Public

~~Old/Changed Text~~

New text

Guidance Note – ~~Good Industry Practice~~FPN Accuracy of BMUs

In relation to FPN Accuracy (Grid Code **BC 1.4.2(a)** & BC 2.5.1).

June 2026

1. Change management.

Change Control	Changed by	Release date
Version 1 of Guidance Note released *Consultation concluded on 26th June 2024.*	*NESO Market Monitoring Team*	*09/08/2024*
Version 2 of Guidance Note released. *Changes made following the consultation period between 2nd December 2024 – 10th January 2025. Changes include an introduction of principles that can be used in preparing PNs and the explanation of each principle in practice, expansion of NESOs description to extenuating circumstances, change to the threshold measures at a set level for both onshore and offshore wind and an appendix detailing some of NESOs decisions.*	*NESO Market Monitoring Team*	*10/02/2025*
(Draft) Version 3 of Guidance Note to be released *Changes will be confirmed after consultation with industry*	*NESO Market Monitoring Team*	*TBC*

2. Foreword

Grid Code BC2.5.1 specifies that "Physical Notifications must represent the BM Participant's best estimate of expected input or output of Active Power, except where a BM Unit is affected by a Stage 2 or higher Network Gas Supply Emergency load shedding event. Physical Notifications shall be prepared in accordance with "**Good Industry Practice**". Given National Energy System Operator (NESO) has a licence obligation (C1.~~5(c)~~10) to monitor balancing services markets, our role is to provide Balancing Mechanism Units (BMUs) and other market participants with a clear understanding of how NESO monitors 'Good Industry Practice' in accordance with Grid Code. The purpose of this guidance note is to ensure transparency and provide guidance on how NESO interprets these requirements.

This Guidance Note is also prepared for the assistance of prospective Generators that intend to connect directly to the National Electricity Transmission System and Embedded Power Stations that also wish to register as BMUs. In the event of a dispute, the Grid Code and Bilateral Agreement documents will take precedence over these notes.

Definitions for the terminology used in this document can also be found in the Grid Code.

It is generally recognised that intermittent units (wind, solar and tidal) demonstrate greater inaccuracy in their PNs, primarily due to the inherent unpredictability of the supply of their fuel inputs. Therefore, previous iterations of this guidance note have concentrated on the monitoring of the performance of wind BMUs, a process that has proven to be highly effective. Since the commencement of official monitoring against established Good Industry Practice thresholds in March 2025, there has been a marked improvement in the accuracy of FPNs associated with wind units. This achievement can be attributed to the commitment of wind units to refine their forecasting methodologies, adjusting the frequency of PN submissions to the ENCC, and the provision of dynamic parameters that correctly reflect the unit capabilities. Furthermore, constructive engagement and open communication from market participants have enabled NESO to gain a comprehensive understanding of advancements as well as the underlying causes of any lack of transparency, culminating in a transparent and efficient monitoring and enforcement process. It is anticipated that these successes could be extended to other intermittent fuel sources to achieve a more secure system operability and lower consumer costs. Given the distinction between intermittent and non-intermittent fuel sources in Grid Code, we have decided to adopt a similar approach in segregating and monitoring performance of all units participating in the Balancing Mechanism.

~~Following the release of the Guidance Note issued in August 2024, a three-month education period commenced, during which NESO engaged with a large number of market participants through one-to-one calls and received some additional feedback highlighting the need for the Guidance Note to provide some further clarity. This document represents the updates made following the targeted consultation between 02nd December 2024 – 10th January 2025. The consultation document that has formed these changes can be found on the NESO Balancing Costs webpage, or directly through the following link: FPN Good Industry Practice Consultation - December 2024.~~

~~Since the initial release of the Guidance Note in August 2024, NESO has observed significant improvements in wind PN accuracy. The dedication to improving PN accuracy, engaging with NESO, and maintaining open communication has been greatly appreciated. NESO would also like to extend our gratitude to the operators who have shared insights into their forecasting models with the industry, fostering a collaborative approach to sharing best practices. Thank you for your continued support and commitment.~~

For the avoidance of doubt, this Guidance Note will replace all versions released before this date.

NESO's Market Monitoring team will be happy to provide clarification and assistance required in relation to these notes and on Grid Code compliance issues.

NESO welcomes additional feedback, and this can be directed to the NESO Market Monitoring Team at:

Market Monitoring Team, National Energy System Operator.

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3. Contents

4. Introduction & Requirements.

Grid Code **BC 1.4.2(a)** and **BC 2.5.1** outline the standard to which Final Physical Notifications (FPNs) should be prepared in accordance with Good Industry Practice. FPNs are an important parameter in the Balancing Mechanism, as the FPN should provide a true and accurate reflection of the power (MW) import or export of a Balancing Mechanism Unit (BMU) for a particular half hour. This is vitally important for balancing as it gauges the difference between the contracted position struck between Generators and Suppliers and outlines to NESO the BMU's intended schedule for export/import. The more accurate an FPN can be, the more accurate the indication of intended BMU export/import schedule, which, in turn will reduce errors and enable much more accurate procurement of bids and offers by NESO in the balancing mechanism, therefore keeping balancing costs down. Furthermore, Bid-Offer-Acceptance payments are based on deviations away from FPNs. Therefore, accurate FPNs will result in a reduction in Balancing Costs through accurate payments.

NESO have identified significant inaccuracies in the provision of FPNs, which is leading to excess Balancing Costs being incurred and unnecessary operational risk in the balancing of Great Britain's electricity system. This Guidance Note outlines the accuracy to which NESO believe FPNs should be prepared. The need for BM participants to submit accurate FPNs has also been highlighted by Ofgem on a number of occasions.[1]

The level of accuracy in FPN submissions is stipulated in Grid Code **BC 1.4.2(a)**:

*…**Physical Notifications** shall be prepared in accordance with **Good Industry Practice**.*

and in **BC 2.5.1** as

Each BM Participant must, applying Good Industry Practice, ensure that each of its BM Units follows the Physical Notification in respect of that BM Unit…

Good Industry Practice is a defined term in the Grid Code as the following:

***Good Industry Practice**: The exercise of that degree of skill, diligence, prudence and foresight which would reasonably and ordinarily be expected from a skilled and experienced operator engaged in the same type of undertaking under the same or similar circumstances.*

This document serves to establish clear guidelines on the performance measures NESO will use to consider whether 'Good Industry Practice' is being followed in relation to BC1.4.1(a) and BC2.5.1. While the term 'Good Industry Practice' allows for interpretation, it strongly emphasises the significance of skilled and experienced operators operating under comparable circumstances. This term is intended to enforce a high standard for operators in terms of their information submission and behaviour.

Previous versions of this Guidance Note focused only on establishing thresholds and principles for the preparation of a Physical Notification that NESO considers to be within the bounds of Good Industry Practice for wind BMUs. However, as this initiative has progressed, we have observed that BMUs amongst other fuel sources (Figure 1), also exhibit significant inaccuracies that contribute to operational risks and excess balancing costs. Therefore, this revised version of the Guidance Note intends to apply Good Industry Practice thresholds to all BMUs.~~This is because Wind BMUs have been identified to be significantly more inaccurate than other fuel types and are causing more operational risks and excess Balancing Costs due to this inaccuracy and the prevalence of the requirement to curtail this particular fuel type. NESO will continue to monitor the accuracy of other fuel types and will raise inaccuracy issues where necessary. Should other fuel types exhibit a similar level of inaccuracy and risk to operations, then NESO will follow a similar process to establish its view of Good Industry Practice for those units.~~

[1] See for example: https://www.ofgem.gov.uk/sites/default/files/2021-06/Open%20letter%20on%20dynamic%20parameters%20and%20other%20information%20submitted%20by%20generators%20in%20the%20Balancing%20Mechanism_0.pdf and https://www.ofgem.gov.uk/sites/default/files/docs/2016/12/scarcity_pricing_and_conduct_in_the_wholesale_energy_market.pdf

~~For the avoidance of doubt, it is expected that operators of all fuel sources should ensure their FPN submissions meet the requirements of Good Industry Practice as defined in Grid Code and that while present levels of inaccuracy in other fuel resources do not lead to a need to establish thresholds within this Guidance Note, the improvement processes outlined within this Guidance Note could be applied to an operator of any fuel source.~~

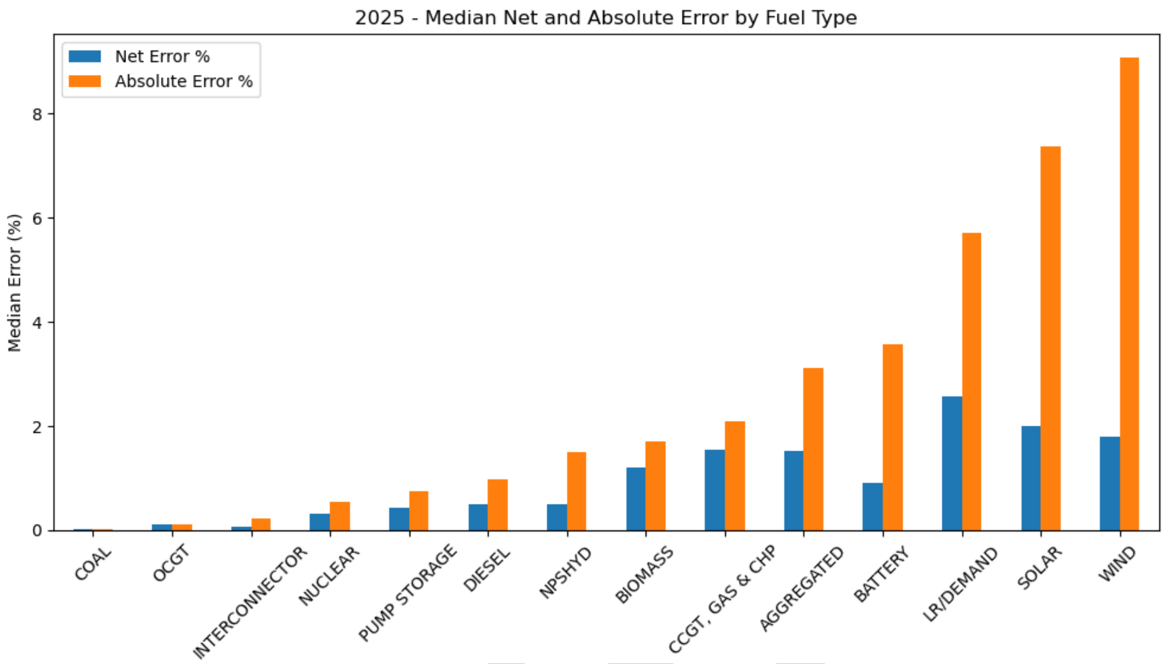


Figure 1: 2025 - median net and absolute error by fuel type

5. Objective.

NESO has established two threshold measurements that will be used, amongst other considerations, to assess its view of 'Good Industry Practice'. It is important to note that these thresholds do not encompass all possible interpretations of what may be regarded as 'Good Industry Practice' and that the process outlined is intended to be collaborative and open in explaining how NESO will approach its existing licence obligations to report potential breaches of the Grid Code to Ofgem.

This Guidance Note provides the following with regards to Good Industry Practice:

- How NESO will continue to monitor the level of accuracy of FPNs;
- Principles that might be employed by an operator demonstrating Good Practices;
- How BMUs can work with NESO to improve FPN accuracy and raise any specific concerns with meeting these thresholds; and
- The enduring escalation and monitoring process and timelines

Throughout the monitoring process, NESO will establish through engagement with responsible parties of units not meeting thresholds if there are any site-specific reasons that thresholds may be unachievable for a BMU or a group of BMUs. If, throughout the monitoring process it has been identified that there are extenuating circumstances leading to these thresholds not being met, NESO will factor this into its decision to raise the inaccuracy to Ofgem. Similarly, demonstrating through engagement application of principles to ensure a high standard in the preparation of PNs such as those outlined in this Guidance Note will be considered in any decision to raise the inaccuracy to Ofgem.

6. Measuring Good Industry Practice in Relation to FPN Accuracy.

This Guidance Note explicitly defines the level of accuracy that NESO will use to monitor whether in its view ~~wind~~ BMUs are operating with the bounds of Good Industry Practice for submitting Final Physical Notifications (FPNs). It will also allow NESO to monitor, in a transparent manner, which units are improving the accuracy of their FPN submissions. We will work collaboratively with market participants to improve their level of accuracy and in cases where thresholds are not met, we will continue to engage with market participants. Finally, if necessary, we will notify Ofgem should we have outstanding concerns that Good Industry Practice is not being followed.

NESO is therefore providing guidance in relation to two measures that it will use to assess its view of Good Industry Practice regarding FPN accuracy, which are the following:

A) The sum of net error between FPN and Actual Metered Output of an

   a. **Intermittent BMU** should be **between 3% and -3% for each month** as a function of their available capacity,

   b. **Non-intermittent BMU** should be **between ~~2.9~~1.0% and -~~2.9~~1.0% for each month** as a function of their available capacity

B) The sum of absolute error between FPNs and Actual Metered Output of an

   a. **Intermittent BMU** should **be below 9.4%** as a function of their available capacity.

   b. **Non-intermittent BMU** should **be below ~~5.8~~2.4%** as a function of their available capacity

Measures provided for net errors are required to ensure that providers are correctly compensated for any bid offer acceptance volume as calculated from the Final Physical Notification. Measures provided for absolute errors are required to minimise operational risk by increasing the certainty on output.

All the measures described in this Guidance Note relate to the Final Physical Notification. It is important that Pre-gate Closure Physical Notifications should also reflect a unit's best expectation of output, but it is recognised that both commercial and weather factors lead to changes in output that make it inappropriate to stipulate a percentage accuracy relative to delivered volume.

The net and absolute error thresholds that NESO considers should be **regularly met** by a unit meeting Good Industry Practice. "Regularly met" means that NESO would not intend to apply strict scrutiny to an isolated month where thresholds are not achieved.

The thresholds for wind units were derived by identifying the worst months performance data for each wind BMU in each measure in 2023, ranking this data and then selecting the 10% of best performing onshore wind BMUs from this dataset. This threshold is also aligned with the median performance across all wind BMUs. On average, the performance of solar BMUs in 2025 has been better than that of wind BMUs, with most units achieving the established Good Industry Practice thresholds. Moreover, as solar units face a same set of forecasting and operational challenges to wind, we believe that these standards can justifiably be applied on solar BMUs while maintaining our commitment not to introduce moving targets for wind.

Non-intermittent fuel sources are expected to have better accuracy than their intermittent counterparts, due to controllable nature of outputs. Inaccuracies amongst non-intermittent BMUs are largely due to anomalous data submissions by a smaller set of BMUs that result in significant errors. Unlike intermittent resources where high errors are necessarily present given input energy variability, non-intermittent resources exhibit extremely low errors in most cases but with an exponential tail error contributing to a significant overall error value. For this reason, thresholds derived from the top performer's risks increasing costs for BMUs while leading to diminishing improvements in operability and visibility. As a result, the 70th percentile values of 2025 errors are used to establish good industry practice for non-intermittent BMUs, focusing on improving the very poor performers. The thresholds for intermittent BMUs will remain the same as derived in the previous versions of this guidance, adhering to our commitment to move the thresholds over time. For the avoidance of doubt, persistent deterioration in existing good performance will also be monitored and may be considered as a failure to meet good industry practice even within the thresholds.

Further description on how these thresholds have been established and why they are considered appropriate can be found in the Appendix of this document.

~~**The Net and Absolute error thresholds outlined below apply to both onshore and offshore wind.**~~

Percentiles	Intermittent		Non-intermittent	
	Net error (%)	Absolute error (%)	Net error (%)	Absolute error (%)
10th	0.74%	6.65%	±0.02%	0.04%
20th	0.94%	7.44%	±0.04%	0.13%
30th	1.10%	7.85%	±0.07%	0.21%
40th	1.385	8.65%	±0.11%	0.26%
50th	1.70%	9.07%	±0.23%	0.47%
60th	2.07%	9.77%	±0.50%	1.27%
70th	2.67%	10.19%	±1.04%	2.36%
80th	3.565%	10.95%	±2.10%	4.12%
90th	5.42%	12.48%	±5.73%	9.90%
NESO view of Good Industry Practice Threshold	**±3.0%***	**9.4%***	**±1.0%**	**2.4%**

*****Previously established view on good industry practice to be continued for intermittent BMUs

Table 1: 2025 Net and absolute error statistics – intermittent vs non-intermittent sources

~~Performance of the Top %~~	~~Net % Threshold~~	~~Absolute % Threshold~~
~~25%~~	~~±4.84%~~	~~10.71%~~
~~20%~~	~~±4.03%~~	~~10.47%~~
~~10%~~	~~±3.03%~~	~~9.38%~~
~~5%~~	~~±2.08%~~	~~8.72%~~
~~**NESO view of Good Industry Practice Threshold**~~	~~±3%~~	~~9.4%~~

7. Methodology

In establishing how NESO interprets Good Industry Practice we have identified two measures as relevant to carrying out this assessment:

1. Net error which is a representation of any directional offset in the errors leading to persistent under or over statement of the expected output of the unit based on submitted data.
2. Absolute error which is a representation of the cumulative errors over time.

A high standard of performance against both metrics is required to minimise costs associated with uncertainty and to ensure fair settlement of bid offer acceptances, which are paid based on calculations from the physical notification and therefore affected by any directional error bias.

In line with received feedback, the methodology has been adapted to one based on the available capacity of the unit rather than the delivered output of the unit as the denominator. This results in a methodology as follows for the calculation of error:

Threshold 1 – Net % Error

$$NET\_PERC\_ERROR(u,m) = \frac{NET\_ERROR(u,m)}{\sum_{s \in S(m)} CAP(u,s)}$$

$$NET\_ERROR(u,m) = \sum_{s \in S(m)} FPN(u,s) - AMO(u,s)$$

In each settlement period the expected energy delivered minus the metered output is calculated. This parameter is then summed across the duration of a month to provide a monthly net energy error. Directionality is maintained so positive errors offset negative errors and the monthly value is a cumulative value across the monthly sample period. To turn this into a percentage, the sum of each settlement period capacity is used as the denominator, whereby capacity is capped by the MEL (if the unit if exporting) or the absolute value of MIL (if the unit is importing) ~~To turn this into a percentage, the sum of each settlement period capacity is used as the denominator, whereby capacity is assumed as the minimum of the average Maximum Export Limit declared in any period or the registered capacity of the units~~

Threshold 2 – Absolute % Error

$$ABS\_PERC\_ERROR(u,m) = \frac{ABS\_ERROR(u,m)}{\sum_{s \in S(m)} CAP(u,s)}$$

$$ABS\_ERROR(u,m) = \sum_{s \in S(m)} |FPN(u,s) - AMO(u,s)|$$

In each settlement period the expected energy delivered minus the metered output is calculated and the absolute value is calculated. This parameter is then summed across the duration of a month to provide a monthly absolute energy error. Directionality is lost so positive errors and negative errors in each settlement period are cumulative across the monthly sample period. To turn this into a percentage, the sum of each settlement period capacity is used as the denominator, whereby capacity is capped by the MEL (if the unit if exporting) or the absolute value of MIL (if the unit is importing)~~To turn this into a percentage, the sum of each settlement period capacity is used as the denominator where capacity is assumed as the minimum of the~~

~~average Maximum Export Limit declared in any period or the registered capacity of the unit~~.

Variable	Units	Description
NET_PERC_ERROR(u,m)	%	The net percentage error measurement.
ABS_PERC_ERROR(u,m)	%	The absolute percentage error measurement.
AMO(u,s)	MWh	The actual metered output according to settlement metering.
CAP(u,s)	MWh	Capacity of a unit, capped by the MEL (if the unit is exporting) or the absolute value of MIL (if the unit is importing), ~~Minimum of the MEL or the capacity of the unit~~ in each settlement period.
FPN(u,s)	MWh	The expected metered output according to Physical Notifications. *(adjusted for any unavailability indicated by Maximum Import Limit below positive Physical Notification or Maximum Import Limit above negative Physical Notification ~~Periods affected by a Bid/Offer acceptance or an unavailability as indicated by a Maximum Export Limit below the Physical Notification adjusts this Expected Output parameter according to wider Grid Code~~).*
NET_ERROR(u,m)	MWh	The net error MWh of error between FPN and AMO.
ABS_ ERROR(u,m)	MWh	The absolute MWh of error between FPN and AMO.
u	BMU_ID	Balancing Mechanism Unit.
m	Month	The month in which the NET_PERC_ERROR and ABS_AVG_ERROR is being calculated for.
s	Settlement Period	Settlement Periods.
S(m)	{}	Set of Settlement Periods in month, exclude Settlement Periods where there is a Bid/Offer acceptance.~~Number of Settlement Periods in month m.~~

Table 2: Variables and their descriptions for calculating the Accuracy Thresholds.

All figures are collected using Elexon data to ensure complete transparency and repeatability of approach. The datasets used in analysis will be updated monthly and published on the NESO market monitoring ~~balancing costs~~ page.

Given the addition of other fuel sources in the monitoring procedure as well as lessons learned from the wind participants' error calculations, we have modified our error calculation methodology, details of which are present in the Appendix.

At the start of the Monitoring Procedure, and monthly there-after NESO will publish each BMU with their NET_PERC_ERROR(u,m) and ABS_PERC_ERROR(u,m) values for the last 6-months, to make transparent NESO's accuracy calculations.

8. Principles for preparation of a Physical Notifications

Intermittent resources

Alongside these thresholds, NESO is introducing a set of non-exhaustive principles that can be applied to preparing accurate FPN data. These principles have been developed based on discussions with wind market participants that own or operate onshore and/or offshore units that demonstrate high levels of PN accuracy according to NESO's benchmarking analysis, NESO's balancing engineers and based on industry feedback received during the FPN Good Industry Practice Consultation December 2024.

Where a unit cannot meet thresholds and cannot demonstrate extenuating circumstances, NESO may consider the following non-exhaustive principles in its view of whether Good Industry Practice is being followed by ~~wind~~ intermittent generators in the preparation of PNs:

- **~~Wind forecasts~~ Forecasts and models used for the preparation of Final Physical Notifications are updated regularly and are reflective of the best data available for that BM Unit.**

  For ~~wind~~ intermittent BMUs we would expect to see that the best available ~~wind~~ data and models are used in the preparation of Physical Notifications. In cases where integrated trading and data submission exist, the principles would be that all models used for creating an expectation of output for the purpose of energy trading should be the same as for PN submission in all timescales until gate closure. For cases where these are separated functions, we would expect that data used is the most recent available within modelling and gate closure constraints and typically using ~~wind~~ forecast data that is no more than an hour before gate closure (2 hours before delivery). In all cases if it can be demonstrated that more frequent and recent data does not lead to improvements in PN accuracy by the operator or responsible party for PN submission this analysis would also be considered as meeting the principle of best data available.

- **Whenever the expected output of the unit changes due to updated forecast data or new model outputs, this is reflected in the Physical Notification.**

  Pre gate closure PNs should be resubmitted on any change greater than 1MW in the ~~wind~~intermittent generators best expectation of a unit's output. For the avoidance of doubt, details regarding best practices for use of Electronic Data Transfer (EDT) and Electronic Data Log (EDL) are shared in wider NESO guidance. However, for ease of reference current best practices for use of these systems is documented in the Appendix.

- **The model should not lead to a Physical Notification which is consistently higher or lower than outputs.**

  This principle is in line with the measure of net error, it is possible that corrections are needed in datasets themselves to increase or decrease the outputs for a weather model, but the output should not lead to a result that consistently over or underestimates generation outputs of a unit.

- **The model used for preparing a Physical Notification is reviewed regularly.**

  Models for the preparation of a PN should be reviewed regularly with approximately once yearly considered appropriate, and where services are provided by a 3rd party, the responsible party should review performance of this provider.

In addition to the outlined principles for the preparation of PNs for intermittent BMUs, non-intermittent BMUs are expected to adhere to best practices relevant to their respective fuel type

Non-Intermittent resources

Please note that this section will be updated following consultation responses recognising the importance of listening to current best practices.

- **There should be no intentional deviation from a Final Physical Notification**

  The balancing and settlements code allows for an unbalanced overall energy position. This rule does not prevent an operator from holding a commercial position different to its generation schedule (where this remains appropriate under REMIT and subject to other market rules), but Grid Code does not allow for engaging in a commercial strategy of active deviation from submitted FPNs. All BM Units must submit FPNs that are their best expectation of delivered energy output and attempt to meet this profile (as adjusted for balancing mechanism bid and offers and balancing services volumes).

- **Whenever the expected output of the unit changes due to updated intended outputs, this is reflected in the Physical Notification.**

  *Pre gate closure PNs should be resubmitted on any change greater than 1MW in the best expectation of a unit's output. At **all times**, the pre gate closure PN should reflect the intended generation output.*

  It is recognised that significant changes may still occur as commercial positions change and this does not prevent an operator from changing a profile, but as soon as practicable after a large change, data should be updated rather than routine re-declarations that risk a large difference from expected output.

  For the avoidance of doubt, details regarding best practices for use of Electronic Data Transfer (EDT) and Electronic Data Log (EDL) are shared in wider NESO guidance. However, for ease of reference current best practices for use of these systems is documented in section 10.Appendix.

- **The submitted data should not lead to a Physical Notification which is consistently higher or lower than outputs.**

  Introducing intentional direction bias compared to expected output has potential to reduce absolute errors in some cases but this should not be used except for the purposes of rounding where decimal values can be rounded.

- **At the point of gate closure a unit should be able to deliver its profile**

  Submission of an FPN must be possible to meet, for example a current state of charge that can deliver the physical notification energy volumes and an expected unit availability at the point of submission. It must not presume a previous non committed NESO balancing action. When 'taking over' from an offer or bid acceptance that is committed to given unit technical parameters, it is appropriate to submit an instantaneous PN to the committed Bid Offer Acceptance level at the next available date.

  Until MDO and MDB are in place, if a Bid Offer Acceptance changes your state of charge, existing practices of Maximum Import Limit and Maximum Export Limit reductions remain appropriate and are accounted for within the error metrics where this will cap your expected delivery but for the avoidance of doubt you should not intentionally enter an FPN which cannot be met at the point of submission.

- **Following a reduction in generation or demand capacity the PN should be updated based on new expected availability**

  In the case such as a fault condition where there is an intention to return the asset to service but the unit is fully or partially unavailable, FPNs may remain at the intended delivery volumes and capped by Maximum Export limit creating a capped committed level visible to the market and NESO control room but this should not normally extend for over 3 hours or a time at which an operator becomes aware of the assets likely continued unavailability.

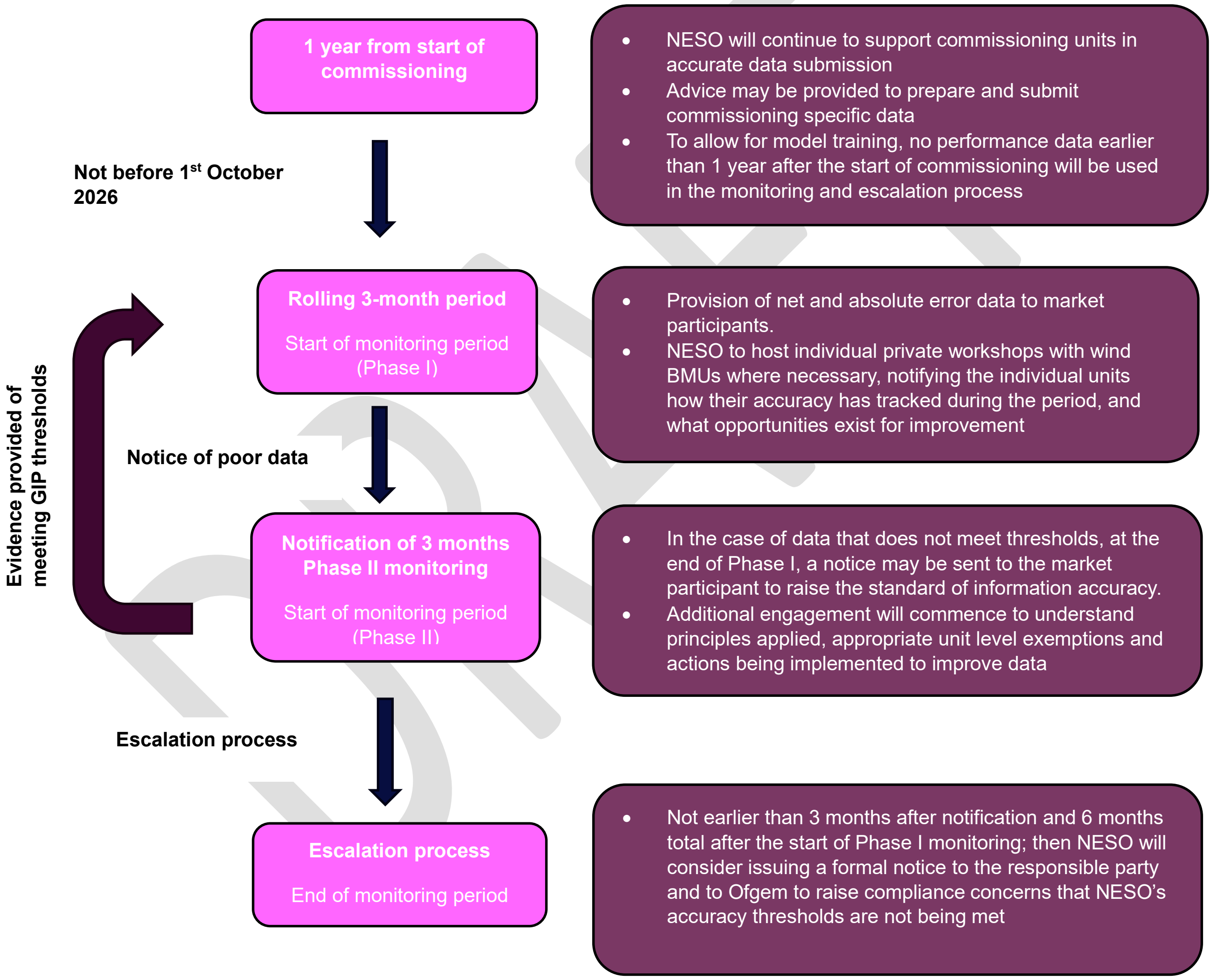
- **A unit should not generate or consume energy where it has an FPN of 0MW**

  For the avoidance of doubt, a physical notification must be submitted and absent a balancing mechanism instruction or balancing services volume, a 0MW FPN (or failure to submit a FPN at all) should result in the unit remaining at 0MW.

9. Monitoring Timelines and Procedures

The monitoring process outlined below aims to foster collaboration and assist Balancing Mechanism Units (BMUs) in reaching the thresholds set out in this Guidance Note where these thresholds are not met. It is important to note that these thresholds do not encompass every aspect of what may be considered Good Industry Practice.

NESO recognises that the monitoring process may uncover extenuating circumstances for certain intermittent BMUs that prevent them from meeting the defined accuracy thresholds, regardless of whether the principles for the preparation of PNs outlined above are being followed. This understanding will be achieved through a collaborative process, involving close engagement with these intermittent BMUs to gain insights into the unique characteristics of their site(s). NESO will consider these circumstances when determining whether to report any inaccuracies to Ofgem.



The Monitoring Procedure is a six-month monitoring period for all BMUs with workshops and a gradual escalation of severity raised from continued inaccuracy. The monitoring period will begin on 1st October 2026. For commissioning units, the monitoring period will start either one full calendar year from the beginning of commissioning or on 1st October 2026, whichever is later.

At the 3-month mark, a **notice** will be given to units that are not regularly meeting NESOs accuracy thresholds that NESO is intending to raise concerns to Ofgem that in NESO's view, Good Industry Practice has not been followed should this continue. Should the inaccuracy continue for another 3-months (6-months monitoring in total) without evidence of extenuating circumstances or application of the appropriate principles for the effective preparation of PNs, then NESO will consider issuing a **formal notice** to the responsible party and to Ofgem that the expected level of accuracy set out in this Guidance Note has not been followed for each BMU not meeting these thresholds.

Where a unit meets NESOs view of Good Industry Practice as set out in this document in the first 3 months, at least 3 months additional data would be needed to consider escalation into phase II monitoring to account for wind variability. If a unit enters phase II monitoring but demonstrates NESOs view of Good Industry Practice within the following 3 months, it will enter Phase I monitoring with a further 3 months before a notice could be re-issued by NESO.

The process outlined is intended to be collaborative and we endeavour to work with BMUs to improve their FPN accuracy throughout. Escalation to the Ofgem is a means of last resort where units cannot show meeting of NESOs accuracy thresholds, employing of principles for the effective preparation of a PN or extenuating circumstances; All escalation to the Ofgem is as part of existing NESO licence obligations.

Across the process, we will make reasonable allowances for exceptional circumstances and specific process or system reasons that thresholds may not be met. If an exceptional circumstance is identified during a performance month, it will be excluded from the performance monitoring for that month or months.

When achieving the thresholds defined within the Guidance Note**, it is not the expectation of NESO that the thresholds can or will be achieved every month** of the calendar year. It would not be the intention of NESO to apply strict scrutiny to a singular month where thresholds are not achieved.

Where improvements or plans for improvements are indicated to NESO as part of the ongoing workshops this will be considered and if appropriate also relayed to Ofgem in any escalation process or used as a mitigating reason not to escalate.

NESO acknowledge that BMUs under construction, commissioning BMUs and newly commissioned BMUs are likely to exhibit more inaccurate PNs due to the lack of history available to train models. Therefore, BMUs that fall into these categories will be subject to the Guidance Note requirements after one full calendar year from the start of commissioning, allowing time to gather adequate operational history.

10. Feedback & Correspondence

NESO will provide updates and initial notifications regarding workshops and the Monitoring Procedure at the Operational Transparency Forum and via NESO's ~~Balancing Cost website~~ Market Monitoring webpage. Private correspondence on ~~Wind~~ BMU performance of FPNs will be made via email and Microsoft Teams conference calls to individual BMUs.

Should any parties wish to provide feedback on the outlined thresholds and Monitoring Procedure in this Guidance Note, we ask that it is submitted via email to marketreporting@neso.energy

At any point in time, if an operator, irrespective of meeting thresholds, would like to hold a workshop on data quality please contact NESO via marketreporting@neso.energy

11. Appendix

This appendix provides additional clarifications required throughout the FPN Good Industry Practice Consultation held in December 2024 and additional data as relevant for the June 2026 consultation on expansion to other fuel sources. These clarifications aim to address specific queries and enhance transparency, providing clear, detailed explanations that support the core principles outlined in the Guidance Note. Furthermore, this appendix includes the rationale and explanations pertaining to the expansion of our calculation methodology in light of the integration of additional fuel sources into the monitoring process.

Best Practices for submission of data via EDT and EDL

The following principles outline how a unit should practically consider meeting the requirements of submitting best expectation of generation output at all times in pre gate closure data without excessive volumes of data being produced and shared.

For the avoidance of doubt, resubmission of the same data is not advantageous and there is no requirement for submitting updated data on a schedule where no change exists.

Data more than 4 hours ahead of delivery would ideally not be updated more than hourly unless there is a significant change in expected outputs

Data between 4 hours ahead of delivery and gate closure should not be updated more than once every 15 minutes to preserve effective operations of Electronic Data Transfer (EDT) systems.

Electronic Dispatch Log (EDL) data, which can be used for submission of Maximum Export Limit data in real time should be used to profile for technical unavailability (inclusive of wind cut out periods) and declared only upon change, data submission on no change or at granularities lower than for 1 minute are not possible to be used within control system timescales and therefore should be avoided.

Thresholds in the Guidance Note

Intermittent sources

Following publication of the last guidance note, a commitment was made that standards would not be changed except in the event of exceptional circumstances or changes to markets. Whilst NESO reserves the right to change any elements of this guidance note, sufficient data improvements have been achieved, and no market changes have occurred which led to a need for revision on wind assets.

Some feedback received throughout the consultation periods focuses on the use of the top 10 percentile of performers in determining the thresholds. NESO would like to outline the rationale behind this figure. We are aware that this same measure may not be appropriate when considering Good Industry Practice across other Grid Code issues and that this represents a high-performance measure, in all guidance notes consideration will be given to the balance between what is achievable and what is needed for operating a safe, secure and economic power system.

Firstly, analysing the 2023 data for wind units, it can be observed that the median net error (2.61%) and the median absolute error (9.18%) are both lower than the accuracy thresholds set by NESO. This ensures that published thresholds are aligned with the central tendency of the error distribution within the sample before any implemented improvements.

Use of the worst months data in assessing performance ensures that this was possible to achieve across varied weather conditions and seasonality, this compares with use of a median in the dataset that may not capture this variability.

Secondly, we've observed significant improvement in the monthly net and absolute errors amongst wind market participants. The mean net error has dropped by more than 3 percentage points between 2023 and

2025, whereas the mean absolute error has dropped by approximately 5 percentage points. On examining this data, we see that it remains skewed by units holding very high error percentages but that units that previously exhibited some of the highest errors also had some of the most significant improvements; now regularly meeting established thresholds.

Upon examining the median monthly performance of individual BMUs, it was found that approximately 107 BMUs met the net error threshold in 2023,128 BMUs met the net error threshold in 2024 and 162 BMUs met the net error threshold in 2025. Among the units that achieved the thresholds in 2023, approximately 51% were offshore wind farms, while 49% were onshore wind farms. In 2024, among the BMUs that achieved the thresholds, 51% were onshore, whereas 49% were offshore. Amongst the achievers in 2025, 56% were onshore units, whereas 44% were offshore units. Figures 2 and 3 present a comparison of the median monthly net errors between 2023 and 2025, classified by BMU. Units that exhibited high net errors in 2023 have significantly improved their performance in 2025, mitigating the worst periods of performance. However, there are some outliers, where BMUs have shown a decline in median performance between the two years.

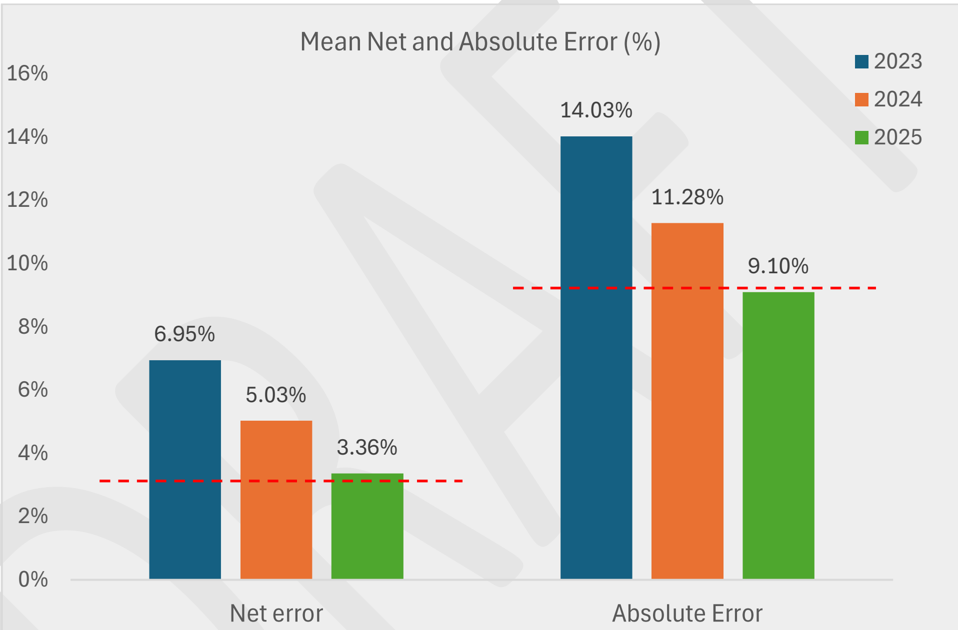


Figure 1: Mean net and absolute errors, 2023 vs 2024 vs 2025

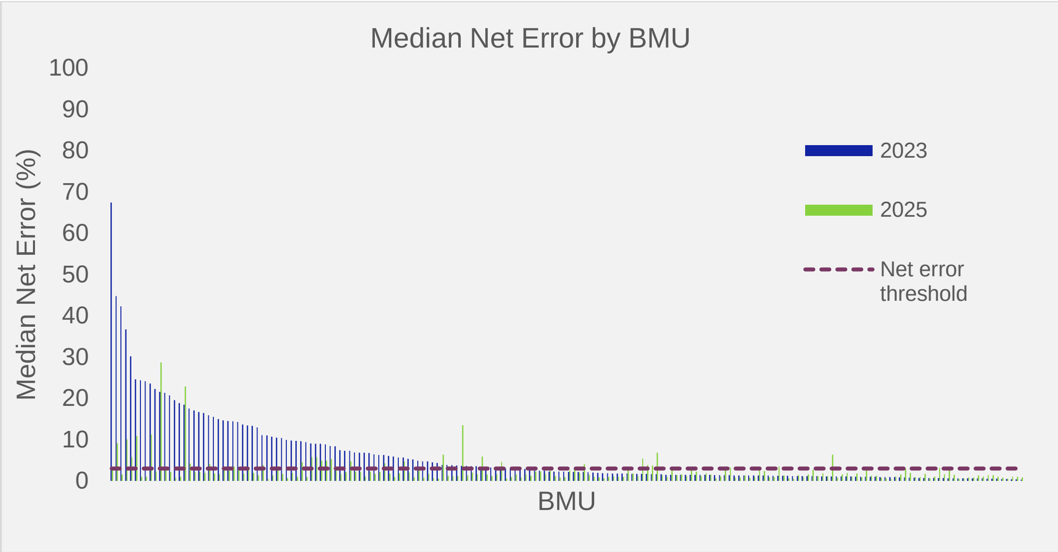


Figure 2: Illustration of median net error by BMU between 2023 (blue) and 2025 (green), in 2023 order

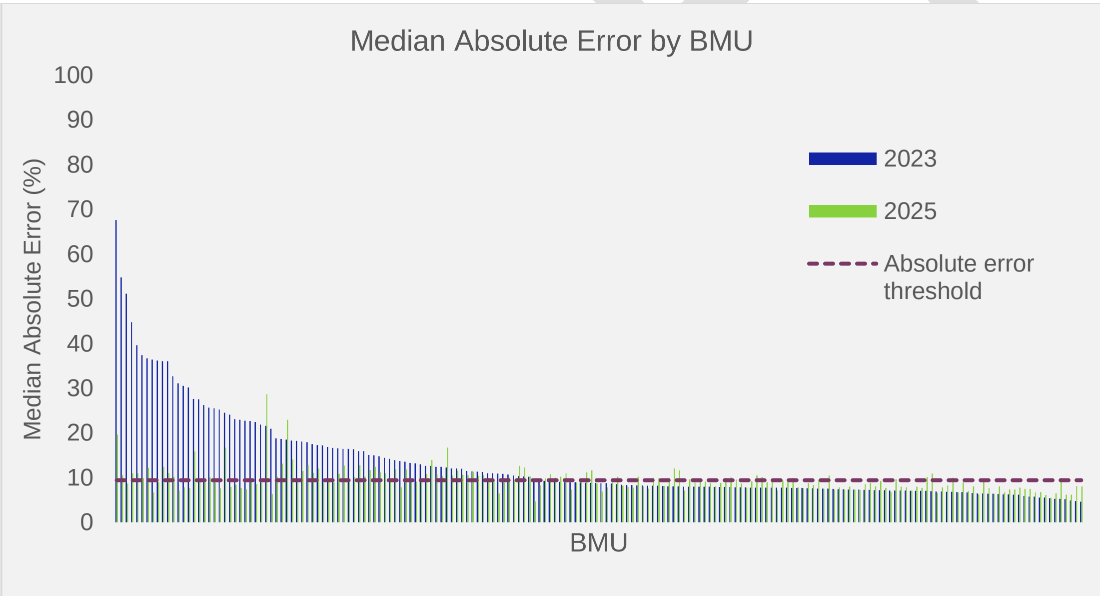


Figure 3: Illustration of median absolute error by BMU between 2023 (blue) and 2025 (green), in 2023 order

Additionally, use of onshore wind units to set the requirement was implemented in response to feedback received in addition to further data analysis and broad agreement from the consultation process for implementation. While there is a relatively even distribution of performance across onshore and offshore assets, in the top 10% without stratification onshore wind units were underrepresented. Similarly, while this may indicate potential for offshore units to deliver more accurate physical notifications it was not deemed reasonable to increase thresholds for this unit type.

In addition to analysing wind BMUs, we examined the performance of solar BMUs throughout 2025. The average monthly net error among nine solar BMUs was 4.65%, while the average monthly absolute error was 8.15%, which is more than one percentage point below our established Good Industry Practice absolute error threshold of 9.4%. Upon analysing the median monthly performance of each solar BMU in 2025, we observed that six out of the nine units were able to meet the error thresholds. The remaining three BMUs exceeded the thresholds by a few percentage points; however, gradual improvements could bring them within the guidelines.

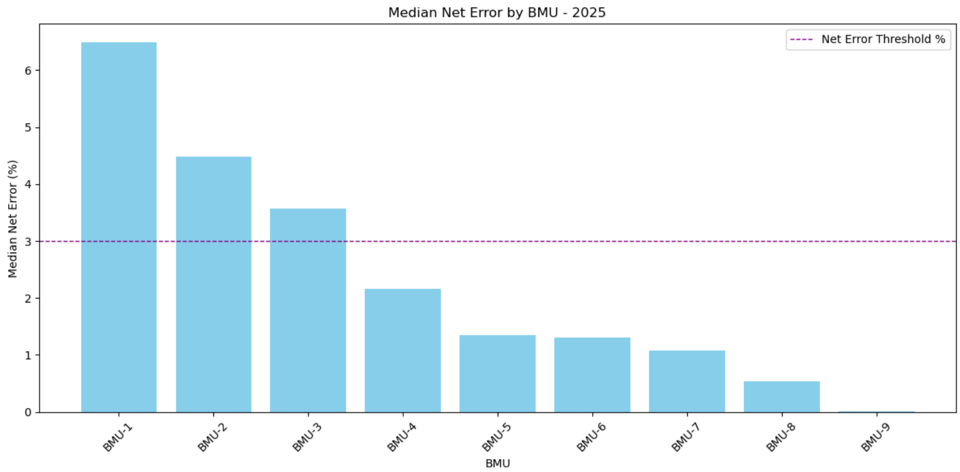


Figure 4: Illustration of median net error by solar BMU in 2025

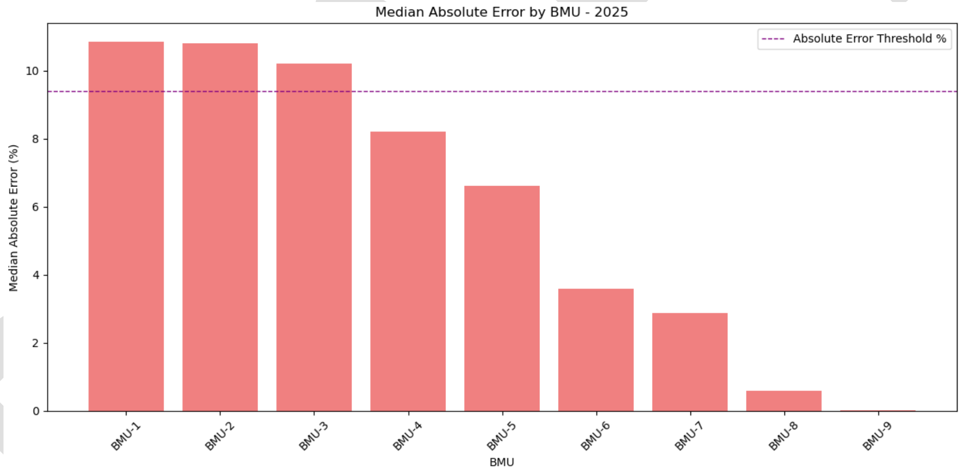


Figure 5: Illustration of median absolute error by solar BMU in 2025

In conclusion, the improvement in the PN accuracy of wind BMUs between 2023 and 2025 highlights the importance of consistent effort alongside set benchmarks in achieving better outcomes. We believe that replicating this process for solar BMUs can enhance data accuracy amongst intermittent sources as a whole.

Non-intermittent sources

In the case of a non-intermittent resource, BMUs are expected to show high comparability between their expected output and actual output, unless subject to extenuating circumstances. However, we have observed that certain behaviours across a small set BMUs are inflating the overall error amongst non-intermittent units. Largely, units in the non-intermittent category are showing exemplary performance, with absolute errors close to The median absolute error for non-intermittent sources tends to significantly below that for intermittent sources. However, as we move from the 50th to 90th percentiles, the percentile values for non-intermittent sources increases from 0.47% to 10.05%, indicating a wider spread in the error values. The presence of anomalies amongst non-intermittent sources are highlighted below via some fuel specific insights:

Fuel	Commentary
Non-Pumped Storage Hydro	Most units in this category generally demonstrate good accuracy. However, the behaviour of certain units involves submitting PN equal to MEL, while the metered output differs. This discrepancy can result in cumulatively high errors over time.
Biomass	These units are known to profile with MEL rather than PN, resulting in significant errors if MEL drops to 0 MW, but PN adjusts later. Certain units amongst this fuel type have been undergoing testing for some time, which has resulted in considerable data inaccuracies. E.g. there have been significant periods of negative MIL and metered output while maintaining a positive PN, leading to very high errors.
CCGT, Gas & CHP	Some units typically display small negative metered outputs across each settlement period when the units do not have a PN to keep the machinery warmed up. Consequently, these small inaccuracies accumulate, resulting in a high monthly error over time. A large CHP unit has experienced significant divergence between its PNs and metered output because the unit has predominantly been submitting block PNs since last year, despite the metered output being variable.
Aggregated	Units in this fuel type tend to be quite small and often face the issue of not reporting any PNs yet still having some metered output. This discrepancy leads to a high error.
Battery	Units in this fuel type experience numerous metering issues, e.g. the direction of output being reversed compared to PNs. Often, units have no metered output, yet PNs are present.
Demand	Units contributing to high error in this category tend to be small in size and have no dynamic parameters or physical notification but consume power, leading to high errors Most larger units amongst this fuel type submit suitable dynamic parameters, while consuming power, leading to good accuracy.

Table 3: Fuel specific insights amongst non-intermittent BMUs

In reviewing the median monthly absolute error of each non-intermittent BMU throughout 2025, it was observed that 359 BMUs did not meet the 70th percentile threshold, out of a total of 1,209 BMUs. The majority of these BMUs were small, aggregated units, characterised by the absence of dynamic parameters and low metered output, which contributed to significant errors. However, there was presence of some large CCGTs as well. Figure 6 illustrates the variety of fuel types falling under the non-achiever category. It is believed that the enforcement of the thresholds based on the 70th percentile, in conjunction with 1-1 discussions with BMU owners and operators, could drive the effort to make necessary changes to reduce the discrepancies across all fuel types and contribute to overall system efficiency.

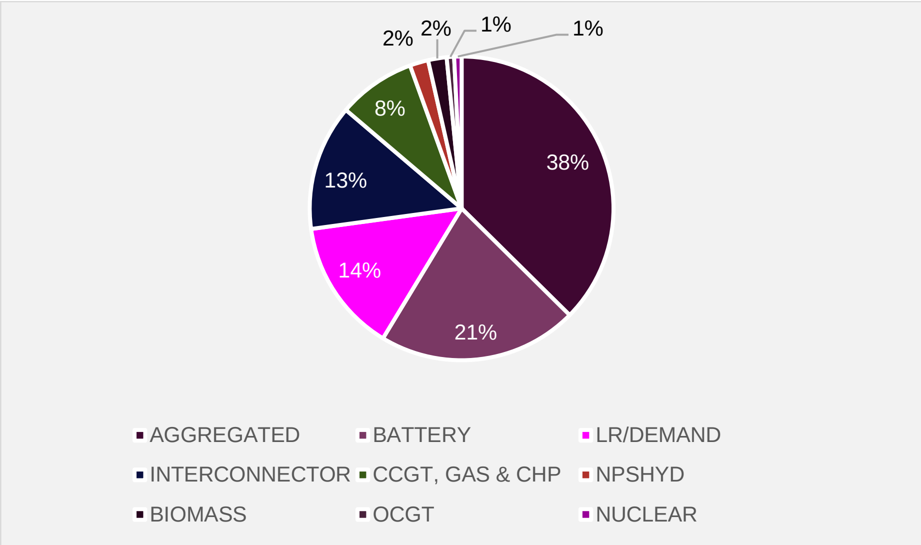


Figure 6: Proportion of units non-achievers by fuel type

Figure 7 illustrates a potential approach to assessing the level of improvement that could be achieved if an absolute error threshold were established at the 70th percentile (2.4%). By taking the median monthly error for each BMU across 2025 and averaging these values across the portfolio, a pre-intervention figure of 4.72% is obtained. In a scenario where the median monthly error of each non-achieving unit is reduced to the threshold—i.e. all non-achieving units meet the 2.4% standard—while the performance of achieving units remains unchanged, the resulting post-intervention average error is estimated at 1.06%.

This approach represents an appropriate balance between achieving meaningful improvements in FPN accuracy and ensuring that the thresholds remain practically achievable on a consistent basis. By contrast, setting thresholds based on the top 10th percentile (sub 1% absolute error) would likely deliver only marginal improvements for already efficient fuel types (Table 4), such as OCGT, interconnectors, and pumped storage units. However, it would also risk setting thresholds that a significant number of units would be unable to meet regularly. This is particularly relevant for certain fuel types identified in Table 4—such as aggregators, batteries, and demand units—where error is heavily concentrated in the latter half of the distribution.

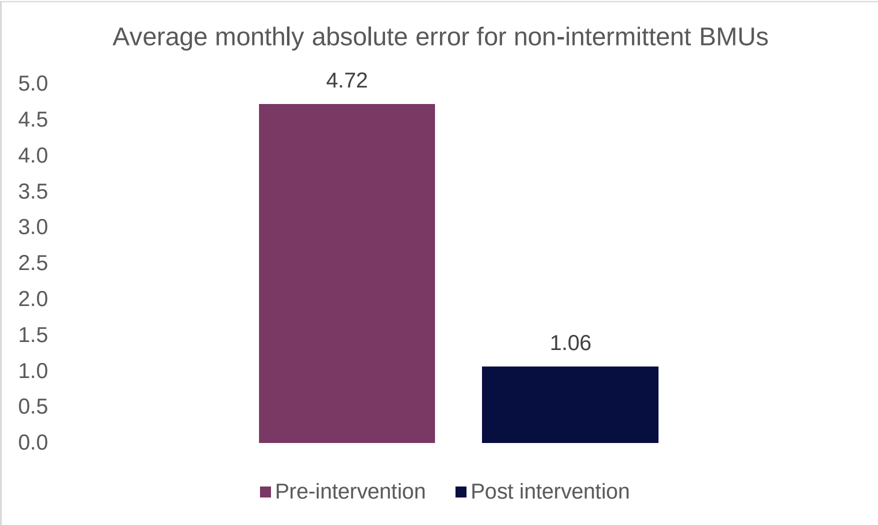


Figure 7: Pre and post intervention average absolute error across non-intermittent BMUs

Percentile	Aggregated	Battery	Biomass	CCGT, Gas & CHP	Demand	Diesel	Interconnector	NPSHYD	Nuclear	OGCT	Pumped Storage
10th	0.47	0.98	0.33	0.25	0.33	0.08	0.02	0.23	0.17	0.00	0.16
20th	1.30	1.82	0.39	0.75	1.16	0.15	0.08	0.29	0.17	0.00	0.48
30th	1.90	2.33	0.77	1.22	2.84	0.23	0.12	0.83	0.42	0.01	0.58
40th	2.70	3.16	1.61	1.56	3.38	0.55	0.17	1.33	0.49	0.01	0.68
50th	3.32	3.63	2.31	2.05	5.50	0.94	0.21	1.46	0.58	0.10	0.76
60th	4.30	4.86	3.99	2.28	6.47	1.01	0.25	1.62	0.62	0.79	0.79
70th	5.91	6.38	5.01	2.59	9.89	1.05	0.27	2.38	0.96	1.61	0.87
80th	11.13	8.82	5.46	4.25	15.67	1.14	0.34	3.53	1.26	2.05	0.95
90th	31.52	13.63	8.80	8.16	39.89	1.22	1.17	5.68	7.48	3.34	1.28

Table 4: Monthly Median Absolute Error For Non-Intermittent Sources, By Fuel Type and Percentile

Changes in the error calculation methodology

The previous approach to calculate error statistics relied on assumptions that were mostly valid for wind market participants. Missing or zero envelopes and capacities caused very small denominators, producing % errors in the tens or hundreds of thousands. These artefacts dominated rankings, distorted monthly and annual summaries, and masked genuine PN accuracy behaviour. This section describes the updated FPN accuracy methodology applied across all fuel types. The changes address structural weaknesses in the legacy wind-only approach, which produced misleading and inflated percentage errors when applied to batteries, interconnectors, load response, aggregated BMUs, and other non-thermal technologies. In addition to these changes, we have also decided to exclude settlement periods where units are subject to bid/offer acceptances; this is intended to capture true inaccuracy of BM participants under normal operating conditions i.e. not subject to instructions from the ENCC.

Major changes - summary

Expectation construction is now fuel-agnostic and includes response volume:

Expected output (per SP) = PN + ABSVD response volume

ABSVD is often zero for BMUs that do not provide response services

Expectation is bounded within [MIL, MEL] when envelopes exist

MEL is applied as an upper bound when available

MIL is applied as a lower bound when available

Denominator selection is directional, metered-aware, and robust

Direction follows metered output when metered output ≠ 0

Direction falls back to expected output when metered output = 0

A multi-layer fallback hierarchy prevents tiny or missing denominators

Explicit minimum calibrated magnitude guardrails prevent artefact % errors, while preserving genuine PN accuracy signals

Monthly error calculation path

Build raw expectation per SP:

Exclude periods where units are subject to bid/offer acceptances

ExpectOT = PN + ABSVD

Clamp expectation to operating envelope bounds:

If ExpectOT>0 (export): Apply MEL as an upper bound

If ExpectOT<0 (import): Apply |MIL| as a lower bound

Direction determines which bound is active in practice

Result: ExpectOT ∈ [MIL, MEL] when envelopes exist

Select capacity (denominator) using a directional hierarchy:

Directional envelope magnitude (MEL or |MIL|), when available

Directional historical capacity (export / import)

Installed capacity

Minimum calibrated magnitude floor = 2.5 MWh per SP

This hierarchy ensures denominator robustness without masking genuine behavioural mismatches

Aggregate SP-level results to monthly and annual summaries to compute % net and absolute error