2024 Annual Over-riding Constraints Report

26 December 2023 to 25 December 2024

JULY 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 (OCs) imposed by the System Operator (SO) on generators for the 2024 billing year. The findings highlight trends and significant changes in the impositions across different regions and plant types in comparison with 2023.

For the billing year 2024, the System Operator (SO) imposed a significantly higher number of OCs compared to the previous year. This upward trend was observed consistently across all quarters, with non-security-related impositions continuing to account for the majority of the observations.

Non-security impositions remained predominantly driven by commissioning tests. Although a quarter-on-quarter decline was recorded—attributable to the completion of tests for several generating units—commissioning-related impositions still accounted for a substantial share. Security-related constraints were exclusively linked to the dispatch of Must-Run Units (MRUs), primarily oil-based plants in the Mindanao grid. These units were deployed to address voltage stability and thermal limit issues. However, MRU dispatches declined markedly compared to the previous year.

On a year-on-year basis, commissioning test-related constraints surged by 209%, primarily due to (i) the entry of new generating plants into the market and (ii) extended testing timelines for certain facilities.

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

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

Additionally, renewable energy facilities—particularly solar, wind, and hydro—continued to account for the highest number of over-riding constraints across all resource types.

In 2024, the Market Surveillance Committee (MSC) continued to observe repeated extensions of commissioning tests beyond the allowable period prescribed under the Department of Energy's (DOE's) Department Circular[1]—i.e. a two-month period with a possible one-month extension. Considering these persistent trends, the MSC formally raised its observations to the concerned participants and the SO and likewise informed the DOE and the Energy Regulatory Commission (ERC) of the results of its coordination. Through its formal communication, the MSC reiterated its long-standing recommendation—first raised in 2016—to both the ERC and the Grid Management Committee (GMC): to review and revise the current allowable commissioning periods. Specifically, the MSC emphasized the need to establish differentiated commissioning timelines that consider

[1] DOE Department Circular No. DC2021-06-0013 entitled "Adopting a General Framework Governing the Test and Commissioning of Generation Facilities for Ensuring Readiness to Deliver Energy to the Grid or Distribution Network"

plant type, technology, and complexity, to promote more efficient, realistic, and enforceable testing schedules.

For the year 2024, deviations between RTD schedules and actual generation were observed across all plant types with over-riding constraints. 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, the Market Surveillance Committee (MSC) shall undertake an assessment and analysis on the results of the monitoring of over-riding constraints[2] imposed by the System Operator (SO) on generators. Hence, this report is prepared covering the billing year of 2024 (26 December 2023 to 25 December 2024).

1.1. Over-riding Constraints by Category and Region

In 2024, a total of 1,324,240 over-riding constraints impositions were recorded, marking a significant increase of nearly 120% (or 722,001 more impositions) compared to 2023. Notably, 95% of these impositions were related to non-security limits. This upward trend was consistent across all quarters of 2024.

The surge in non-security-related impositions can be attributed to several factors, including the entry of new generation capacities undergoing commissioning and other regulatory or commercial testing requirements. These drivers are further explored in Section 1.2 of the report.

Table 1. Summary of Over-riding Constraints by Category per Quarter, 2023 vs 2024

By Category	2023				Total for 2023	2024				Total for 2024	Change (Y-on-Y)	
	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4		Diff	% Change
Non-Security Limit	83,648	130,023	127,821	156,870	498,362	265,084	322,170	339,367	333,620	1,260,241	▲ 761,879	▼ 152.88%
Security Limit	25,809	45,236	16,188	16,644	103,877	13,754	25,059	11,003	14,183	63,999	▼ - 39,878	▼ -38.39%
Total	**109,457**	**175,259**	**144,009**	**173,514**	**602,239**	**278,838**	**347,229**	**350,370**	**347,803**	**1,324,240**	**▲ 722,001**	**▲ 119.89%**

The remaining 4% of constraints were classified as security limits, all of which were tied to the operation of Must-Run Units (MRUs) from oil-based plants. MRUs were primarily deployed to support voltage stability or address thermal loading issues. However, the overall use of MRUs declined by 38% compared to 2023, reflecting a reduced reliance on oil-based support units. As a rule,[3] MRUs are only dispatched once reserves are fully depleted, and with the Reserve Market commercial operation (from February to March 2024 before its temporary suspension and eventual resumption in August), its implementation may have contributed to optimizing reserve dispatch and reducing the need for MRUs during those periods.

While a relatively higher volume of MRU-related impositions was observed in mid-2024, particularly in May (see Table 2), a downward trend emerged in the latter half of the year, suggesting a reduced necessity for such interventions.

[2] 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.

[3] Dispatch Protocol Section 17 – Management of Must-Run Units

Table 2. Monthly Comparison of Over-riding Constraints by Category, 2024

	Q1			Q2			Q3			Q4		
By Category	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
Non-Security Limit	84,170	100,288	80,626	98,259	108,999	114,912	121,190	116,534	101,643	106,167	99,953	127,500
Security Limit	5,564	4,561	3,629	7,855	10,789	6,415	3,466	4,196	3,341	4,711	4,997	4,475
Total	**89,734**	**104,849**	**84,255**	**106,114**	**119,788**	**121,327**	**124,656**	**120,730**	**104,984**	**110,878**	**104,950**	**131,975**

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

As shown in Figure 1, a major contributor to the rise in over-riding constraint impositions was the increasing number of power plants categorized as non-security limits undergoing commissioning tests. These included both newly registered plants entering the market and those granted extensions to their initial commissioning test periods. The influx of new generation facilities into the WESM prompted heightened SO impositions to accommodate testing requirements while ensuring grid reliability and operational security.

In addition, the sustained upward trend in impositions throughout the year was closely linked to the extension of Provisional Certificates of Approval to Connect (PCATCs). These extensions allowed certain power plants to continue their commissioning tests beyond the period originally prescribed under the DOE Department Circular (DC). Such extensions were typically granted in response to delays in technical validation, additional testing needs, or unmet regulatory requirements. Further discussion on the drivers of PCATC extensions is provided in Section 1.4 of this report.

Meanwhile, the decline in impositions observed during several months (as illustrated in Figure 2) can be attributed to either the completion of commissioning activities or the reduction in the number of tests conducted during those periods.

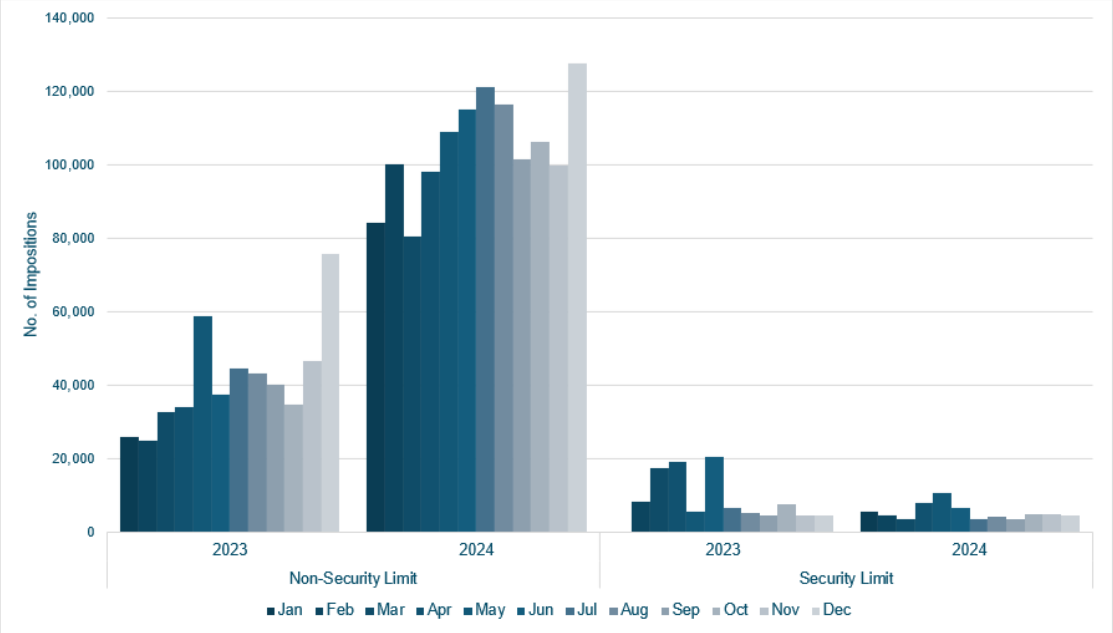

Figure 2. Comparison of Over-riding Constraints by Category, 2023 vs 2024

Majority of over-riding constraints in 2024 were recorded in the Luzon grid, which accounted for 79% of the total system impositions. This was followed by the Visayas region, contributing 12%, while Mindanao had the smallest share at 9%. The relatively low number of impositions in Mindanao was primarily associated with MRU dispatches involving oil-based plants that were scheduled to maintain voltage stability or manage thermal constraints in specific areas such as in Zamboanga. Compared to the previous year, the number of MRU-related impositions in the region significantly dropped in 2024 suggesting a declining reliance on oil-based plants as MRU in Mindanao.

The sharp increase in Luzon impositions compared to 2023 (see Table 3) can be attributed to several factors. During the early months of 2024, a spike in performance tests was observed among natural gas plants undergoing fuel conversion to Liquefied Natural Gas (LNG) — a process that began in 2023 and resumed testing in earnest of 2024. The highest number of impositions was documented in July and December 2024, driven by the addition of several newly commissioned plants, which underwent testing alongside existing units under the same category.

Like Luzon, the Visayas grid also experienced a notable year-on-year increase in impositions. In particular, the February 2024 billing period saw elevated constraint levels due to geothermal plants conducting commissioning tests toward the end of the month. Another sharp increase was recorded in May 2024, with a 148% month-on-month rise, linked to a surge in commercial and regulatory testing requirements.

Historical trends indicate a consistent increase in over-riding impositions in both Luzon and Visayas, reflecting the growing volume of constraints imposed to accommodate regulatory, and commercial testing requirements. This pattern highlights the operational challenges faced by the SO in balancing reliability while integrating new capacity and facilitating compliance-related activities.

Table 3. Summary of Over-riding Constraints by Category per Region

By Region	2023				Total for 2023	2024				Total for 2024	Change (Y-on-Y)	
	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4		Diff	% Change
Luzon	61,100	96,415	112,591	152,938	423,044	244,395	275,417	266,002	266,691	1,052,505	▲ 629,461	▲ 148.79%
Visayas	26,936	14,605	13,019	4,809	59,369	11,282	38,155	45,264	60,189	154,890	▲ 95,521	▲ 160.89%
Mindanao	21,421	64,238	18,399	15,767	119,825	23,161	33,657	39,104	20,923	116,845	▼ -2,980	▼ -2.49%
Total	**109,457**	**175,258**	**144,009**	**173,514**	**602,238**	**278,838**	**347,229**	**350,370**	**347,803**	**1,324,240**	▲ **722,002**	▲ **119.89%**

Table 4. Summary of Over-riding Constraints by Category per Region

By Category	Q1			Q2			Q3			Q4		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Luzon	82,621	93,711	68,063	90,085	90,178	95,154	101,961	90,550	73,491	84,659	79,496	102,536
Visayas	462	3,455	7,365	7,326	18,191	12,638	10,670	15,311	19,283	17,277	19,727	23,185
Mindanao	6,651	7,683	8,827	8,703	11,419	13,535	12,025	14,869	12,210	8,942	5,727	6,254
Total	**89,734**	**104,849**	**84,255**	**106,114**	**119,788**	**121,327**	**124,656**	**120,730**	**104,984**	**110,878**	**104,950**	**131,975**

As illustrated in Figure 3, the Visayas region exhibited a notable upward trend in over-riding constraint impositions toward the end of the review period. This increase was primarily driven by the entry of new power plants during the period.

In contrast, Mindanao experienced a significant decline in impositions from its peak in Q3 2024, largely due to the completion of commissioning tests for select generating units and the reduction in MRU-related impositions.

Despite temporary dips in March 2024 (1st quarter) and August–September 2024 (3rd quarter), Luzon continued to experience a general increase in impositions throughout the year, culminating in its highest monthly total in December 2024. This sustained growth was driven by the issuance of new PCATCs for plants entering the WESM, alongside extensions granted to existing plants still undergoing testing (see Section 1.4 of the report). These dual factors compounded the volume of impositions observed in the latter part of the year.

While Luzon and Visayas both showed year-on-year increases in over-riding constraint impositions, Mindanao recorded a modest decline of approximately 2.49%. This regional contrast underscores the varying operational dynamics across the grid, with Luzon and Visayas integrating more new capacity, while Mindanao heads toward operational normalization.

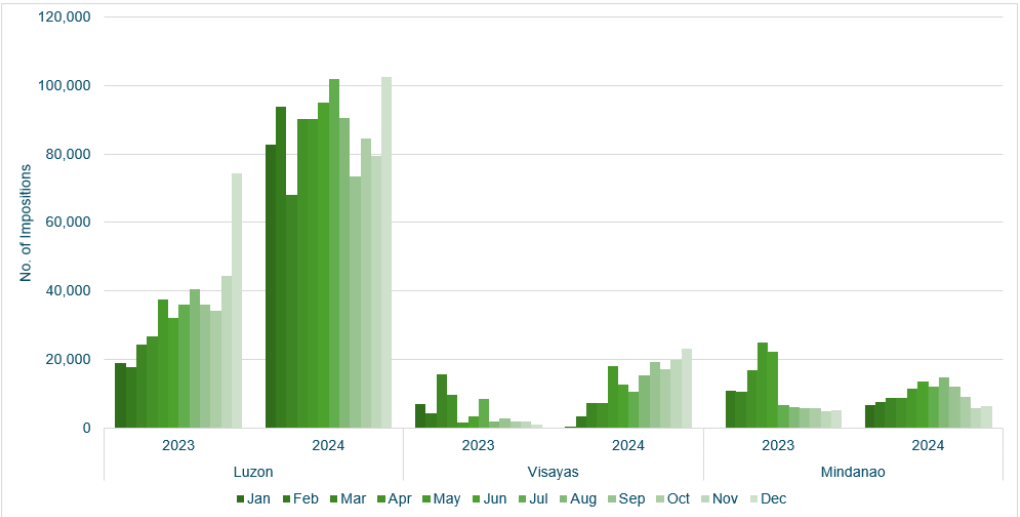

Figure 3. Monthly Comparison of Over-riding Constraints, by Region

1.2. Over-riding Constraints by Incidents

A detailed breakdown of over-riding constraint impositions, as presented in Table 5, shows that in 2024, all security limit-related impositions were imposed on oil-based plants designated as MRUs. This pattern was consistent across all quarters of the year, and aligns with trends observed in 2023, where MRUs were primarily dispatched to support system voltage levels and mitigate thermal constraints, particularly in the Mindanao region.

In terms of non-security limits, the primary driver of over-riding constraint impositions continued to be the conduct of commissioning tests—a trend observed in previous years as well. These tests were conducted for both newly registered power plants entering the market and existing plants that were granted extensions due to pending final approvals. Furthermore, a significant portion of impositions was also attributed to various commercial and regulatory compliance tests, which contributed to the sustained high volume of non-security-related impositions during the review period.

Table 5. Summary of Over-riding Constraints by Incidents

	Q1			Q2			Q3			Q4		
Incidents	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
Per Security Limit												
Must Run Units	5,643	4,561	3,629	7,855	10,789	6,415	3,466	4,196	3,341	4,711	4,997	4,475
Total	***5,643***	***4,561***	***3,629***	***7,855***	***10,789***	***6,415***	***3,466***	***4,196***	***3,341***	***4,711***	***4,997***	***4,475***
Per Non-security Limit												
Testing and Commissioning	45,447	64,826	69,945	88,327	85,705	110,642	111,829	109,256	94,999	96,848	92,024	109,296
Commercial and Regulatory Requirements	38,644	35,462	10,681	9,932	23,294	4,270	9,361	7,278	6,644	9,319	7,929	18,204
Total	***84,091***	***100,288***	***80,626***	***98,259***	***108,999***	***114,912***	***121,190***	***116,534***	***101,643***	***106,167***	***99,953***	***127,500***
Grand Total	***89,734***	***104,849***	***84,255***	***106,114***	***119,788***	***121,327***	***124,656***	***120,730***	***104,984***	***110,878***	***104,950***	***131,975***

A sharp increase in over-riding constraint impositions was observed in February, following a relatively lower level in January. This uptick was driven by the entry of additional power plants undergoing commissioning tests, as well as the rise in testing activities from existing plants. The trend continued steadily, peaking around mid-year, as more units entered the system or proceeded with pending testing requirements. In addition, most of the plants conducting commissioning tests during the billing year were solar plants.

Towards the latter part of the year, the number of commissioning test-related impositions declined, primarily due to the issuance of Final Certificates of Approval to Connect (FCATCs) for several power plants that had successfully completed their required testing protocols. The decline was also partially attributed to delays or postponement of testing activities by certain plants, as reflected in Figure 4.

However, a renewed spike in over-riding constraints emerged toward year-end, largely driven by an influx of ancillary services testing, particularly for hydro and battery energy storage systems. This included performance and capability tests for hydro plants, such as the Angat Hydroelectric Power Plant Unit A, which conducted maximum generation capability testing in preparation for its Grid Compliance Testing (GCT).

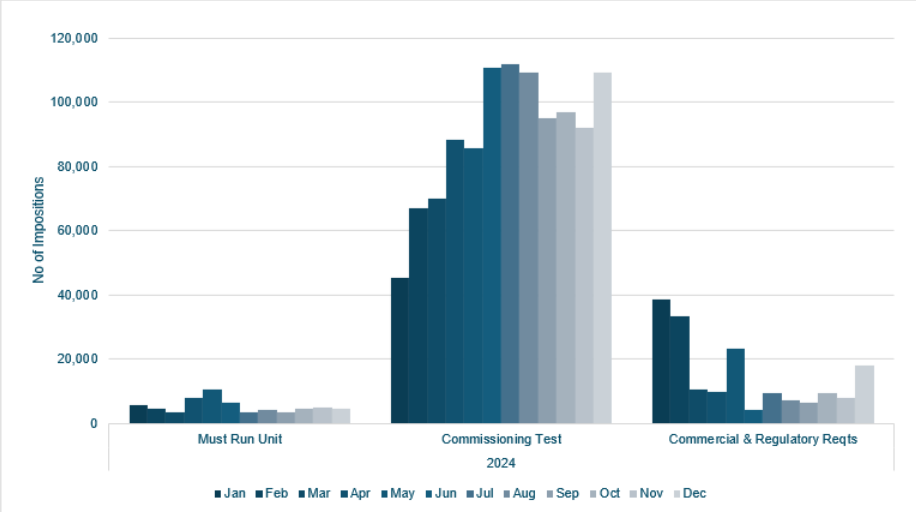

Figure 4. Monthly Comparison of Over-riding Constraints, by Incidents

A comparison with the same period in the previous year (see Figure 5) reveals a significant 209% year-on-year increase in over-riding constraints related to commissioning tests. This surge reflects two key factors:

- The entry of more power plants into the market, and
- The extension of testing periods for several existing facilities.

The number of power plants and facilities subjected to over-riding constraints for commercial and regulatory testing also contributed to the overall increase in this classification during the review period, compared to 2023. However, unlike last year's pattern, commercial and regulatory test-related impositions in 2024 generally showed a downward trend, except for notable spikes in May and December. These spikes were primarily associated with performance testing of Angat Hydroelectric Power Plant Unit A.

In contrast, a substantial decline of approximately 48% was observed in MRU-related impositions compared to 2023. Despite this reduction, system voltage issues and thermal constraints in Mindanao persisted throughout all quarters of 2024.

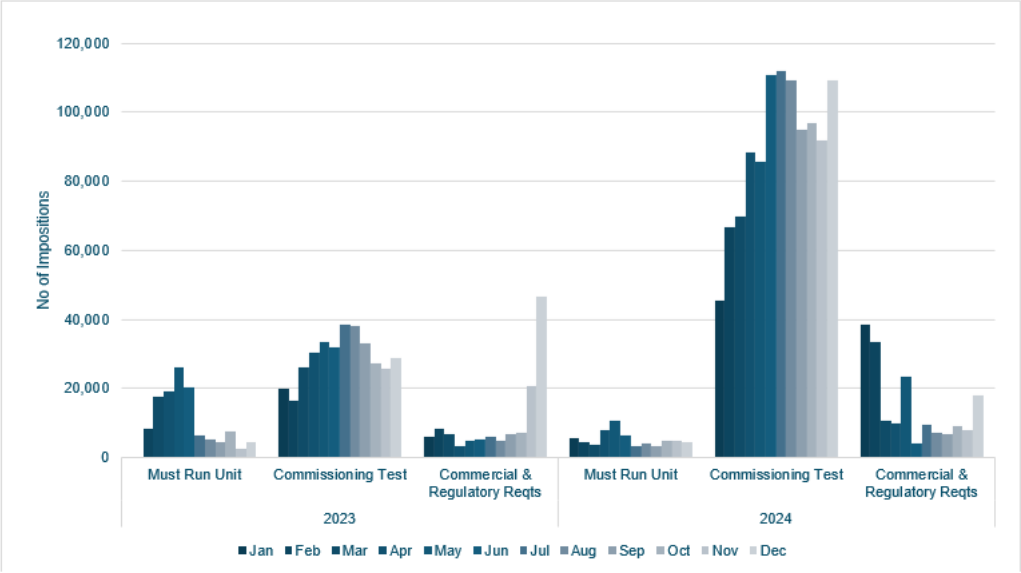

Figure 5. Comparison of Over-riding Constraints by Incidents, 2023 vs 2024

Table 6. Year-on-Year Comparison of Over-riding Constraints per Incidents

	Year-on-Year Comparison		
	Must Run Unit	Commissioning Test	Commercial & Regulatory Reqts
January	5,643	25,631	32,440
February	-3,683	50,547	24,926
March	-13,936	43,945	3,868
April	-11,408	57,823	6,555
May	-15,279	52,113	18,561
June	-13,924	78,534	-1,005
July	-3,125	73,336	3,251
August	-914	70,947	2,338
September	-1,146	61,723	-49
October	-2,701	69,568	2,027
November	2,393	66,338	-12,900
December	-153	80,279	-28,562

An examination of the types of tests imposed as over-riding constraints in 2024 reveals that, as in previous years, commissioning tests remained the leading cause of impositions throughout the year. However, MRU impositions and performance tests alternated as the second and third most frequent reasons by year-end, reflecting shifts in operational and regulatory testing activities.

A notable surge in impositions occurred mid-year, primarily driven by the entry of new power plants conducting commissioning tests to assess their readiness to deliver energy to the grid. This was further compounded by extensions granted by the SO to plants already undergoing testing. In contrast, a significant decline in impositions was recorded between September and November, following the successful completion of tests and the issuance of FCATCs to several solar, hydro, and coal plants.

Performance test-related impositions spiked sharply in May and December 2024, largely due to the Angat Hydroelectric Power Plant Unit A. Meanwhile, the dip in March was attributed to reduction of impositions or completions of commercial and regulatory tests at the San Gabriel Avion Natural Gas Power Plant (NGPP) and Sta. Rita NGPP.

Ancillary services testing ranked as the fourth most common reason for over-riding constraints. While activity was generally steady, notable reductions were observed in April and September. This was followed by emission testing and grid compliance testing, which recorded 16,515 and 7,787 impositions, respectively, for the year. Additional impositions were related to Net Contracted Capacity (NCC) and Net Dependable Capacity (NDC) testing—mainly involving six (6) units of the Sta. Rita Natural Gas Plant, which underwent significant number of testing in January and July 2024.

Other less frequent but still noteworthy reasons included capacity/capability tests, heat rate tests, and the conduct of ERC audits, all of which registered substantially lower imposition counts compared to the dominant categories of commissioning and performance tests.

Table 7. Quarterly Comparison of Over-riding Constraints per Specific Tests

	Q1			Q2			Q3			Q4		
By Incidents	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
Ancillary Service Test	7,130	1,761	4,166	654	6,336	1,664	3,053	1,164	877	3,834	1,887	3,650
Capacity Test	-	1,941	-	204	358	-	-	-	433	-	-	-
NCC Test	599	-	-	-	23	-	1,726	-	-	-	-	539
NDC Test	4,320	157	-	-	-	-	576	-	-	75	-	-
Capability Test	-	366	790	24	335	-	191	-	329	297	-	191
Commissioning Test	45,447	64,826	69,945	88,327	85,705	110,690	111,949	109,256	94,999	96,848	92,024	109,296
Emission Test	601	631	533	2,423	809	1,108	1,030	3,036	1,191	2,297	1,498	1,358
Grid Compliance Test	144	2,287	3,825	105	-		-	283	478	168	418	79
MRU	5,643	4,561	3,629	7,855	10,789	6,415	3,466	4,196	3,341	4,711	4,997	4,475
Performance Test	25,800	28,235	1,367	6,522	15,433	1,450	2,665	2,792	3,336	2,648	4,030	12,303
Heat Rate Test	-	84	-	-	-	-	-	-		-	96	84
ERC Audit	50	-	-	-	-	-	-	3	-	-	-	-
Total	**89,734**	**104,849**	**84,255**	**106,114**	**119,788**	**121,327**	**124,656**	**120,730**	**104,984**	**110,878**	**104,950**	**131,975**

As shown in Figure 6, the distribution of over-riding constraints throughout the day follows a pattern across the year. Impositions normally experience 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.
- Conducting commercial and regulatory compliance tests are typically scheduled during peak demand hours, ensuring that they can accurately assess operational performance under hectic market conditions.

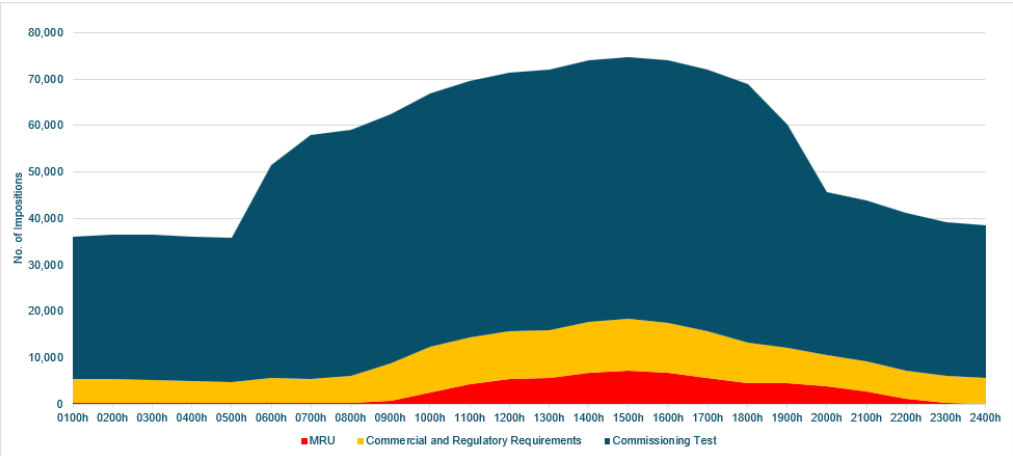

Figure 6. Hourly Profile of Over-riding Constraints Imposition per Incident

1.3. Over-riding Constraints by Plant Type

Similar with the previous year, renewable energy (RE) plants continued to account for the highest number of over-riding constraints. Solar plants topped the list, contributing 26% of the total impositions for the covered period. This dominance was largely attributable to the extended commissioning tests conducted during the period. Wind and hydro plants followed at 17% and 15%, respectively, while geothermal plants accounted for about 12%.

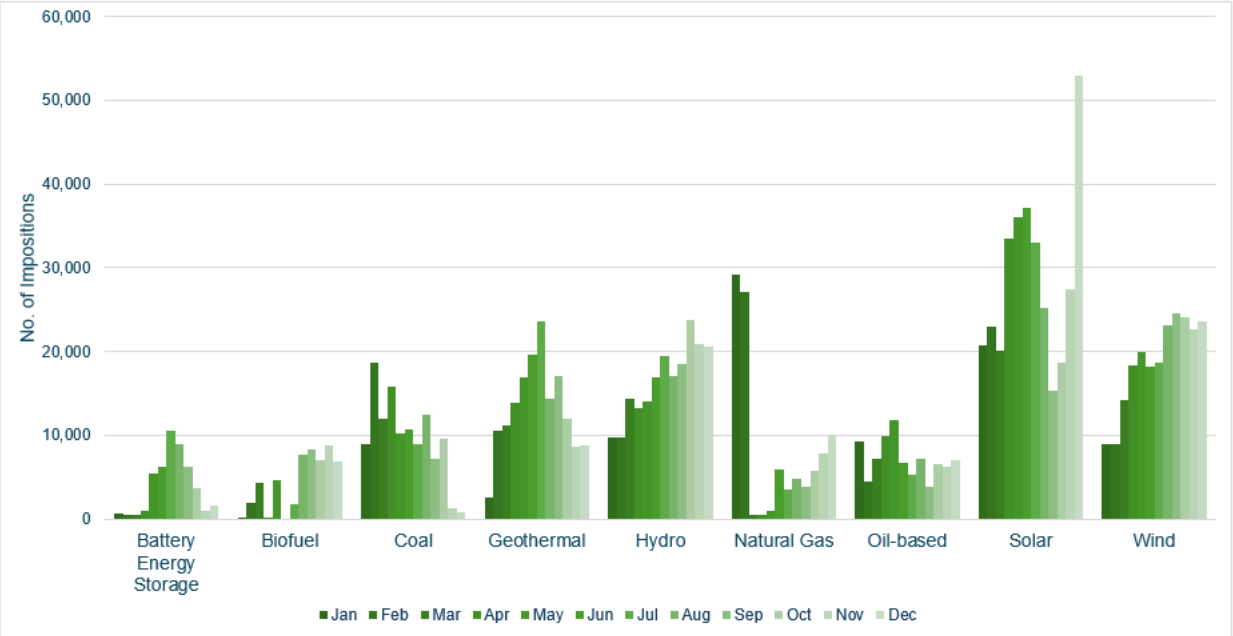

Figure 7. Over-riding Constraints by Plant Type, Q3 to Q4 2024

Table 8. Quarterly Comparison of Over-riding Constraints by Plant Type

	Q1			Q2			Q3			Q4		
Plant type	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Battery Energy Storage	566	533	556	890	5,384	6,153	10,494	8,906	6,222	3,630	1,004	1,519
Biofuel	60	1,941	4,318	88	4,594	-	1,788	7,636	8,248	7,076	8,820	6,801
Coal	8,926	18,730	11,992	15,738	10,176	10,722	8,910	12,465	7,236	9,600	1,323	858
Geothermal	2,475	10,511	11,190	13,921	16,968	19,655	23,651	14,420	17,126	11,931	8,640	8,848
Hydro	9,724	9,733	14,285	13,306	13,958	16,917	19,380	16,994	18,443	23,721	20,962	20,505
Natural Gas	29,116	27,048	432	486	888	5,849	3,511	4,804	3,823	5,778	7,880	9,849
Oil-based	9,188	4,480	7,161	9,919	11,863	6,732	5,191	7,162	3,896	6,462	6,216	7,008
Solar	20,784	22,961	20,075	33,411	36,007	37,134	33,053	25,234	15,362	18,597	27,442	52,929
Wind	8,895	8,912	14,246	18,355	19,950	18,165	18,678	23,109	24,628	24,083	22,663	23,658
Total	**89,734**	**104,849**	**84,255**	**106,114**	**119,788**	**121,327**	**124,656**	**120,730**	**104,984**	**110,878**	**104,950**	**131,975**

Impositions related to solar plants were primarily due to 1) the issuance of PCATCs for new power plants entering the market; and 2) the additional PCATC extensions granted to existing plants still undergoing commissioning tests. This trend highlights the ongoing expansion of solar generation capacity in line with the objectives of the government to transition to cleaner energy, and the corresponding compliance requirements before plants can enter full commercial operations.

Similarly, wind plants also experienced impositions due to both new market entry and extended testing periods of existing plants under commissioning tests. Along with Solar plants, they remained among the resource types with the highest impositions during the year and under the abovementioned category.

While RE plants continued to dominate overall impositions, conventional power plants such as coal, natural gas, and oil-based plants accounted for 6% to 9% of total constraints. A declining trend in coal-related impositions was observed, largely due to the completion of commissioning tests for Mariveles Coal-Fired Thermal Power Plant Unit 4, which received its FCATC on 18 October 2024, signaling its readiness to transition to full commercial operations.

In contrast, natural gas plant impositions showed an upward trend towards the end of the year, despite a notable dip from March to May 2024. The decline during this period was driven by the completion of performance testing for San Gabriel Avion NGPP and Sta. Rita NGPP, which were being tested under new LNG fuel configurations. The increase during the latter part of the year was mainly attributed to the ongoing commissioning activities for Batangas Combined Cycle Power Plant Units 1 and 2, which extended throughout the review period.

Changes in oil-based plant impositions were linked to their MRU designations, particularly in Mindanao, where they were dispatched to maintain system voltage or address thermal limits. These impositions reflect the persistent challenge of ensuring voltage stability, especially in areas with limited reactive power support from the grid. Based on the Transmission Development Plan 2024–2050, ongoing efforts by SO are in place to address the identified issues and, hopefully, reduce the number of MRU-related impositions (e.g., Zamboanga Peninsula Voltage Improvement Project, construction of transmission lines, substation expansion project, etc.).

Meanwhile, Battery Energy Storage Systems (BESS) experienced impositions primarily for commissioning tests. However, a declining trend was recorded toward year-end driven by the completion of necessary testing for commercial operations for some plants and reduced testing activities for others.

A similar trend was noted for geothermal plants, which saw impositions peak in July 2024 before declining in subsequent months. This variability is attributed to a combination of factors, including:

- Phased testing schedules, where plants were not consistently subjected to constraints throughout the period; and
- Operational adjustments, such as plant output modifications or temporary postponement of testing.

1.4. Plants under Commissioning Test

An examination of the profile of power plants under extended commissioning tests at the end of the review period reveals that wind power plants had the highest number of multiple extensions. One wind facility, with a capacity of 80 MW, was recorded to have been under commissioning tests for up to 19 months—the longest duration observed. Across the board, wind plants under commissioning had capacities ranging from 13 MW to 80 MW.

Solar power plants followed closely, accounting for the largest share of over-riding constraints during the period. As of December 2024, three (3) solar plants were operating under extended

PCATCs. The longest extension among them lasted eight months, involving a facility with a capacity of 62.7 MW.

On another note, one (1) geothermal plant, rated at 31 MW, was recorded to have undergone an 11-month extension. Additionally, two (2) natural gas plants, each with a capacity of 440 MW—the largest among those under commissioning during the review period—had multiple extensions of up to five (5) months each. Other plants under extended commissioning had extension durations ranging between one (1) and eight (8) months, across different technologies.

As shown in Figure 8, solar plants continued to dominate the number of commissioning test-related impositions throughout 2024. However, a gradual decline was noted toward the latter part of the year, followed by a sharp resurgence in December, which recorded the highest number of impositions for solar facilities.

In contrast, wind plants exhibited a steadily increasing and consistent share of impositions, reflecting a growing number of wind projects entering the grid and progressing through the necessary commissioning stages. This trend highlights the ongoing expansion of wind energy capacity, and the operational challenges tied to their integration into the market.

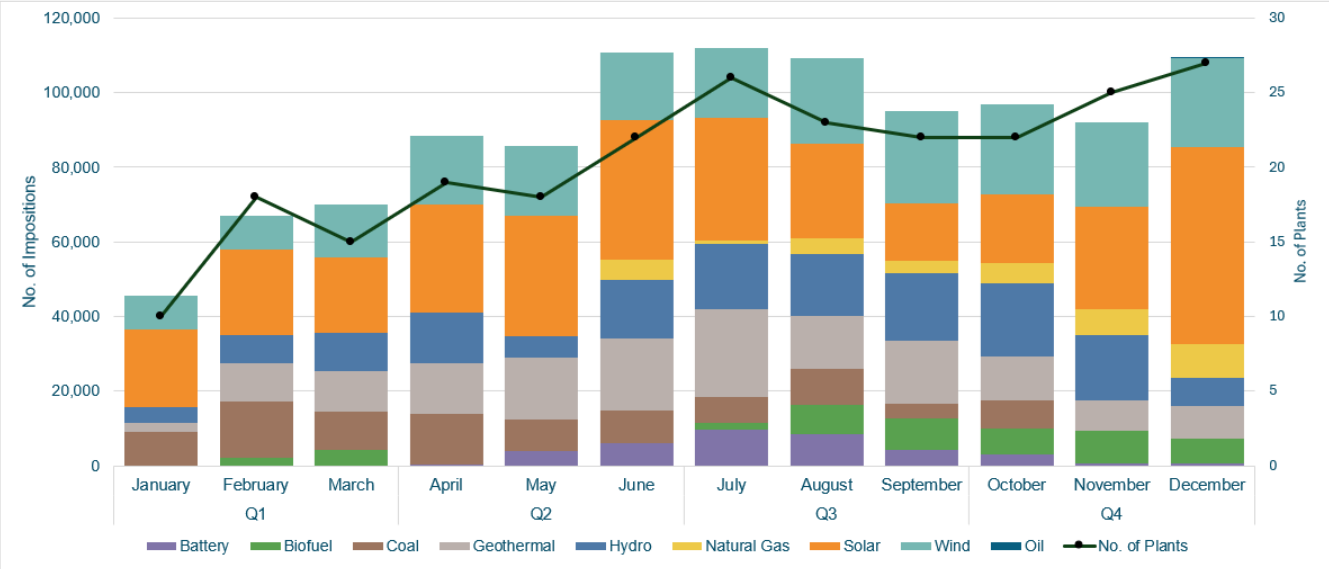

Figure 8. Monthly Comparison of Over-riding Constraints due to Commissioning Test and the Corresponding Number of Power Plants

Meanwhile, Figure 9 shows the average scheduled capacity across all regions during the covered period under commissioning tests. The negative scheduled capacity recorded in Luzon and Mindanao are related to the conduct of testing of BESS' charging capabilities. Overall, the average capacities imposed with over-riding constraints were recorded ranging from 4.45 MW to 35.19 MW.

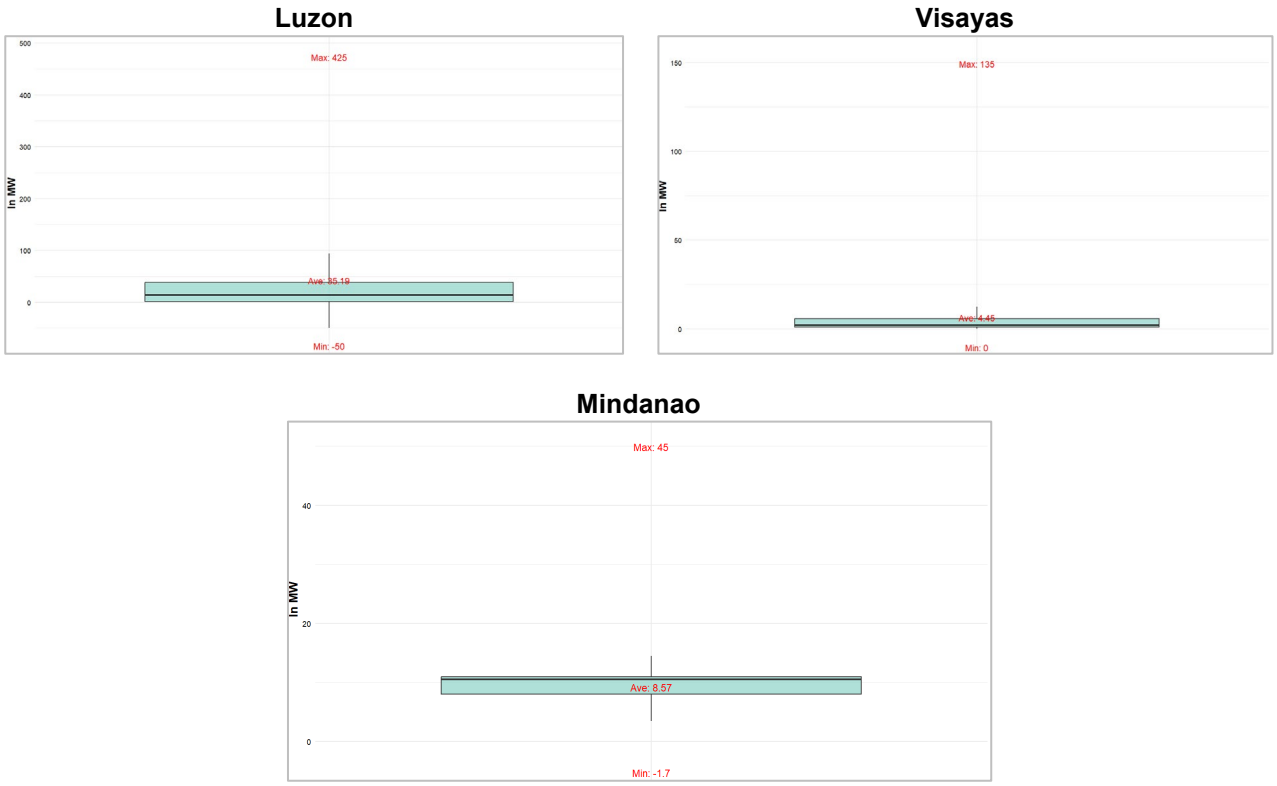

Figure 9. Monthly Scheduled Capacities of Over-riding Constraints due to Commissioning Test, Per Region

In view of these notable observations and as part of its mandate under the Market Surveillance Manual (MSM), to regularly monitor over-riding constraints, particularly for plants under commissioning tests, the MSC consistently coordinates with both the Market Operator (MO) and the SO. These coordination efforts verify the reasons for extended tests, ensuring transparency and compliance. The responses received are recorded and maintained by the Market Assessment Group (MAG) to facilitate market monitoring and assessment.

Section 4.7.1 of Department Circular No. 2024-08-0022 stipulates that when a generation facility experiences unsatisfactory test and commissioning results due to technical issues or internal challenges, the Transmission Network Provider (TNP) or the Distribution Utility (DU) may extend the validity of the PCATC for a maximum of one (1) month following the evaluation of results. However, this extension is subject to the availability of a testing schedule, as confirmed by the TNP or DU.

Consistent with previous years, the conduct of commissioning tests remained the primary driver of over-riding constraint impositions throughout the covered period. Generally, there was an observed increasing trend in the total number of impositions related to commissioning tests with a slight decline in September to November 2024, as shown in Figure 9. This reduction was mainly due to the completion of the commissioning period for various solar, hydro, and coal plants.

While the Department Circular prescribes a two-month commissioning period with a one-month allowable extension, the MSC continues to note multiple extensions for several plants in 2024. This ongoing trend raises concerns about potential inefficiencies in the commissioning process and the need for stricter enforcement of regulatory timelines.

In view of the said observations, during the first half of 2024, the Committee sent formal letters of inquiry to all generator trading participants that exceeded the 2-month allowable period of commissioning test as well as the 1-month acceptable extensions, and the common reasons noted and discussed by the Committee as provided by the participants are as follows:

1) Failed Testing: Common in all resource types are failed test results and not meeting required standards (e.g., SCADA, Power Quality, and internal tests);
2) Technical or Mechanical Issues: Across all resource types inquired, projects are delayed due to various technical problems (e.g., leaks in hydro plants, inverter/cable issues in solar);
3) Resource Constraints: Insufficient natural resources (e.g., brine supply for geothermal or wind speed for wind power); and
4) External factors: force majeure, weather disturbance, and issues with contractors.

The Committee has likewise coordinated and requested the assistance of the REM Governance Committee to solicit the input and responses of the renewable energy generators involved. On the provided responses, the following recommendations were noted and adopted by the Committee:

1) Review the definition of Test and Commissioning to consider the size, technology, and resources needed by the facility, and the period of evaluation of the results of the test conducted until such time that the FCATC is issued by the TNP or DU.

   To ensure that facilities are given adequate period to conduct thorough commissioning activities, considering their size, technology, and resource requirements. This recommendation aims to provide a sufficient period for evaluating the results of the tests conducted.

2) Review the provisions in Section 4.3.3. of DOE DC 2021-06-0013 to allow the continuous operation of the generation facility so long as it will not pose any threat to the grid pending the issuance of the FCATC and the Provisional Authority to Operate (PAO) or Certificate of Compliance (COC).

Similar with its recommendations in its letters to the Energy Regulatory Commission (ERC) and the Grid Management Committee (GMC) as early as 2016, the MSC notes that the duration of testing and commissioning depends on the type of generation facility. The MSC duly recommends revisiting the allowable period for conducting testing and commissioning under the and setting the allowable timeframe depending on the type of facility.

Aside from its communications with the respective power plants, the MSC also deemed it appropriate to formally coordinate with the SO to request the reasons for the extensions granted to these power plants. The reasons provided by the SO were found to be consistent with the explanations submitted by the power plants.

In view of the responses received from both generators and SO, the MSC has formally informed both the DOE and the ERC. The letters sent to these regulatory bodies include:

- A consolidated report on power plant responses regarding commissioning test extensions.
- A status update on plants currently under commissioning tests.
- A summary of observed extension trends and their market implications.

Additionally, the MSC reiterated its long-standing recommendations (first raised in 2016) to the ERC and the Grid Management Committee (GMC) to re-evaluate the allowable commissioning test periods for various types of power plants, and establish differentiated commissioning timelines based on plant type, technology, and complexity to ensure realistic yet enforceable testing periods. These recommendations aim to encourage realistic and transparent commissioning phases, and prevent any significant effect on market operations, system planning and overall grid stability. Since 2015, the MSC has actively engaged with SO and concerned power plants regarding over-riding constraint impositions due to commissioning tests. This ongoing coordination has been instrumental in identifying trends and refining regulatory interventions.

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 year. The comparison was conducted on a quarterly basis to determine the possible behavioral changes.

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 reasons.

For the 2024 billing year, deviations between RTD schedules and actual generation were observed across all plant types with over-riding constraints. Figures 10 to 18 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[4], which indicates that the differences are unlikely to have happened by chance.

Coal-fired plants showed consistent deviations, with most units recording differences between their RTD schedules and actual generation. These plants show a consistent daily ramp-up in output starting around 0600h to 0800h, peaking between midday and early evening across all quarters. 2nd quarter records the highest average RTD schedule and actual generation for plants under over-riding constraints, and 4th quarter displays more variability. Actual generation often diverges from

[4] 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.

scheduled dispatch, especially in 3rd and 4th quarters, indicating real-time deviations. The largest deviations ranged from 150 MW to 271 MW across all quarters. In some instances—particularly in the 1st and 3rd quarters—actual generation exceeded scheduled levels by 113 MW to 150 MW, notably by Mariveles Coal-fired Thermal Power Plant Unit 3. In both instances, the recorded RTD schedules were 0 MW. During the 2nd and 4th quarters, QPPL Coal-Fired Power Plant recorded the largest deviations, with actual generation exceeding the schedule by 214 MW to 271 MW.

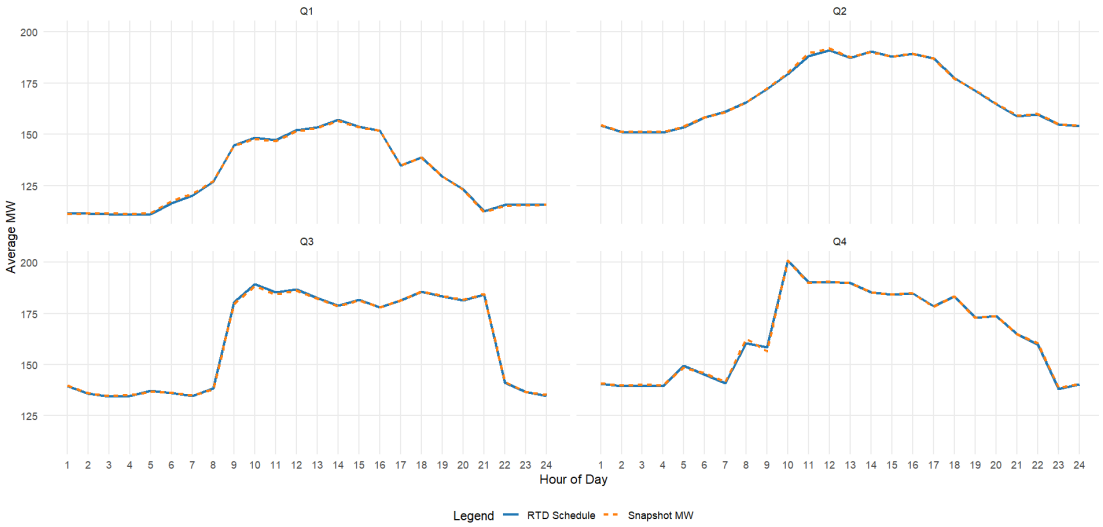

Figure 10. Average Hourly RTD Schedule vs Actual Generation, Per Plant Type (Coal)

Wind resources occasionally exceeded RTD schedules throughout 2024, likely due to the intermittency of the resource type. Wind plant output shows high variability throughout the day across all quarters, with no consistent peak hours. Actual generation often diverges significantly from RTD Schedule, reflecting the intermittent nature of wind generation. 3rd and 4th quarters exhibit more pronounced fluctuations, possibly due to seasonal wind patterns. Overall, wind plants demonstrate a non-dispatchable profile, contributing variable energy depending on real-time wind availability. At other times, actual generation typically fell short of scheduled levels, with the largest shortfall—80 MW—recorded by the Balaoi and Caunayan Wind Power Project Phase 1. This plant also registered the largest deviation between RTD and actual generation in some periods.

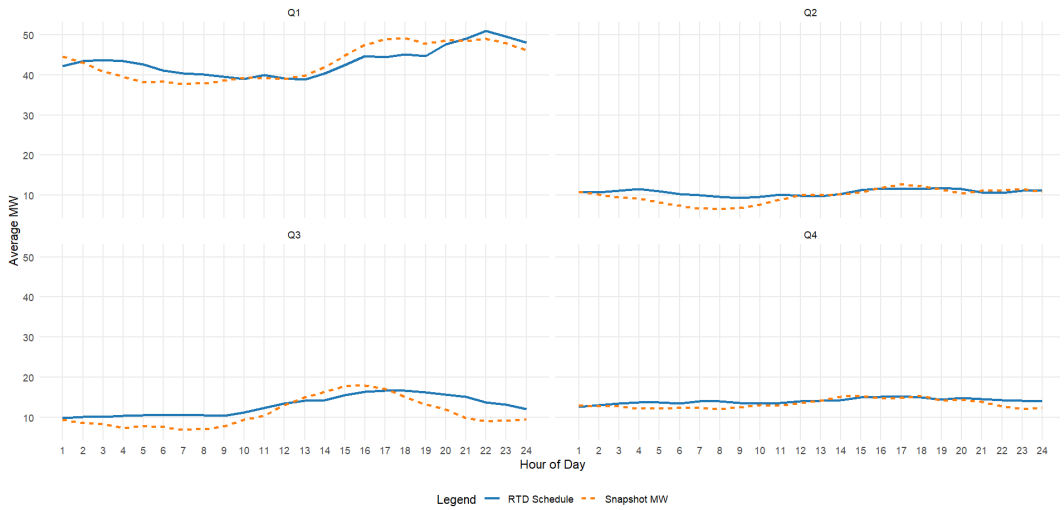

Figure 11. Average Hourly RTD Schedule vs Actual Generation, Per Plant Type (Wind)

As expected, solar plant schedules and actual generation peaked during daylight hours, with the highest generation observed at 1200h. As the sun set, the generation gradually declined, reaching 0 MW by around 1900h. This trend was consistent across all quarters in 2024. Intervals with actual generation below -10 MW were excluded from the analysis, as these values are subject to further validation with the Market Operator and/or System Operator. For the 2024 billing year, deviations ranged from 82 MW to 262 MW.

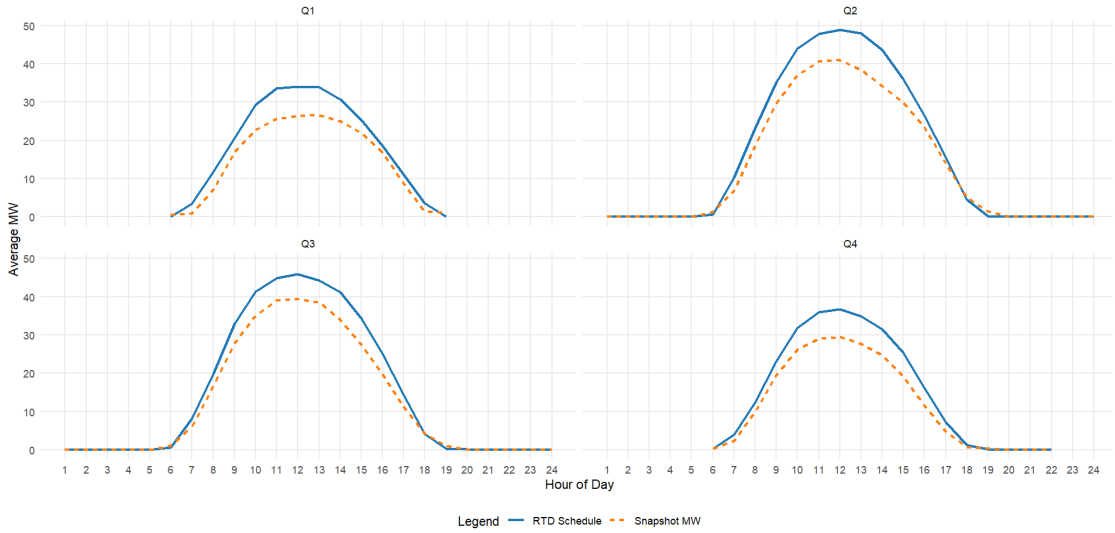

Figure 12. Average Hourly RTD Schedule vs Actual Generation, Per Plant Type (Solar)

Oil-based facilities exhibited minimal average deviations, as shown in Figure 13. The largest deviation—160 MW—was recorded for Malaya Thermal Power Plant Unit 2 noting that the plant experienced tripping in 3rd quarter, while the smallest—52 MW—noted during the 1st quarter at 100.337 MW for Mobile 1 Bunker C-Fired Power Plant Unit 2. As with other resource types, some instances of over-generation were observed, ranging from 19 MW to 101 MW. A consistent hourly trend was noted across most quarters, except in the 3rd quarter, where both RTD and actual generation increased from 0100h to 0700h, dropped to 0800h, and surged again at 2200h.

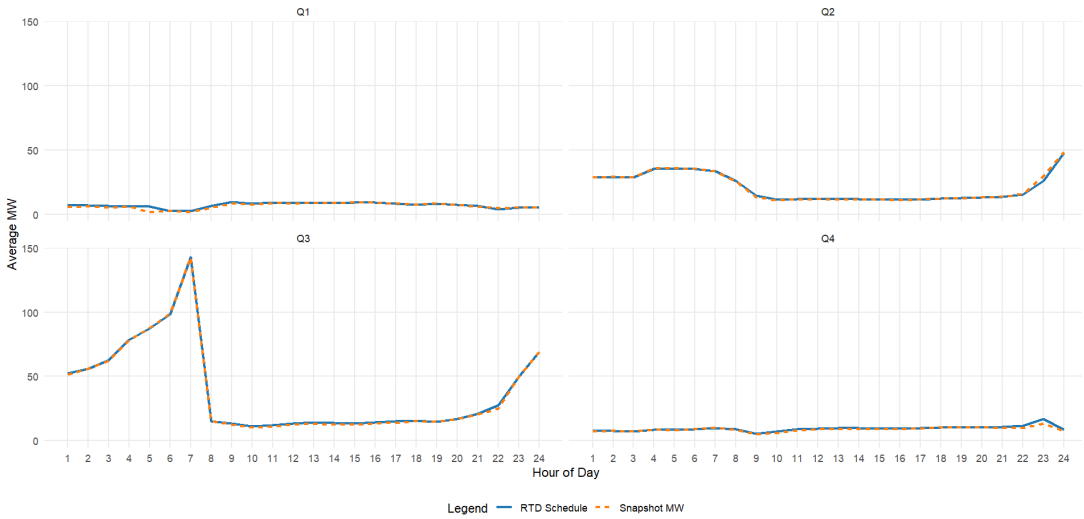

Figure 13. Average Hourly RTD Schedule vs Actual Generation, Per Plant Type (Oil)

For hydro plants, the second half of the year showed that across all trading hours, actual generation was consistently lower than the scheduled capacity. In contrast, the 1st quarter exhibited the opposite, with actual generation exceeding RTD schedules. Meanwhile, the 2nd quarter showed consistent average levels throughout the day, with varying instances where either the schedule or actual output was higher. The recorded deviation for 2024 ranged from 95 MW to 185 MW. The four units of the Kalayaan Hydro Electric Power Plant consistently had negative snapshot data, attributed to their operation in pumping mode.

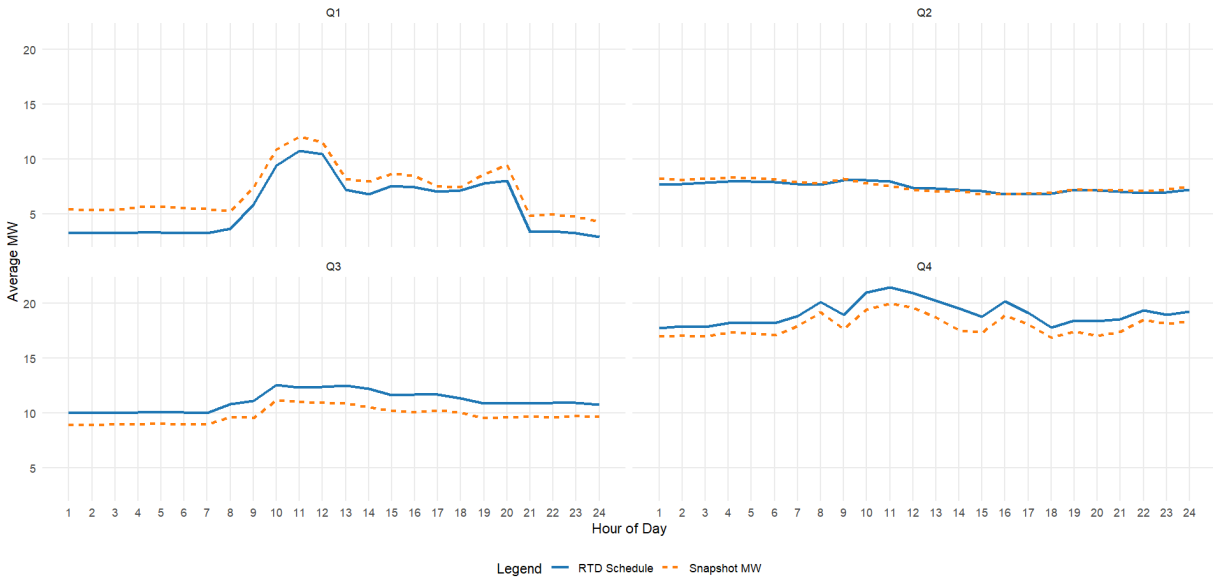

Figure 14. Average Hourly RTD Schedule vs Actual Generation, Per Plant Type (Hydro)

Natural gas units similarly showed deviations, averaging 5.8 MW, with the most significant deviation—351 MW—occurring in the 4th quarter, attributable to Batangas Combined Cycle Power Plant Unit 1 on 15 December 2025. The same plant also recorded the largest instance of over-generation during the year.

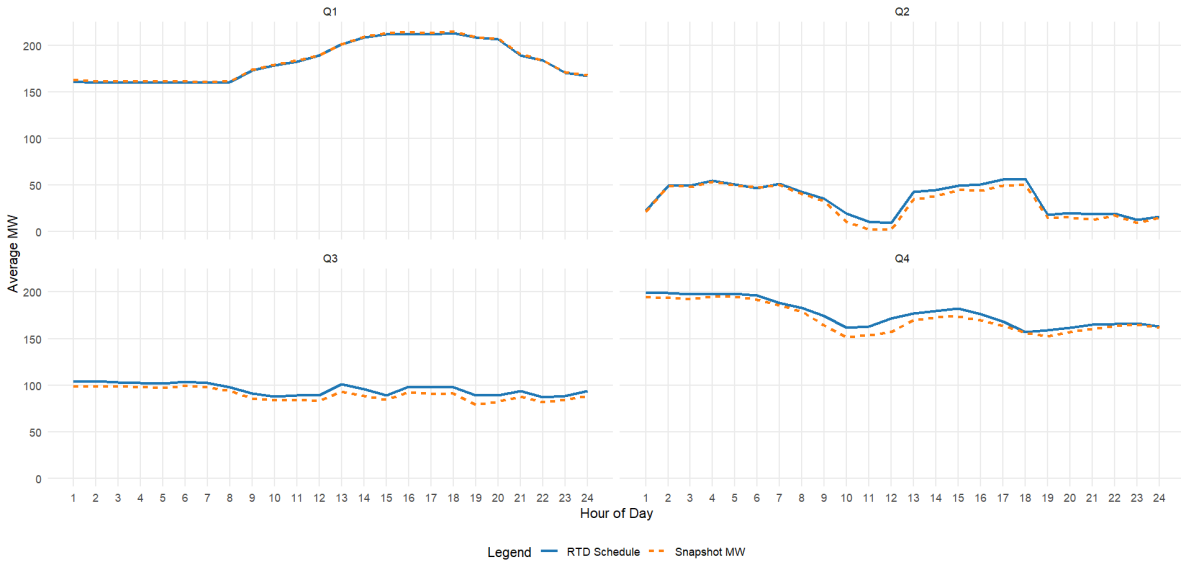

Figure 15. Average Hourly RTD Schedule vs Actual Generation, Per Plant Type (NatGas)

Biofuel plants exhibited a steady pattern of under-generation during the second half of 2024, with an average deviation of 1.60 MW and a maximum of 10 MW. The 1st quarter showed a consistent pattern of over-generation across all hours, while the 2nd quarter also saw under-generation, but with a larger deviation of 40 MW.

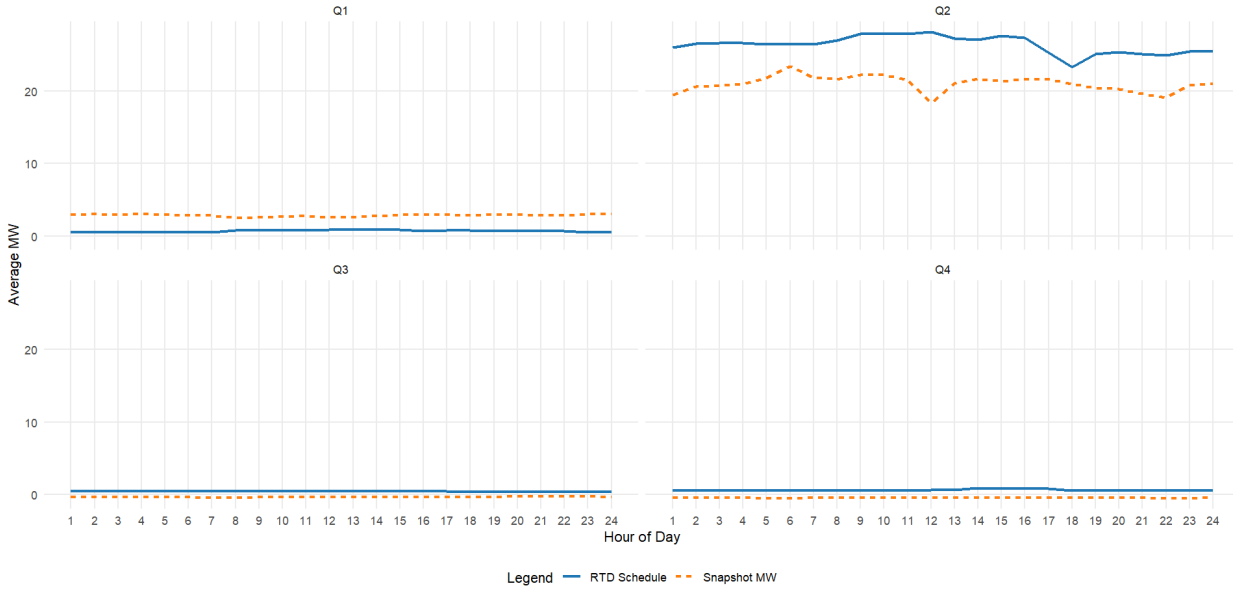

Figure 16. Average Hourly RTD Schedule vs Actual Generation, Per Plant Type (Biomass)

Geothermal plants consistently produced less than their scheduled output in 2024, with deviations ranging from 28 MW to 40 MW. However, like other technologies, some geothermal plants are also over-generated relative to their schedules in certain periods. The deviations, though moderate, may be attributed to changes in reservoir pressure or steam availability that affect short-term generation capability.

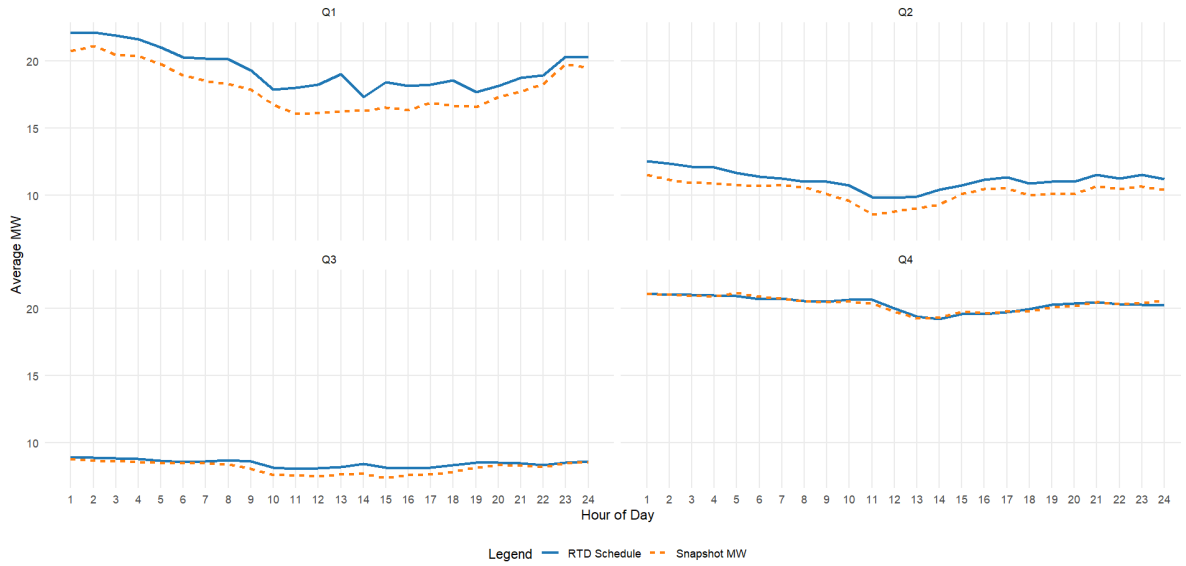

Figure 17. Average Hourly RTD Schedule vs Actual Generation, Per Plant Type (GEO)

Battery Energy Storage Systems (BESS), by design, showed intermittent deviation patterns due to their charging and discharging behavior. On average, deviations reached 0.31 MW, with the largest difference recorded at 59 MW. These variations are likely influenced by predefined charging windows. Since BESS can either absorb or inject power depending on grid needs, such deviations are often reflective of intentional system operator interventions or arbitrage strategies.

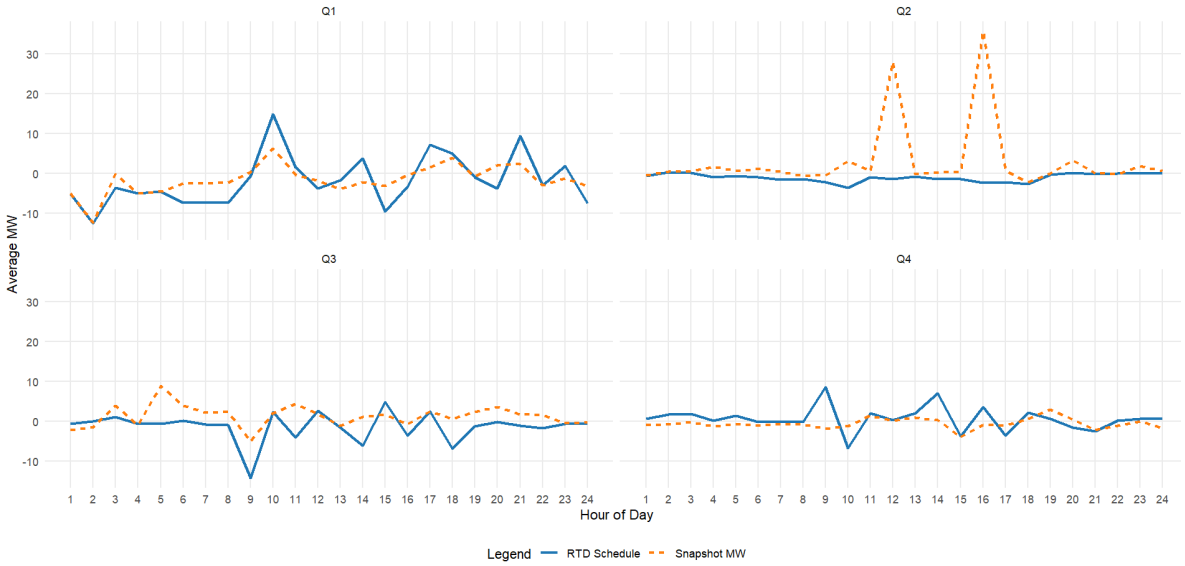

Figure 18. Average Hourly RTD Schedule vs Actual Generation, Per Plant Type (BAT)

ANNEX A. List of Plants with Over-riding Constraints due to Commissioning Test for 2024

Participant Name	Resource ID	Facility Name	Plant Type	January	February	March	April	May	June	July	August	September	October	November	December
SMGP BESS Power Inc.	01LMAY_BAT	47.486 MW Bataan Battery Energy Storage System (BESS) Market	BAT							✓	✓				
SMGP BESS Power Inc.	01MAGAPIT_BAT	(+/-) 40 MW Magapit Battery Energy Storage System	BAT										✓		
SMGP BESS Power Inc.	01CNCEP_BAT	72.281 MW Concepcion Battery Energy Storage System (BESS)	BAT	✓											
Mariveles Power Generation Corporation	01MPGC_U02	Mariveles Coal-fired Thermal Power Plant Unit 2	COAL	✓	✓	✓	✓								
Angat Hydropower Corporation	01ANGAT_A	Angat Hydroelectric Power Plant Unit A	HYD						✓			✓	✓	✓	
BEHMC Lower Labayat Hydropower Corp.	03LWERLAB_G01	1.400 MW Lower Labayat Hydroelectric Power Plant	HYD	✓	✓	✓	✓	✓							
Prime Meridian PowerGen Corporation	03AVION_U01	San Gabriel Avion Natural Gas-Fired Power Plant Unit 1	NATG									✓			
Solar Philippines Tarlac Corporation	01CONSOL_G01	Concepcion 1 Solar Power Project	SOLR						✓	✓	✓	✓	✓	✓	✓
PH Renewables, Inc.	02PNGYSOL_G01	95.827 MWp Pinugay Solar Power Plant	SOLR									✓			
PV Sinag Power Inc.	01CAYBSOL_G01	94.717 MWp Cayanga-Bugallon Solar Power Plant	SOLR	✓	✓	✓	✓	✓	✓		✓				
Trustpower Corporation	01TRUSTSOL_G01	20.888 MWp Trust Solar Power Plant	SOLR	✓	✓										
Natures Renewable Energy Devt. (NARREDCO) Corpor	01CAGYSOL_G01	133.464 MWp Cagayan North Solar Power Plant	SOLR	✓	✓	✓	✓	✓	✓	✓					
Pavi Green Bataan Renewable Energy, Inc.	01PAVGSOL_G01	20.397 MWp Orion Solar Power Plant	SOLR	✓	✓	✓	✓	✓	✓	✓	✓				
Santa Cruz Solar Energy Inc.	01SNMARSOL_G01	384.781 MW San Marcelino Solar Power Project	SOLR	✓	✓	✓	✓	✓							
Bayog Wind Power Corp.	01BALWIND_G01	80.000 MW Baloi and Caunayan Wind Power Project Phase 1	WIND	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bac-Man Geothermal Inc.	03PALAYAN_G01	35.700 MW Palayan Binary Power Plant	GEO	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Cotabato Sugar Central Company, Inc.	14COTSUGR_G01	9.900 MW Cotabato Cogeneration Power Plant	BID			✓									
Mariveles Power Generation Corporation	01MPGC_U03	Mariveles Coal-fired Thermal Power Plant Unit 3	COAL		✓	✓	✓	✓	✓	✓					
Bilran Geothermal Incorporated	04BILGPP_G01	2.000 MW (Phase 1) Bilran Geothermal Power Plant Project	GEO		✓	✓	✓	✓	✓	✓					
BOHECO I Sevilla Mini Hydro Corp.	07SEVILL_G01	BOHECO I Sevilla Mini Hydro Power Plant	HYD		✓	✓									
Matuno River Development Corporation	01MATUNO_G01	Matuno River Hydroelectric Power Plant	HYD			✓	✓	✓	✓	✓	✓	✓			
Jobin-SQM Inc.	01SUPSOL_G01	72.128 MWp Subic New PV Power Plant Project	SOLR			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Amihan Renewable Energy Corp.	01CAPRIS_G02	Caparispisan II Wind Power Project	WIND			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SMGP BESS Power Inc.	01GAMU_BAT	45.758 MWh Gamu Battery Energy Storage System (BESS)	BAT				✓	✓	✓	✓	✓	✓	✓	✓	✓
Central Azucarera de San Antonio	08CASA_G02	8.000 MW (Unit 2) Biomass Co-Generation Power Plant	BID				✓								
Hydrocore Corp.	01BULAO_G01	4.500 MW Bulao Hydroelectric Power Project	HYD				✓	✓	✓	✓	✓				
PV Sinag Power Inc.	01LAOSOL_G01	72.020 MWp Laoag Solar Power Plant	SOLR				✓	✓	✓	✓	✓	✓	✓	✓	
Calabanga Renewable Energy (CARE), Inc.	03CLABSOL_G01	74.168 MWp Calabanga Solar Power Project	SOLR				✓	✓	✓	✓	✓				
PetroWind Energy Inc.	08PWIND_G02	13.200 Nabas Wind Power Plant Phase 2 (Nabas-2)	WIND				✓	✓	✓	✓	✓	✓	✓	✓	✓
AP Renewables Inc.	03TGPP_G01	17MW Tiwi Geothermal Binary Power Plant	GEO					✓	✓	✓	✓	✓	✓		✓
SMGP BESS Power Inc.	03LUMBAN_BAT	57.125 MWh Lumban Battery Energy Storage System (BESS)	BAT						✓	✓	✓	✓	✓		✓
Sigul Hydro Power Corporation	14SIGHYDRO_G01	14.500 MW Sigul Hydroelectric Power Project	HYD						✓	✓	✓				
Excellent Energy Resources Inc.	03EERI_G01	Batangas Combined Cycle Power Plant Unit 1	NATG						✓	✓	✓	✓	✓	✓	✓
PH Renewables, Inc.	02PNGYSOL_G01	95.827 MWp Pinugay Solar Power Plant	SOLR						✓	✓	✓				
Trustpower Corporation	01TRUSTBIO_G01	Biogas Power Plant (Phase 1)	BID							✓	✓	✓	✓	✓	✓
Mariveles Power Generation Corporation	01MPGC_U04	Mariveles Coal-fired Thermal Power Plant Unit 4	COAL							✓	✓	✓	✓		
Bac-Man Geothermal Inc.	03BACMAN_U01	Bacman Geothermal Power Plant Unit 1	GEO							✓					
Energy Development Corporation (additional facility)	06BBGPP_G01	Bago Binary Geothermal Power Plant	GEO							✓	✓	✓			
Liangan Power Corporation	10LIAN_G01	Liangan Hydroelectric Power Project	HYD							✓	✓	✓	✓		
PetroWind Energy Inc.	08PWIND_G01	36.000 MW Nabas Phase I Wind Power Plant (NWPP-I)	WIND							✓					
Palm Concepcion Power Corporation	08PALM_G01	135.000 MW Circulating Fluidized Bed (CFB) Coal-Fired Power Plant (CFPP)	COAL								✓				
Excellent Energy Resources Inc.	03EERI_G03	Batangas Combined Cycle Power Plant Unit 3	NATG									✓	✓	✓	
Inaya Ventures, Inc.	04UTH_G01	14.160MW Upper Taft Hydroelectric Power Plant	HYD									✓	✓	✓	✓
First Gas Power Corporation (Sta Rita)	03STA-RI_G02	Sta. Rita Natural Gas Power Plant 2	NATG									✓			
Angat Hydropower Corporation	01ANGAT_M	Angat Hydroelectric Power Plant Unit M	HYD										✓		
Bataan Solar Energy Inc.	01BTSOLEN_BAT	0.531 MW/1.400 MWh Energy Storage System (ESS)	BAT										✓	✓	
RASLAG Corp.	01RASLAG_G04	36.646 MWp RASLAG IV Solar Power Project	SOLR										✓	✓	✓
Shizen Inc.	01SHIZEN_G01	75.214 MWP Palauig Solar Power Project	SOLR										✓	✓	✓
Sinocalan Solar Power Corp.	01DOMSOL_G01	Sto. Domingo Solar Power Plant (SD SPP)	SOLR											✓	✓
Megasol Energy 1 Inc.	01MEGASOL_G01	56.578 MWp Gamu Solar Power Project	SOLR											✓	✓
Nuevasol Energy Corp.	01NUEVASOL_G01	42.900 MWp Bongabon Solar Power Plant	SOLR											✓	✓
COLASI MINI HYDRO ELECTRIC POWER PLANT CO	03COLASI_G01	4.00 MW Colasi Mini Hydroelectric Power Plant (MHEPP)	HYD											✓	
Excellent Energy Resources Inc.	03EERI_G02	Batangas Combined Cycle Power Plant Unit 2	NATG											✓	✓
Dagohoy Green Energy Corporation	07DAGSOL_G01	27.121 MWp Dagohoy Solar Power Project	SOLR											✓	✓
Power Sector Assets & Liabilities Management Corpo	10AGUS2_U02	180 MW Agus II Hydroelectric Power Plant Unit 2	HYD											✓	
Power Sector Assets & Liabilities Management Corpo	10AGUS2_U03	180 MW Agus II Hydroelectric Power Plant Unit 3	HYD											✓	
Crystal Sugar Company, Inc	11CRYSSUG_G01	14.9MW Biomass Cogeneration Plant	BID											✓	
Fort Pilar Energy, Inc.	09SANGALI_BAT	22.928 Sangali Battery Energy Storage System (BESS)	BAT											✓	
Tarlac Power Corporation	01TPCBUNK_G01	18.6 MW Bunker C-Fired Diesel Power Plant	OIL											✓	
RE Resources, Inc.	01ARESOL_G01	46.658MWP Armenia Solar Power Project (SPP)	SOLR											✓	
Greentech Solar Energy Inc.	01BONGSOL_G01	23.776 MWP Bongabon Solar Power Project	SOLR											✓	
San Jose Green Energy Corporation	01SJSOL_G01	19.613 MWp San Jose Solar Power Plant (SPP)	SOLR											✓	
Solar Tanauan Corporation	03MARAGSOL_G01	64.206MWp/48.118MWac Maragondon Solar Power Plant	SOLR											✓	
Solar Tanauan Corporation	03TANSOL_G01	64.206MWp/48.118MWac Tanauan Solar Power Plant	SOLR											✓	
Aboitiz Solar Power, Inc.	06CALASOL_G01	137.400 MWAC Calatrava Solar Power Project (SPP)	SOLR											✓	