



Monthly Over-riding Constraints Report

26 May to 25 June 2023

This Report is prepared by the
Philippine Electricity Market Corporation –
Market Assessment Group
and approved by the
Market Surveillance Committee

August 2023

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LUZON

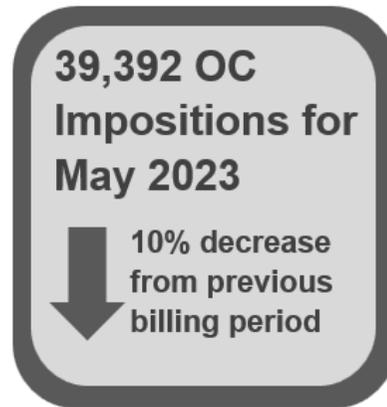
VISAYAS

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

IMPOSITIONS BY CATEGORY AND REGION

35,450 Total OC Impositions

91% of which were **non-security** limits.

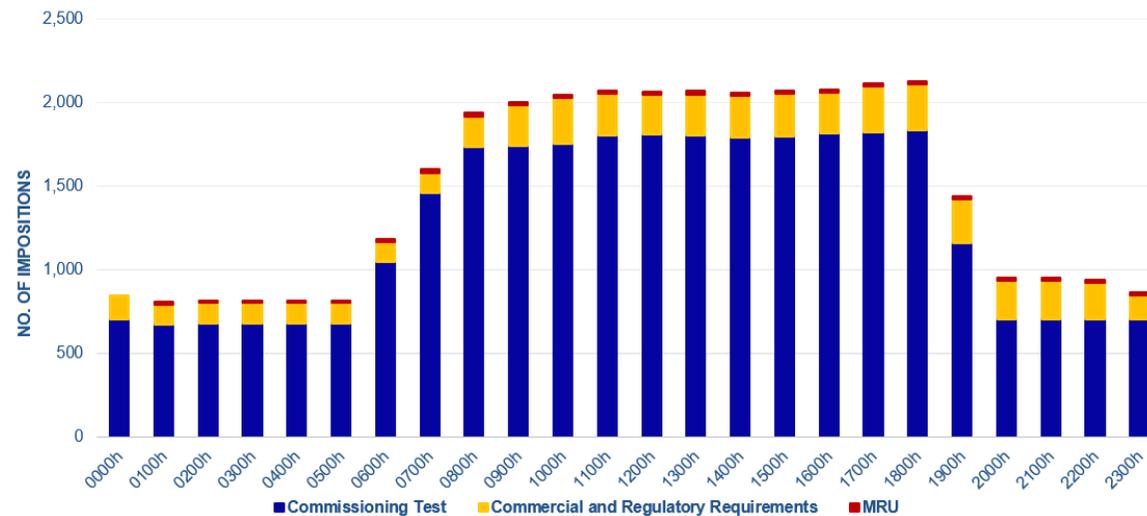


A decrease of **10%** in total over-riding constraint (OC) impositions was observed during the June 2023 billing period involving **17 Luzon** and **12 Visayas plants**.

Note: Under the Dispatch Protocol Manual Issue 18.0, imposition of over-riding constraints falls into 2 categories – 1) security limit i.e., MRU and other types as may be recommended by SO and 2) non-security limit. Security limit is imposed to address possible threats in system security while non-security limit is related to 1) generating unit limitations, 2) commercial and regulatory requirements, and lastly, 3) conduct of commissioning test of plants.

The monitoring of the over-riding constraints is based on the data and information provided by MO (i.e., real time market results and MMS-input files on security limits) and SO (i.e., SO Data for Market Monitoring).

IMPOSITIONS BY HOUR



Majority of over-riding constraints imposed over a 24-hour period were caused by the conduct of commissioning tests which constituted **85% of the total impositions**. Most of which were imposed during peak hours, mainly **due to commissioning test of Solar plants**.

Commercial and regulatory requirements likewise increased during peak hours attributable to performance tests conducted by Hydro and Coal plants. Also, impositions related to Must-Run Units (MRUs) remain fairly same throughout the 24-hour period and was mainly attributable to the dispatch of Oil-based plants.

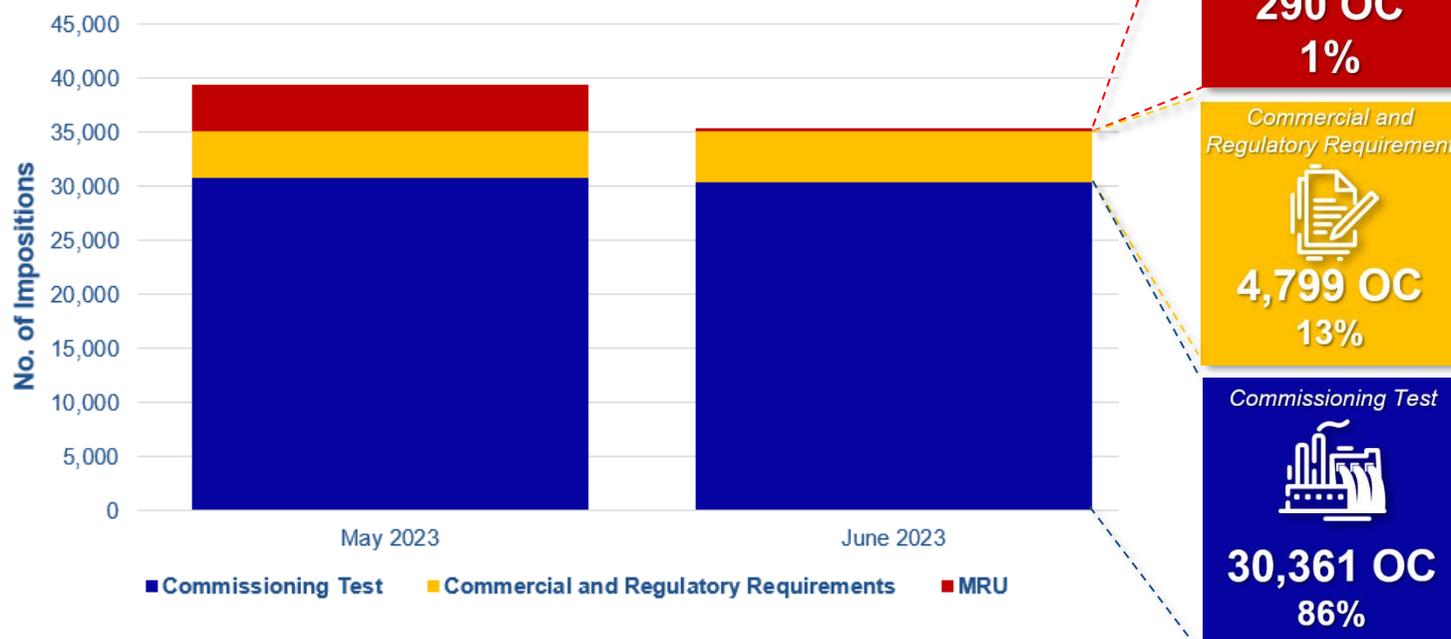
MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

IMPOSITIONS BY INCIDENT

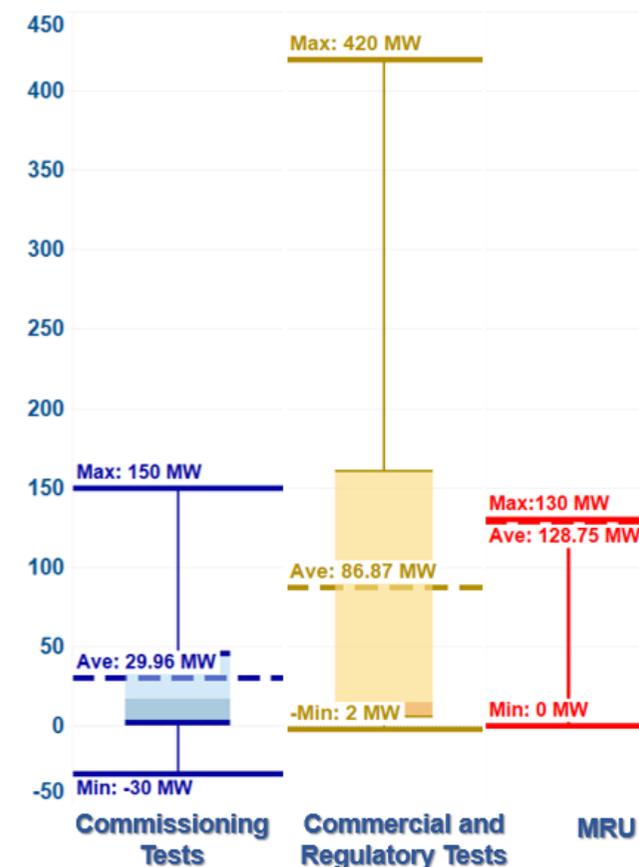
Contributing to the overall decrease in OC impositions during the billing period was the significant decline in the number of impositions related to Must-Run Unit of oil-based plants to address the real power balancing and frequency control in Luzon Grid. Meanwhile, impositions attributed to commissioning test and commercial and regulatory remains fairly the same when compared to previous billing period.

It was likewise observed that during the billing period, OCs accounted to commercial and regulatory requirements were imposed to generators with large capacities registered in the WESM, specifically Coal and Oil-based plants. Meanwhile, commissioning tests were mostly undertaken by renewable energy (RE) plants with relatively low registered capacities with wind power plant recording the largest RE plants under commissioning tests.

The graph (on the right) shows the scheduled capacities corresponding to the impositions.



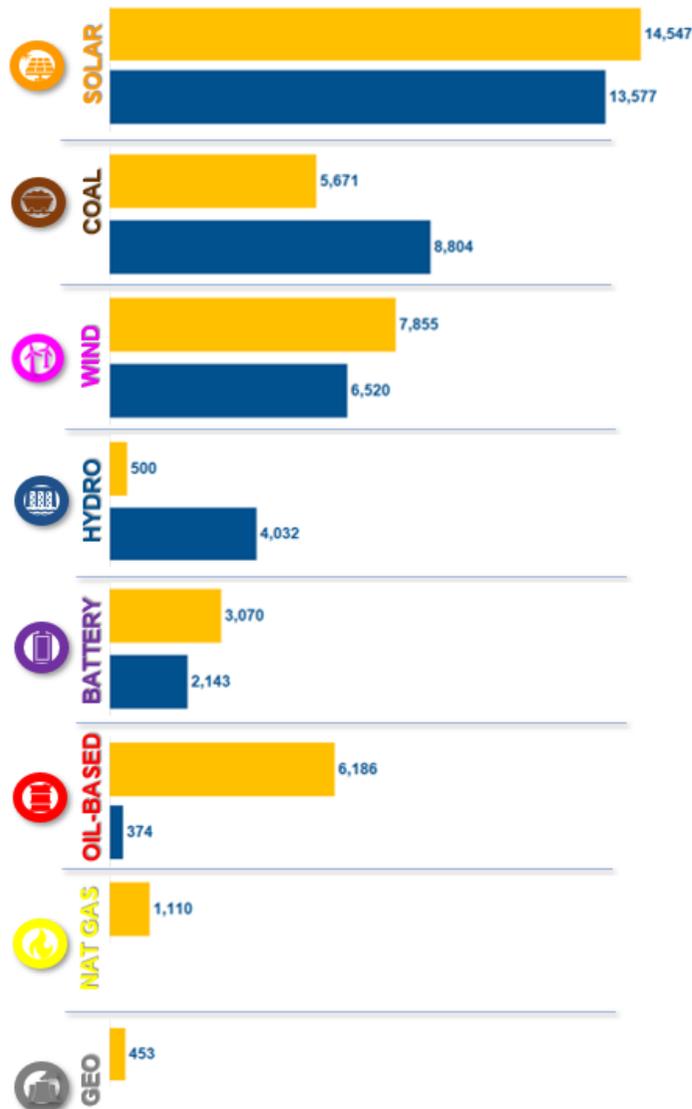
SCHEDULED CAPACITIES (MW)



MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

 May 2023

 June 2023



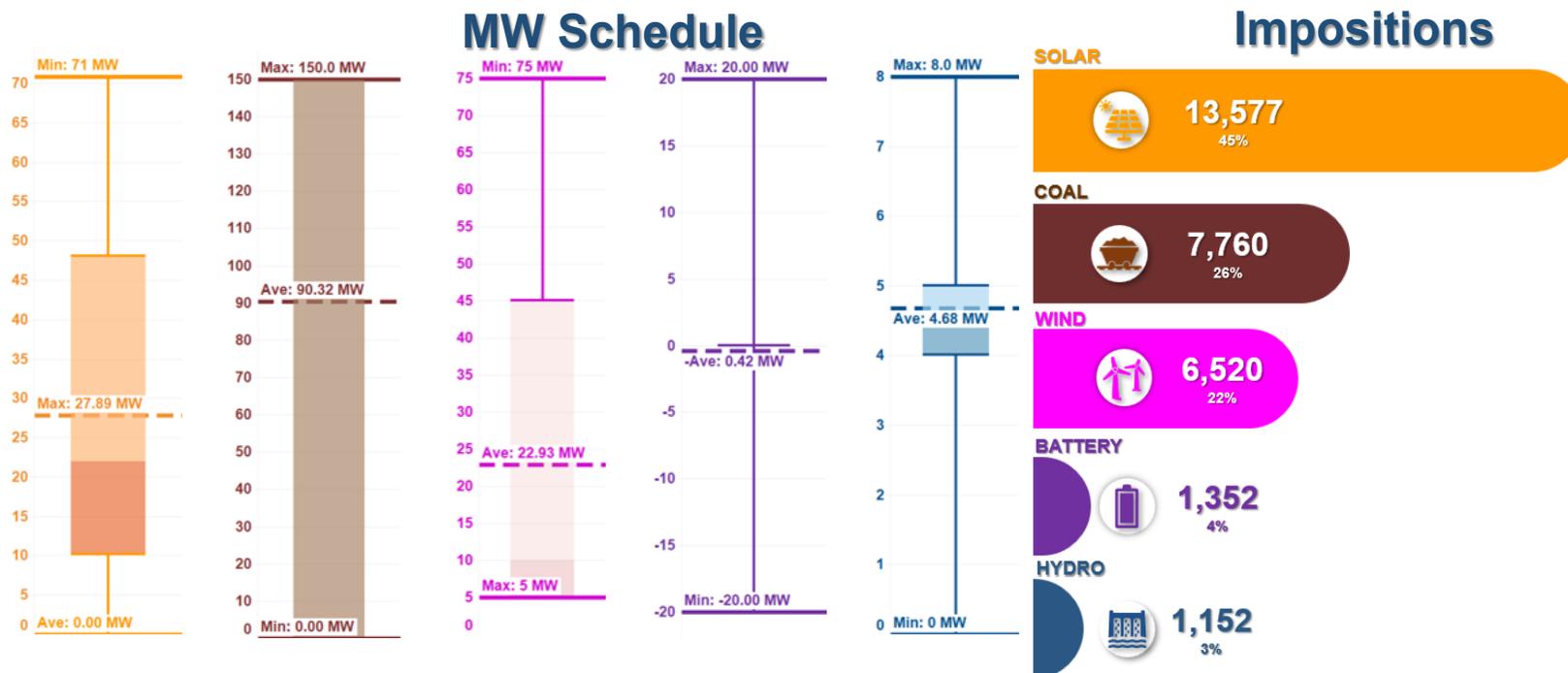
IMPOSITIONS BY PLANT TYPE

As compared with the previous billing period, a decrease in OC impositions was observed during June 2023. The reasons for the impositions per plant types were as follows:

- Keeping with the trend from previous month, majority of impositions related to **Solar** plants was due to commissioning test which experienced minimal decrease during the billing period.
- The start of commissioning test by one (1) **Coal** plant caused the significant increase in the imposition to the said technology.
- One (1) **Wind** plant continues with the downward trend due to lesser commissioning test imposition.
- Conduct of commissioning test of one (1) **Hydro** plant as well as the increase in performance test of six (6) plants were the reason for the significant increase in the imposition during the billing period.
- Expiration of Provisional Certificate of Approval to Connect (PCATC) of two (2) **Battery Energy Storage System (BESS)** attributed to the decrease in the over-riding constraints for this resource type.
- Decrease in impositions related to **Oil-based** plants was noted due to the lesser MRU impositions **to address the real power balancing and frequency control in Luzon Grid** during the current billing period.
- No impositions were observed for **Natural gas** and **Geothermal** plants.

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

PLANTS ON COMMISSIONING TEST



June 2023 saw a slight **decrease in the number of impositions of OCs attributable to commissioning tests**, recording a total of **30,361 impositions** from 30,831 imposition from previous billing period, with an average scheduled capacity of **40.7 MW**. Majority of these impositions were attributable to solar plants, followed by coal and wind, with small shares of commissioning tests impositions from BESS and hydro plants.

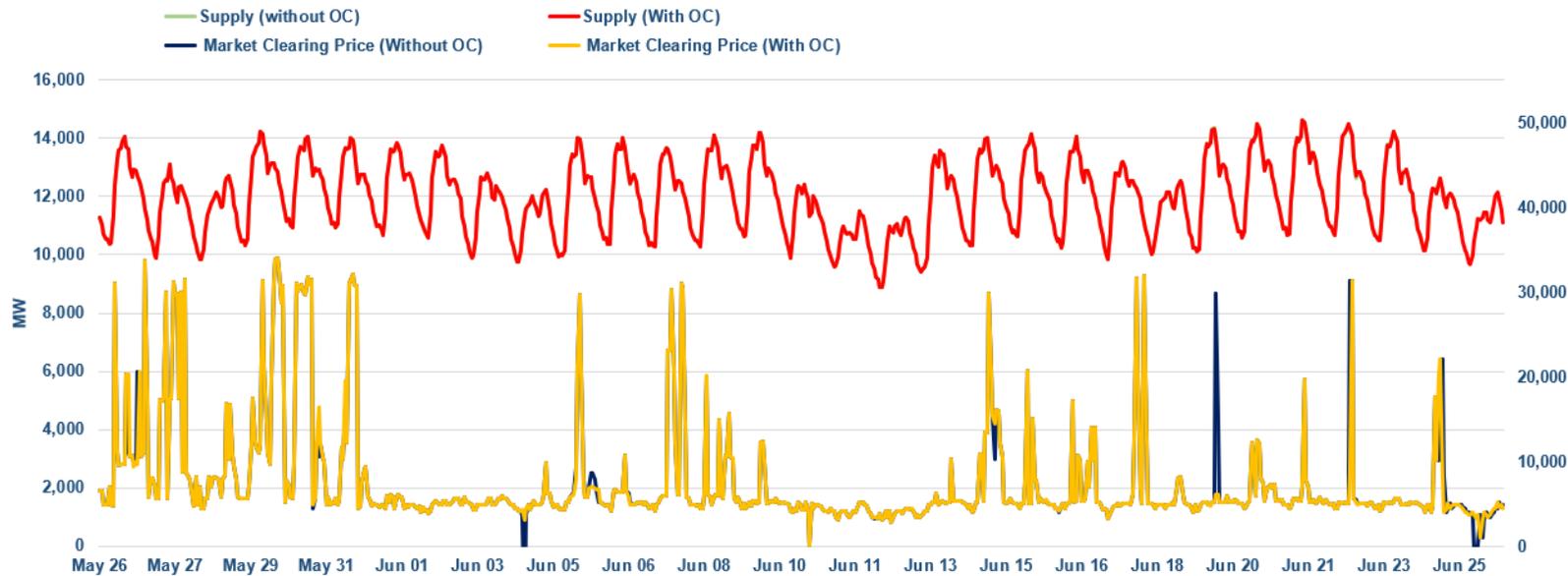
Based on the updates provided by the Independent Electricity Market Operator of the Philippines (IEMOP) and the System Operator as of 10 July 2023, the following were the updates on the **status of power plants under commissioning tests**:

- **1 BESS** had expired PCATC.
- **1 Hydro plant** has **extended its commissioning test period**.
- **1 Wind plant, 1 Coal plant, and 3 Solar plants** were continuing their **commissioning test periods**, from previous month.

Generally, the scheduled capacities imposed to plants undergoing commissioning tests were noted to be less than their registered capacity.

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

SIMULATED IMPACT ON THE MARKET



Difference	MCP (PHP/MWh)	Supply (MW)
Minimum	-13,255.74	-413.00
Average	27.85	-1.82
Maximum	23,712.66	55.00

Note:

- The simulation based on an unconstrained solution.
- OC imposed with Commissioning Tests were not altered due to their restriction to submit offers through MMS.

During the June 2023 billing period, it may be seen that when Coal, Hydro, and Oil-based plants were imposed with OC, there was an observed effect in the resulting market clearing prices, with difference averaging **PHP 27.85/MWh**. Observing the possible effect on supply, there was a slight decrease, averaging **-1.82 MW**, when OC are imposed. These effects may be a result of the scheduling of subject plants to lower levels of operations than being dispatched at their available capacities. Though there may be instances that OC impositions caused a decrease in the resulting market prices based on simulations, it tends to not reflect the true cost of generation and actual market forces.

MINDANAO

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

IMPOSITIONS BY CATEGORY

22,272

Total OC Impositions

90% of which were **security** limits.

25,001 OC impositions for
May 2023

10% decrease

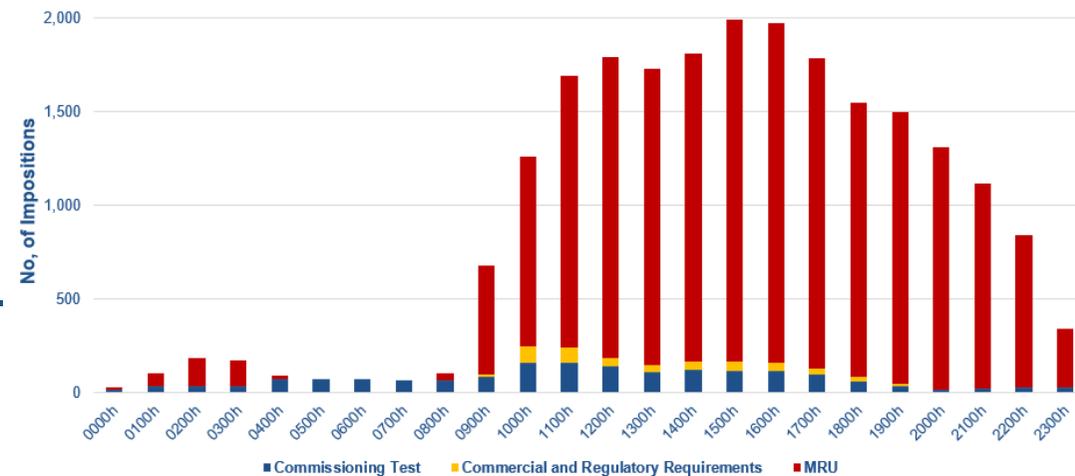


During the June 2023 billing period, it was noted that the Mindanao region had a total of 22,272 impositions compared to 25,001 over-riding constraints impositions, which is a 10 percent decrease from the previous billing period.

Note: Under the Dispatch Protocol Manual Issue 18.0, imposition of over-riding constraints falls into 2 categories – 1) security limit i.e., MRU and other types as may be recommended by SO and 2) non-security limit. Security limit is imposed to address possible threats in system security while non-security limit is related to 1) generating unit limitations, 2) commercial and regulatory requirements, and lastly, 3) conduct of commissioning test of plants.

The monitoring of the over-riding constraints is based on the data and information provided by MO (i.e., real time market results and MMS-input files on security limits) and SO (i.e., SO Data for Market Monitoring).

IMPOSITIONS BY HOUR



Similar with the previous billing periods, majority of over-riding constraints imposed over a 24-hour period in Mindanao were imposed as **Must-Run Units (MRUs)** constituting **90% of the total impositions** to address the system voltage requirement in the region.

It can be observed that bulk of the impositions, may it be non-security or security limits, were mainly imposed during peak hours when the demand is high.

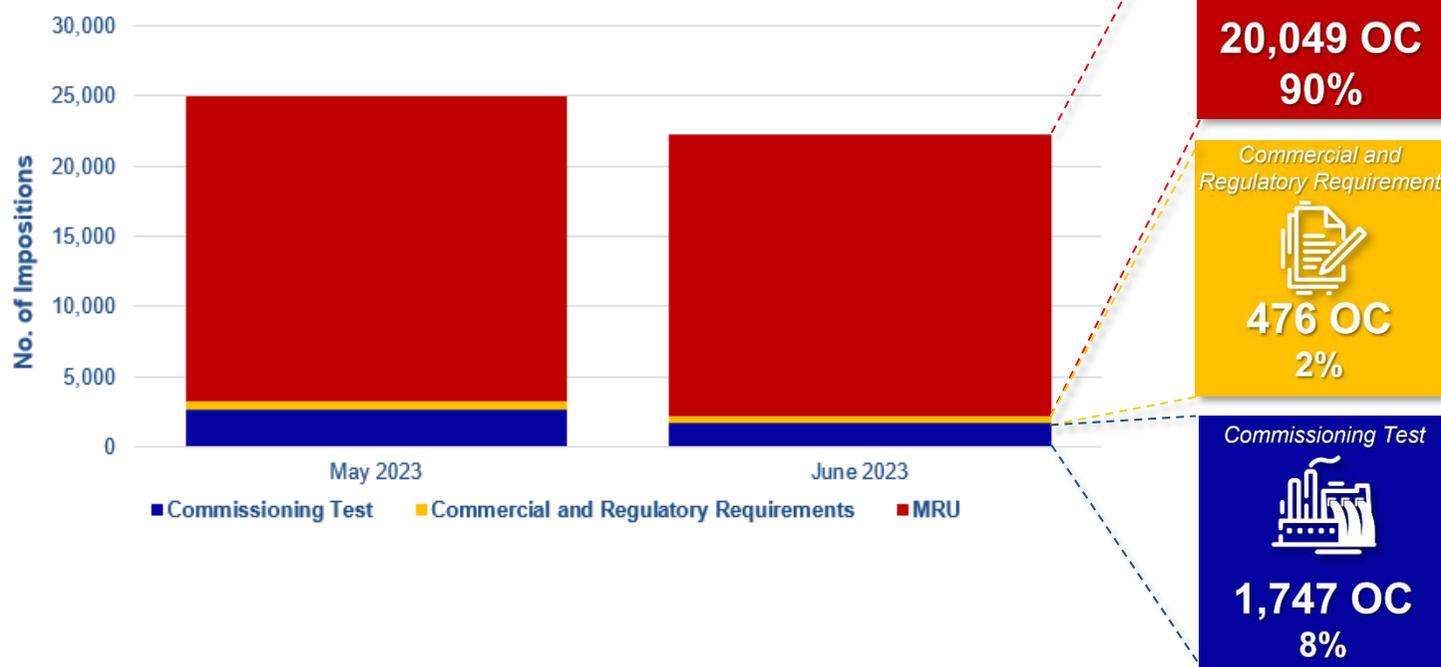
MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

IMPOSITIONS BY INCIDENT

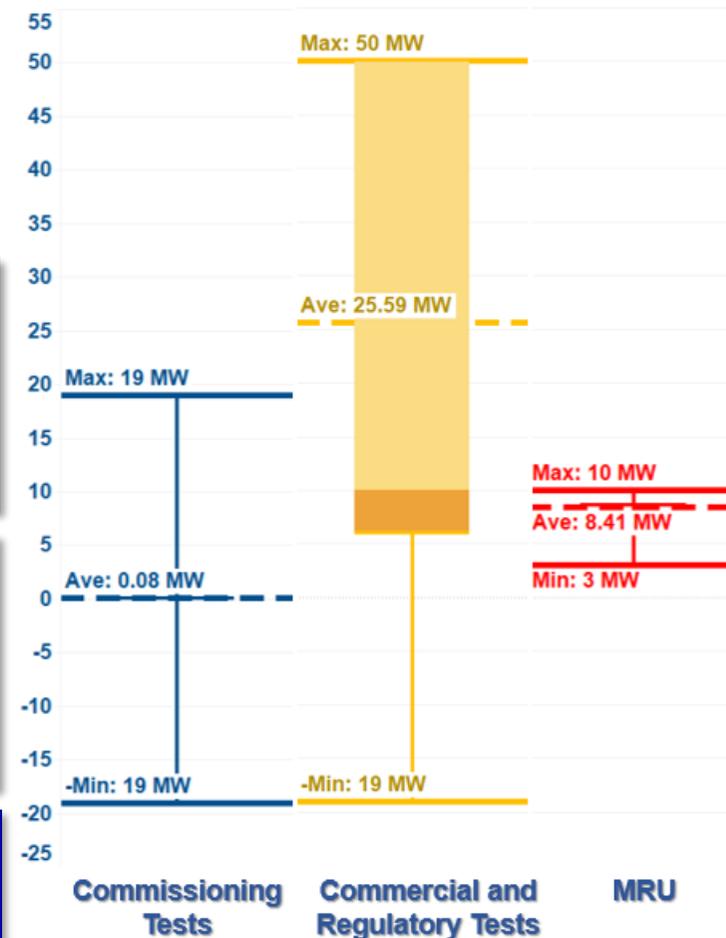
Keeping with the trend from the previous billing period, most of the OCs in Mindanao were due to MRU impositions, though there is an observed decrease in the said imposition during the current billing period. Similar with the MRU impositions, there is a decline in impositions related to commercial and regulatory requirement tests were likewise observed due to fewer ancillary service tests conducted. Lastly, for plants under commissioning tests, expiration of testing period of one (1) plant was observed contributing to the overall decrease in imposition during the billing period.

In terms of MW scheduled capacities, commercial and regulatory tests were nominated with higher MW level due to the imposed plants having larger capacities compared to MRU and commissioning tests.

The graph (on the right) shows the scheduled capacities corresponding to the impositions.



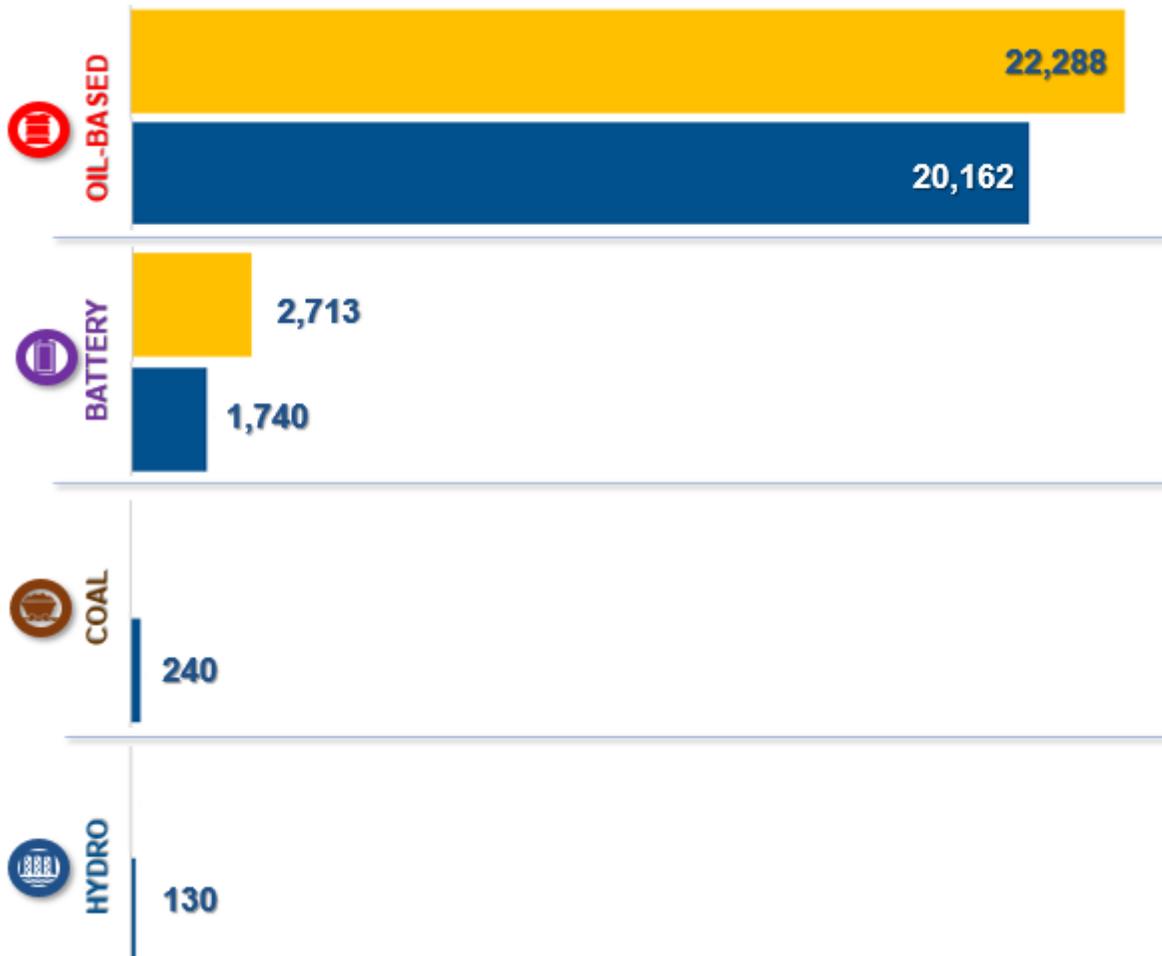
SCHEDULED CAPACITIES



MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

 May 2023

 June 2023



IMPOSITIONS BY PLANT TYPE

Majority of the impositions in the Mindanao region were attributable to Oil-based plants with BESS plants having a small share in the total impositions followed by coal and hydro plants. The following were the reasons for the impositions per plant

- Impositions to **Oil-based** plants were related to the dispatch of generators as MRUs in order to address the system voltage requirement in the region.
- Noticeable decrease of conduct of commissioning test of **BESS** was due to expiration of its PCATC.
- Emission test by one (1) **Coal** plant and ancillary service test done by (1) **Hydro** plant were the reasons for their imposition in Mindanao region.

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

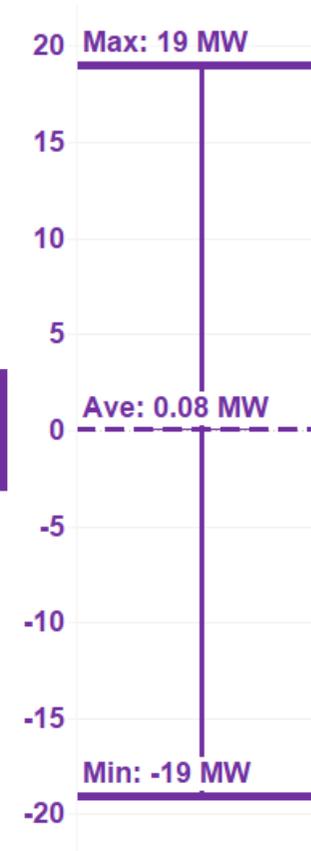
PLANTS ON COMMISSIONING TEST

June 2023 billing period recorded a total of **1,747 commissioning test impositions**, with an average scheduled capacity of **0.08 MW**. All of which were attributable to BESS plant, based on the updates provided by the Independent Electricity Market Operator of the Philippines (IEMOP) and the System Operator as of 10 July 2023.

Generally, the scheduled capacities imposed to plants undergoing commissioning tests were noted to have been less than their registered capacities.

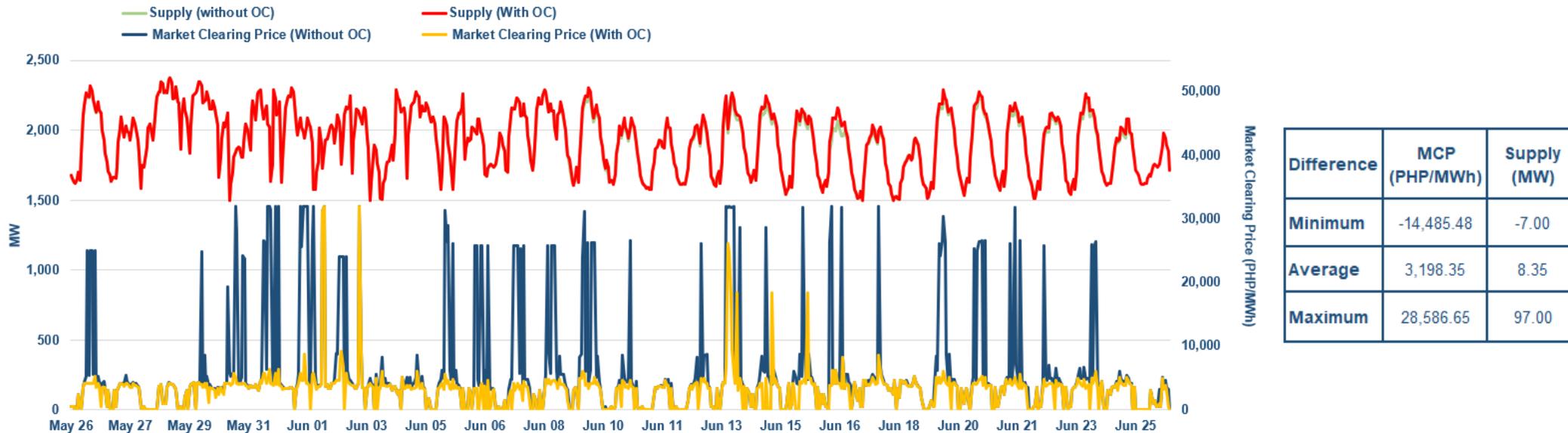


BATTERY



MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

PRICE IMPACT ON THE MARKET



Note:

- The simulation based on an unconstrained solution.
- OC imposed with Commissioning Tests are not altered due to their restriction to submit through MMS.

It may be noted that when Oil-based plants were imposed with OCs, there was an observed decrease in the resulting market clearing prices that yielded an average price difference of **PHP 3,198.35/MWh**. In terms of the effect of impositions to the supply, a supply difference was noted at an average of **8.35 MW**. The variability in supply difference is attributed to the offer behavior of the plants being imposed with over-riding constraints. Though there may be instances that OC impositions caused a decrease in the resulting market prices based on the simulation, it tends to not reflect the true cost of generation and actual market forces.

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

ANNEX A. LIST OF PLANTS WITH OVER-RIDING CONSTRAINTS¹

Plant/Unit Name	Plant Type	Registered Capacity (MW) ²
LUZON		
Ambuklao Hydroelectric Power Plant Unit 3	Hydro	37.5
Angat Hydroelectric Power Plant Unit A	Hydro	18
Arayat-Mexico Solar Power Plant Project Phase 2	Solar	30.9
Balaoi and Caunayan Wind Power Project Phase 1	Wind	80
Currimao 2 Solar Power Plant	Solar	68.7
Lamao Battery Energy Storage System (BESS)	Battery	20
Magat Hydroelectric Power Plant Unit 2	Hydro	97
Magat Hydroelectric Power Plant Unit 4	Hydro	97
Mariveles Coal-fired Thermal Power Plant- Phase 1	Coal	150
AES Masinloc Advancion Energy Storage Array	Battery	10
Pantabangan Hydro Electric Power Plant Unit 1	Hydro	60
Pantabangan Hydro Electric Power Plant Unit 2	Hydro	60
Pinugay Solar Power Plant	Solar	75
Malaya Thermal Power Plant Unit 2	Oil-Based	130
Pagbilao Coal-Fired Power Plant 1	Coal	382
Pagbilao Coal-Fired Power Plant 2	Coal	382
Pagbilao 3 Power Plant	Coal	420

¹ In accordance with the Market Operator Information Disclosure and Confidentiality (MO IDC) Manual Issue 7.0

² As of 26 July 2023

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

Plant/Unit Name	Plant Type	Registered Capacity (MW) ²
VISAYAS		
Isabel Modular Diesel Power Plant Sector 1	Oil-Based	6.5
Isabel Modular Diesel Power Plant Sector 2	Oil-Based	6.5
Isabel Modular Diesel Power Plant Sector 3	Oil-Based	6.5
Isabel Modular Diesel Power Plant Sector 4	Oil-Based	6.5
Isabel Modular Diesel Power Plant Sector 5	Oil-Based	6.5
Isabel Modular Diesel Power Plant Sector 6	Oil-Based	6.5
Toledo Battery Energy Storage System	Battery	40.0
Panay Diesel Power Plant 3 (Unit Echo)	Oil-Based	6.7
PEDC Coal-Fired Thermal Power Plant Unit 1	Coal	6.7
PEDC Coal-Fired Thermal Power Plant Unit 2	Coal	6.8
PEDC Unit 3 Circulating Fluidized Bed Power Plant	Coal	6.8
Timababan Hydro Power Plant	Hydro	6.8
MINDANAO		
Misamis Occidental Bunker C-Fired Diesel Power Plant 3	Oil-Based	15.5
Misamis Occidental Bunker C-Fired Power Plant 2	Oil-Based	15.7
Bunker-C Fired Diesel Power Plant Unit 1	Oil-Based	10.7
Bunker-C Fired Diesel Power Plant Unit 2	Oil-Based	10.7
Bunker-C Fired Diesel Power Plant Unit 3	Oil-Based	10.7
Bunker-C Fired Diesel Power Plant Unit 5	Oil-Based	10.7
Bunker-C Fired Diesel Power Plant Unit 6	Oil-Based	10.7
Bunker-C Fired Diesel Power Plant Unit 7	Oil-Based	10.7

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

Plant/Unit Name	Plant Type	Registered Capacity (MW) ²
Bunker-C Fired Diesel Power Plant Unit 8	Oil-Based	10.7
Bunker-C Fired Diesel Power Plant Unit 9	Oil-Based	10.7
Bunker-C Fired Diesel Power Plant Unit 10	Oil-Based	10.7
Agus IV Hydroelectric Power Plant Unit 1	Hydro	52.7
Agus IV Hydroelectric Power Plant Unit 2	Hydro	52.7
Agus IV Hydroelectric Power Plant Unit 3	Hydro	52.7
Agus V Hydroelectric Power Plant Unit 1	Hydro	27.5
Agus V Hydroelectric Power Plant Unit 2	Hydro	27.5
Iligan Diesel Power Plant (Units 1-19)	Oil-Based	102
Villanueva Battery Energy Storage System	Battery	20
Surigao Del Sur Power Plant	Oil-Based	7.8
Malita Battery Energy Storage System (BESS)	Battery	25
Sarangani Phase 1 Coal - Fired Power Plant	Coal	118.5
Sarangani Phase 2 Coal - Fired Power Plant	Coal	118.5