Market Surveillance Committee
Monthly Over-riding Constraints Report

26 April to 25 May 2023

July 2023

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

LUZ VIS MIN

CONTENTS OF THE REPORT

LUZON

VISAYAS

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

Philippine Electricity Market Corporation

OCR-2023-05

IMPOSITIONS BY CATEGORY AND REGION

39,392 Total Impositions

89% of which were non-security limits.

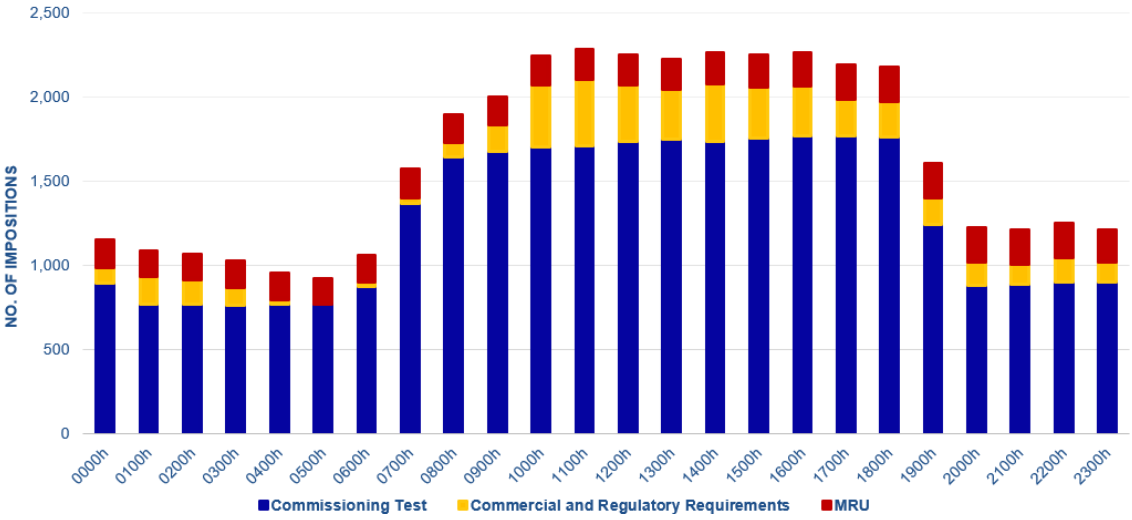
Luzon
96%
37,654 OC

Visayas
4%
1,738 OC

36,178 OC Impositions for April 2023

8.9% increase from previous billing period

IMPOSITIONS BY HOUR



An increase of **8.9%** in over-riding constraint (OC) impositions was observed during the May 2023 billing period involving **30 Luzon** and **23 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).

Majority of over-riding constraints imposed over a 24-hour period were caused by the conduct of commissioning tests which constituted **78% 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 plants and emission tests by Oil-based plants. Also, impositions related to Must-Run Units (MRUs) during the same period were mainly attributable to the dispatch of Oil-based plants.

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

Philippine Electricity Market Corporation

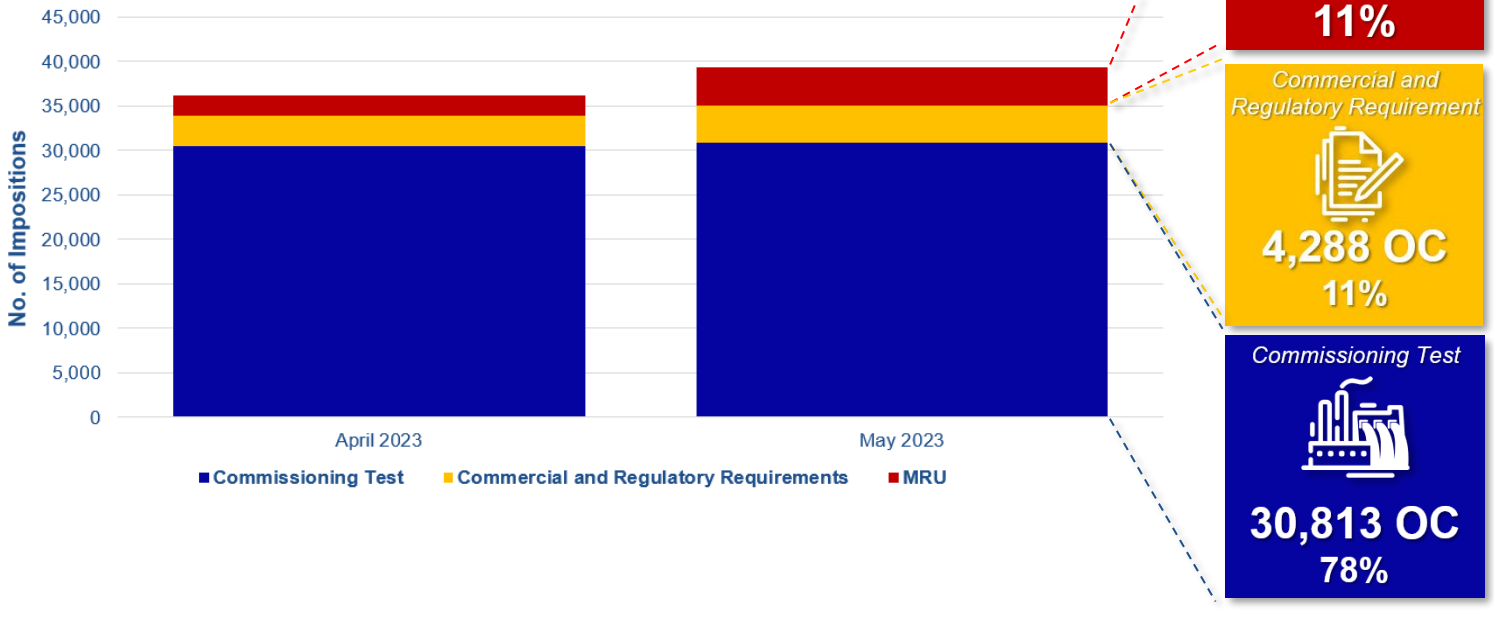
OCR-2023-05

IMPOSITIONS BY INCIDENT

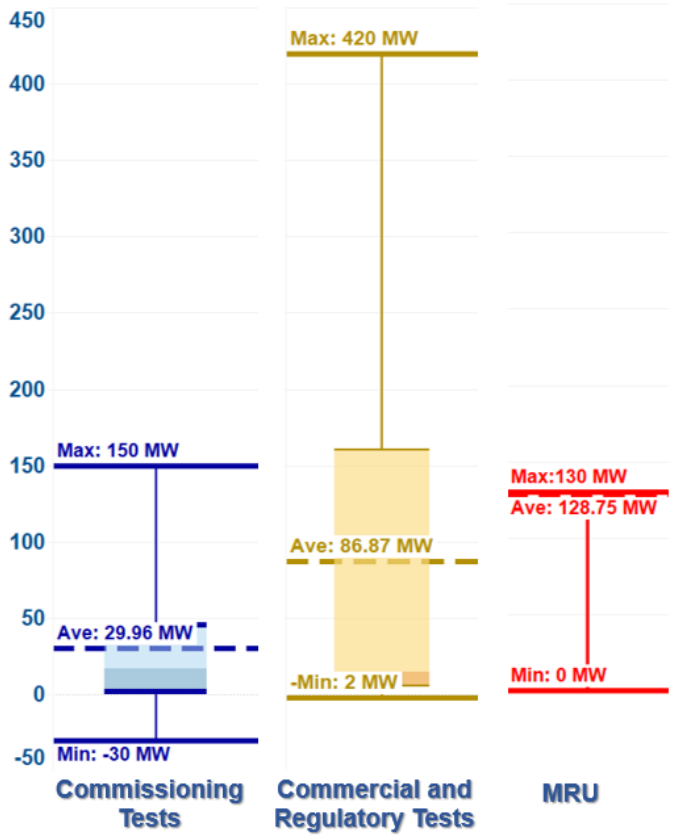
Contributing to the over-all increase in OC impositions during the billing period was the observed increase in the number of impositions related to commissioning test following the start of testing period of one (1) Coal plant. MRU impositions likewise increased to address the power balancing and frequency control in the Luzon region during the period. Also, incidents related to commercial and regulatory requirements (e.g., Ancillary Services Test and Grid Compliance Test) increased.

During the billing period, OCs related to commercial and regulatory requirements were imposed to generators with high registered capacities. It was however noted that despite this, majority were over-ridden to lower capacities especially Coal plants. Meanwhile, commissioning tests were mostly undertaken by renewable energy plants with relatively low registered capacities with additional one (1) Coal plant undertaking this activity.

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



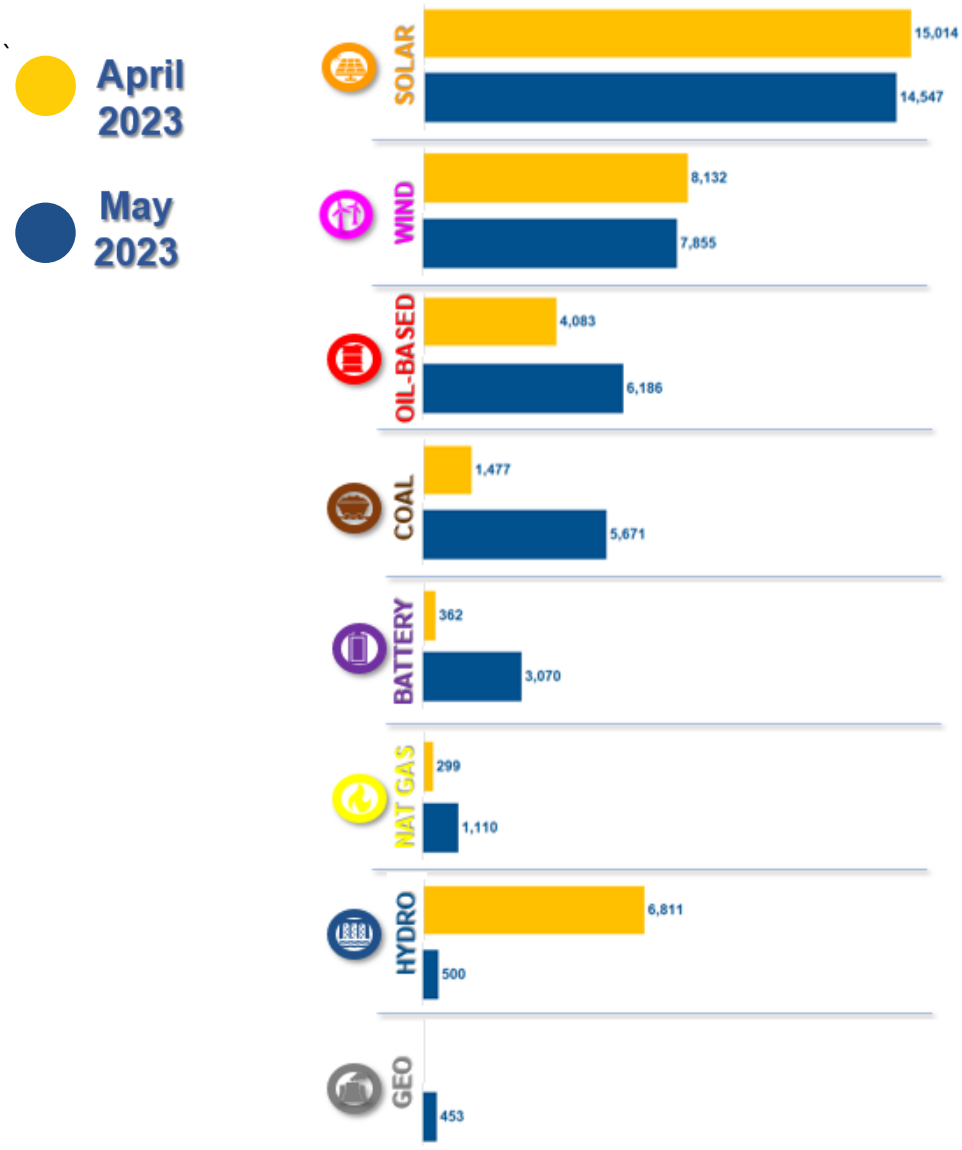
SCHEDULED CAPACITIES (MW)



MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

Philippine Electricity Market Corporation

OCR-2023-05



IMPOSITIONS BY PLANT TYPE

Generally, OC impositions increased in May 2023 as compared with the previous billing period. The reasons for the impositions per plant types were as follows:

- Majority of impositions related to ***Solar*** plants was due to commissioning test which experienced slight decrease during the billing period.
- Same with solar plants, slight decrease in commissioning test of one (1) ***Wind*** plant contributed to the decline in impositions observed.
- Increase in impositions related to ***Oil-based*** plants was noted due to the conduct of emission tests.
- Start of commissioning test by one (1) ***Coal*** plant caused the significant increase in the imposition to the said technology, contributing to the general increase in the over-all over-riding constraints imposition throughout the billing period.
- Resumption of commissioning test of one (1) ***Battery Energy Storage System (BESS)*** which previously expired was the reason for the increase in the over-riding constraints for this resource type.
- Increase in the number of impositions related to ***Natural gas*** plants was observed due to the conduct of grid compliance test.
- Expiration of commissioning test of one (1) ***Hydro*** plant was the reason for the significant drop in the imposition during the billing period.
- Conduct of ancillary service test of ***Geothermal*** plants was the reason for the imposition of said resource type during the billing period.

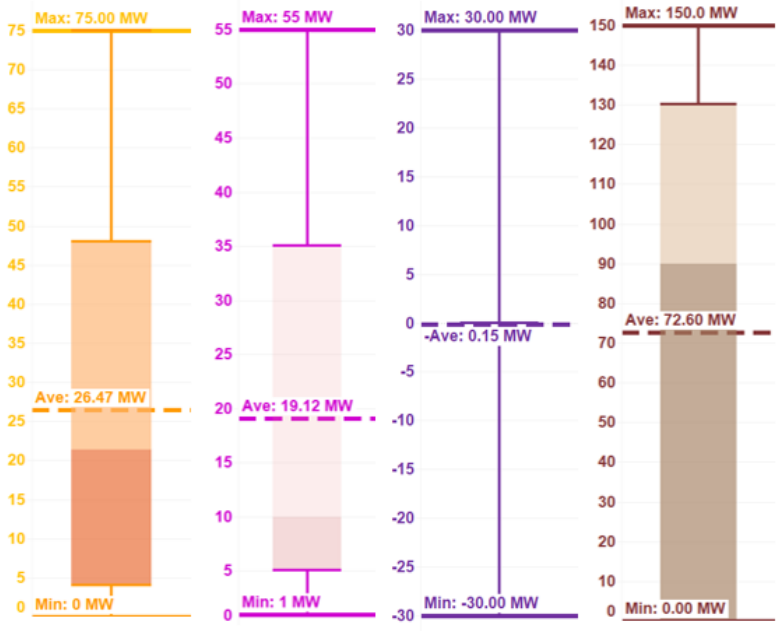
MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

Philippine Electricity Market Corporation

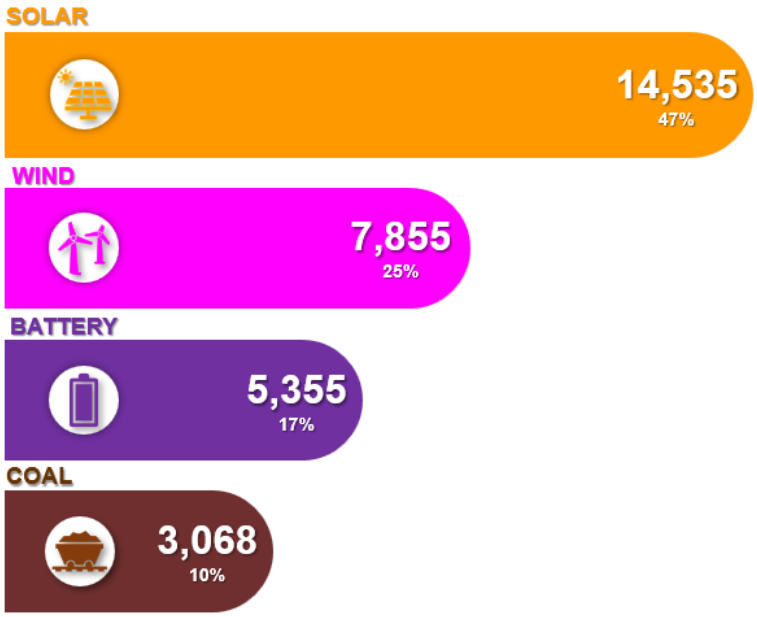
OCR-2023-05

PLANTS ON COMMISSIONING TEST

MW Schedule



Impositions



May 2023 saw a slight **increase in the number of impositions of OCs attributable to commissioning tests**, recording a total of **30,813 impositions** with an average scheduled capacity of **29.96 MW**. Majority of these impositions were attributable to solar plants, followed by wind, BESS, and coal plants.

Based on the updates provided by the Independent Electricity Market Operator of the Philippines (IEMOP) and the System Operator as of 13 June 2023, the following were the updates on the **status of power plants under commissioning tests**:

- **1 BESS extended** its **commissioning test period**.
- **1 Coal plant** just **started** its **commissioning test period.**
- **1 Wind plant and 3 Solar plants** were continuing their **commissioning test** periods**.**

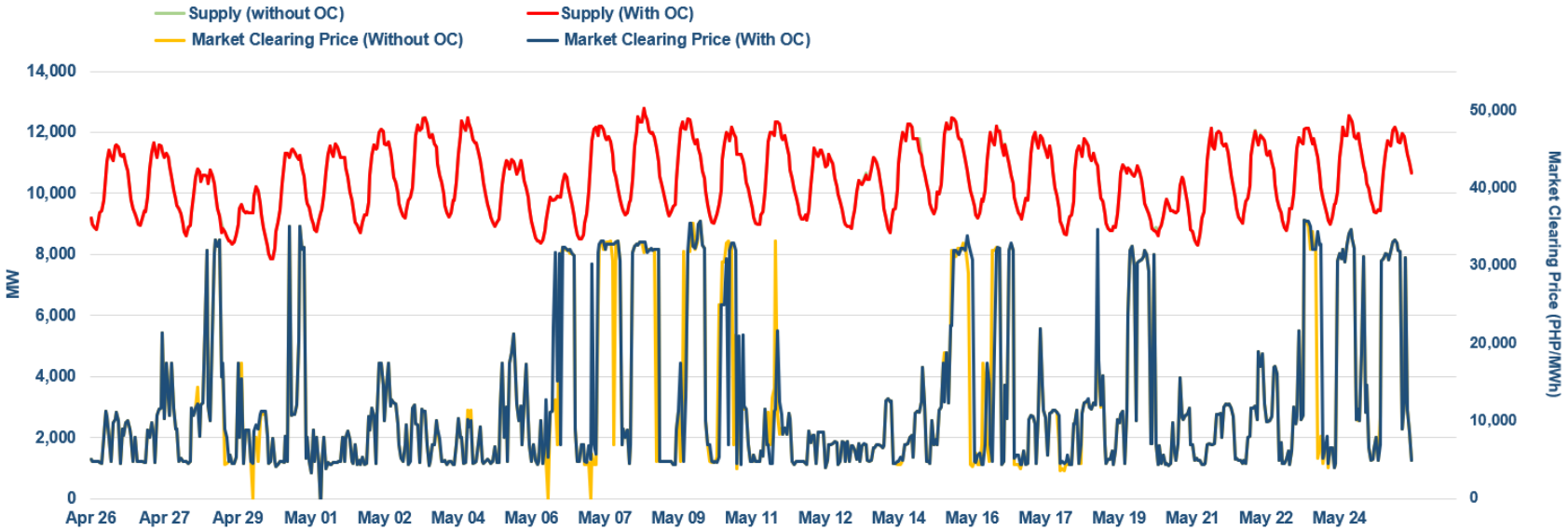
Generally, the scheduled capacities imposed to plants undergoing commissioning tests were noted to be less than their registered capacity.

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

Philippine Electricity Market Corporation

OCR-2023-05

PRICE IMPACT ON THE MARKET



Difference	MCP (PHP/MWh)	Supply (MW)
Minimum	-29,154.82	-404.00
Average	-270.00	-20.70
Maximum	27,564.74	16.00

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 May 2023 billing period, it may be seen that when Coal, Hydro, and Oil-based plants were imposed with OC, there was an observed increase in the resulting market clearing prices, with difference averaging at ***PHP -270/MWh***. Looking at the effects in terms of the supply, there was an observed decrease, averaging at ***-20.7 MW***. This may be due to 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 the simulation, it tends to not reflect the true cost of generation and actual market forces.

MINDANAO

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

Philippine Electricity Market Corporation

OCR-2023-05

IMPOSITIONS BY CATEGORY

25,001

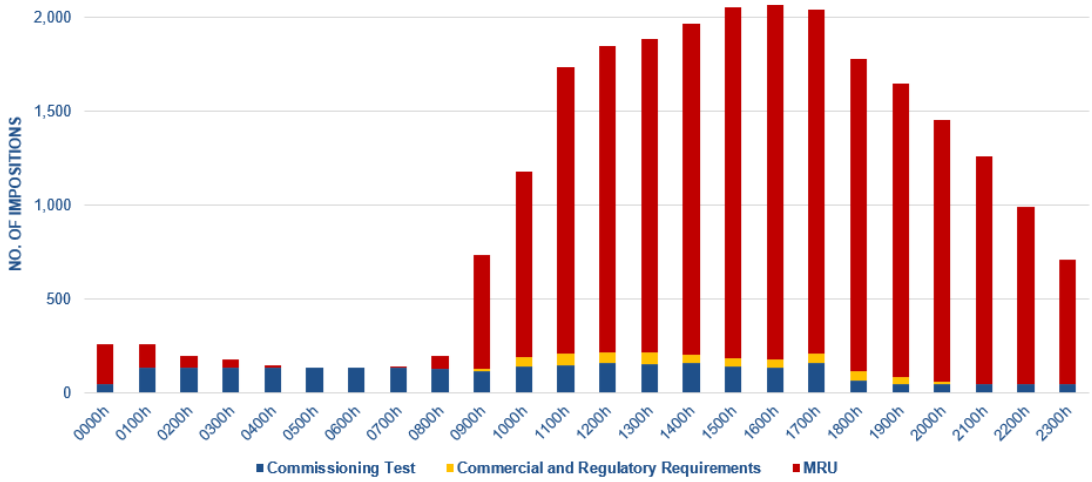
Total Impositions

87% of which were **security** limit.

16,966 OC impositions for April 2023

47.3% increase

IMPOSITIONS BY HOUR



During the May 2023 billing period, it was noted that the Mindanao region had a total of 25,001 over-riding constraints impositions, a 47.3 percent increase 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).

Similar with the previous billing periods, majority of over-riding constraints imposed over a 24-hour period in Mindanao were for generators as **Must-Run Units (MRUs)** constituting **93% of the total impositions.**

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

Philippine Electricity Market Corporation

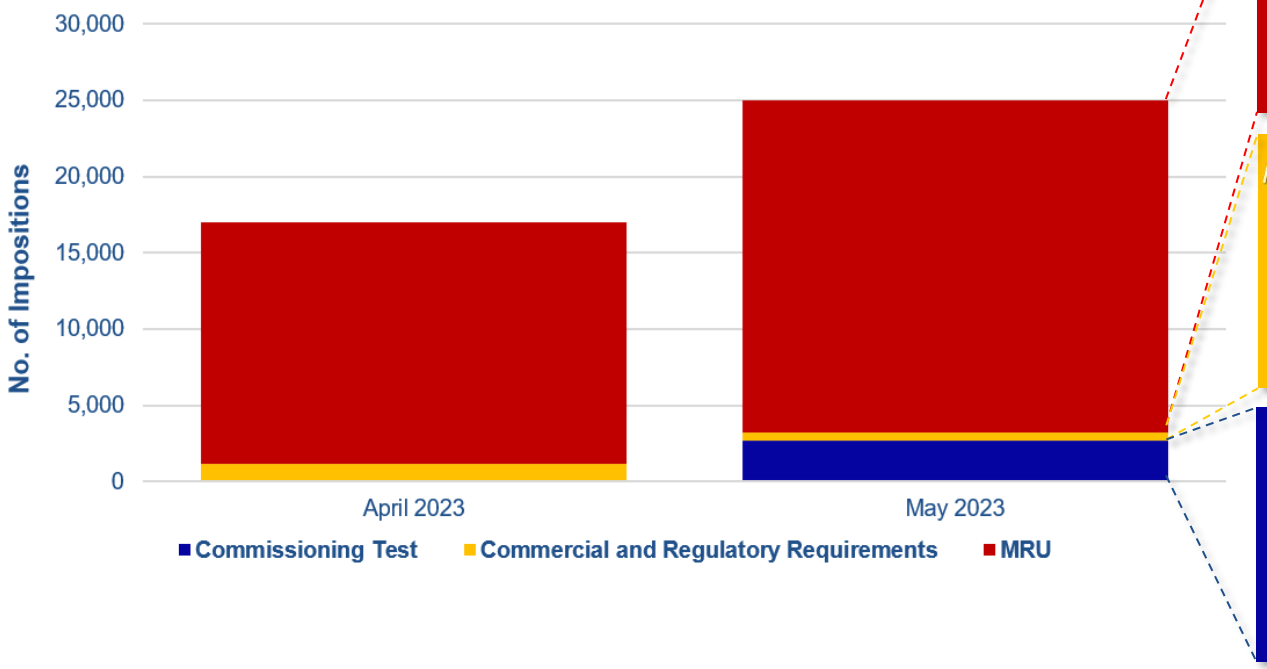
OCR-2023-05

IMPOSITIONS BY INCIDENT

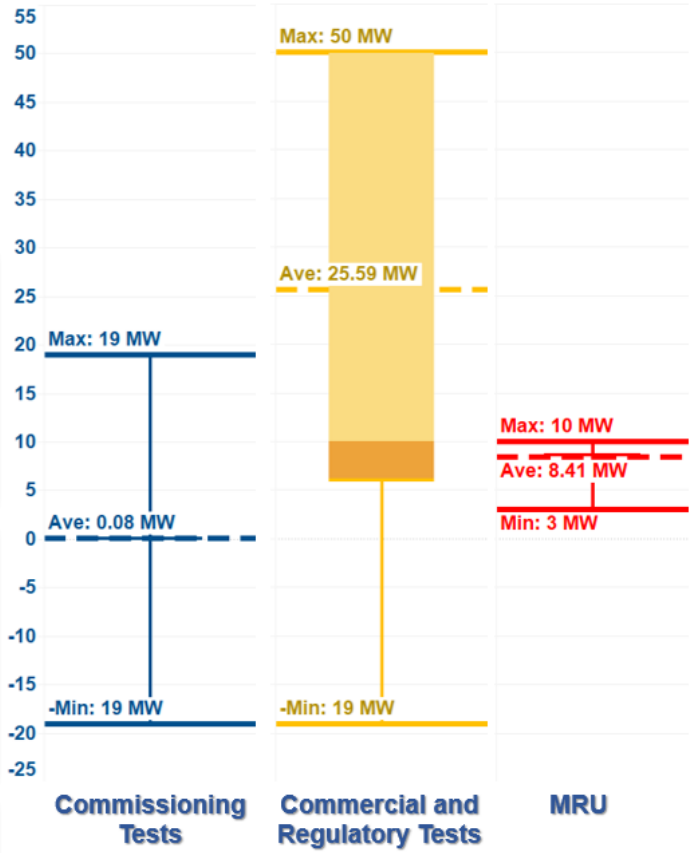
Keeping with the trend on the previous billing period, most of the OCs in Mindanao were due to MRU impositions to address the system voltage requirement in the region. The decrease in commercial and regulatory requirement tests were likewise observed due to fewer ancillary service tests conducted. Lastly, for plants under commissioning tests, extension of testing period of one (1) plant was observed.

It is important to note that incidents related to commercial and regulatory requirements were imposed on plants with large capacities which had greater market impact than impositions for commissioning tests. It was, however, noted that despite the large capacities of these plants, majority were over-ridden to smaller capacities. Meanwhile, commissioning tests were mostly undertaken by renewable energy plants with relatively lower capacities.

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



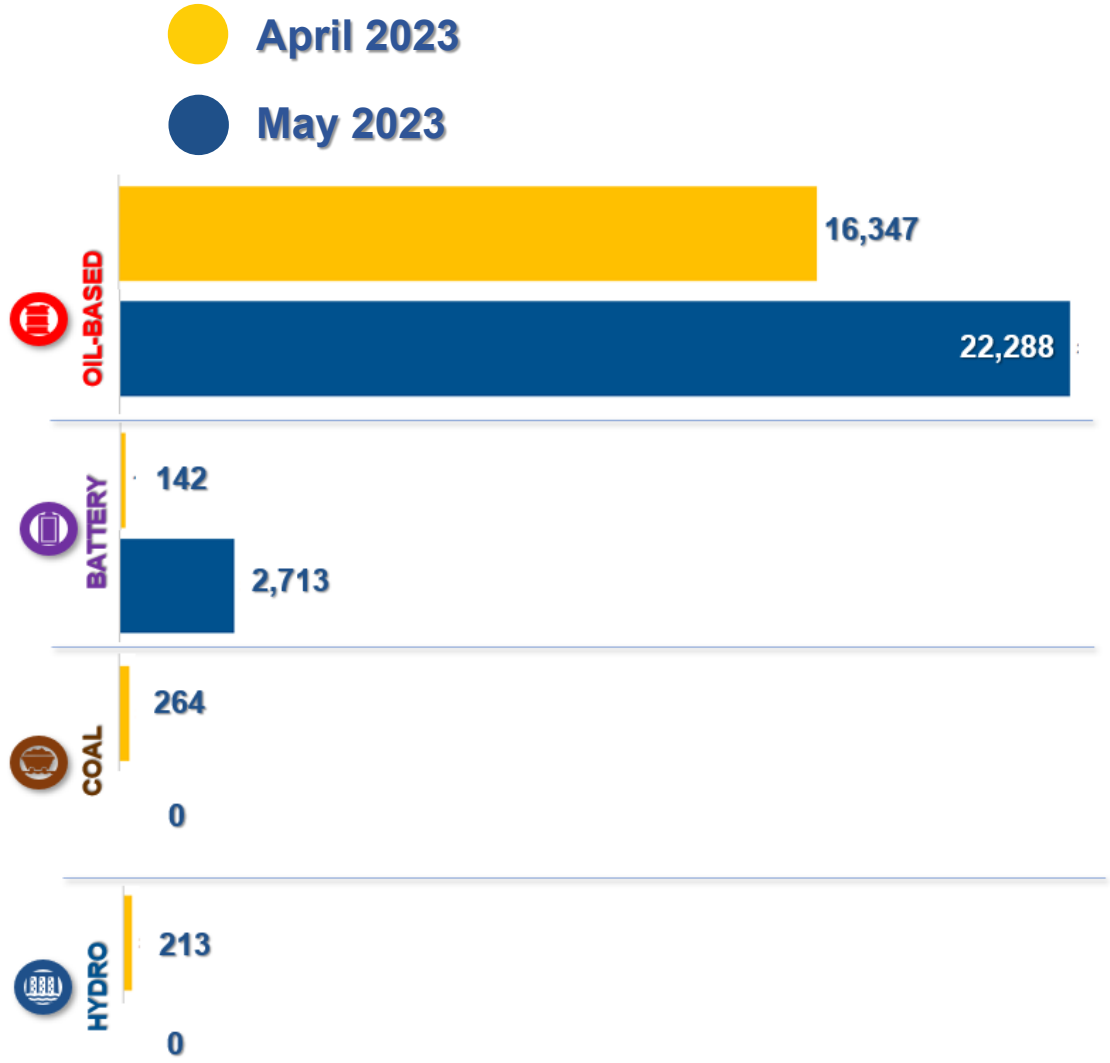
SCHEDULED CAPACITIES



MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

Philippine Electricity Market Corporation

OCR-2023-05



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. The following were the reasons for the impositions per plant types:

- Impositions to ***Oil-based*** plants were related to the dispatch of generators as MRUs in order address the system voltage requirement in the region.

- Conduct of commissioning due to extended PCATC were the reason for impositions related to ***BESS***.

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

Philippine Electricity Market Corporation

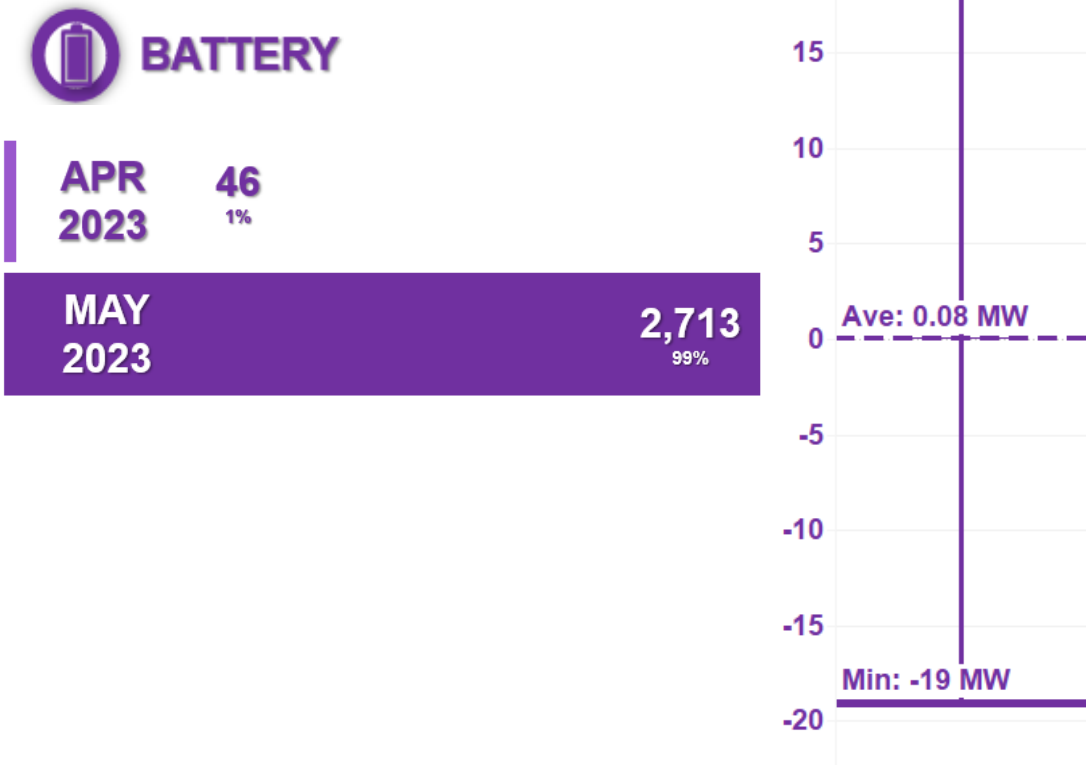
OCR-2023-05

PLANTS ON COMMISSIONING TEST

May 2023 billing period recorded **2,713 over-riding constraints impositions** attributable to conduct of **commissioning tests**, with an average scheduled capacity of **0.08 MW** All of which were attributable to BESS plant, based on the updates provided by IEMOP and the System Operator as of 13 June 2023.

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

.

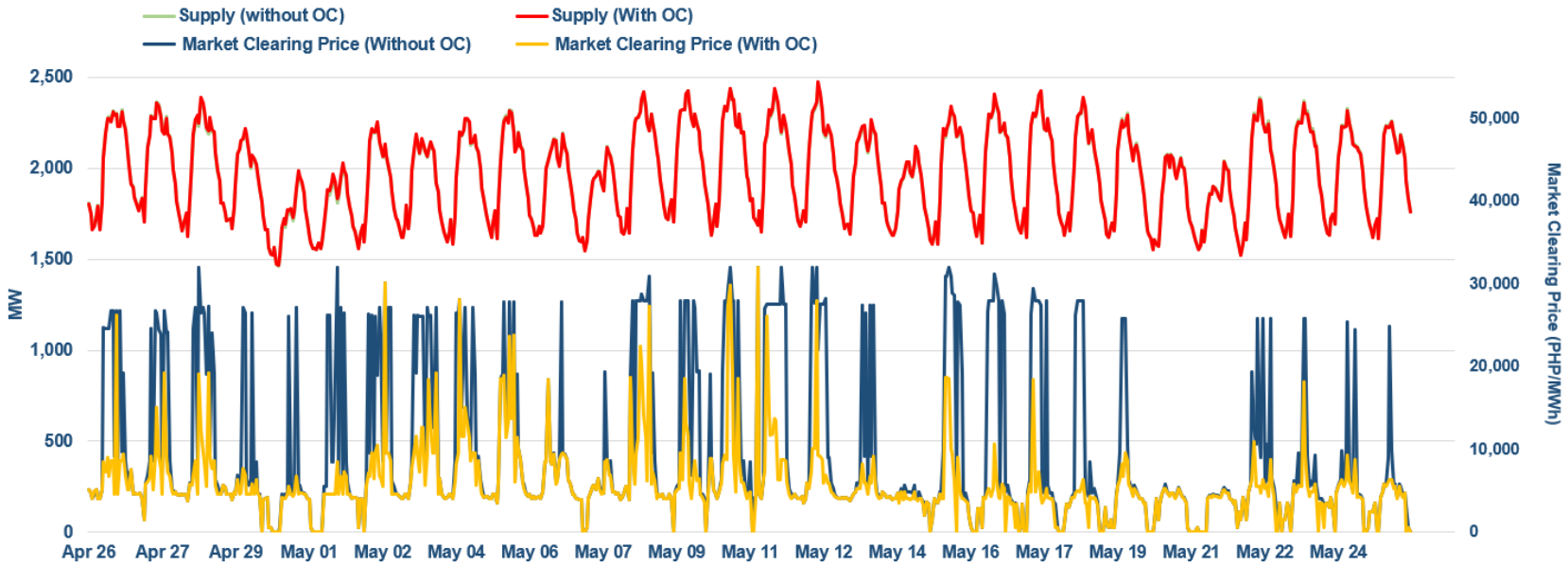


MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

Philippine Electricity Market Corporation

OCR-2023-05

PRICE IMPACT ON THE MARKET



Difference	MCP (PHP/MWh)	Supply (MW)
Minimum	-364.26	-17.00
Average	4,120.44	1.06
Maximum	23,842.05	22.00

* MCP Diff. = MCP (Without OC –With OC)
**Supply Diff. = Supply (With OC – Without OC)

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 4,120.44/MWh***. In terms of the effect of impositions to the supply, a supply difference was noted at an average of ***1.06 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

Philippine Electricity Market Corporation

OCR-2023-05

ANNEX A. LIST OF PLANTS WITH OVER-RIDING CONSTRAINTS[1]

Plant/Unit Name	Plant Type	Registered Capacity (MW)[2]
LUZON		
Ambuklao Hydroelectric Power Plant Unit 1	Hydro	37.5
Ambuklao Hydroelectric Power Plant Unit 2	Hydro	37.5
Ambuklao Hydroelectric Power Plant Unit 3	Hydro	37.5
Arayat-Mexico Solar Power Plant Project Phase 2	Solar	30.9
Bakun Hydro Electric Power Plant	Hydro	74.0
Balaoi and Caunayan Wind Power Project Phase 1	Wind	80.0
Bauang Diesel Power Plant GS1	Oil-Based	70.0
Bauang Diesel Power Plant GS2	Oil-Based	70.0
Bauang Diesel Power Plant GS3	Oil-Based	70.0
Currimao 2 Solar Power Plant	Solar	68.7
Magat Hydroelectric Power Plant Unit 1	Hydro	97.0
Magat Hydroelectric Power Plant Unit 3	Hydro	97.0
Magat Hydroelectric Power Plant Unit 4	Hydro	97.0
Mariveles Coal-Fired Power Plant 1	Coal	316.0
Mariveles Coal-fired Thermal Power Plant- Phase 1	Coal	150.0
AES Masinloc Advancion Energy Storage Array	Battery	10.0
Pantabangan Hydro Electric Power Plant Unit 1	Hydro	60.0

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

[2] As of 02 June 2023

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

Philippine Electricity Market Corporation

OCR-2023-05

Plant/Unit Name	Plant Type	Registered Capacity (MW)[2]
Pantabangan Hydro Electric Power Plant Unit 2	Hydro	60.0
San Roque Hydro Electric Power Plant Unit 3	Hydro	145.0
Pinugay Solar Power Plant	Solar	75.0
Malaya Thermal Power Plant Unit 2	Oil-Based	130.0
Pagbilao Coal-Fired Power Plant 1	Coal	382.0
Pagbilao Coal-Fired Power Plant 2	Coal	382.0
Pagbilao 3 Power Plant	Coal	420.0
Batangas Diesel Power Plant Unit 1	Oil-Based	5.5
Batangas Diesel Power Plant Unit 2	Oil-Based	5.5
Sta. Rita Natural Gas Power Plant 1	Natural Gas	257.3
Sta. Rita Natural Gas Power Plant 2	Natural Gas	255.7
Sta. Rita Natural Gas Power Plant 3	Natural Gas	265.5
Sta. Rita Natural Gas Power Plant 4	Natural Gas	264.0
VISAYAS		
CPPC Bunker C-Fired Diesel Power Plant Unit 5	Oil-Based	6.5
CPPC Bunker C-Fired Diesel Power Plant Unit 6	Oil-Based	6.5
CPPC Bunker C-Fired Diesel Power Plant Unit 7	Oil-Based	6.5
CPPC Bunker C-Fired Diesel Power Plant Unit 8	Oil-Based	6.5
CPPC Bunker C-Fired Diesel Power Plant Unit 9	Oil-Based	6.5
CPPC Bunker C-Fired Diesel Power Plant Unit 10	Oil-Based	6.5
TPC Carmen Diesel Power Plant	Oil-Based	40.0
Naga Oil-Fired Power Plant Unit 1	Oil-Based	6.7

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

Philippine Electricity Market Corporation

OCR-2023-05

Plant/Unit Name	Plant Type	Registered Capacity (MW)[2]
Naga Oil-Fired Power Plant Unit 2	Oil-Based	6.7
Naga Oil-Fired Power Plant Unit 3	Oil-Based	6.8
Naga Oil-Fired Power Plant Unit 4	Oil-Based	6.8
Naga Oil-Fired Power Plant Unit 6	Oil-Based	6.8
Unit 4 Calumangan Bunker C-Fired Diesel Power Plant	Oil-Based	6.7
Nasulo Geothermal Power Plant	Geothermal	47.5
Palinpinon Geothermal Power Plant II Unit 1	Geothermal	20.0
Palinpinon Geothermal Power Plant II Unit 2	Geothermal	20.0
Palinpinon Geothermal Power Plant II Unit 3	Geothermal	19.5
Power Barge 104 Unit 2	Oil-Based	7.0
Power Barge 104 Unit 3	Oil-Based	7.0
Power Barge 104 Unit 4	Oil-Based	8.0
Power Barge 101- Unit 1	Oil-Based	6.0
Power Barge 101- Unit 2	Oil-Based	6.0
Power Barge 101- Unit 4	Oil-Based	6.0
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 4	Oil-Based	10.7

MONTHLY REPORT ON OVER-RIDING CONSTRAINTS

Philippine Electricity Market Corporation

OCR-2023-05

Plant/Unit Name	Plant Type	Registered Capacity (MW)[2]
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
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
Iligan Diesel Power Plant (Units 1-19)	Oil-Based	102
Villanueva Battery Energy Storage System	Battery	20
NACSUR Diesel Power Plant Unit	Oil-Based	10.9
Mobile 2 Bunker C-Fired Power Plant Unit 1	Oil-Based	50
Mobile 2 Bunker C-Fired Power Plant Unit 2	Oil-Based	50
Misamis Occidental Bunker C-Fired Diesel Power Plant 3	Oil-Based	15.5