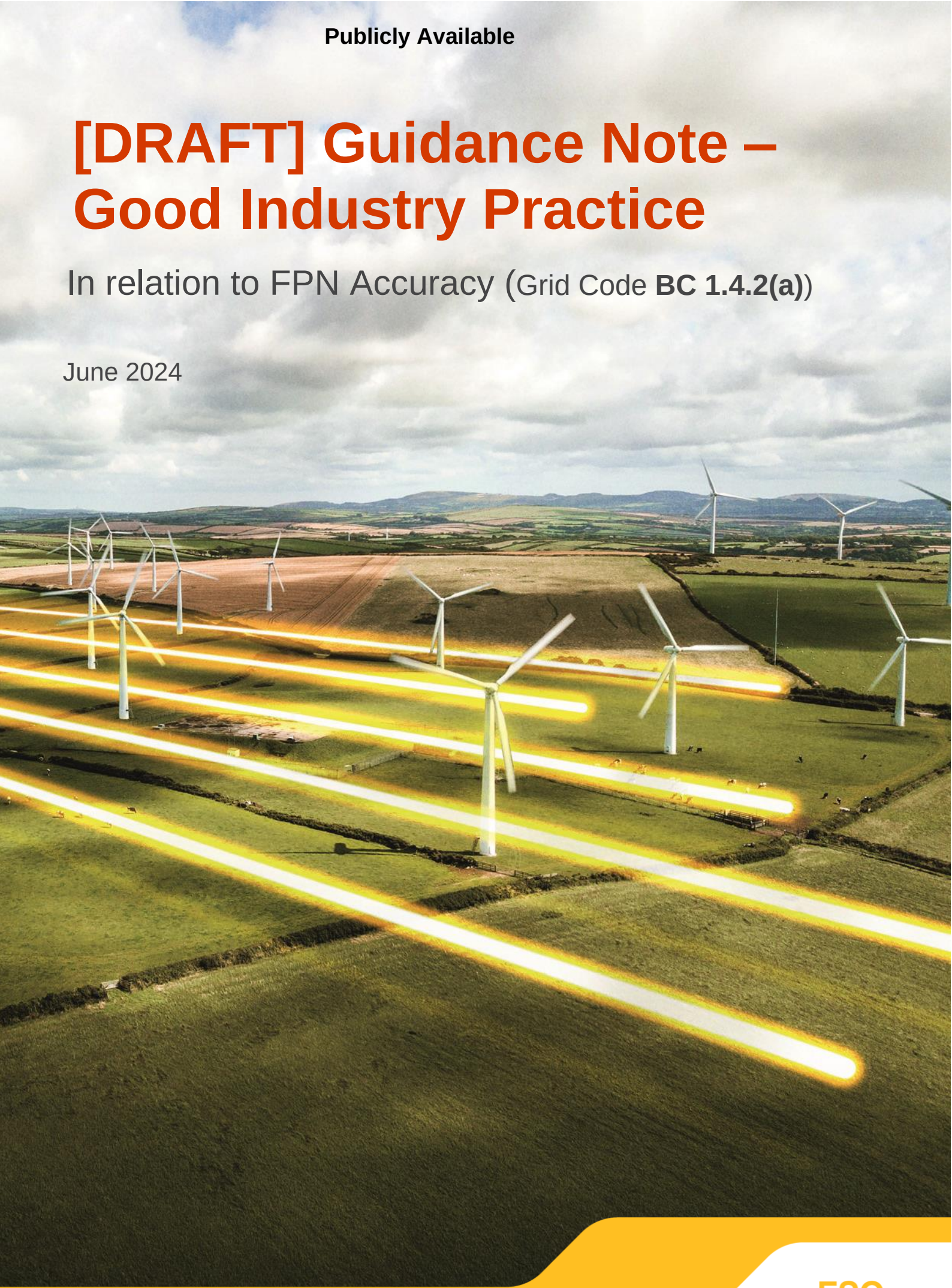
Publicly Available

[DRAFT] Guidance Note – Good Industry Practice

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

June 2024



ESO

Foreword

This Guidance Note has been prepared by the National Grid Electricity System Operator (ESO) to describe to Balancing Mechanism Units (BMUs) and other Market Participants how the term 'Good Industry Practice' should be interpreted in relation to the Grid Code **BC 1.4.2(a)**. Wind BMUs on average exhibit greater inaccuracy of Final Physical Notifications (FPNs) than other fuel types and should take particular note of this Guidance Note. However, the monitoring process outlined in this document will also consider the accuracy of FPNs from all BMU fuel types.

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 dispute, the Grid Code and Bilateral Agreement documents will take precedence over these notes.

This Guidance Note is based on the most recent Grid Code Issue as of this publication date 05/06/2024.

Upon publication of this Draft Guidance Note, a three-week period of consultation will begin, in which Market Participants may submit feedback and considerations into the above threshold calculation methodology and the monitoring procedure outlined below. This will mean that the consultation period will close on Monday, 24/06/2024. A Final Guidance Note will be subsequently published in July 2024. The Final Guidance Note will outline the date from which the below procedure will commence, which the ESO expects to be in July 2024, dependent on findings from the consultation period.

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

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

ESO welcomes comments including ideas to reduce the compliance effort while maintaining the level of confidence. Feedback should be directed to the ESO Market Monitoring Team at:

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1. Introduction & Requirements

Grid Code **BC 1.4.2(a)** and **BC 2.5.1** outline a level of accuracy that Final Physical Notifications (FPNs) should be prepared in accordance with. FPNs are an important parameter in the Balancing Mechanism, as the FPN should provide a true and accurate reflection of the 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 the ESO 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 the ESO in the balancing mechanism therefore keeping balancing costs down. Further, Bid-Offer-Acceptance payments are based on deviations away from FPNs. Therefore, more accurate FPNs will result in more accurate Balancing Costs.

The ESO have identified significant inaccuracies in the provision of FPNs, which is leading to the incursion of excess Balancing Costs and unnecessary operational risk in the balancing of Great Britain's electricity system. This Guidance Note outlines the accuracy to which FPNs should be prepared. The need for BM participants to submit accurate FPNs has also been highlighted by the regulator, 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 provides guidance on what can be considered 'Good Industry Practice' in relation to Grid Codes **BC 1.4.2(a)** and **BC 2.5.1**. The term Good Industry Practice is to some extent open to interpretation, however there is explicit mention of *'skilled and experienced operators…under the same or similar circumstances'*. The purpose of this term is designed to ensure that operators are held to a high standard in their submission of information and behaviour. The term does require though, some guidance on what that standard looks like.

It is important to note that **this Guidance Note focuses on establishing thresholds for a level of accuracy which ESO considers to be within the bounds of good industry practice for wind 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. The ESO 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 the ESO will follow a similar process to establish Good Industry Practice for those units.

For the avoidance of doubt, it is expected that operators of all fuel sources should ensure their FPN submissions meet the principles of Good Industry Practice and that while present levels of inaccuracy

[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

in other fuel resources do not lead to a need to establish thresholds within this guidance note, the principles for the improvement processes outlined could be applied to an operator of any fuel source.

2. Objective

The aim of this Guidance Note is to assist Wind BMUs with the interpretation of 'Good Industry Practice' specifically in relation to Grid Code clauses **BC 1.4.2(a)** and **BC 2.5.1**. The ESO has developed two threshold measurements to establish a level of accuracy that can be considered within the bounds of 'Good Industry Practice'. These thresholds are not an exhaustive interpretation of what may be considered Good Industry Practice. If, throughout the monitoring process it has been identified that there are extenuating circumstances leading to these thresholds not being met, the ESO will factor this into its decision to raise the inaccuracy to Ofgem.

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

1. How the ESO has identified these thresholds;
2. How the ESO will continue to monitor the level of accuracy of FPNs; and
3. How BMUs can work with ESO to improve FPN accuracy and raise any specific concerns with meeting these thresholds.

3. Defining Good Industry Practice in Relation to FPN Accuracy

The ESO is establishing a level of accuracy for a wind BMU's following of FPNs relative to metered output that may be within the definition of 'Good Industry Practice'. This Guidance Note will explicitly define the level of accuracy that should be followed to be considered within the bounds of Good Industry Practice. This will then allow the ESO to monitor which wind units are submitting FPNs in accordance with Good Industry Practice, work with industry to improve their level of accuracy, and notify Ofgem should a failure to operate in line with Good Industry Practice occur.

In our establishment of a level of accuracy that will meet the definition of Good Industry Practice, we have considered the following:

1. What would provide a significant improvement to operational risk and reduce balancing costs?
2. What would the BMUs be capable of achieving?
3. How should this threshold be adjusted in the future?

The ESO is therefore providing guidance in that two measures should be used to establish Good Industry Practice regarding FPN accuracy, which are the following:

A) The Net error between FPN and Actual Metered Output of a BMU should be **between 1.0% and -1.0% for each month**; and

B) The sum of absolute error between FPNs and Actual Metered Output relative to total generation across a month should **be below 16%**.

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 to be minimised by increasing the certainty on output.

All of these 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.

4. Methodology

The mean absolute percentage error for Wind BMUs in 2023 was 23.89%. The issue of FPN inaccuracy is particularly prevalent with the wind fuel type. These wind units are frequently bid down to manage constraints and are settled from BOAs based on their deviation away from the FPN, not their actual output. Thus, the methodology below has been established to improve the accuracy of Wind BMU FPNs.

There is a strong indication that there is some bias to which FPNs are submitted from wind units. When looking at the net percentage error[2], 60% of BMUs have an overall percentage error greater than 0 and are therefore under-generating (or overstating FPNs). Further, nearly 30% of wind units have an overall percentage error between 0-10%, which aligns closer to other fuel types. Figure 1 below shows an anonymised distribution of the net percentage error of Wind BMUs and the Net Information Imbalance Volume in 2023. As can be seen, there is a greater prevalence of a positive percentage error, meaning that more Wind BMUs are over-stating rather than are under-stating their FPNs. Another key observation on Figure 1 is that just because the percentage error is relatively low, it does not mean that the total volume error is also low. Further, by establishing a net percentage error threshold, there is a risk that limited improvements to FPN accuracy can be made, as units can both over-state and under-state FPNs to a significant degree but still have a low net percentage error. For cases of units that have 100% or -100% wind error they have been excluded in Figure 1, as this should be a relatively easy exercise to improve their FPNs, as it means a FPN of zero is submitted. A flat-lined FPN for these units would be more accurate.

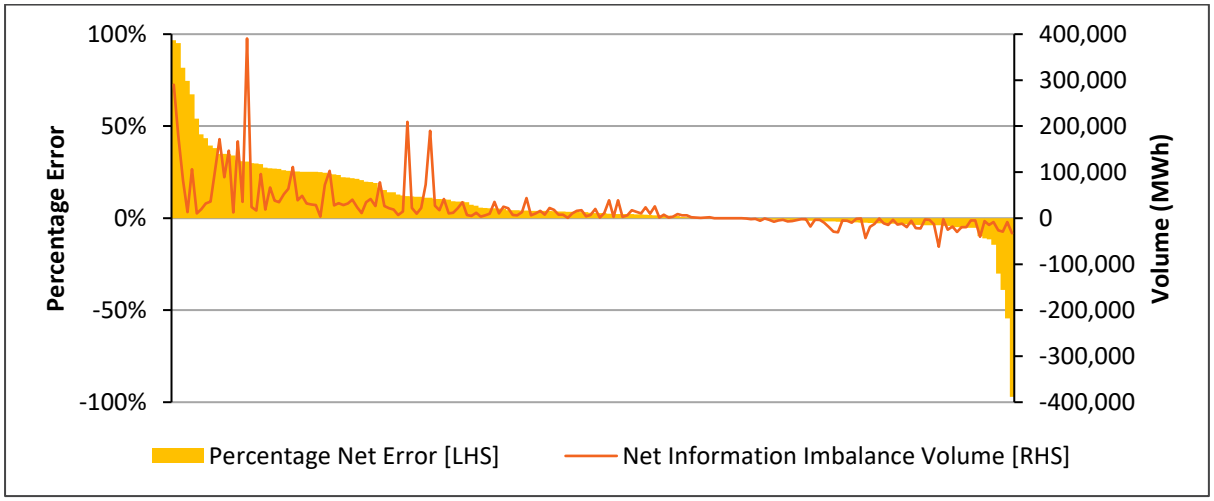

Figure 1: The Net Error of Wind BMUs

Figure 2 below shows the absolute percentage error of Wind BMUs, which shows just how significant some of the errors are in FPN submissions. What can be seen from Figures 1 and 2 is that there is a prevalence of error across all the wind units by some form of measurement, whether it be net error, absolute error, or a percentage error.

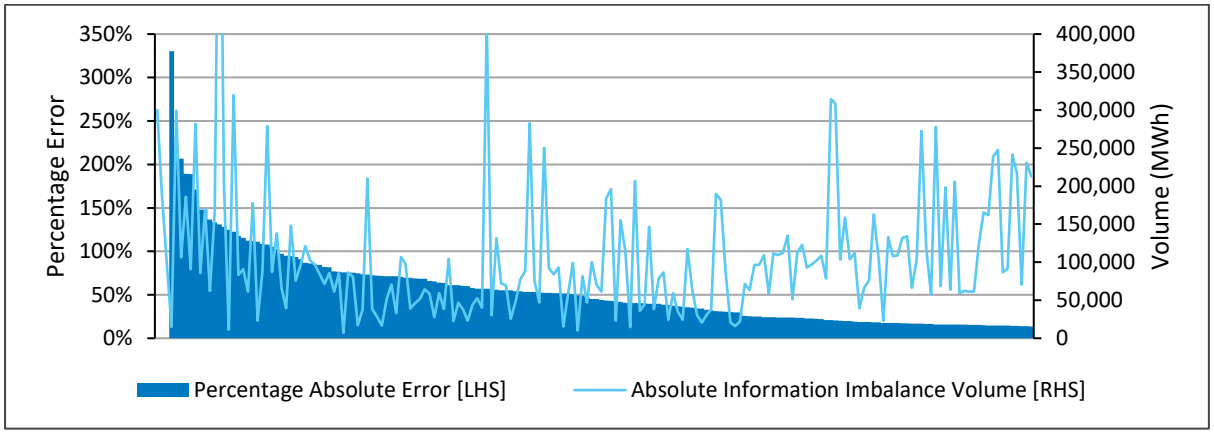

Figure 2: The Absolute Error of Wind BMUs

When assessing the monthly net error, and the monthly absolute error for units, Figures 3 and 4 show what the top performance of accuracy looks like. Figures 3 and 4 graph the net percentage error for each Wind BMU for each month in 2023, and the percentage value of absolute error relative to total

[2] $\%Error = \frac{PN - metered\ output}{metered\ output}$

generation for each month for each Wind BMU in 2023, respectively. All values are expressed as an absolute value and capped at 100% for the sake of visualisation.

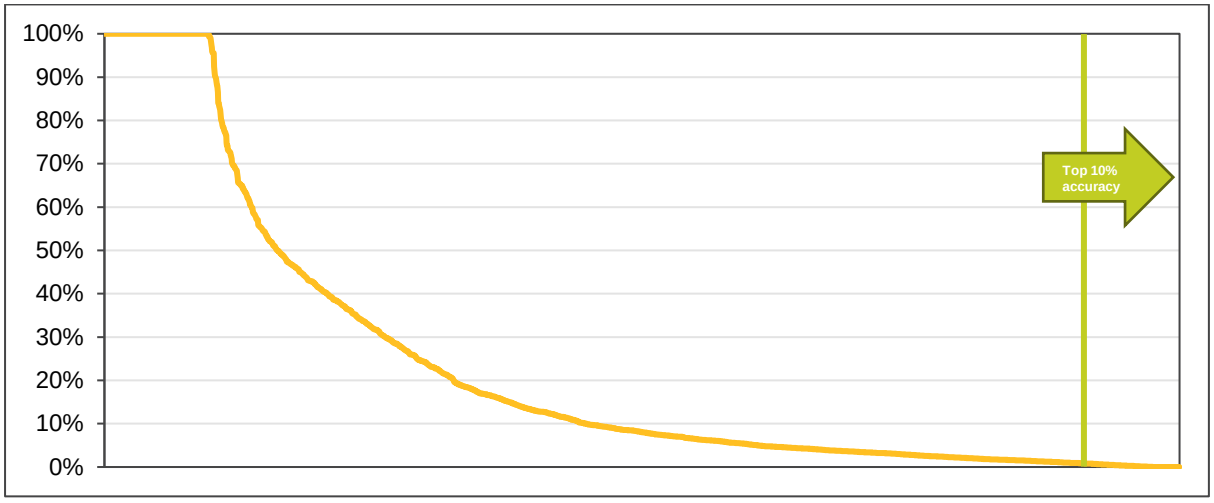

Figure 3: A ranking of the Monthly Net % Error for Wind BMUS (All error expressed as a positive percentage, and capped at 100%)

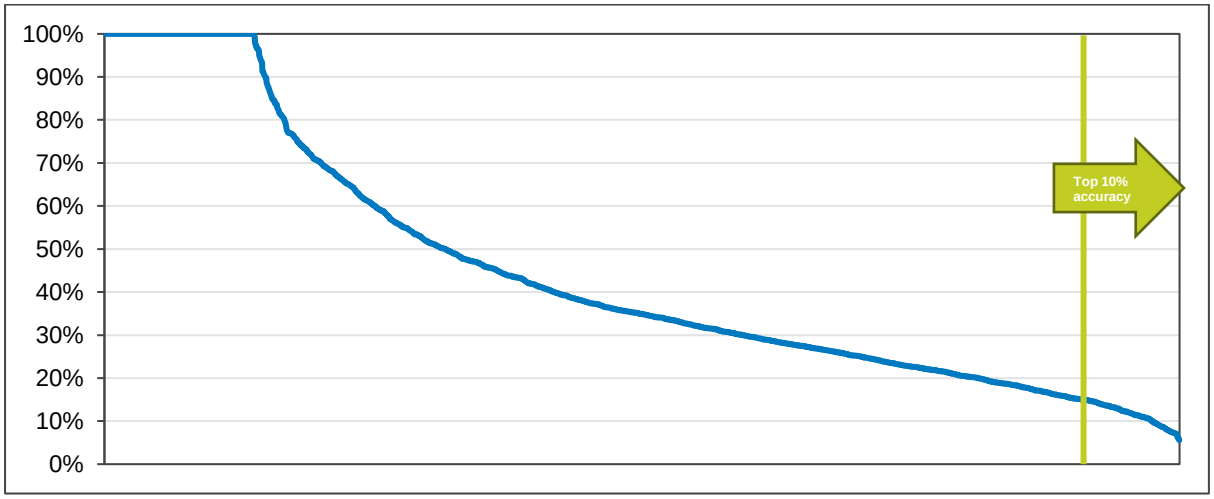

Figure 4: A ranking of the % Absolute Error of Wind BMUs (All error expressed as a positive percentage, and capped at 100%)

Based on the above observations, the ESO is providing the guidance that in order to meet Good Industry Practice in relation to Grid Codes **BC 1.4.2(a)** and **BC 2.5.1**, the net error between FPN and Actual Metered Output of a BMU should be between 1.0% and -1.0% for each month; and the absolute error relative to total generation for each month for each Wind BMU should be below 16%. Because Good Industry Practice refers to what would 'reasonably and ordinarily be expected from a skilled and experienced operator', the ESO has provided this guidance having considered behaviour across the industry. Based on this analysis and the definition of Good Industry Practice, the ESO is proposing that performance of the top 10% of accurate monthly FPN errors (identified in Figures 3 and 4) provide a suitable indicator of the minimum level of accuracy which could be reached more widely across the industry, whilst also providing a beneficial amount of improvement to manage system security and reduce Balancing Costs. The performance of the top 10% therefore represent a good industry benchmark when assessing whether other generators are failing to prepare their FPNs in line with Good Industry Practice. A table summary of other performance is provided in Table 1 below.

Performance of the Top %	Net % Threshold	Absolute % Threshold
25%	2.81%	22.68%
20%	2.11%	20.47%
10%	0.94%	15.37%

Table 1: Performance thresholds for Wind BMU FPN Accuracy

Should Wind BMUs wish to check whether their FPNs and Metered Output meet these thresholds, they may verify with the following calculations.

Threshold 1 – Net % Threshold

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

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

Threshold 2 – Absolute % Threshold

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

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

Variable	Units	Description
NET_PERC_ERROR(u,m)	%	The net percentage error threshold measurement.
ABS_PERC_ERROR(u,m)	%	The absolute percentage error threshold measurement.
AMO(u,s)	MWh	The actual metered output according to settlement metering.
FPN(u,s)	MWh	The expected metered output according to Physical Notifications. *(Periods affected by a Bid/Offer acceptance or an unavailability as indicated by a Maximum Export Limit below the Physical Notification adjust 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 Period s
S(m)	{}	Set of Settlement Periods in month m that exclude Settlement Periods where a Bid/Offer acceptance or unavailability as indicated by a Maximum Export Limit below the Final Physical Notification adjust this Expected Output parameter in accordance with wider Grid Code.

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

For the avoidance of any confusions, for a Wind BMU to be considered within the bounds of Good Industry Practice in the submission of their FPNs, it is expected that the NET_PERC_ERROR(u,m) value remains within ±1.0%, and that the ABS_PERC_ERROR(u,m) remains below 16%.

The thresholds outlined above are being proposed as acceptable levels of accuracy within Good Industry Practice given that the top 10% of wind BMUs can currently meet this level of accuracy and Good Industry Practice refers to 'skilled and experienced' operation. It has been observed that units currently fitting within these thresholds range from new to established units, and small to large units. The ESO have provided opportunity for feedback into this process and have outlined further opportunity for feedback and collaboration should there be any concerns with these thresholds. The monitoring process below is designed to be as collaborative as possible in helping BMUs reach these thresholds of Good Industry Practice.

The ESO acknowledges that these thresholds are not an exhaustive interpretation of what may be considered Good Industry Practice. If, throughout the monitoring process it has been identified that there are extenuating circumstances leading to these thresholds not being met, the ESO will factor this into its decision to raise the inaccuracy to Ofgem.

5. Monitoring Procedure

The Monitoring Procedure below is a six-month monitoring period with workshops and a gradual escalation of severity raised from continued inaccuracy. At the 3-month mark, a **notice** will be given to units not meeting these thresholds that the ESO is intending to raise to Ofgem that Good Industry Practice has not been followed should this continue. Should the inaccuracy continue for another 3-months (6-months monitoring in total), then the ESO will issue a **formal notice** to the unit and to Ofgem that the expected level of accuracy has not been followed for each BMU not meeting these thresholds. Following these six-months, to ensure the continued accuracy of FPNs, the last three months of the outlined Monitoring Procedure will continue to roll-over, with the ESO remaining collaborative and working with the BMUs to improve their FPNs throughout.

It is expected that newly connected BMUs are likely to exhibit more inaccurate FPNs. So, should a new Wind BMU connect to the network, then this particular BMU will begin at the start of this six-month Monitoring Procedure to allow more time to improve their FPNs should it be required.

At the start of the Monitoring Procedure, the ESO will contact each Wind BMU with their NET_PERC_ERROR(u,m) and ABS_PERC_ERROR(u,m) values for the last 6-months, to indicate how their accuracy has been recently. We will also immediately host an Initial Education Workshop on what we see as Good Industry Practice, and what we have encountered as regular inaccuracies, and how Wind BMUs may improve their accuracy. The aim of this initial workshop is to be collaborative with industry in resolving their information inaccuracies, but to also ensure that BMUs are made aware of avenues for improvement.

Following the commencement of the Monitoring Procedure, the ESO will monitor the accuracy of Wind BMU's FPNs to ensure improvements are being captured and further inaccuracy can be resolved. During these first three-months, the ESO will be hosting individual private workshops with Wind BMUs where necessary, notifying the individual units how their accuracy has tracked during the period, and what further improvements need to be made before they may be considered operating within Good

Industry Practice. At the end of this initial three-month period, should Wind BMUs continue to operate outside of Good Industry Practice as defined in this guidance, then a notice will be sent to the Market Participant informing them that their efforts to improve information inaccuracy have not been acceptable and that the next stage of the escalation process is being triggered.

The second three months of the Monitoring Procedure will see a continued monitoring period, which provides a final opportunity for the unit to improve their information accuracy. The ESO will continue to host workshops with Wind BMUs not meeting the Good Industry Practice thresholds. At the end of the second three-month monitoring period, should these thresholds still not be met by a Wind BMU, then a formal notification will be sent to Ofgem that the thresholds have not been met. Should there be any remediating circumstances or conditions that would justify reasons for not meeting these thresholds, these will of course be considered.

Across the process as a whole, we will make reasonable allowances for exceptional circumstances and specific process or system reasons that thresholds may not be met. Where improvements or plans for improvements are indicated to ESO as part of the ongoing workshops this will be considered and if appropriate also relayed to Ofgem in any escalation process.

6. Feedback & Correspondence

The ESO will provide updates and initial notifications regarding workshops and the Monitoring Procedure at the Operational Transparency Forum and via the ESO's Balancing Cost website. 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@nationalgrideso.com before 26th June 2024.