



MONTHLY FORECAST ACCURACY STANDARDS REPORT

(26 December 2022 to 25 January 2023)

24-April-2023
Enforcement and Compliance Office



Philippine Electricity
Market Corporation

MONTHLY FAS REPORT

ENFORCEMENT AND COMPLIANCE OFFICE

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A. COVERAGE

This Monthly Forecast Accuracy Standards (FAS) Report covers:

1. Must Dispatch Generating Units (**MDGU**) or plants on commercial operation (Plants on test and commissioning are not yet included)
2. Plants with Final Certificate of Approval to Connect (FCATC) in alignment with the provisions of DOE Department Circular DC 2022-05-0015.¹
3. MDGU plants in Luzon and Visayas. (Plants in Mindanao are not included pending the commercial operation in WESM Mindanao.²)
4. For the period 26 December 2022 to 25 January 2023 (**January 2023 Billing Period**).

B. RULE REFERENCE

1. FAS Under the Enhanced WESM Design and Operations

On 16 March 2021, the WESM Manual "Procedures for the Monitoring of Forecast Accuracy Standards for Must Dispatch Generating Units" (WESM-FASMD) Issue 2.0 was promulgated by the Department of Energy (DOE). Said manual establishes the procedures for the monitoring, reporting, and review of the FAS for compliance by the (must-dispatch generating units) MDGU **under the Enhanced WESM Design and Operations (EWDO)**.

On 25 June 2021, the DOE, through the Department Circular DC2021-06-0015, officially declared the commercial operation of the EWDO which necessitated the launching of the NMMS on 26 June 2021 by Independent Electricity Market Operator of the Philippines (IEMOP). PEMC, on the other hand, commissioned the CPEMS in view of the directive of the DOE to monitor the compliance of the trading participants in the WESM under the EWDO.

The FAS Manual Issue 2.0 that was promulgated in March 2021 thus became effective on 26 June 2021 or upon such declaration of commercial operation of the EWDO.

PEMC, through the Enforcement and Compliance Office (ECO), has implemented interim procedures in the form of compliance bulletins and advisories to carry out the mandate as contained in the WESM Rules and FAS Manual. In the process, it noted and consolidated various concerns and issues encountered by both ECO and the trading participants (TPs), and their observations during the implementation of the FAS monitoring under the EWDO regime. ECO also made consultations with the DOE, the Market Operator (MO), and the TPs on those matters. As the one-year monitoring period (January-December 2022 billing period) is about to end and the cumulative results are required to be assessed with finality by the first quarter of 2023, PEMC deems it appropriate to properly address the gaps and to give effect to the related DOE issuance by filing an Urgent Amendment to FAS Manual 2.0 and the relevant provisions of the WESM Rules, including among others, the provision for a pro-rated penalty exemption application, more accurate data reference of the initial loading to address the voluminous cases of data variance, and the consideration of special computation for plants with expansion units.

On 25 December 2022, the WESM Manual "Procedures for the Monitoring of Forecast Accuracy Standards for Must Dispatch Generating Units" (WESM-FASMD) Issue 2.1 became effective after the approval of the

¹ "Supplementing Department Circular No. DC2021-06-0013 on the Framework Governing the Test and Commissioning of Generation Facilities for Ensuring Readiness to Deliver Energy to the Grid or Distribution Network." Published in DOE Website in June 2022.

² DC2022-12-0039 - Declaring the Commercial Operation of the Wholesale Electricity Spot Market (WESM) in the Mindanao Grid. The DOE declared 26 January 2023 as the commercial operation date of the WESM in Mindanao.



B. RULE REFERENCE

PEM Board of Directors.³ The amendments made to the FAS Manual 2.1 took effect from the beginning of the year 2022 pursuant to Section 5.3.2 of the said Manual.⁴

2. Transition Period

The compliance with the FAS Manual is determined on an annual basis. The Mean Absolute Percentage Error (MAPE) and Percentile 95 (Perc95) of each must-dispatch generating unit shall be calculated over the period starting on the 26th of December of a year and ending on the 25th of December of the succeeding year.⁵

As mentioned in the preceding paragraphs, the FAS Manual became effective on 26 June 2021 wherein the WESM switched from one-hour trading interval to 5-minute dispatch intervals. With the changes both in the resolution of trading intervals and the formula and conditions in computing the FAS, it becomes impossible to determine the *annual* compliance with the FAS Manual for 2021, *i.e.*, from January 2021 to December 2021 billing periods.

While the ECO already commenced the compliance monitoring of the FAS in July 2021, the monitoring of the FAS from the July to December 2021 billing period was understood to be as the transition period. And with the Urgent Amendment to the FAS Manual on 23 December 2022, the provision on the transition period was likewise amended for clarity. It now reads –

“4.5.1. A *transition period* shall be six (6) months from the commercial operation of the enhanced WESM design and operations unless extended by the DOE through appropriate issuance.”

During the transition period, the must dispatch generating units that fail to meet the requisite forecast accuracy standards, as set out in the FAS Manual, shall not be liable for sanctions imposed under the relevant Market Manual.⁶

| Period | Governing Manual | Monitoring Entity | Status |
|-------------------------------|-----------------------------|-------------------|--|
| Jan – Jun 2021 | FAS Manual 1.0 (Old) | IEMOP | Not subject to sanction |
| July – Dec 2021 | FAS Manual 2.0 (Old) | PEMC | Not subject to sanction (transition period) |
| Jan – Dec 2022 and onwards | FAS Manual 2.0 (Old) | PEMC | Subject to sanction |
| Jan – Dec 2022 and onwards | FAS Manual 2.1 (Current) | PEMC | Subject to sanction |

³ PEM Board Resolution No. 2022-54-06 (Approving the Urgent Amendment to the FAS Manual)

⁴ “Sec. 5.3.2 The amendments made herein and approved pursuant to the *Procedures for Changes to the WESM Rules, Retail Rules and Market Manuals* shall have a retroactive effect from the beginning of the year that the said amendments are approved, unless the application thereof becomes inequitable and impracticable under the circumstances. For avoidance of doubt, the amended provisions that are given retroactive effect shall be indicated in the PEM Board resolution and/or DOE issuance approving or promulgating them.” *FAS Manual 2.1, 25-Dec-2022*

⁵ Section 4.1.2 of the FAS Manual 2.1

⁶ Section 4.5.2 of the FAS Manual 2.1



B. RULE REFERENCE

3. FAS (MAPE and PERC95) Formula

3.1 Forecast Accuracy Standards

Each must dispatch generating unit shall comply with the following standards with respect to its mean absolute percentage error (MAPE) and percentile 95 of the forecasting error (Perc95)

| Technology | MAPE | PERC95 |
|--------------------|------|--------|
| Run-of-river (ROR) | <9% | <30% |
| Solar | <18% | |
| Wind | | |

MAPE and Perc95 shall be calculated over the period starting on the 26th of December of a year and ending on the 25th of December of the succeeding year. Failure to meet the requisite FAS may be liable for sanctions imposed under Clause 7.2 of the WESM Rules and the Penalty Manual.

Calculating Forecast Percentage Error

The Forecast Percentage Error for a dispatch interval of a must-dispatch generating unit shall be calculated using the following formula:

$$FPE_{i,t} = \left| \frac{PQ_{i,t} - MQ_{i,t}}{MQ_{\max,i,bp,t}} \right| \times 100\%$$

Where:

$FPE_{i,t}$ refers to the Forecast Percentage Error (in %) of must dispatch generating unit i for dispatch interval t

$PQ_{i,t}$ refers to the Projected Quantity (in MWh) of must dispatch generating unit i for dispatch interval t . It shall be computed as follows.

$$PQ_{i,t} = \frac{1}{n} \times \frac{IL_{i,t} + PO_{i,t}}{2}$$

Where:

$IL_{i,t}$ refers to the Initial Loading (in MW) of must dispatch generating unit i for dispatch interval t used in the scheduling process

$PO_{i,t}$ refers to the Projected Output (in MW) of must dispatch generating unit i or dispatch interval t used during the scheduling process

n refers to the number of dispatch interval(s)



B. RULE REFERENCE

$MQ_{i,t}$ refers to the Metered Quantity (in MWh) of must dispatch generating unit i for dispatch interval t as provided by the Metering Services Provider

$MQ_{max,i,bp,t}$ refers to the Maximum Metered Quantity (in MWh) of must dispatch generating unit i during the billing period where dispatch interval t belongs as provided by the Metering Services Provider

3.2 Calculating Mean Absolute Percentage Error (MAPE)

The MAPE is the average of the Forecast Percentage Errors for a given period. It is calculated as follows.

$$MAPE_{i,p} = \frac{\sum_{t=1}^{n_p} FPE_{i,t}}{n_p}$$

Where:

$MAPE_{i,p}$ refers to the mean absolute percentage error (in %) of MDGU i for period p

n_p refers to the number of dispatch intervals within period p wherein forecast percentage errors were calculated

$FPE_{i,t}$ refers to the forecast percentage error (in %) of MDGU i for dispatch interval t calculated in accordance with Section 4.2.3

3.3 Calculating Perc95

The Perc95 of a MDGU for a period shall refer to the value (in %) not exceeding 95% of the forecast percentage errors of the MDGU during the period and shall be calculated using the NIST method.

For a more detailed explanation of the NIST Method for Calculating Percentiles, please refer to Appendix A of the FAS Manual.

3.4 Additional Provision in Calculation

Section 4.2 of the FAS Manual Issue 2.0 also provides for the following conditions to be considered in the calculation of forecast percentage errors for each dispatch interval:

- “4.2.5 A one hundred (100) percent FPE shall be imposed to a must dispatch generating unit on a particular dispatch interval where its maximum metered quantity is equal to zero (0) and a projected quantity is not equal to zero (0).



B. RULE REFERENCE

4.2.6 A one hundred (100) percent FPE shall be imposed to a must dispatch generating unit for non-submission of projected output.

4.2.7 A zero (0) percent FPE shall be imposed to a must dispatch generating unit on a particular dispatch interval where its projected quantity and maximum metered quantity are equal to zero (0)."

4.2.8 For generating plants with expansion unit that is either on test and commissioning or in actual operation, as may be allowed by the rules, but is awaiting the issuance of the Certificate of Compliance (COC) or the Provisional Authority to Operate, the following shall apply:

- a) A zero (0) FPE shall be imposed if the projected quantity is less than the combined metered quantity.
- b) A one hundred (100) FPE shall be imposed if the projected quantity is greater than the combined metered quantity.

For this purpose, the combined metered quantity shall refer to the sum of the metered quantity of the existing capacity unit and that of the expansion unit.

This provision shall apply until the registered Pmax of the power plant or facility is updated in the WESM to include both the capacity of the existing and expansion unit."

3.5 Exclusions

Forecast percentage errors occurring on the following conditions shall be excluded from the calculation of the MAPE and Perc95 of MDGU based on Section 4.3 of the FAS Manual:

- 3.5.1 The dispatch target of the MDGU was restricted below its projected output;
- 3.5.2 The output of the must dispatch generating unit was restricted by the System Operator (SO) as indicated in the SO's report submitted to the Market Operator (MO) in accordance with the WESM Rules;
- 3.5.3 A market suspension or market intervention was declared for the dispatch interval;
- 3.5.4 An outage resulted in its derating; or
- 3.5.5 A natural calamity (e.g., typhoon, landslide) affected the ability of the MDGU to forecast accurately.
- 3.5.6 Any variance in the market data used in the calculation of MAPE and/or PERC95 that may be discovered during the monitoring and assessment must be properly addressed, validated, and verified within the prescribed timeline. The Generation Company shall provide adequate supporting documents to substantiate any claim of data variance. Only those data that have been proven and verified to be inaccurate, inconsistent, or erroneous shall be considered in the recalculation of the results. *(As amended via PEM Board Resolution No. 2022-54-06)*

The exclusions and other basis of recalculation are already incorporated in the Final FAS Result by ECO, considering data and information provided by the Trading Participants.



B. RULE REFERENCE

4. Penalty/Sanctions

Item 4 of Section 5 (Schedule of Breach and Penalties) of the WESM Penalty Manual provides for the following:

- 4.1 Type of Breach: Failure to comply with forecast accuracy standards with respect to projected output submitted for must-dispatch generating unit.

One breach is counted for each year that the failure occurs.

One breach is counted for each category of forecast accuracy standard that was not complied with. That is, failure to comply with the prescribed mean absolute percentage error (MAPE) and failure to meet the prescribed percentile 95 of the forecasting error (Perc95) are counted as separate breaches even if they occur on the same periods.

- 4.2 The MDGU that is in operation for less than a year and is found in breach of *MAPE* or *PERC95*, shall be:

- a) imposed a penalty in proportion to the number of months in operation during the covered monitoring year. For instance, if the plant commenced operation on 26 March, the financial penalty to be imposed shall be in proportion to the nine (9) billing months over the twelve (12) month period.
- b) exempted from liability, if it commences operation within three (3) months prior to the end of the covered monitoring year.

A MDGU shall be considered in operation upon commencement of its operation or participation in the WESM either by virtue of the Final Certificate of Approval to Connect (FCATC) or the commercial operation registration in the WESM, whichever is applicable.

- 4.3 Applicable Penalty: Level 1 – Reprimand; Level 2 - Financial Penalties; Level 3 – Escalated Financial Penalties; Suspension and Deregistration

- 4.4 Financial Penalty: PhP500,000/Breach of MAPE; and PhP500,000/Breach of PERC95

- 4.4.1 Level 2: PhP500,000/Breach of MAPE; and PhP500,000/Breach of PERC95

- 4.4.2 Level 3 (Escalated Penalty: PhP1,000,000/Breach of MAPE; and PhP1,000,000/Breach of PERC95

C. FAS CALCULATION, VALIDATION, AND PUBLICATION PROCEDURE

1. Processes and Timelines of Activities

1.1 Publication of Results

The Prelim FASR published by ECO is based on the data gathered from the Independent Electricity Market Operator of the Philippines (IEMOP) and the application of the formula set in the FAS Manual.



C. FAS CALCULATION, VALIDATION, AND PUBLICATION PROCEDURE

1.2 Validation

The trading participants will have the opportunity to review the monthly initial results of MAPE and PERC95.

The TPs may submit requests for exclusion of dispatch intervals and/or replacement of data for a specific dispatch interval within the current billing month through Accomplished FAS Forms together with the relevant evidence and justifications.

The requested action by TP will be subject to validation by ECO.

1.3 Publication of Final Results

The Final FASR will be issued after due verification and assessment of the relevant data or information.

In summary –

| Process | Report/Forms | Platform/Tool | Timeline |
|---|--|---------------|--|
| Publication of the Initial FAS Results | Preliminary Monthly FASR | CPEMS | Within 30 calendar days from the end of the calendar month of the covered monitoring period. |
| Validation by TP | Accomplished FAS Form (AFASF) | FTP | Within 15 calendar days from the publication of the Preliminary Monthly FASR |
| Validation by ECO | Submitted AFASF and Supporting Documents | CPEMS | Within 15 calendar days from the receipt of AFASF |
| Publication of the Final FAS Results | Final Monthly FASR | CPEMS | Within seventy (70) calendar days from the end of the calendar month of the covered monitoring period. |
| Publication of the Annual Final FAS Results | Annual FASR | CPEMS | On or before 31 March of the year following the covered monitoring year. |



D. OVERALL FAS RESULTS

This report covers the final Monthly results of the MAPE and PER95 monitoring of MDGUs in **Luzon and Visayas** covering **January 2023** billing period. Considered in the calculation of the Monthly FAS results are the exclusions and other basis for recalculation mentioned in Section (B) (3.5) of this Report.

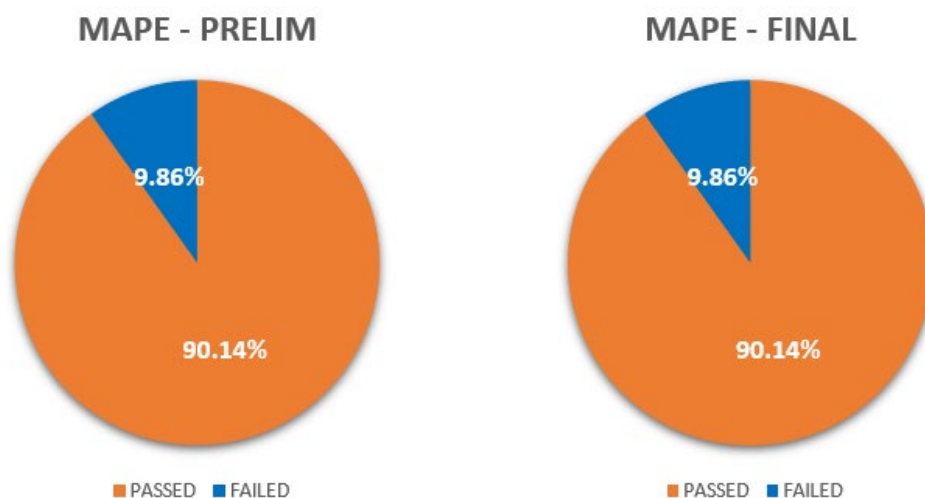
As of 25 January 2023, there are 93 facilities registered as MDGU in the WESM. From the registered facilities, 71 facilities from Luzon and Visayas region are being monitored; 3 facilities are under test and commissioning (T&C); and the remaining 19 plants pertain to Mindanao plants/facilities which are exempted from the evaluation as the commercial operation of the WESM Mindanao commenced only on 26 January 2023. (DOE DC2022-12-0039, 23 December 2022)

| Technology | No. of Resources in Luzon | No. of Resources in Visayas | No. of Resources in Mindanao* | Total |
|--|---------------------------|-----------------------------|-------------------------------|-----------|
| On T&C* | 2 | 1 | - | 3 |
| On Commercial Operations/With FCATC | | | | |
| Run of River | 17 | 2 | 14 | 34 |
| Solar | 33 | 12 | 5 | 52 |
| Wind | 5 | 2 | 0 | 7 |
| Total | 55 | 16 | 19 | 90 |
| Covered in the FAS Monitoring | | | | 71 |

*Not yet covered in the FAS Compliance Monitoring in January 2023 Billing Period

Table 1. Summary of WESM Registration on Must Dispatch Generating Units as of 25 January 2023

JANUARY PRELIM VS. FINAL FAS RESULTS



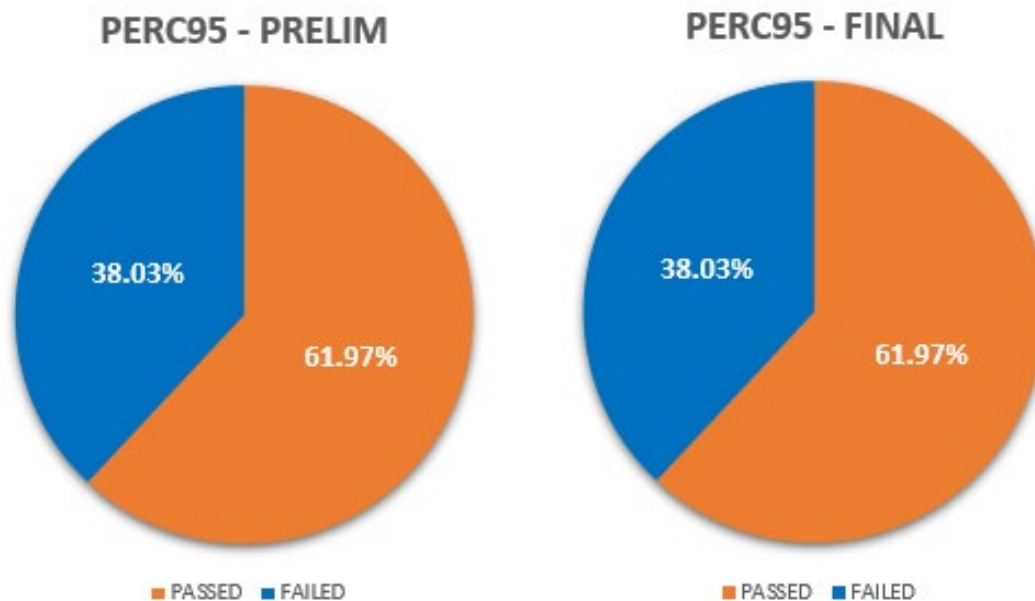
Graph 1. MAPE Prelim FAS Results vs. Final FAS Results for Luzon and Visayas



D. OVERALL FAS RESULTS

Graph 1 shows the comparison of MAPE Preliminary Forecast Accuracy Standards Results (Prelim FASR) and Final Forecast Accuracy Standards Results (Final FASR) for Luzon and Visayas must dispatch generators.

- From the initial results of monitoring of MAPE, it appears that 64 out of 71 facilities performed within the <9% and <18% threshold and recorded a MAPE passing rate of 90.14%, while only 7 out of 71 facilities failed to meet the MAPE standards.
- The ECO performed validation and recalculation, as stated in Section C of this report, and determined the Final FASR-MAPE. There was no change in the overall rating of Final FASR-MAPE after such re-validation/recalculation.



Graph 2. PERC95 Prelim FAS Results vs. Final FAS Results for Luzon and Visayas

Graph 2, on the other hand, shows the comparison of PERC95 Prelim FASR and Final FASR for Luzon and Visayas MDGUs.

- The initial computation of the PERC95 yielded the following results, 44 out of 71 facilities performed within the <30% threshold with a PERC95 passing rate of 61.97%.
- The ECO likewise performed validation and recalculation, as stated in Section C of this report, and determined the Final FASR-PERC95. Similar to MAPE results, there was also no change in the overall rating of Final FASR-PERC95 after such re-validation/recalculation.



D. OVERALL FAS RESULTS

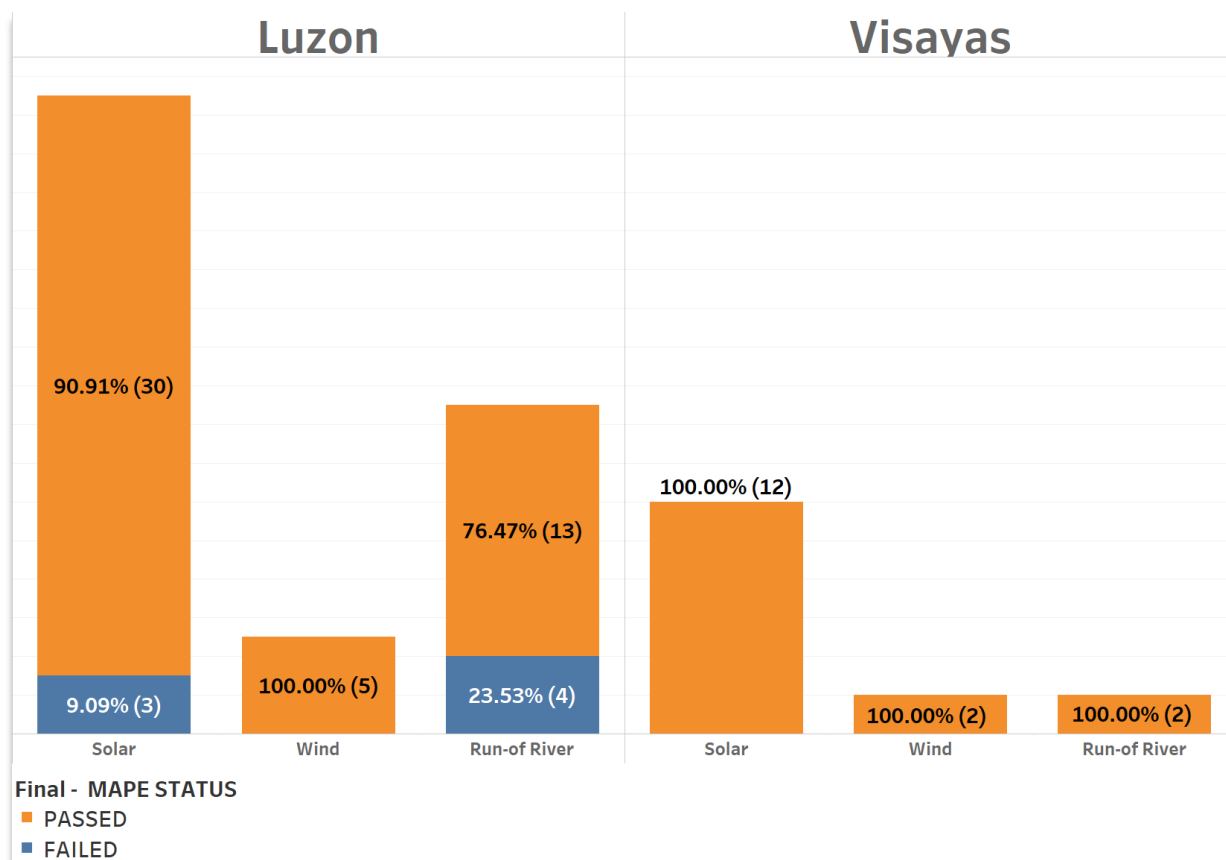
BY REGION AND RESOURCE TYPE

The performance of MDGUs with respect to MAPE and PERC95 was also assessed per region and per technology.

For MAPE

- In the Luzon region, most facilities are solar power plants. Thirty (30) out of thirty-three (33) of solar facilities performed within the MAPE threshold resulting in a passing rating of 91%. On the other hand, all the facilities under Wind technology passed the MAPE standards resulting in a 100% passing rate. For ROR technology, thirteen (13) facilities passed the MAPE standards resulting in a 76% passing rate.
- In the Visayas region, sixteen (16) facilities were monitored. Based on the results, all facilities under solar technology performed within the MAPE standards resulting in a passing rating of 100%. On the other hand, 100% of facilities under wind and ROR technology passed the MAPE standards.

See Graph 3 below for the summary illustration:



Graph 3. MAPE Final Performance of MDGUs per Region/Technology for Luzon and Visayas

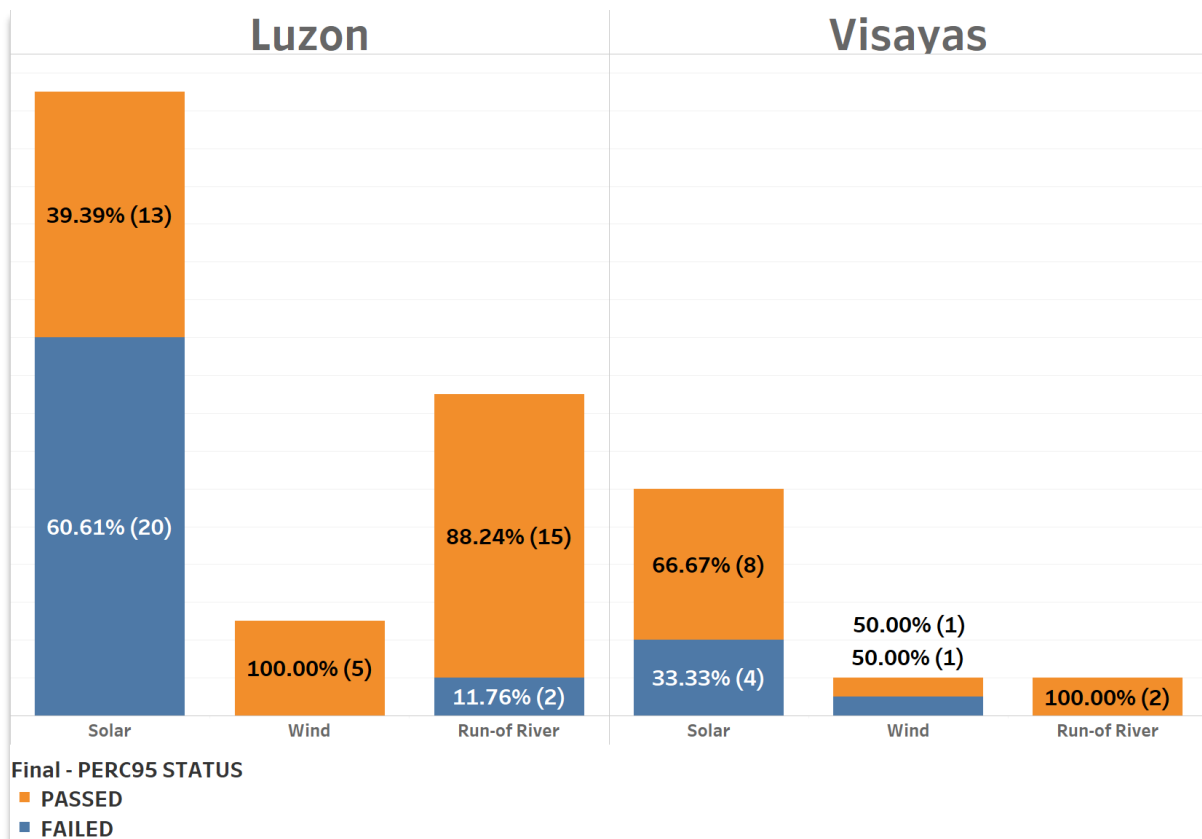


D. OVERALL FAS RESULTS

For PERC95

- In the Luzon region, majority of facilities are solar power plants, where only thirteen (13) out of thirty-three (33) facilities passed the PERC95 with a total passing rate of 39%. On the other hand, 100% of facilities under wind technology passed the PERC95 standards. For ROR technology, fifteen (15) of the seventeen (17) facilities passed the PERC95 standards giving an 88% passing rate.
- In the Visayas region, sixteen (16) facilities were monitored, where eight (8) out of twelve (12) solar facilities performed within the PERC95 standards resulting in a passing rate of 67%. On the other hand, facilities under wind technology had a passing rate of 50%. For ROR technology, 100% of facilities passed the PERC95 standards.

See below Graph 4 for summary results –



Graph 4. PERC95 Final Performance of MDGUs per Region/Technology for Luzon and Visayas



E. MAPE RESULTS

The table below shows the list of MDGUs with their respective cumulative MAPE results in Luzon and Visayas as of January 2023. The summary MAPE performance rating refers to the **January 2023 Prelim FASR and Final FASR**.

Seventeen (17) facilities had improved MAPE results in their Final FASRs, while the final monthly rating for three (3) facilities had declined after re-validation and/or recalculation. There was no change in the ratings with respect to the other fifty-one (51) facilities.

Table 2. Individual Performance of MDGUs (Running MAPE)

| Resource Name | MAPE Performance as of January 2023 | |
|---------------------------|-------------------------------------|------------|
| | Prelim FASR | Final FASR |
| RUN-OF-RIVER (ROR) | | |
| 01AMPHAW_G01 | 1.84% | 1.83% |
| 01BAKSIP_G01 | 5.51% | 5.49% |
| 01BAKUN_G01 | 2.74% | 2.74% |
| 01BINENG_G01 | 0.92% | 0.33% |
| 01BUTAO_G01 | 7.45% | 7.45% |
| 01NMHC_G01 | 0.41% | 0.37% |
| 01NMHC_G03 | 0.00% | 0.00% |
| 01SABANG_G01 | 0.73% | 0.72% |
| 01SLANGN_G01 | 5.75% | 5.67% |
| 01SMBELL_G01 | 0.71% | 0.71% |
| 03BALUG_G01 | 7.01% | 7.01% |
| 03BART_G01 | 16.20% | 16.20% |
| 03CLBATO_G01 | 11.58% | 11.43% |
| 03INARI_G01 | 8.48% | 8.48% |
| 03MAJAY_G01 | 12.62% | 12.55% |
| 03PALAK_G01 | 10.51% | 10.51% |
| 03UPLAB_G01 | 0.86% | 0.86% |
| 04TAFT_G01 | 1.76% | 1.76% |
| 08SUWECO_G01 | 1.98% | 1.98% |
| SOLAR | | |
| 01ARAYSOL_G01 | 8.95% | 8.95% |
| 01ARMSOL_G01 | 8.16% | 8.16% |
| 01BOSUNG_G01 | 100.67% | 100.67% |
| 01BTNSOL_G01 | 8.94% | 8.94% |
| 01BTSOLEN_G01 | 4.70% | 4.70% |
| 01BULSOL_G01 | 7.53% | 7.53% |



E. MAPE RESULTS

| Resource Name | MAPE Performance as of January 2023 | |
|---------------|-------------------------------------|------------|
| | Prelim FASR | Final FASR |
| 01BURGOS_G02 | 6.68% | 6.69% |
| 01BURGOS_G03 | 7.14% | 7.16% |
| 01CABSOL_G01 | 10.32% | 10.32% |
| 01CLASOL_G01 | 6.75% | 6.75% |
| 01CONSOL_G01 | 8.08% | 8.07% |
| 01DALSOL_G01 | 8.19% | 8.39% |
| 01GIGSOL_G01 | 3.00% | 3.00% |
| 01MAEC_G01 | 4.76% | 4.76% |
| 01MARSOL_G01 | 8.80% | 8.80% |
| 01PETSOL_G01 | 4.34% | 4.34% |
| 01PETSOL_G02 | 4.32% | 4.32% |
| 01RASLAG_G01 | 6.55% | 6.55% |
| 01RASLAG_G02 | 6.47% | 6.47% |
| 01RASLAG_G03 | 7.82% | 7.82% |
| 01SPABUL_G01 | 8.07% | 8.07% |
| 01SUBSOL_G01 | 4.65% | 4.49% |
| 01TERASU_G01 | 3.91% | 3.90% |
| 01YHGRN_G01 | 6.53% | 6.53% |
| 01ZAMSOL_G01 | 6.03% | 6.03% |
| 02ECOPRK_G01 | 4.34% | 4.34% |
| 02ECOTAGA_G01 | 5.30% | 5.30% |
| 02SMNRTH_G01 | 69.79% | 69.78% |
| 02VALSOL_G01 | 5.19% | 5.19% |
| 03ADISOL_G01 | 64.31% | 64.31% |
| 03CALSOL_G01 | 7.25% | 7.24% |
| 03MEC_G01 | 8.64% | 8.64% |
| 03SOLACE_G01 | 4.66% | 4.66% |
| 04PHSOL_G01 | 3.90% | 3.90% |
| 04SEPSOL_G01 | 3.47% | 3.46% |
| 05TOLSOL_G01 | 6.80% | 6.80% |
| 06CARSOL_G01 | 3.90% | 3.90% |
| 06HELIOS_G01 | 3.58% | 3.58% |
| 06MANSOL_G01 | 4.39% | 4.39% |



E. MAPE RESULTS

| Resource Name | MAPE Performance as of January 2023 | |
|---------------|-------------------------------------|--------------|
| | Prelim FASR | Final FASR |
| 06MNTSOL_G01 | 3.98% | 3.98% |
| 06SACASL_G01 | 10.86% | 10.86% |
| 06SACASL_G02 | 7.58% | 7.58% |
| 06SACSUN_G01 | 6.00% | 5.99% |
| 06SLYSOL_G01 | 6.92% | 6.90% |
| 08COSMO_G01 | 0.00% | 0.00% |
| WIND | | |
| 01BURGOS_G01 | 8.00% | 7.99% |
| 01CAPRIS_G01 | 4.74% | 4.74% |
| 01NWIND_G01 | 8.03% | 8.03% |
| 01NWIND_G02 | 6.48% | 6.48% |
| 03AWOC_G01 | 8.33% | 8.33% |
| 08PWIND_G01 | 13.71% | 13.71% |
| 08SLWIND_G01 | 6.27% | 6.24% |

F. PERC95 RESULTS

Table 3 shows the cumulative PERC95 results for each MDGU in Luzon and Visayas as of January 2023. The PERC95 summary performance rating refers to the **January 2023 Prelim FASR and Final FASR**.

Eighteen (18) facilities had improved PERC95 results in their Final FASRs, while the final monthly rating for one (1) facility had declined after re-validation and/or recalculation. There was no change in the overall ratings with respect to the other fifty-two (52) facilities.

Table 3. Individual Performance of MDGUs (Running PERC95)

| Resource Name | PERC95 Performance as of January 2023 | |
|---------------------------|---------------------------------------|--------------|
| | Prelim FASR | Final FASR |
| RUN-OF-RIVER (ROR) | | |
| 01AMPHAW_G01 | 4.49% | 4.49% |
| 01BAKSIP_G01 | 10.00% | 10.00% |
| 01BAKUN_G01 | 8.10% | 8.10% |
| 01BINENG_G01 | 0.73% | 0.50% |
| 01BUTAO_G01 | 22.50% | 22.50% |
| 01NMHC_G01 | 0.00% | 0.00% |



F. PERC95 RESULTS

| Resource Name | PERC95 Performance as of January 2023 | |
|---------------|---------------------------------------|---------------|
| | Prelim FASR | Final FASR |
| 01NMHC_G03 | 0.00% | 0.00% |
| 01SABANG_G01 | 2.21% | 2.19% |
| 01SLANGN_G01 | 14.21% | 14.07% |
| 01SMBELL_G01 | 1.62% | 1.62% |
| 03BALUG_G01 | 18.08% | 18.08% |
| 03BART_G01 | 16.52% | 16.52% |
| 03CLBATO_G01 | 57.84% | 57.84% |
| 03INARI_G01 | 33.78% | 33.78% |
| 03MAJAY_G01 | 26.38% | 26.05% |
| 03PALAK_G01 | 27.66% | 27.66% |
| 03UPLAB_G01 | 1.26% | 1.26% |
| 04TAFT_G01 | 1.97% | 1.97% |
| 08SUWECO_G01 | 4.96% | 4.96% |
| SOLAR | | |
| 01ARAYSOL_G01 | 37.80% | 37.80% |
| 01ARMSOL_G01 | 39.09% | 39.00% |
| 01BOSUNG_G01 | 136.84% | 136.84% |
| 01BTNSOL_G01 | 41.03% | 41.03% |
| 01BTSOLEN_G01 | 24.41% | 24.41% |
| 01BULSOL_G01 | 32.87% | 32.86% |
| 01BURGOS_G02 | 28.64% | 28.60% |
| 01BURGOS_G03 | 31.49% | 31.47% |
| 01CABSOL_G01 | 46.57% | 46.57% |
| 01CLASOL_G01 | 28.86% | 28.86% |
| 01CONSOL_G01 | 33.05% | 33.03% |
| 01DALSOL_G01 | 37.26% | 37.39% |
| 01GIGSOL_G01 | 16.22% | 16.22% |
| 01MAEC_G01 | 32.67% | 32.67% |
| 01MARSOL_G01 | 42.08% | 42.08% |
| 01PETSOL_G01 | 21.66% | 21.66% |
| 01PETSOL_G02 | 21.44% | 21.44% |
| 01RASLAG_G01 | 33.80% | 33.80% |
| 01RASLAG_G02 | 33.17% | 33.17% |



F. PERC95 RESULTS

| Resource Name | PERC95 Performance as of January 2023 | |
|---------------|---------------------------------------|------------|
| | Prelim FASR | Final FASR |
| 01RASLAG_G03 | 37.88% | 37.88% |
| 01SPABUL_G01 | 33.29% | 33.29% |
| 01SUBSOL_G01 | 23.67% | 22.53% |
| 01TERASU_G01 | 18.20% | 18.18% |
| 01YHGRN_G01 | 29.86% | 29.86% |
| 01ZAMSOL_G01 | 32.31% | 32.31% |
| 02ECOPRK_G01 | 22.04% | 22.04% |
| 02ECOTAGA_G01 | 26.57% | 26.57% |
| 02SMNRTH_G01 | 100.00% | 100.00% |
| 02VALSOL_G01 | 27.72% | 27.72% |
| 03ADISOL_G01 | 100.00% | 100.00% |
| 03CALSOL_G01 | 35.23% | 35.20% |
| 03MEC_G01 | 36.36% | 36.36% |
| 03SOLACE_G01 | 22.56% | 22.56% |
| 04PHSOL_G01 | 20.65% | 20.65% |
| 04SEPSOL_G01 | 18.15% | 18.10% |
| 05TOLSOL_G01 | 31.42% | 31.42% |
| 06CARSOL_G01 | 21.63% | 21.62% |
| 06HELIOS_G01 | 18.47% | 18.47% |
| 06MANSOL_G01 | 22.57% | 22.57% |
| 06MNTSOL_G01 | 20.21% | 20.21% |
| 06SACASL_G01 | 100.00% | 100.00% |
| 06SACASL_G02 | 34.10% | 34.10% |
| 06SACSUN_G01 | 27.74% | 27.70% |
| 06SLYSOL_G01 | 32.59% | 32.54% |
| 08COSMO_G01 | 0.00% | 0.00% |
| WIND | | |
| 01BURGOS_G01 | 23.66% | 23.64% |
| 01CAPRIS_G01 | 15.46% | 15.46% |
| 01NWIND_G01 | 26.51% | 26.51% |
| 01NWIND_G02 | 22.33% | 22.33% |
| 03AWOC_G01 | 24.27% | 24.27% |
| 08PWIND_G01 | 44.00% | 44.00% |
| 08SLWIND_G01 | 18.15% | 18.07% |



G. ECO GENERAL OBSERVATION

The following were observed and noted during the **January 2023** monitoring period and based on the computed FAS results:

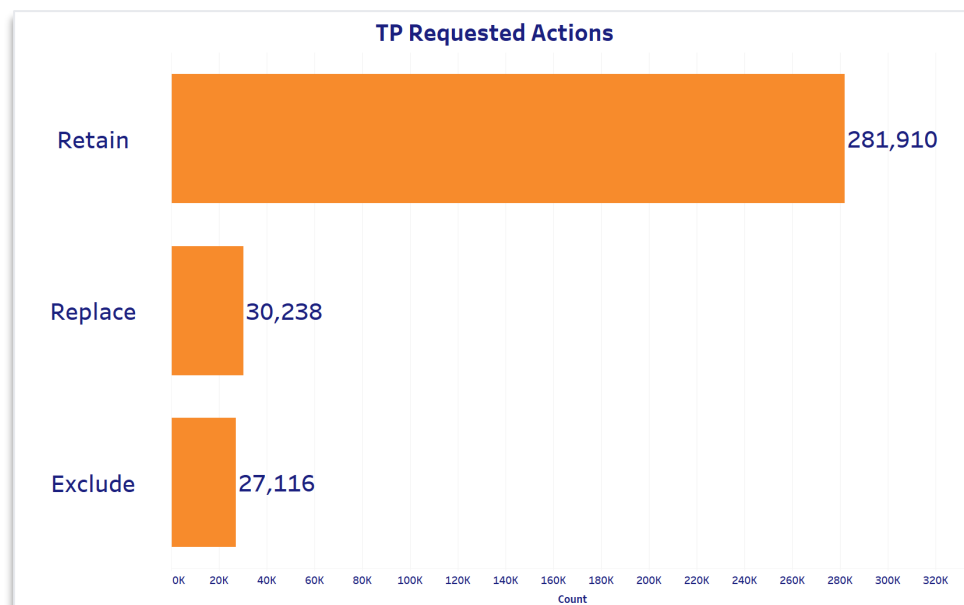
1. **Actual Basis for Recalculations.** Out of the 71 facilities monitored, 38 facilities or 54% submitted justifications and supporting documents relative to the requested exclusion/s as mentioned in Section (C) (1.2) of this report. In terms of interval counts, a total of 339,264 out of 633,888 or 54% were covered by the submissions. After due consideration of the requests for recalculation, the result remains the same for MAPE and PERC95 ratings.

For this period, the recalculations were based on the requests:

- (a) For exclusions due to Outages, Market Suspension/Intervention, System Operator Instructions, Force Majeure; and
- (b) For replacement of data for specific dispatch intervals due to data variance.

Such requests would have involved recalculation for 27,116 intervals (for exclusion) but only 290 or 1.07% of the intervals were considered by ECO.

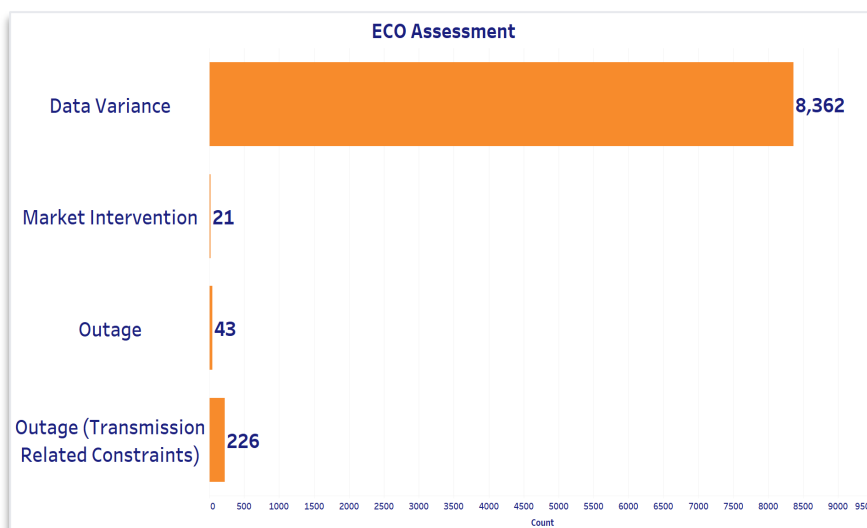
For data variance, only 8,362 out of 30,238 intervals or only 27% were verified to be data variance and thus warrant recalculation.



Graph 5 – Summary of Requested Exclusions/Replacement of Data for Recalculation



G. ECO GENERAL OBSERVATION



Graph 6 – Summary of Accepted Exclusions/Replacement of Data Used in Recalculation

Another reason for the low acceptance rate for the January 2023 billing period is the request for exclusion is not covered by Exclusions under Section 4.3.1 of the FAS Manual. For instance, the hydro constraints due to low water elevation is not among the incidents that is allowed to be excluded from the calculation. It is not synonymous to the outage that is considered in the Exclusion.

The request for exclusion by reason of outage is also assessed based on the actual occurrence of an incident. The outage that is considered for purposes of recalculation as Exclusion (under Section 4.3.1 [d]) is any full or partial unavailability of *equipment or facility*, as defined in the WESM Rules⁷. It is, thus, distinguished from the resource constraints which refer to the unavailability of the supply or source of energy. Resource constraint is not one of the Exclusions provided in the FAS Manual.

- 2. Non-Submission of 0 MW Projected Outputs.** The non-submission of nominations resulted in 100% Forecast Percentage Error (FPE) in some dispatch intervals. It must be noted that under Section 4.2.6 of the FAS Manual, the nomination of zero (0) MW in times of zero projection in the generation would carry some weight in the calculation of the FPE. It was observed that only 5% of the total number of intervals from January 2023 had missing nomination of projected outputs. This also concludes the high passing rate in MAPE and PERC95.
- 3. Results After Recalculation.** For those intervals which have been recalculated due to the occurrences of some incidents that qualify as “exclusions,” within the meaning of Section 4.3 of the FAS Manual, it was observed that the resulting FPE varies depending on the plant’s performance with respect to the intervals that have not been covered by exclusions. The exclusions had either yielded a higher FPE for some plants or an improved FPE for others.

For those intervals which have been recalculated due to the occurrences of data error or non-updating/bad data in the NMMS that qualify as “data variance” and which allows replacement or substitution of corrected/validated data under Section 4.3.2 of the FAS Manual, it was observed that the resulting FPE also varies depending on the plant’s performance using the correct data in place of the bad data.

⁷ WESM Rules Glossary, Chapter 11



Philippine Electricity
Market Corporation

MONTHLY FAS REPORT

ENFORCEMENT AND COMPLIANCE OFFICE

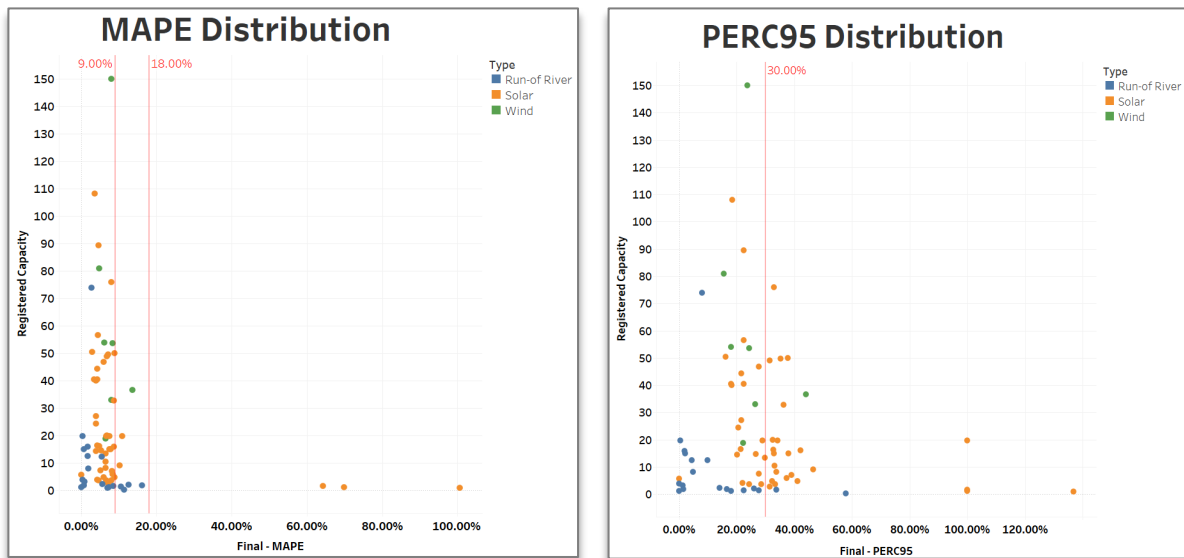
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G. ECO GENERAL OBSERVATION

4. **Result Distribution.** The majority of the MAPE results are concentrated at 60MW and 10% MAPE area while the majority of the PERC95 results are concentrated at 60MW and 40% PERC95 area. While it was also noticeable in both graphs that there are three (3) solar facilities with low accuracy at 60% MAPE and 100% PERC95 area due to non-submission of projected output during nighttime that contributes to a 100% FPE.



Graph 7 – MAPE and PERC95 Result Distribution

It can be observed in the above graph that the size of the MDGU has no direct relation to MAPE and PERC95. It is because the forecast errors are derived from the percentage of a metered quantity.

5. **Cumulative Computation.** The periodic FAS results for this billing period will form part of the subsequent periodic and annual calculation of the FAS results as the computation for the current and the succeeding months will be cumulative until 25 December 2023.

For the information of the DOE, the PEM Board, and the Compliance Committee pursuant to Section 4.4.5 of the FAS Manual, Section 4.15 of the Penalty Manual Issue 1.0 and Section 10.3.1 of the Enforcement and Compliance Manual Issue 1.0.

Prepared By:

CARL ANGELO B. DELA CRUZ
EC Specialist | 18-Apr-2023

DARLENE C. DUBLAR
EC Manager | 18-Apr-2023

Reviewed By:

MARK ANTHONY C. ANDRADA
Deputy Enforcement and Compliance Officer
20-Apr-2023

Approved By:

MA. HAZEL M. GUBATON-LOPEZ
Chief Enforcement and Compliance Officer
24-Apr-2023









MFASR_2023-01-01-signed

Final Audit Report

2023-04-25

| | |
|-----------------|--|
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| By: | Darlene Dublar (dcdublar@wesm.ph) |
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