Over-riding Constraints Report for 1st Quarter of 2025

26 December 2024 to 25 March 2025

May 2025

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

EXECUTIVE SUMMARY

This report provides the results of the monitoring of over-riding constraints imposed by the System Operator (SO) on generators during the 1st quarter of 2025. The findings highlight trends and significant changes in the impositions across different regions and plant types in comparison with 2024.

For the 1st quarter of 2025, the total number of over-riding constraints imposed by the SO saw a minimal decline compared to the previous quarter. Despite this slight reduction, the overall trend remained consistent with previous reports, with non-security limits continuing to dominate the total impositions.

Security limit impositions were all associated with Must-Run Units (MRUs) for oil-based plants. The deployment of MRUs—primarily to support voltage stability in the Mindanao region—experienced a 16% increase compared to the previous quarter. In view of the continuous observation on these MRU-related impositions, the Market Surveillance Committee (MSC) coordinated with the System Operator as to the measures undertaken by the operator to reduce the frequency of such impositions including the planned upgrades or projects to address the same. Meanwhile, commissioning tests remained the leading cause of non-security limit impositions. A decline in commissioning test-related impositions was recorded compared to the previous quarter, driven by the completion of commissioning tests for various solar, biofuel, and hydro plants.

A comparison with the same period last year shows a significant increase in impositions related to commissioning tests, marking a 37% surge year-on-year, primarily due to: i) the entry of new power plants into the market, and ii) extended testing periods for certain facilities which commenced their commissioning test in 2024.

It can also be observed that over-riding constraints peaked between 0500h and 2000h, following a trend like previous quarters. This was largely driven by:

- Solar plant commissioning tests, which must be conducted during daylight hours.
- Commercial and regulatory compliance tests, which are typically scheduled during peak demand hours.

Additionally, renewable energy plants accounted for the highest number of constraints, with solar, wind, and geothermal plants experiencing the most impositions.

For the 1st quarter of 2025, deviations between RTD schedules and actual generation were observed across all plant types with over-riding constraints. Figures 11 to 14 illustrate these hourly differences. The comparison reveals that deviations between RTD schedules and actual generation are prevalent across all resource types when over-riding constraints are imposed.

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1. OVER-RIDING CONSTRAINTS MONITORING

In accordance with Clause 1.6.2 of the WESM Rules and Sections 3.1 and 5.5 of the Market Surveillance Manual (MSM), the Market Surveillance Committee (MSC) shall undertake an assessment and analysis of the over-riding constraints[1] imposed by the System Operator (SO) on generators. Hence, this report is prepared covering the period of the 1st quarter of 2025 (26 December 2024 to 25 January 2025).

1.1. Over-riding Constraints by Category

For the quarter in review, a minimal decline of 8.25% (equivalent to 28,703 fewer impositions) was observed in the total number of over-riding constraints by the SO compared to the previous period. Despite this minimal reduction, the overall trend remained consistent with the previous quarterly and monthly reports, where non-security limits continued to dominate. As shown in Table 1, majority (96%) of the impositions[2] were categorized as non-security limits.

The remaining 4% of impositions were classified as security limits, all of which were associated with MRUs for oil-based plants. The use of MRUs—primarily to support voltage stability requirements—experienced a 16% increase compared to the previous quarter.

A sudden drop in over-riding constraints was recorded towards the end of the 1st quarter, as illustrated in Figure 1. This decline is attributed to various factors, including the completion of commissioning tests and a decrease in several other testing activities for commercial or regulatory compliance. A more detailed analysis of these drivers is discussed in Section 1.2 of the report.

Table 1. Summary of Over-riding Constraints by Category

By Category	Q4 2024				Q1 2025				Change (Q-on-Q)	
	Oct	Nov	Dec	Total	Jan	Feb	Mar	Total	Diff	% Change
Non-Security Limit	106,167	99,953	127,500	333,620	109,768	114,043	83,406	307,217	- 26,403	-7.91%
Security Limit	4,711	4,997	4,475	14,183	3,362	4,288	4,233	11,883	- 2,300	-16.22%
Total	**110,878**	**104,950**	**131,975**	**347,803**	**113,130**	**118,331**	**87,639**	**319,100**	**- 28,703**	**-8.25%**

[1] WESM Rules Clause 3.5.13.1 states that the SO may require the Market Operator (MO) to impose constraints on the power flow, energy generation of a specific facility in the grid to address system security threat, to mitigate the effects of a system emergency, or to address the need to dispatch generating units to comply with systems, regulatory and commercial tests requirements.

[2] The monitoring of the over-riding constraints on generators is done on a per generator trading node per trading interval. A constraint imposed on a generator trading node on a particular trading interval is considered as one **over-riding constraints**. 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).

Figure 1. Monthly Comparison of Over-riding Constraints, by Category

As depicted in Figure 2, a significant contributor to the decline in over-riding constraints in the 1st quarter of 2025 was the reduced number of power plants subjected to impositions related to the conduct of commissioning tests following the completion of testing.

Furthermore, the slight rise in impositions in the middle of the quarter was linked to the entry of additional power plants with Provisional Certificates of Approval to Connect (PCATCs) for the conduct of commissioning tests on top of the extensions granted to power plants to continue undertaking commissioning tests beyond the prescribed period under the DOE Department Circular (DC). These extensions may be either due to delays in technical validation, additional testing requirements, or regulatory compliances. The reasons for these PCATC extensions are further discussed in Section 1.4 of the report.

The dip in March was associated with the completion of commissioning tests recorded for various plants during the period and a general reduction in testing activities related to commercial and regulatory requirements in addition to the shorter number of days for the March billing period (26 February to 25 March).

Figure 2. Comparison of Over-riding Constraints by Category, 2024 vs 2025

By region, Luzon accounted for the largest share of total impositions at 76%, followed by Visayas at 20%, and Mindanao at 4%. The number of impositions in Mindanao was primarily due to MRU-related dispatches for voltage regulation in specific areas.

Although a slight increase in impositions was observed in February, a significant 39% decline occurred toward the end of the quarter, driven by the completion of commissioning activities and a reduction in other impositions related to commercial and regulatory requirements. Notably, a similar pattern was observed in Luzon and Visayas during the same period last year, as shown in Figure 3.

Overall, the first quarter of 2025 saw a slight decline in total impositions, with the March billing period recording the lowest number of constraints in the past six months[3].

Table 2. Summary of Over-riding Constraints by Category per Region

By Category	Q4 2024				Q1 2025				Change (Q-on-Q)	
	Oct	Nov	Dec	Total	Jan	Feb	Mar	Total	Diff	% Change
Luzon	84,659	79,496	102,536	266,691	91,579	93,276	57,008	241,863	- 24,828	-9.31%
Visayas	17,277	19,727	23,185	60,189	17,569	20,000	25,888	63,457	3,268	5.43%
Mindanao	8,942	5,727	6,254	20,923	3,982	5,055	4,743	13,780	- 7,143	-34.14%
Total	**110,878**	**104,950**	**131,975**	**347,803**	**113,130**	**118,331**	**87,639**	**319,100**	**- 28,703**	**-8.25%**

Compared to the previous quarter, Visayas had a minor increase in constraints towards the end of the period, despite a notable drop at the beginning of the year. This was primarily due to the entry of new power plants and the resulting system adjustments during their commissioning tests. In contrast, Luzon's impositions significantly declined in March following the issuance of FCATCs for plants that completed testing. Mindanao also experienced a notable reduction in constraints, largely due to fewer MRU-related impositions (see Figure 3).

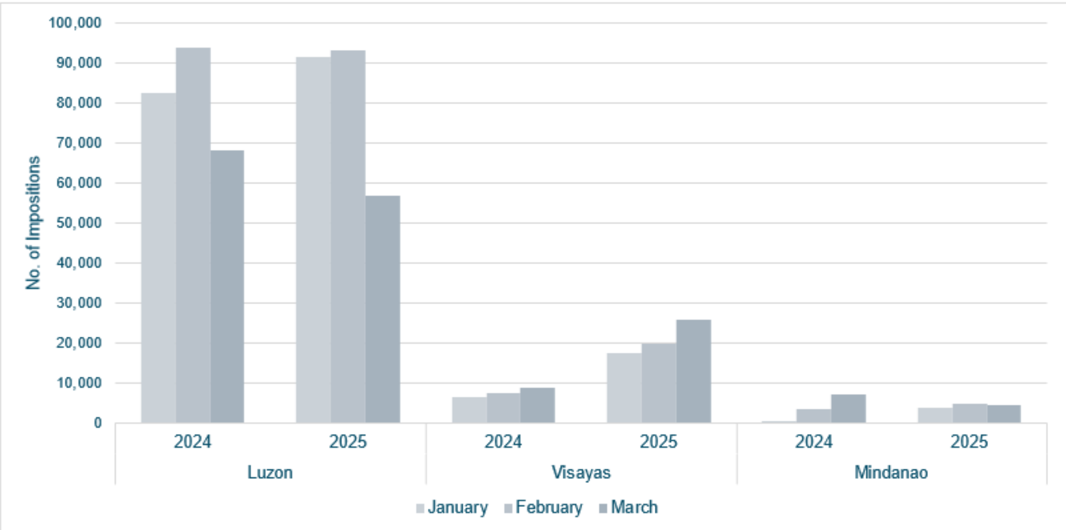


Figure 3. Monthly Comparison of Over-riding Constraints, by Region, for Q1 of 2024 and 2025

1.2. Over-riding Constraints by Incidents

[3] https://www.wesm.ph/market-outcomes/over-riding-constraints-report/quarterly-over-riding-constraints-report

Similar with the previous quarters, a detailed classification of over-riding constraints impositions (as shown in Table 3) reveals that in the 1st quarter of the year, all security limit incidents were associated with oil-based power plants designated as MRUs. These units were primarily dispatched to support voltage stability requirements in specific areas of the Mindanao grid, where reactive power and voltage control capabilities may require augmentation. The continued reliance on MRUs reflects the operational challenges inherent in maintaining grid stability in areas with evolving demand profiles and infrastructure development needs.

In line with the MSC's ongoing oversight function, the Committee coordinated with the SO, through a formal letter, to understand the measures being implemented to manage and potentially reduce the frequency of MRU impositions. The letter included updates on planned grid enhancements and projects aimed at strengthening voltage regulation capabilities, as well as operational initiatives designed to optimize MRU scheduling while maintaining system reliability.

For non-security limits, the conduct of commissioning tests remained the primary reason for over-riding constraint impositions. These tests are essential part of the process to ensure that newly registered power plants can deliver electricity safely and reliably to the grid. They include a series of technical evaluations to verify operational readiness. Additionally, various commercial and regulatory compliance tests also contributed to the substantial share of over-riding constraints during the period under review.

Table 3. Summary of Over-riding Constraints by Incidents

	Q4 2024				Q1 2025			
Incidents	**Oct**	**Nov**	**Dec**	**Total**	**Jan**	**Feb**	**Mar**	**Total**
Per Security Limit								
Must Run Units	4,711	4,997	4,475	14,183	3,362	4,288	4,233	11,883
Total	***4,711***	***4,997***	***4,475***	14,183	***3,362***	***4,288***	***4,233***	**11,883**
Per Non-security Limit								
Testing and Commissioning	96,848	92,024	109,296	298,168	102,244	106,662	80,196	289,102
Commercial and Regulatory Requirements	9,319	7,929	18,204	35,452	7,524	7,381	3,210	18,115
Total	***106,167***	***99,953***	***127,500***	333,620	***109,768***	***114,043***	***83,406***	**307,217**
Grand Total	***110,878***	***104,950***	***131,975***	***347,803***	***113,130***	***118,331***	***87,639***	***319,100***

A significant decline in commissioning test-related impositions was observed in March 2025, following the issuance of FCATCs to several power plants that had completed their required testing. The decline was also partly influenced by the postponement or non-conduct of certain scheduled tests, as shown in Figure 4. Moreover, impositions related to Ancillary Services (AS) testing also decreased during the quarter, largely due to the successful completion of testing requirements (see Table 5). Overall, the observed patterns in over-riding constraint impositions reflect the combined impact of system operations requirements, infrastructure readiness, and regulatory requirements.

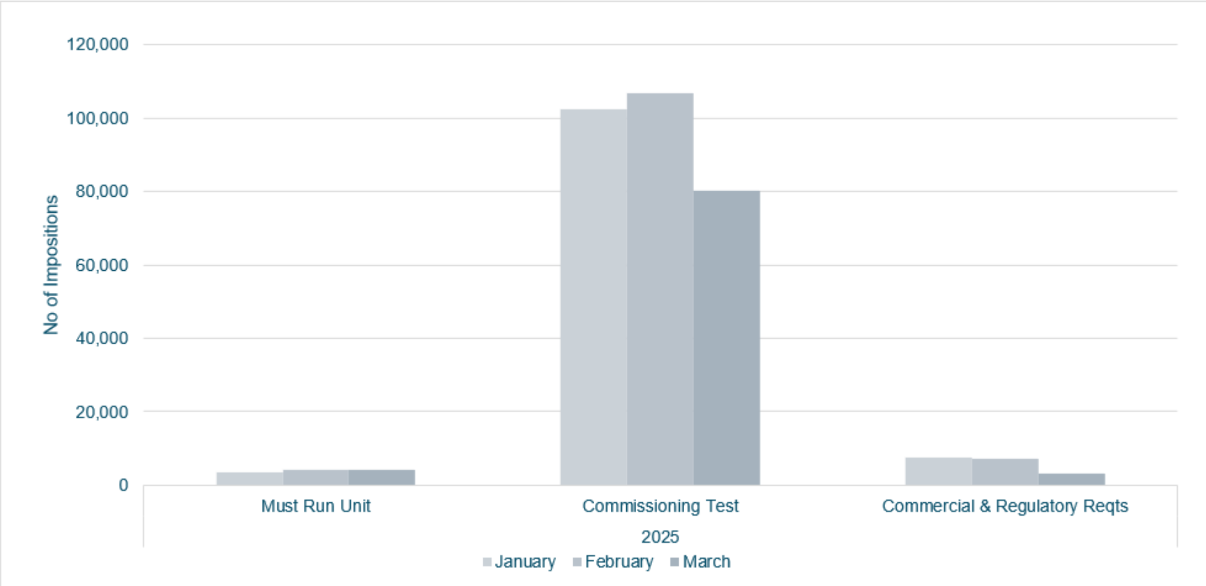


Figure 4. Monthly Comparison of Over-riding Constraints, by Incidents

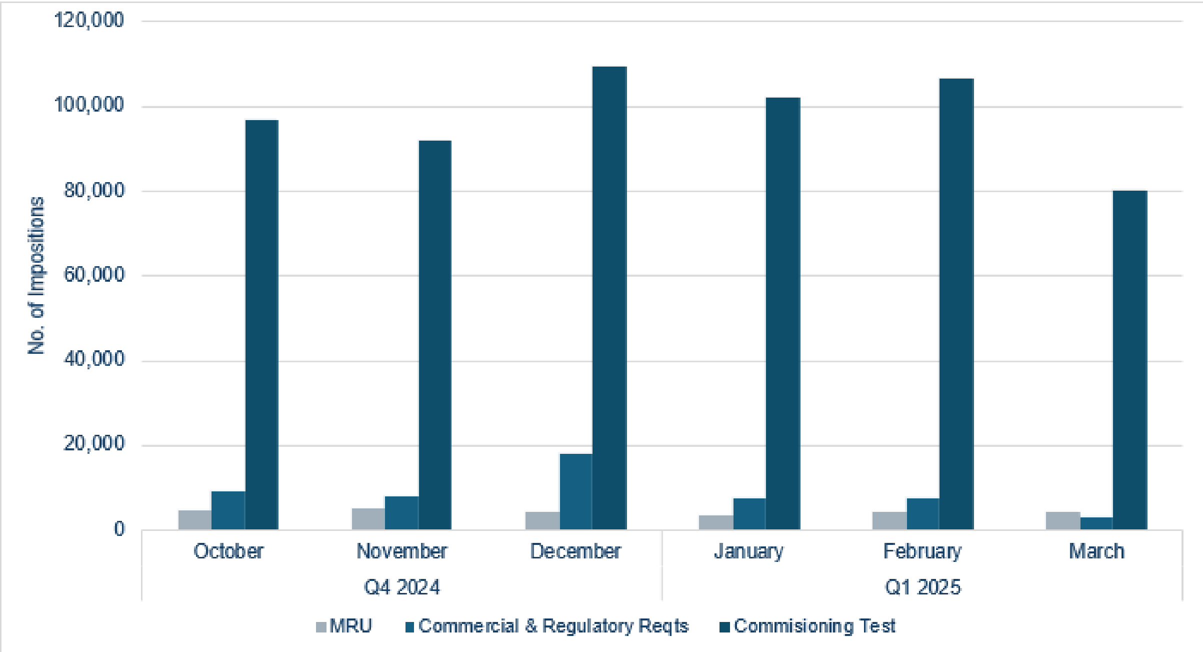


Figure 5. Monthly Comparison of Over-riding Constraints, by Incidents for the past 6 months

A comparison with the same period last year (see Figure 6) shows a significant increase in constraints related to commissioning tests, marking a 37% surge year-on-year following the:

- The entry of more power plants into the market; and
- Extended testing periods for certain facilities which commenced their commissioning test in 2024[4].

Notably, impositions related to commercial and regulatory compliance requirements registered a significant decline compared to the same period last year, indicating improved coordination and

[4] Quarterly Over-riding Constraints for Q1 to Q4 2024 published in PEMC Website.

progress in fulfilling regulatory obligations and technical readiness of participating plants.

Meanwhile, impositions associated with MRUs recorded a marginal decrease of approximately 14% from the previous year. Despite this slight reduction, system voltage management in Mindanao in the areas of Zamboanga and Agusan Del Norte remains a continuing operational challenge, consistent with trends observed in previous quarters. This underscores the need for sustained efforts in infrastructure development and reactive power support to enhance grid reliability in the region.

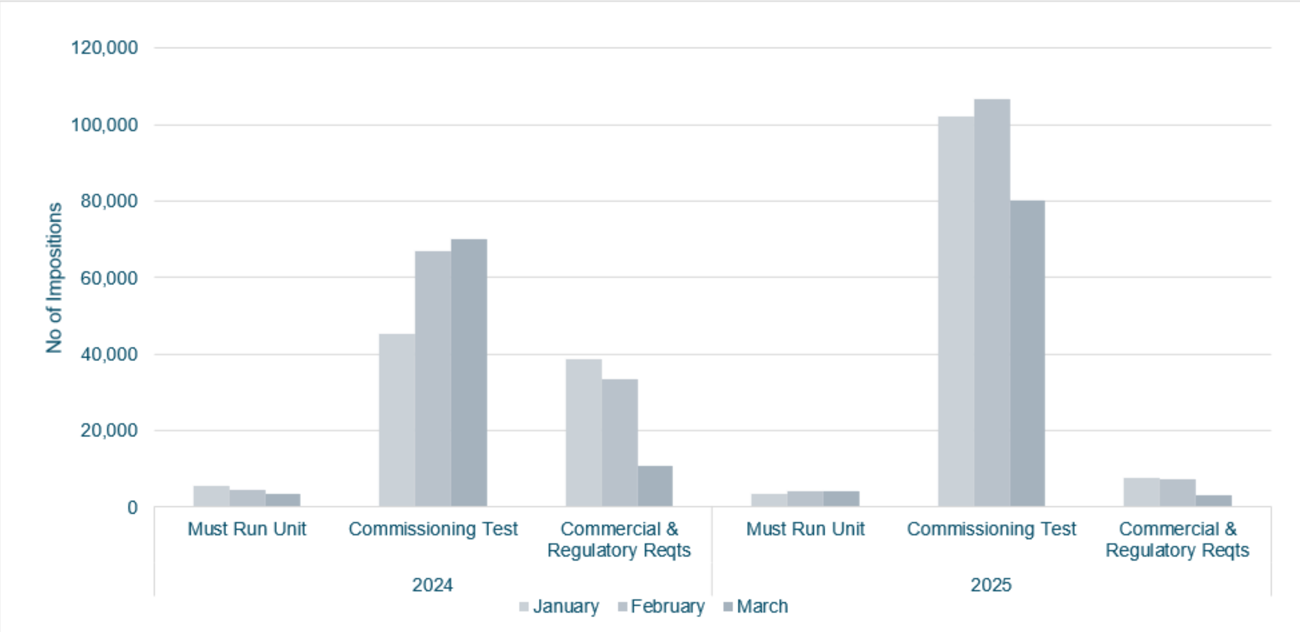


Figure 6. Comparison of Over-riding Constraints by Incidents, 2024 vs 2025

Table 4. Year-on-Year Comparison of Over-riding Constraints per Incidents

Incidents	Year-on-Year Comparison		
	Must Run Unit	Commissioning Test	Commercial & Regulatory Reqts
January	▼ -2,281	▲ 56,797	▼ -31,120
February	▼ -273	▲ 39,820	▼ -26,065
March	▲ 604	▲ 10,251	▼ -7,471

An examination of the types of tests that triggered over-riding constraints reveals that commissioning tests consistently remained the leading cause of impositions throughout the year. MRU dispatches and performance tests alternated in the second position in terms of frequency.

The decline in commissioning test-related impositions during the quarter was primarily due to the successful completion of required testing activities and the subsequent issuance of FCATCs for several solar, biofuel, and hydro power plants. Meanwhile, performance test-related impositions declined by 77% quarter-on-quarter, primarily due to the absence of impositions on Angat Hydroelectric Power Plant Unit A in 1st quarter of 2025 following the completion of its Pmax capability testing under Grid Compliance Testing (GCT).

Ancillary service-related tests accounted for the third highest number of impositions, which declined by 29% during the quarter—particularly in March 2025. Although most testing-related impositions declined, GCT saw a minimal increase in February 2025, primarily due to the conduct of tests for one (1) BESS.

Other reasons for over-riding constraints—such as capacity tests, emissions testing, Net Contracted Capacity, and heat rate testing—remained relatively limited in frequency compared to commissioning and performance tests.

Table 5. Quarterly Comparison of Over-riding Constraints per Specific Tests

By Incidents	Q4 2024				Q1 2025				Q-o-Q
	Oct	Nov	Dec	Total	Jan	Feb	Mar	Total	Comparison
Ancillary Service Test	3,834	1,887	3,650	9,371	2,350	3,342	988	6,680	-2,691
Capacity Test	-	-	-	-	-	-	36	36	36
NCC Test	-	-	539	539	969	-	-	969	430
NDC Test	75	-	-	75	-	-	-	-	-75
Capability Test	297	-	191	488	-	-	-	-	-488
Commissioning Test	96,848	92,024	109,296	298,168	102,244	106,662	80,196	289,102	-9,066
Emission Test	2,297	1,498	1,358	5,153	342	909	867	2,118	-3,035
Grid Compliance Test	168	418	79	665	588	1,742	751	3,081	2,416
MRU	4,711	4,997	4,475	14,183	3,362	4,288	4,233	11,883	-2,300
Performance Test	2,648	4,030	12,303	18,981	3,011	860	568	4,439	-14,542
Heat Rate Test	-	96	84	180	264	528	-	792	612
Total	**110,878**	**104,950**	**131,975**	**347,803**	**113,130**	**118,331**	**87,639**	**319,100**	-28,703

As shown in Figure 7, the distribution of over-riding constraints throughout the day follows a pattern like the previous quarter. Impositions normally experienced peak during the early morning and extend until early evening, specifically starting at 0500h and gradually declining after 2000h. This trend is largely due to:

- The fact that commissioning tests of solar plants need to be conducted during daylight hours.
- Conduct of commercial and regulatory compliance tests scheduled during peak demand hours.

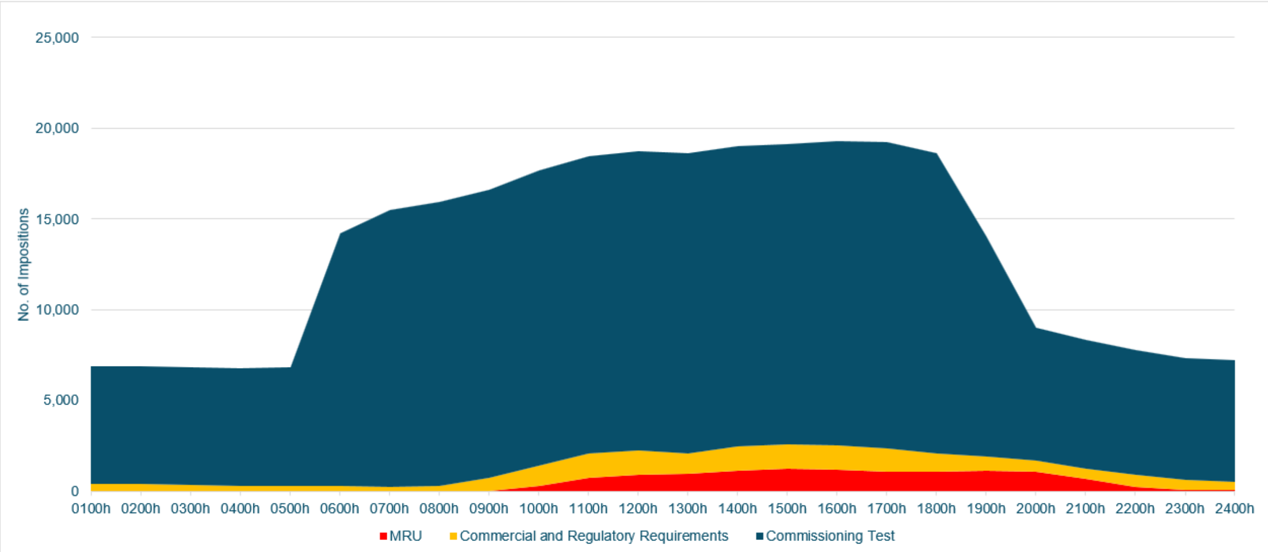


Figure 7. Hourly Profile of Over-riding Constraints Imposition per Incident

1.3. Over-riding Constraints by Plant Type

During the 1st quarter of 2025, renewable energy (RE) plants continued to account for the highest number of over-riding constraints. Solar plants topped the list, contributing 40% of the total impositions, with an average scheduled capacity of 16.12 MW[5]. This dominance was largely attributable to the extended commissioning tests conducted during the period. Wind and geothermal plants followed at 21% and 13%, respectively.

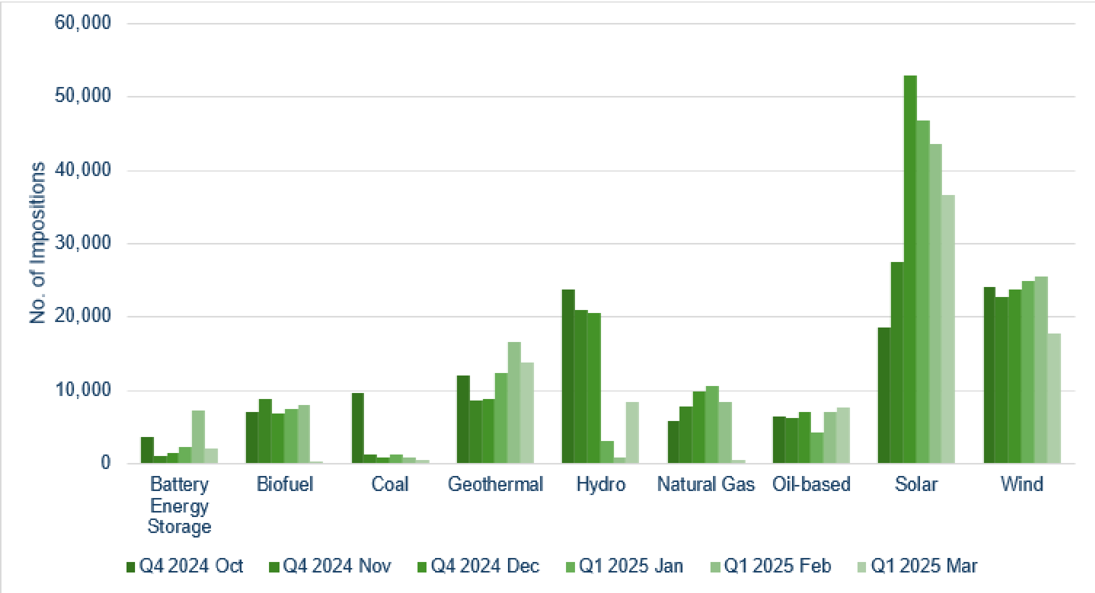


Figure 8. Over-riding Constraints by Plant Type, Q4 2024 to Q1 2025

Table 6. Quarterly Comparison of Over-riding Constraints by Plant Type

Plant type	Q4 2024				Q1 2025				Q-o-Q Comparison
	Oct	Nov	Dec	Total	Jan	Feb	Mar	Total	
Battery Energy Storage	3,630	1,004	1,519	6,153	2,195	7,252	2,164	11,611	▲ 5,458
Biofuel	7,076	8,820	6,801	22,697	7,486	8,060	114	15,660	▼ -7,037
Coal	9,600	1,323	858	11,781	1,354	990	404	2,748	▼ -9,033
Geothermal	11,931	8,640	8,848	29,419	12,449	16,560	13,719	42,728	▲ 13,309
Hydro	23,721	20,962	20,505	65,188	3,036	859	8,400	12,295	▼ -52,893
Natural Gas	5,778	7,880	9,849	23,507	10,581	8,377	540	19,498	▼ -4,009
Oil-based	6,462	6,216	7,008	19,686	4,267	7,096	7,712	19,075	▼ -611
Solar	18,597	27,442	52,929	98,968	46,817	43,533	36,743	127,093	▲ 28,125
Wind	24,083	22,663	23,658	70,404	24,945	25,604	17,843	68,392	▼ -2,012
Total	**110,878**	**104,950**	**131,975**	**347,803**	**113,130**	**118,331**	**87,639**	**319,100**	▼ **-28,703**

Compared to the previous quarter, impositions on solar plants increased by 28%, primarily by 1) the issuance of PCATCs to new solar plants entering the market; and 2) the additional PCATC extensions granted to existing plants still undergoing commissioning tests. This trend reflects the ongoing growth in solar generation capacity and the associated compliance requirements prior to full commercial operations.

[5] Further details of scheduled capacities per plant type is attached in the report as Annex B

Geothermal plant impositions also rose significantly—by 45% quarter-on-quarter—mainly due to the commencement of commissioning tests for the 21.573 MW Tanawon Geothermal Power Plant.

Impositions involving Battery Energy Storage Systems (BESS) increased due to the concurrent conduct of commissioning tests (with a total capacity of 90.5 MW) and commercial and regulatory compliance requirements (with a total capacity of 300 MW from nine plants), reflecting the growing deployment of BESS in the grid.

Conversely, most other resource types experienced a decline in impositions during the review period:

- The largest drop was observed among hydro plants, attributed to a reduction in both commissioning and commercial/regulatory testing.
- For coal-fired plants, the decrease in impositions was primarily due to the start of commercial operations for Mariveles Coal-Fired Thermal Power Plant Unit 4 on 09 January 2025, which had begun testing on 28 June 2024.
- The decline in impositions related to biofuel plants was influenced by the start of commercial operations of the Biogas Power Plant (Phase 1).

Although RE plants dominated overall impositions, other conventional technologies also showed notable trends:

- Natural gas plant impositions decreased due to the completion of commissioning tests for Batangas Combined Cycle Power Plant Units 1 and 2.
- Oil-based plant impositions saw a slight reduction, driven by a decrease in test activity during the quarter.

Despite a slight quarter-on-quarter decline, wind plants remained the second-highest resource type in terms of impositions. This was due to the continued commissioning of the below three power plants:

- 80 MW Balaoi and Caunayan Wind Power Project Phase 1,
- Caparispisan II Wind Power Project, and
- 13.2 MW Nabas Wind Power Plant Phase 2 (Nabas-2).

1.4. Plants under Commissioning Test

A review of plant commissioning profiles at the end of the period reveals that wind power plants had the highest number of multiple extensions. One facility, with a capacity of 80 MW, conducted commissioning tests for up to 22 months. Wind plants undergoing commissioning during the period had capacities ranging from 13.2 MW to 81 MW.

Geothermal plants followed, with three (3) facilities recording extensions to their PCATCs. The longest extension observed among these reached 12 months for a plant with a capacity of 31 MW.

In terms of the number of facilities affected, solar power plants accounted for the most commissioning test extensions. As of March 2025, eight (8) solar plants had recorded PCATC extensions, with the longest lasting approximately 11 months. One additional solar facility recorded an extension of around 5 months.

Beyond renewable energy facilities, one natural gas plant—the largest among those under commissioning during the review period, with a capacity of 440 MW—was granted an extension of up to 5 months. In addition, two (2) BESS recorded multiple extensions, lasting 9 and 10 months, respectively.

As illustrated in Figure 9, solar power plants continued to represent the largest share of commissioning test-related impositions over the past six (6) months. However, the number of impositions gradually declined toward the end of the quarter, indicating that a growing number of solar projects have completed their respective commissioning phases. Wind plants similarly exhibited a downward trend by the end of the quarter.

The decline in biofuel-related commissioning test impositions was primarily attributed to the completion of testing for the Biogas Power Plant (Phase 1) on 25 February 2025.

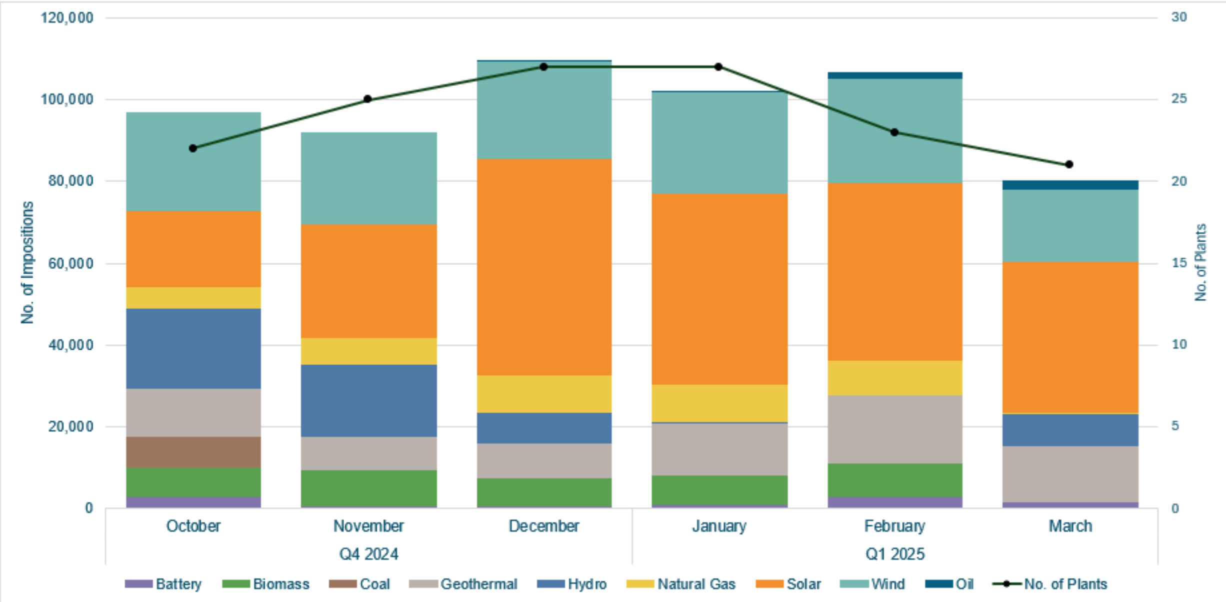


Figure 9. Monthly Comparison of Over-riding Constraints due to Commissioning Test and the Corresponding Number of Power Plants

Figure 10 shows the average scheduled capacity across all regions during the review period for plants under commissioning tests. The negative scheduled capacities recorded in Luzon and Visayas are associated with the testing of BESS charging capabilities. In Luzon, the average schedule of 30.8 MW is noticeably higher than the median of 14.4 MW, influenced by extreme values ranging from a minimum of -40 MW to a maximum of 430 MW. The median shows the middle value of the data and is not affected as much by extreme highs or lows, so it better reflects where most schedules fall during the covered period in the region. In Visayas, all schedules are zero or positive, the average is also higher than the median because a few plants have much higher schedules, but there are no negative values to lower the average.

Luzon | **Visayas**

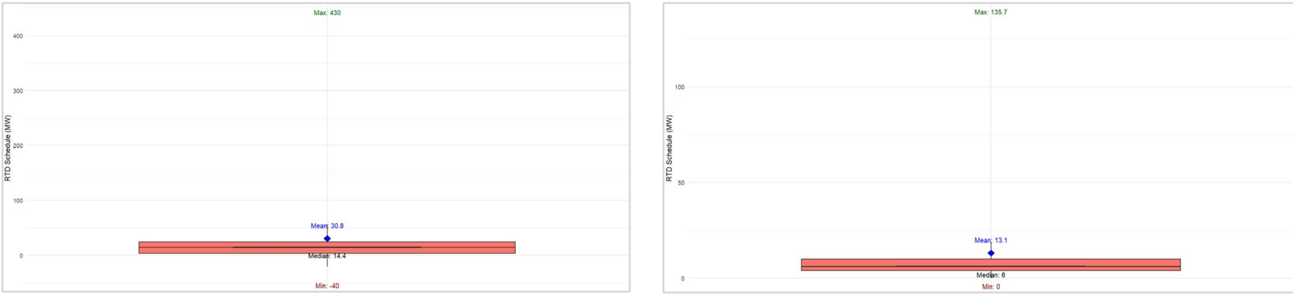


Figure 10. Monthly Scheduled Capacities of Over-riding Constraints due to Commissioning Test, Per Region[6]

In line with the Market Surveillance Manual (MSM), the MSC is mandated to regularly monitor over-riding constraints, particularly those related to power plants undergoing commissioning tests. The Committee also maintains consistent coordination with the Market Operator (MO) and the SO to verify the reasons behind extended testing periods, especially considering DOE Department Circulars, which generally prescribe a two-month duration for commissioning tests.

While the extension of commissioning tests is permitted under DOE Department Circular No. 2021-06-0013 and related issuances, such extensions are limited to one (1) month after the evaluation of initial test results. These are further contingent on the availability of a testing schedule, as confirmed by the Transmission Network Provider (TNP) or Distribution Utility (DU).

Throughout the quarter under review, there were commissioning tests that concluded and were with corresponding FCATCs issuances. These plants are the following[7]:

Power Plants	Remarks
Sto. Domingo Solar Power Plant	Started submitting nominations in Market Participants Interface (MPI) on 11 February 2025
56.578 MWp Gamu Solar Power Project	Started submitting nominations in MPI on 09 January 2025
42.900 MWp Bongabon Solar Power Plant	Started submitting nominations in MPI on 06 January 2025
75.214 MWp Palauig Solar Power Project	Started submitting nominations in MPI on 07 January 2025
Biogas Power Plant (Phase 1)	Can start submitting nominations in MPI on 25 February 2025
Batangas Combined Cycle Power Plant Unit 1	Started submitting nominations in MPI on 27 December 2024
Batangas Combined Cycle Power Plant Unit 2	Started submitting nominations in MPI on 30 January 2025
4.00 MW Colasi Mini Hydroelectric	To start submitting nominations in MPI on 13 March 2025

[6] No plant under Commissioning Test is recorded in Mindanao during the covered period.
[7] As checked with the information gathered from the Market Operator as of 25 March 2025

Power Plant (MHEPP)	

While the DOE circulars establish clear timelines for commissioning—including a two-month period with a possible one-month extension—the MSC observed multiple instances of extended testing periods beyond the prescribed limits throughout 2024. These recurring extensions underscore the importance of reassessing the implementation and enforcement of existing regulatory timelines for commissioning.

Considering these observations, the MSC continues to formally report such cases to the DOE and ERC, ensuring transparency and regulatory oversight through the regular submission of its monitoring reports for their review and appropriate action.

1.5. Schedule and Actual Generation for Plants under Over-riding Constraints

This section presents a comparison between the RTD schedule and the actual generation (as observed from the snapshot data) for generating units that were subjected to over-riding constraints during the covered billing period.

As a background, over-riding constraints are imposed by the SO to dispatch plants due to various reasons such as to address system security threat, to mitigate the effects of a system emergency, or to address the need to dispatch generating units to comply with systems, regulatory and commercial tests requirements. While these impositions are allowed under the rules and manuals, there might be possible deviations between the scheduled dispatch and actual plant output due to various possible reasons due to, among others, operational, system, or resource-specific factors. Verification and identification of such reasons are not covered in this report.

For the 1st quarter of 2025, deviations between RTD schedules and actual generation were observed across all plant types with over-riding constraints. Figures 11 to 14 illustrate these hourly differences. The comparison reveals that deviations between RTD schedules and actual generation are prevalent across all resource types when over-riding constraints are imposed. Further checking confirmed that the difference between the two data across all plant types is statistically significant[8], which indicates that the differences are unlikely to have happened by chance.

Coal-fired plants showed consistent deviations, with all 13 units registering differences between their RTD schedules and actual generation. The average deviation was 4.41 MW, and the largest was recorded at 258 MW. In some instances, actual generation exceeded scheduled levels by as much

[8] This is done using Paired t-test which is a statistical method used to determine whether there is a significant difference between two related sets of values. For this section, it is applied to assess if the difference between the RTD schedule and actual generation (MW snapshot) for the same plant and time interval per plant type is statistically significant. This helps identify whether deviations are likely due to random variation or reflect consistent differences in dispatch and actual output.

as 92 MW, notably by Pagbilao Coal-Fired Power Plant 1.

Natural gas units similarly recorded deviations, averaging 3.33 MW, with the most significant deviation reaching 412 MW. As with coal, instances of over-generation were noted, peaking at 430 MW for unit Batangas Combined Cycle Power Plant Unit 3.

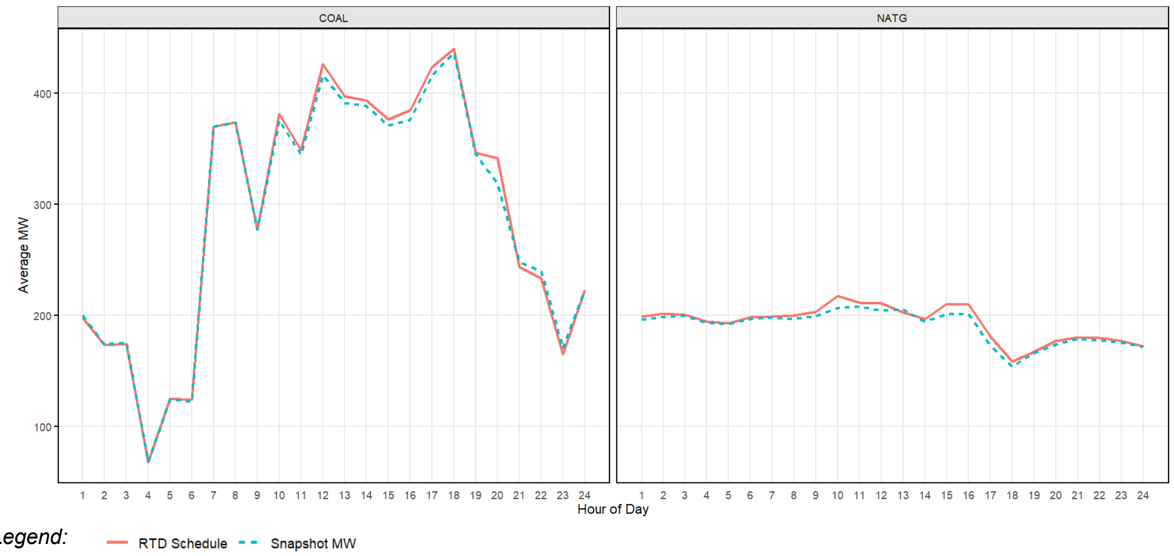
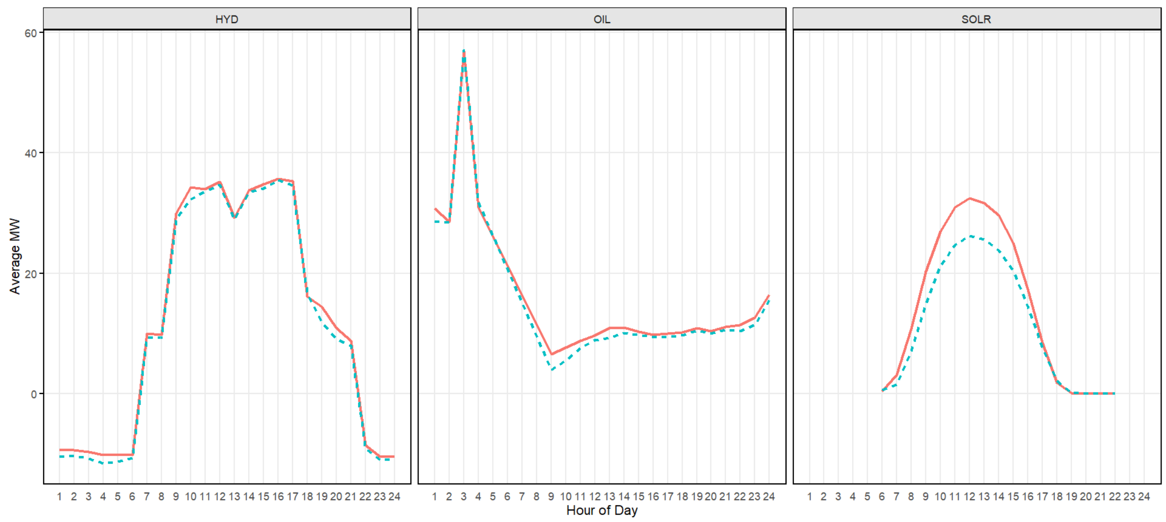


Figure 11. Average Hourly RTD Schedule vs Actual Generation, Per Plant Type (Coal, Natural Gas)

Hydro facilities exhibited one of the smallest average deviations at just 0.79 MW. The highest difference was 153 MW, while the smallest—approaching near-alignment—was observed from San Roque Hydro Electric Power Plant Unit 2 on 12 February 2025 at 1410h. Similarly, oil-fired units mirrored this behavior, with an average deviation also at 0.79 MW and a peak difference of 60 MW, noted for Bataan Combined Cycle Power Plant Unit 6.

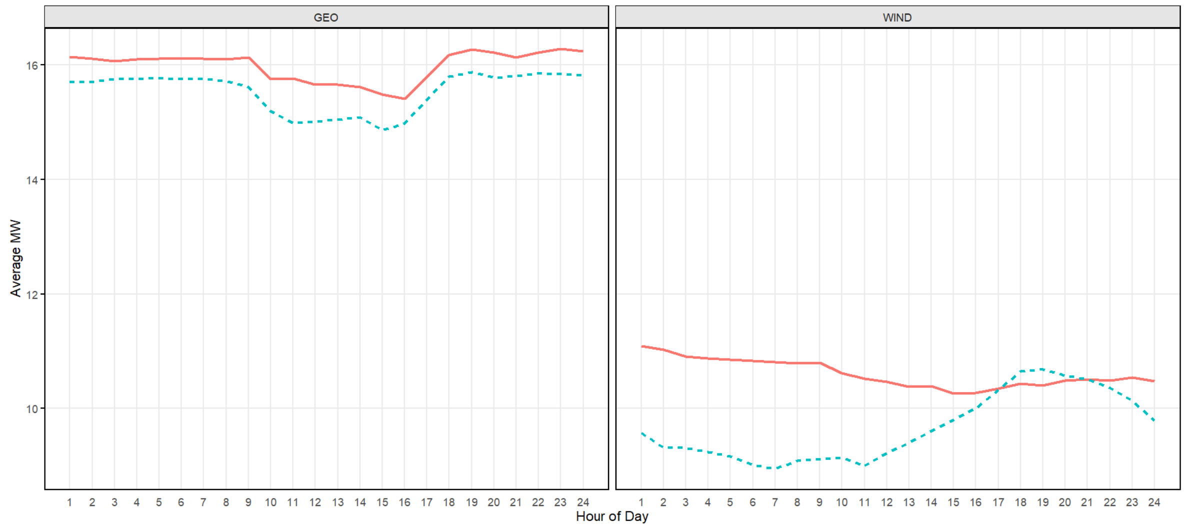
Solar plants, following expected daytime patterns, peaked between 0600h and 1800h. Despite this predictable output curve, deviations averaged 3.62 MW, with the highest at 113 MW from 137.40 MWAC Calatrava Solar Power Project (SPP). These variances are likely caused by intermittent cloud cover or local irradiance changes not captured in the forecast.



Legend: RTD Schedule Snapshot MW

Figure 12. Average Hourly RTD Schedule vs Actual Generation, Per Plant Type (Hydro, Oil, Solar)

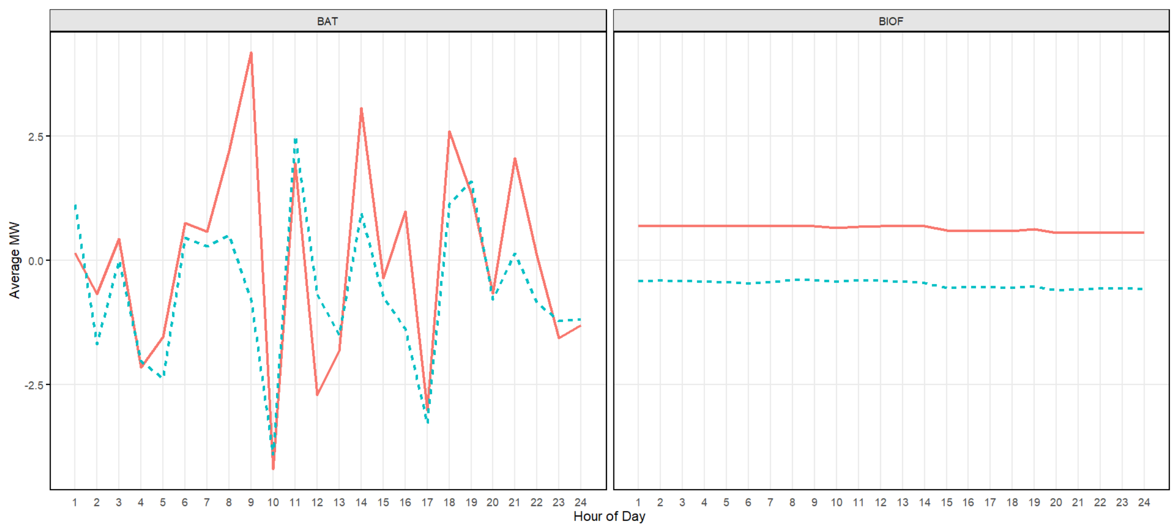
Geothermal plants consistently produced less than their scheduled output across all hours, with no instances of full alignment with the schedule. The largest difference was 26 MW for 03PALAYAN_G01. In contrast, wind resources occasionally exceeded RTD schedules, particularly between 1800h and 2000h, possibly due to improved wind conditions during those hours. At other times, actual generation typically trailed the schedule, with the maximum shortfall recorded at 25 MW.



Legend: RTD Schedule Snapshot MW

Figure 13. Average Hourly RTD Schedule vs Actual Generation, Per Plant Type (Geothermal, Wind)

Biofuel plants also demonstrated a steady pattern of under-generation, with an average deviation of 1.13 MW and a peak difference of 2.32 MW. Battery energy storage systems, by design, displayed an intermittent deviation pattern due to charging and discharging behavior. On average, they deviated by 0.56 MW, with the largest difference recorded at 75.4 MW. These differences are likely influenced by charging windows.



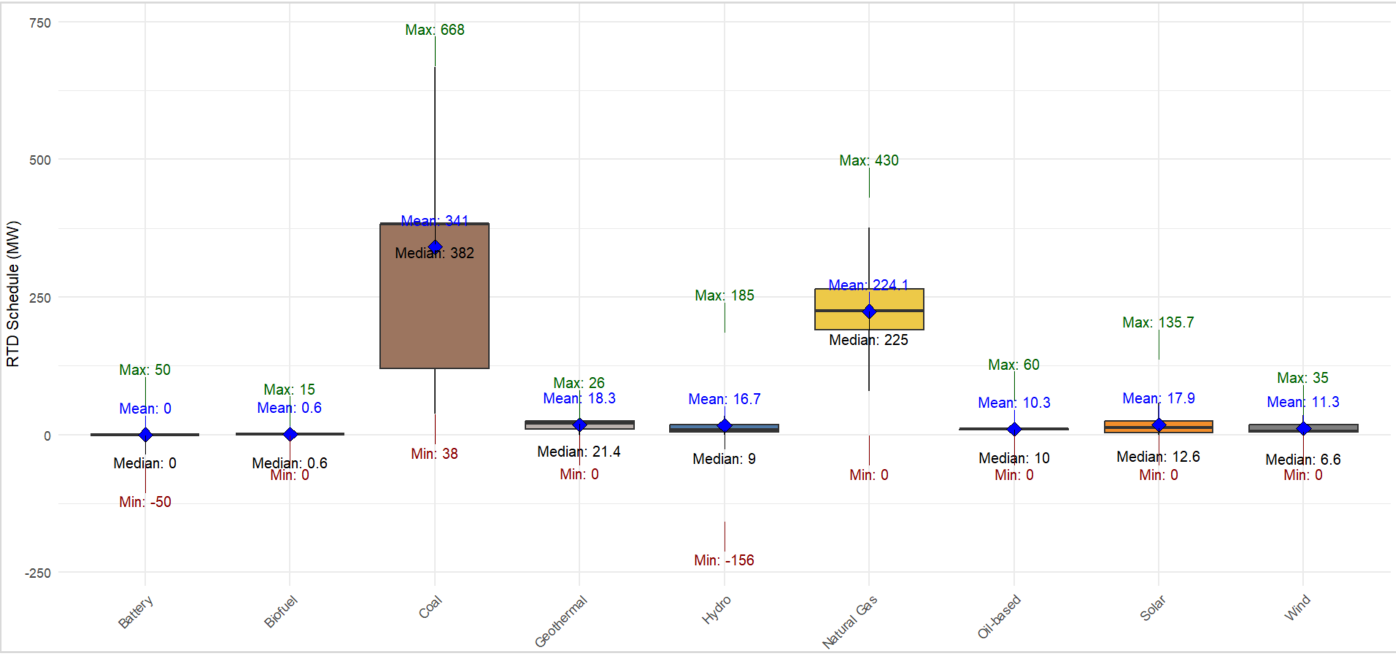
Legend: RTD Schedule Snapshot MW

Figure 14. Average Hourly RTD Schedule vs Actual Generation, Per Plant Type (Battery and Biofuel)

ANNEX A. List of Plants with Impositions due to Commissioning Test for Q1 2025

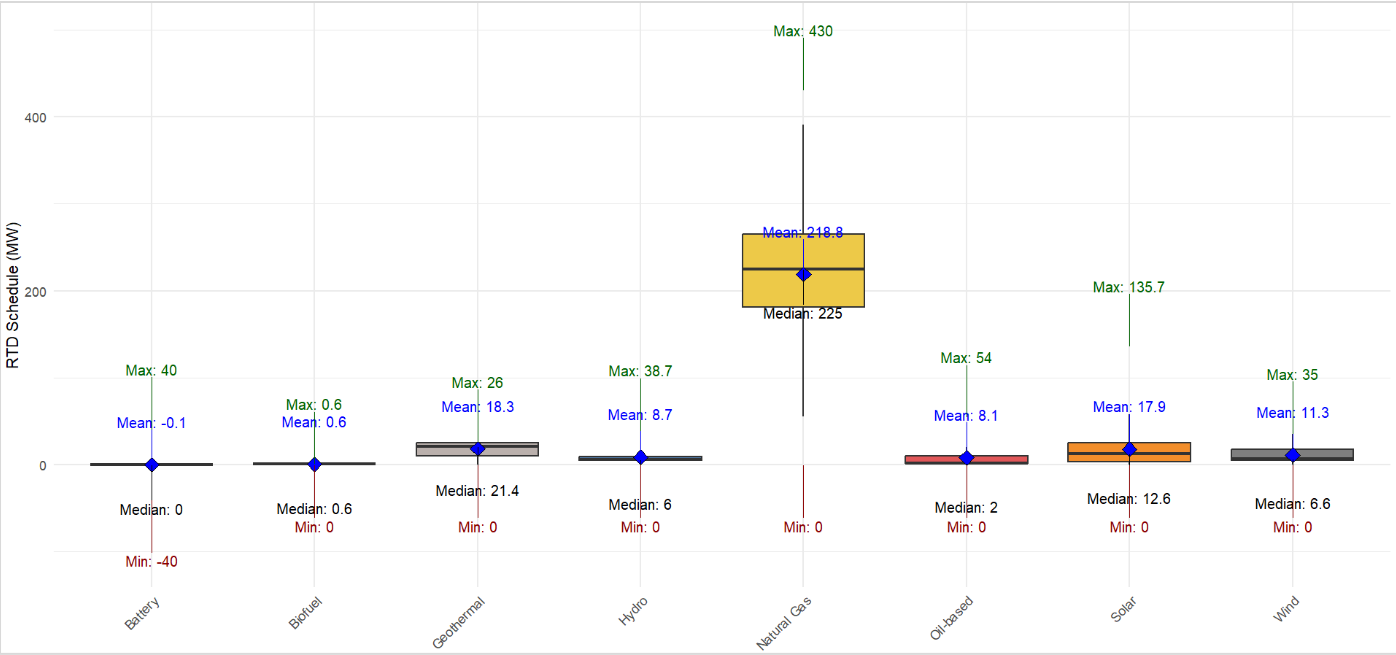
Participant Name	Resource ID	Facility Name	Plant Type	January	February	March
Angat Hydroelectric Power Plant Unit A	Angat Hydropower Corporation	01ANGAT_A	HYD	✓		
Concepcion 1 Solar Power Project	Solar Philippines Tarlac Corporation	01CONSOL_G01	SOLR	✓	✓	✓
80.000 MW Balaoi and Caunayan Wind Power Project Phase 1	Bayog Wind Power Corp.	01BALWIND_G01	WIND	✓	✓	✓
35.700 MW Palayan Binary Power Plant	Bac-Man Geothermal Inc.	03PALAYAN_G01	GEO	✓	✓	✓
72.128 MWp Subic New PV Power Plant Project	Jobin-SQM Inc.	01SUPSOL_G01	SOLR	✓	✓	✓
Caparispisan II Wind Power Project	Amihan Renewable Energy Corp.	01CAPRIS_G02	WIND	✓	✓	✓
45.758 MWh Gamu Battery Energy Storage System (BESS)	SMGP BESS Power Inc.	01GAMU_BAT	BAT		✓	✓
13.200 Nabas Wind Power Plant Phase 2 (Nabas-2)	PetroWind Energy Inc.	08PWIND_G02	WIND	✓	✓	✓
17MW Tiwi Geothermal Binary Power Plant	AP Renewables Inc.	03TGPP_G01	GEO	✓	✓	✓
57.125 MWh Lumban Battery Energy Storage System (BESS)	SMGP BESS Power Inc.	03LUMBAN_BAT	BAT	✓		✓
Batangas Combined Cycle Power Plant Unit 1	Excellent Energy Resources Inc.	03EERI_G01	NATG	✓		
Biogas Power Plant (Phase 1)	Trustpower Corporation	01TRUSTBIO_G01	BIO	✓	✓	
Batangas Combined Cycle Power Plant Unit 3	Excellent Energy Resources Inc.	03EERI_G03	NATG	✓	✓	✓
14.160MW Upper Taft Hydroelectric Power Plant	Iraya Ventures, Inc.	04UTH_G01	HYD			✓
0.531 MW/1.400 MWh Energy Storage System (ESS)	Bataan Solar Energy Inc.	01BTSOLEN_BAT	BAT	✓	✓	
36.646 MWp RASLAG IV Solar Power Project	RASLAG Corp.	01RASLAG_G04	SOLR	✓	✓	✓
75.214 MWP Palauig Solar Power Project	Shizen Inc.	01SHIZEN_G01	SOLR	✓		
Sto. Domingo Solar Power Plant (SDSPP)	Sinocalan Solar Power Corp.	01DOMSOL_G01	SOLR	✓	✓	
56.578 MWp Gamu Solar Power Project	Megasol Energy 1 Inc.	01MEGASOL_G01	SOLR	✓		
42.900 MWp Bongabon Solar Power Plant	Nuevasol Energy Corp.	01NUEVASOL_G01	SOLR	✓		
Batangas Combined Cycle Power Plant Unit 2	Excellent Energy Resources Inc.	03EERI_G02	NATG	✓	✓	
27.121 MWp Dagohoy Solar Power Project	Dagohoy Green Energy Corporation	07DAGSOL_G01	SOLR	✓	✓	✓
18.6 MW Bunker C-Fired Diesel Power Plant	Tarlac Power Corporation	01TPCBUNK_G01	OIL	✓	✓	
46.658MWP Armenia Solar Power Project (SPP)	RE Resources, Inc.	01ARESOL_G01	SOLR	✓	✓	✓
23.776 MWP Bongabon Solar Power Project	Greentech Solar Energy Inc.	01BONGSOL_G01	SOLR	✓	✓	✓
19.613 MWp San Jose Solar Power Plant (SPP)	San Jose Green Energy Corporation	01SJSOL_G01	SOLR	✓	✓	✓
64.206MWp/48.118MWac Maragondon Solar Power Plant	Prime Solar Solutions Corp.	03MARAGSOL_G01	SOLR	✓		
64.206MWp/48.118MWac Tanauan Solar Power Plant	Prime Solar Solutions Corp.	03TANSOL_G01	SOLR	✓		
137.400 MWAC Calatrava Solar Power Project (SPP)	Aboitiz Solar Power, Inc.	06CALASOL_G01	SOLR	✓	✓	✓
63.961 MWp Cordon Solar Power Project	Greenergy for Global Inc.	01CORDONSOL_G01	SOLR		✓	✓
21.573 MW Tanawon Geothermal Power Plant	Bac-Man Geothermal, Inc.	03TANAWON_G01	GEO		✓	✓
60.702 MW Bohol In-Island Diesel Power Plant	Conal Holdings Corporation	07BIDPP_G01	OIL		✓	✓
Samal Solar Power Project Phase 1	Samal Solar Renewable Energy Corp.	01SAMLSOL_G01	SOLR			✓
23.776 MWP Bongabon Solar Power Project	Greentech Solar Energy Inc.	01BONGSOL_G01	SOLR	✓	✓	✓
19.613 MWp San Jose Solar Power Plant (SPP)	San Jose Green Energy Corporation	01SJSOL_G01	SOLR	✓	✓	✓
137.400 MWAC Calatrava Solar Power Project (SPP)	Aboitiz Solar Power, Inc.	06CALASOL_G01	SOLR	✓	✓	✓
63.961 MWp Cordon Solar Power Project	Greenergy for Global Inc.	01CORDONSOL_G01	SOLR		✓	✓
21.573 MW Tanawon Geothermal Power Plant	Bac-Man Geothermal, Inc.	03TANAWON_G01	GEO		✓	✓
60.702 MW Bohol In-Island Diesel Power Plant	Conal Holdings Corporation	07BIDPP_G01	OIL		✓	✓
Samal Solar Power Project Phase 1	Samal Solar Renewable Energy Corp.	01SAMLSOL_G01	SOLR			✓

ANNEX B. Scheduled Capacities per Plant Type

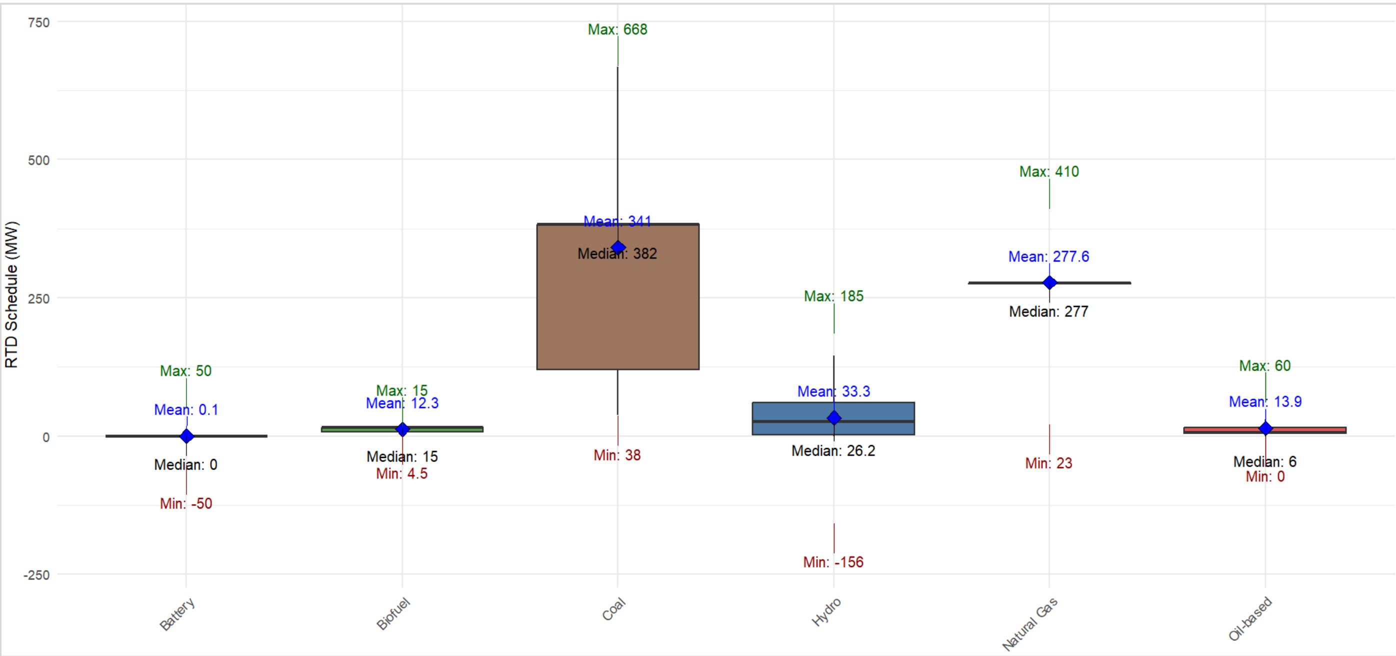


ANNEX C. Scheduled Capacities per Plant Type per Incident

C.1 Commissioning Test



C.2 Commercial and Regulatory Requirements



C.3 Must-Run Units