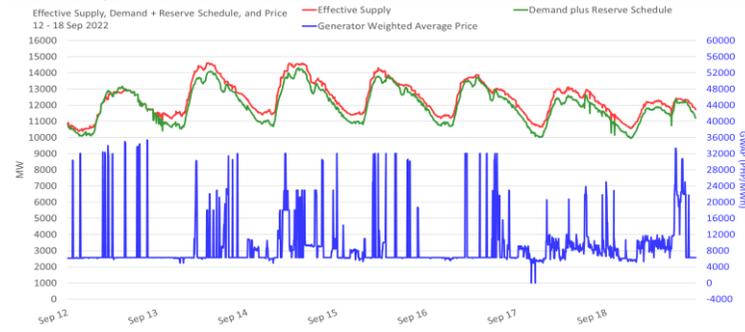
## SUPPLY PROFILE



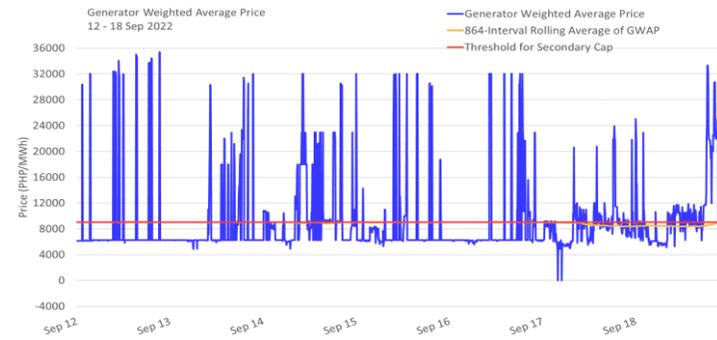
## OUTAGE CAPACITY BY OUTAGE CATEGORY



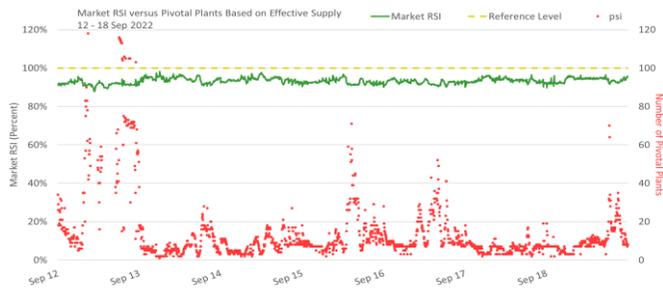
**SUPPLY, DEMAND AND PRICE**



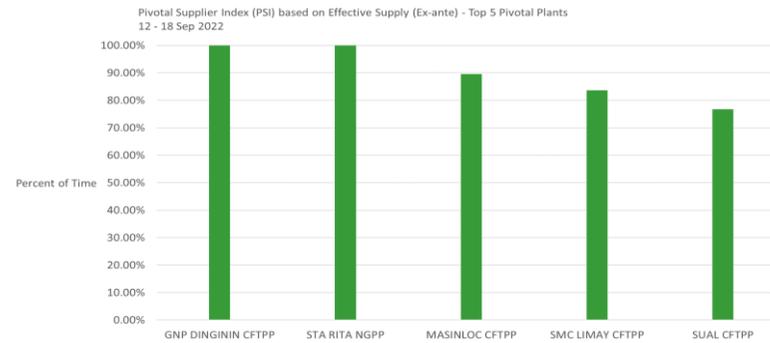
**GENERATOR WEIGHTED AVERAGE PRICE**



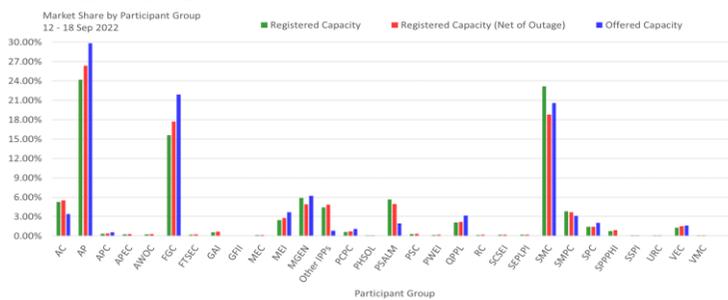
**MARKET RSI VS PIVOTAL PLANTS**



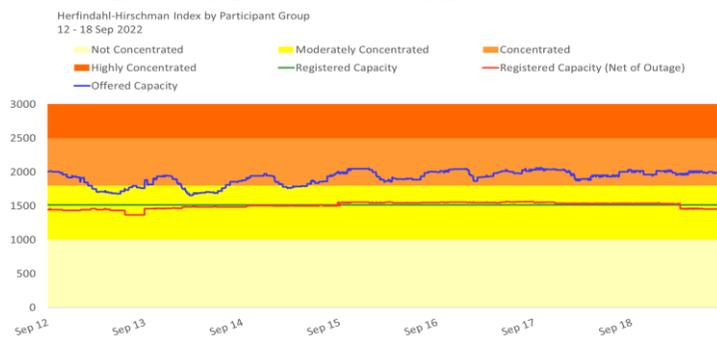
**PSI**



**MARKET SHARE**



**HERFINDAHL-HIRSCHMAN INDEX**

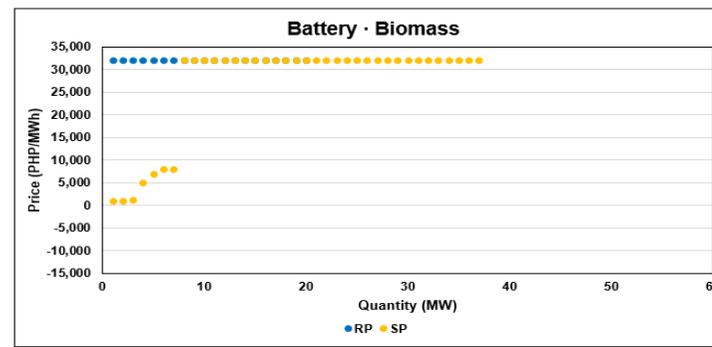
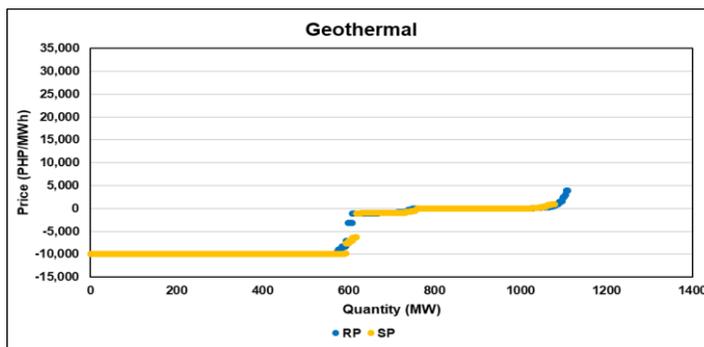
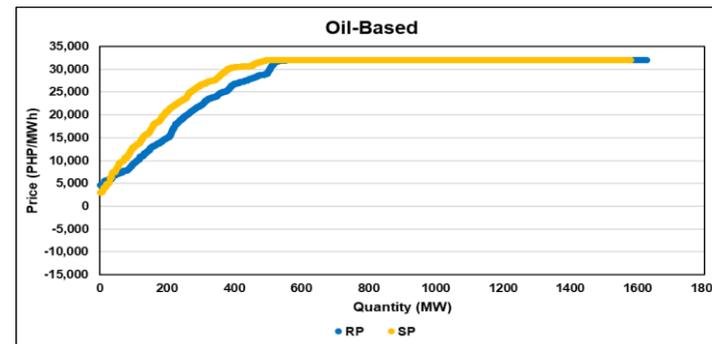
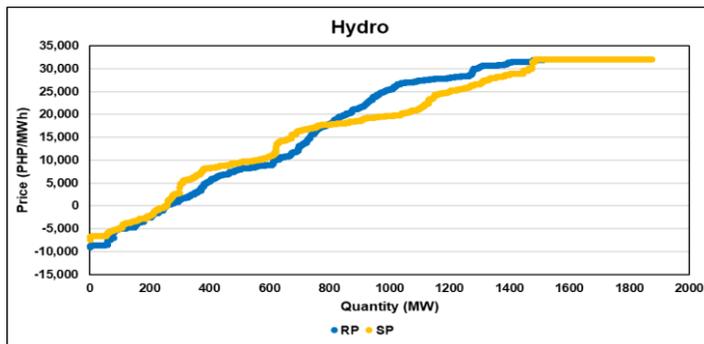
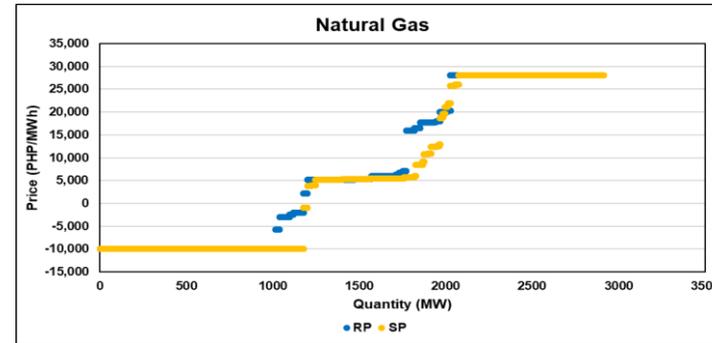
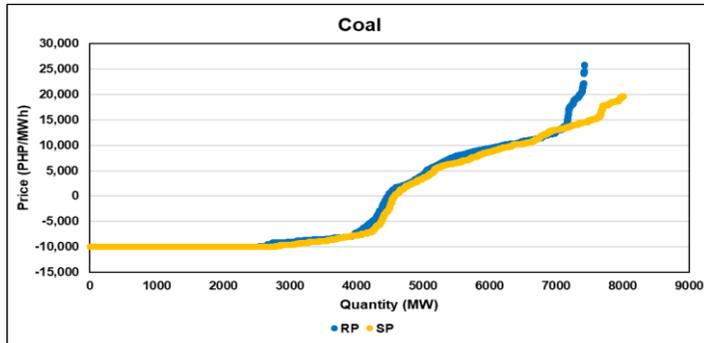


**OFFER PATTERN ANALYSIS**

**Legend**

RP: Reference Offer Price – the week of 05-11 Sep 2022 was used as a control for the comparison with the subject price

SP: Subject Offer Price – the week of 12-18 Sep 2022



**GLOSSARY OF TERMS**

**HERFINDAHL-HIRSCHMAN INDEX (HHI)** - is a commonly accepted measure of market concentration that takes into account the relative size and distribution of participants in the market. The HHI is a number between 0 and 10,000, which is calculated as the sum of squares of the participant's market share. The HHI approaches zero when the market has very large number of participants with each having a relatively small market share. In contrary, the HHI increases as the number of participants in the market decreases, and the disparity in the market shares among the participants increases. The following are the widely used HHI screening numbers: (1) less than 1,000 - not concentrated; (2) 1,000 to 1,800 - moderately concentrated; (3) greater than 1,800 - concentrated; and (4) greater than 2,500 - highly concentrated.

The HHI is calculated using the (i) registered capacity, (ii) registered capacity net of outage, (iii) offered capacity, (iv) metered quantity, and (v) spot transaction (metered quantity net of bilateral contract declarations).

**MARKET RESIDUAL SUPPLY INDEX (Market RSI)** - The RSI is a dynamic continuous index measured as ratio of the available generation without a generator to the total generation required to supply the demand. The RSI is measured for each generator. The greater the RSI of a generator, the less will be its potential ability to exercise market power and manipulate prices, as there will be sufficient capacity from the other generators. In contrary, the lower the RSI, the greater the market power of a generator (and its potential benefit of exercising market power), as the market is strongly dependent on its availability to be able to fully supply the demand. In particular, a RSI greater than 100% for a generator means that the remaining generators can cover the demand, and in principle that generator cannot manipulate market price. On the other hand, a RSI less than 100% means that the generator is pivotal in supplying the demand.

The RSI for the whole market (Market RSI) is measured as the lowest RSI among all the generators in the market. A Market RSI less than 100% indicates the presence of pivotal generator/s.

**PRICE SETTING FREQUENCY INDEX (PSFI)** - 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 price setters are determined from: (i) ex-ante for trading intervals without pricing error during ex-ante, (ii) ex-post with pricing error during ex-ante but without pricing error during ex-post, (iii) market re-run results for trading intervals with pricing error both in ex-ante and ex-post, and (iv) trading intervals where the price substitution methodology (PSM) was applied. For trading intervals affected by PSM, the unconstrained marginal plants are considered price setters. Further, in instances of regional price separation, price setters are determined separately for each region.

**MARKET SHARE** - The fraction of the total capacity or energy that a company or related group owns or controls in the market.

**PIVOTAL SUPPLIER INDEX (PSI)** - The pivotal supplier index is a binary variable (1 for pivotal and 0 for not pivotal) for each generator. The index identifies whether a generator is pivotal in supplying the demand. The PSI is calculated as the percentage of time that a generator is pivotal in a period (i.e. monthly).

**CAPACITY FACTOR** - The index assesses the performance of the generators in the market. A high capacity factor indicates the high utilization of the generators.

**CAPACITY PROFILE** - The hourly factors affecting supply, which include, among others, the offered capacity, outage capacity and ancillary services schedule.

**MAJOR PARTICIPANT GROUP** - The grouping of generators by ownership or control.

**REGISTERED CAPACITY** - The capacity registered by a generator with WESM.

**REGISTERED CAPACITY (NET OF OUTAGE)** - The capacity registered by a generator with WESM less capacity on outage.

**OFFERED CAPACITY** - The hourly offer to supply electricity submitted by a generator.

**METERED QUANTITY** - The hourly quantity of electricity generated by a generator.

**SPOT TRANSACTION** - The hourly quantity of electricity sold to the market by a generator net of bilateal contract declaration accounted for in the settlement.

**ANCILLARY SERVICES SCHEDULES** - The hourly quantity scheduled by the System Operator to provide regulating, contingency and dispatchable reserves.

**EFFECTIVE SUPPLY** - The hourly effective supply is equal to the offered capacity of all scheduled generator resources, nominated loading level of non-scheduled generating units and projected output of preferential dispatch generating units, adjusted for any security limit provided by the System Operator and other constraints considered during MMS simulation such as generator offered ramp rates. Scheduled output of plants on testing and commissioning through the imposition of security limit by SO and scheduled output of Malaya plant when it is called to run as Must Run Unit (MRU) are likewise accounted for in the effective supply.

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