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# Defining, measuring, and addressing skip rates

**Energy storage will play a critical role in the delivery of a clean power system in Great Britain. Without investment in new battery capacity, the clean power target is at risk.**

Battery capacity levels today stand at 5 GW. In the National Energy System Operator’s (NESO) ‘Clean Power 2030’ report (5 November 2024), our analysis found that the capacity of batteries on the system needs to quadruple to more than 22 GW over the next five years.

We are determined to make sure our market works for the sector and are committed to resolving any issues the sector faces. Addressing ‘skip rates’ is fundamental to doing so.

The way Great Britain produces power has changed dramatically in recent years. Fewer power stations were needed to balance the system and output was largely unaffected by weather. For our control room, dispatching electricity was relatively straightforward due to its overall predictability and fewer numbers of power stations than there are today.

Until recent years, dispatching electricity relied on a smaller number of daily energy balancing actions, with just 5% of the market requiring rebalancing. The acceleration of renewable energy has seen both the volume and complexity of these required actions rapidly change, and operational decisions now need to be made close to real-time. For example, since April 2021, more than 500 new units have registered to operate within the Balancing Mechanism (BM), which represents a 55% overall increase of assets on the system.

This increase, alongside the introduction of our new Open Balancing Platform (OBP) in December 2023, has seen the number of balancing actions taken increase 10-fold, with battery instructions up 940% in the last year.

We know our operational systems, processes and networks have not always kept up with the pace of this rapid transition. Challenges remain around incorporating new technologies into legacy systems and have, therefore, hindered our ability to effectively access and utilise these electricity storage assets.

We recognise that we need to do much more to unlock and utilise new technologies. We are committed to working with our customers to deliver flexible systems in the Electricity National Control Centre (ENCC) to enable us to adapt quickly to today’s challenges and prepare us for future challenges. A central strand of this is working to ensure that batteries are included on a level economic playing field with all other technologies.

This report, alongside independent analysis from LCP delta, shows the challenges that smaller assets are having within the balancing market and our commitment to rectify the situation.

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# Our commitments

NESO recognises that the industry wants transparency and agreed metrics for skip rates as soon as possible.

Our commitments outline how we plan to hold ourselves accountable to drive this necessary progress.



**1**

**Agree the definition of the term skip rates, continue to be open with our operational actions and the metrics we hold ourselves accountable to.**

<b>Action</b>	A commitment to the openness and accessibility of our markets.	<b>Impact</b>	This transparency will facilitate and maintain competition to help us deliver the best possible result for consumers.	<b>Timescale</b>	Ongoing through Markets Roadmap
	Publish close to real time information to explain operational actions we have taken.		We commit to sharing our rationale behind these decisions and our plan for mitigating it in the future.		Late December 2024 onwards with planned iterations of our Skip Rate datasets.

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**2**

**Continue to work with industry to reduce all skip rates.**

<b>Action</b>		<b>Impact</b>		<b>Timescale</b>	
	The introduction of new grid code changes (GC166). We also want to explore voluntary submission of information associated with the change, ahead of implementation, to speed up the benefit realisation.		Grid code change GC166 will enable us to understand the charge and capacity available to support the case for dispatching battery assets.		Working group to reconvene in January.
	Review reserve holding requirements and increase the volume of Balancing Reserve procured with immediate effect.		Additional Balancing Reserve volume and the introduction of Quick Reserve mean increased market services for all assets.		Phase one of NESO's Quick Reserve service will become operational from 3 December 2024.
	Train a team of additional full-time dispatch engineers.		These engineers will support existing colleagues in dispatching all assets across our operational zones.		These engineers will be fully operational 24/7 in the ENCC by spring 2025.

**3**

**Continue to evaluate and implement changes to legacy systems during the transition to the Open Balancing Platform.**

<b>Action</b>		<b>Impact</b>		<b>Timescale</b>	
	In addition to the recent improvements to automated dispatch guidance, we will change the VERGIL system to improve the efficiency of manual dispatch processes.		The new VERGIL features will enhance visibility and navigation for managing constraints and improve the automatic extension of manually created Bid Offer Acceptance (BOA), thereby increasing manual dispatch		Planned for delivery in mid-December 2024.

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		efficiency and supporting better economic decisions for units behind constraints.	
We will launch a new constraint management feature on the OBP. It will enhance constraint visualisation, allow manual limit management, and include 'what-if' analysis to simulate system issues.		This new feature will improve situational awareness and support better economic decisions for units behind constraints.	The launch of this new management feature is scheduled for early 2025.
We will introduce the national optimisation capability on the OBP. This will provide advice for balancing across all zones over longer timeframes, while respecting transmission system constraints.		This will result in improved dispatch advice and efficiency compared to our legacy systems.	This new capability is scheduled for implementation in summer 2025.
We will deploy Constraint Optimisation capabilities within OBP, which will build on existing constraint management processes to automate and further optimise decision making for units behind a constraint.		This new feature will streamline decision-making, reduce operational costs, and improve economic decisions for units behind constraints.	This new capability is scheduled for implementation in summer 2025.
The OBP will interface with the Network Control Management System (NCMS). NCMS will calculate constraint limits in real time and provide data to the OBP.		This development will enable more accurate actions to manage the transmission system.	This development is due to be implemented in early 2026.
The OBP will support the delivery of new Quick and Slow Reserve services. These services will offer a more flexible and reliable way to manage the system.		This will reduce the likelihood of skips within our control and enhancing overall efficiency.	Quick Reserve (phase 1): December 2024 Quick Reserve (phase 2): Q2 2025 Slow Reserve: Q3 2025

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**4**

**Commit to undertaking a strategic review of dispatch to explore options for a clean power sector in 2030.**

<b>Action</b>	This will include both tactical and strategic reviews of the processes and policies underpinning dispatch.	<b>Impact</b>	Will highlight and remove blockers to dispatch today and deliver a process fit for the future.	<b>Timescale</b>	This review will begin early 2025.
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**5**

**Continue to explore the wider impact of skip rates and work with LCP Delta.**

<b>Action</b>	LCP Delta's analysis to date has been helpful in creating a methodology to explain skip rates and our operational actions.  NESO's dataset will give additional insights into skip rates and actions.	<b>Impact</b>	Established methodology for skip rates. We will further build on this, in collaboration with industry for a complete view.  We will use the insights from the dataset to identify any additional underlying causes of skip rates to be addressed.	<b>Timescale</b>	Quarterly engagement with industry through 2025.  Dataset update and releases in line with engagement in 2025, first one in March.
	We want to further explore the materiality of skip rates and associated costs and will be commencing a review with LCP Delta to address this in 2025.		Greater understanding the materiality of skip rates to wider industry and end consumer.		Phase 3 to commence in early 2025

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# Understanding skip rates

**Skips that are avoidable must be minimised through improvements in our systems, processes and in market design.**

There have been various different attempts to define a skip rate across the energy market, and this had led to differing and conflicting definitions and measures of what a skip is.

A skip is created when a non-economic dispatch decision is made. In the Balancing Market, if we send an instruction via a Bid Offer Acceptance (BOA) which is at a higher price than an alternative action that could have been taken, this creates a skip (the alternative action is skipped).

The skip rate refers to the frequency at which certain actions or assets are bypassed or skipped through our operational decisions.

Whatever the measure, we are prioritising the continued minimisation of all skips within our control, where they are avoidable. There is a need to provide confidence in the design and operation of markets which means continuing to focus on tackling skip rates and ensuring optimum dispatch at all times.

We understand that we need to do more to reduce skips within our control. Monitoring skip rates helps us measure the efficiency of decision-making processes in operations, highlighting areas where we can improve and optimise our performance and transparency.

Some skips, however, are a result of how we need to factor in a multitude of operational constraints. This means it can be misleading if not accounted for in the skip rate analysis.

These operational constraints can include:

- The location of the asset on the transmission system
- Transmission constraints (getting the energy around)
- Length of time the asset can produce energy
- Maintaining the frequency of the network
- Ramp up and ramp down times of the asset
- Ancillary services required to meet operational requirements.

The actions we take are critical to the safe operation of the power system and it is, therefore, important to acknowledge that these do not necessarily represent inefficient dispatch. However, we understand that these wider issues need to be improved by us to truly unlock the capacity of all technologies.

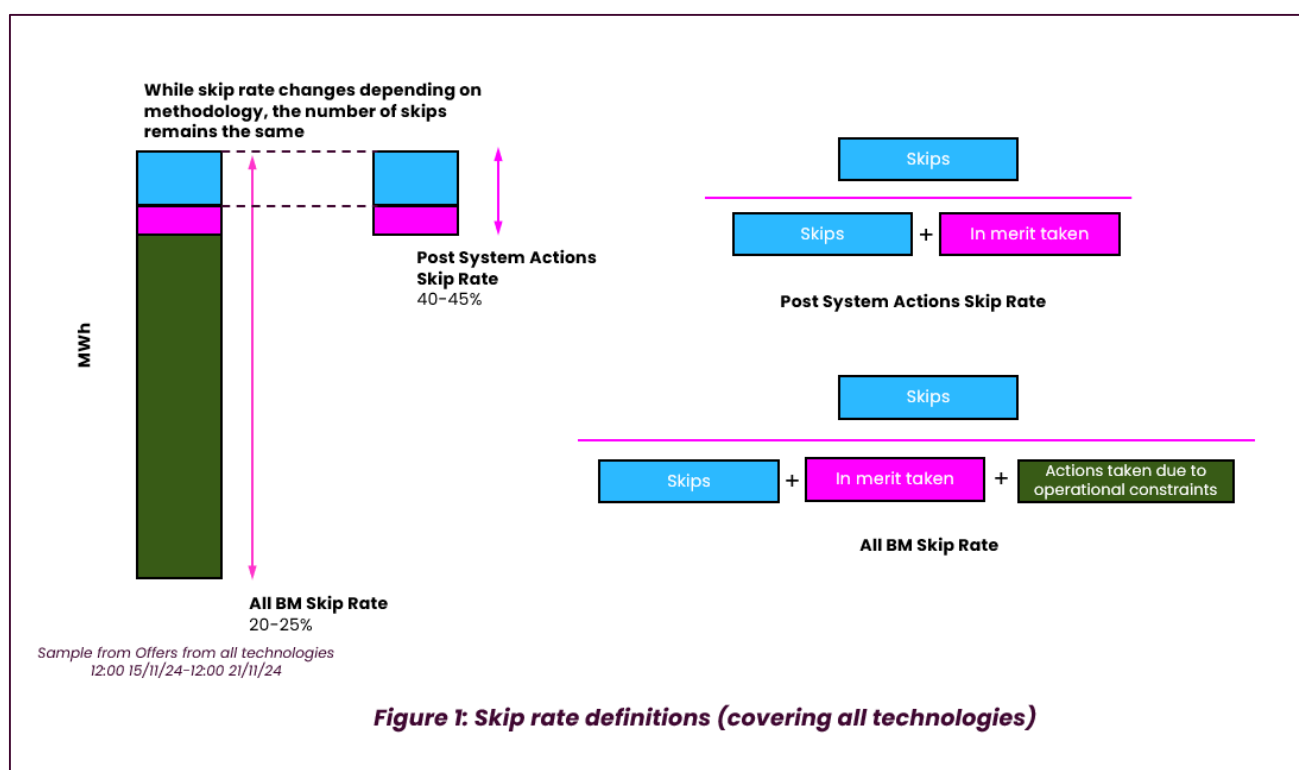
While there are varying definitions of skip rates across industry, we are proposing two distinct categories of skips to be used by both us and industry, to be tracked and measured to hold us to account for our performance.

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These two distinct categories are:

- **"All Balancing Mechanism Skip Rate" (BM skip)**. A measure of avoidable skips, taking into consideration BM actions we could have taken over the relevant period.
- **"Post System Action Skip Rates"**. A more targeted measure of avoidable skips not in context of all actions taken at the time. The occurrence of these skips is far less the BM Skips.

Figure 1 below illustrates these two categories and how they are calculated.



Reducing skips in our control is a priority but understanding the reasons they occur is critical to implementing the right solution.

Some skips within our control can be reduced through changes to systems and processes, although those caused by system constraints need wider whole system solutions and strategic network investment.

Solutions that are within NESO's remit to address are, and will continue to be, prioritised.

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## Skip rates to date

**While work is underway to understand and begin to address skip rates, further progress must continue to be made.**

One of our key priorities as NESO is to review how we balance the electricity system and, therefore, how we reduce All BM skips.

Transitioning from outdated systems to those fit for both today and the future has been underway for some time. In December 2023, we introduced the first iteration of the OBP in the ENCC – a new system that allows us to send hundreds of instructions to smaller balancing mechanism and battery storage unit sites using one central command.

The OBP has greatly reduced the time taken to instruct balancing mechanism units, improve the information made available to the control room and reduced the number of manual instructions required from control room engineers.

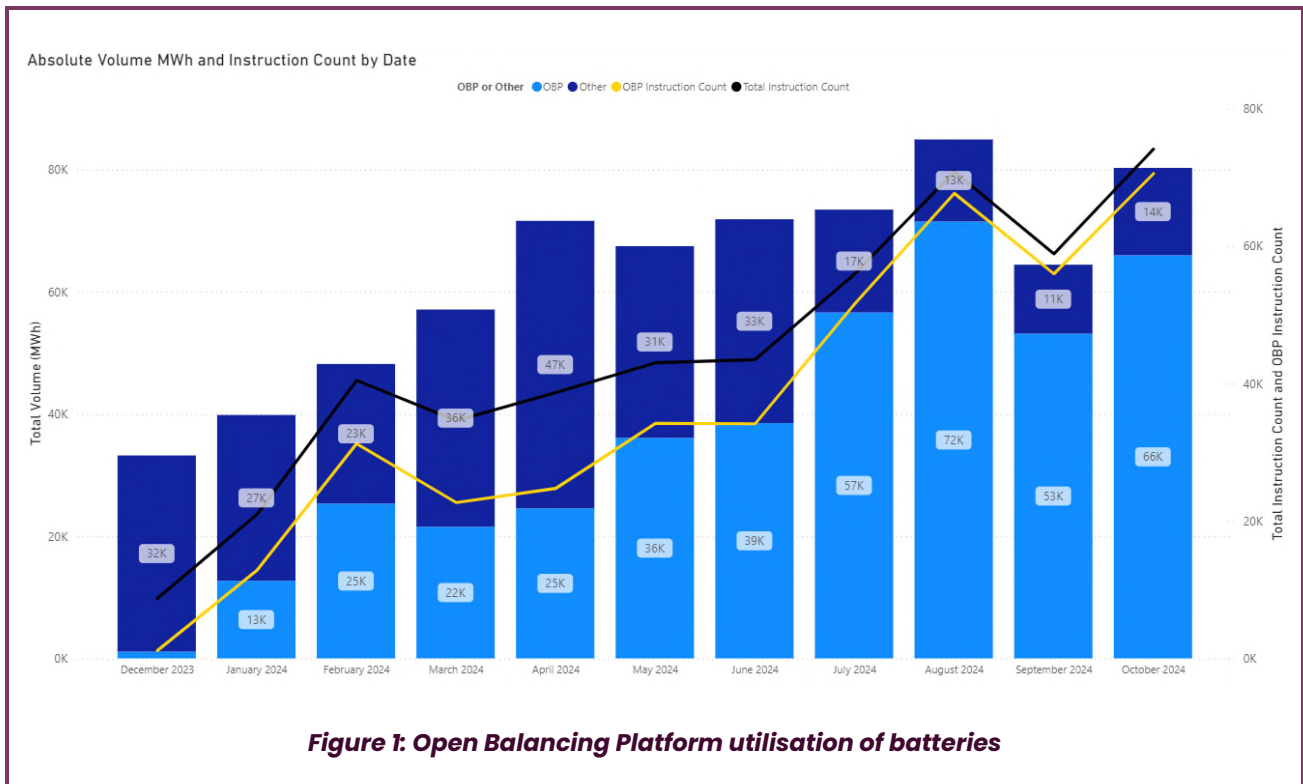
In the past we were restricted on the ability to instruct multiple assets at the same time. The OBP will address these issues by allowing us to send instructions to multiple assets simultaneously, improving efficiency and utilisation of smaller assets, such as batteries.

In the first year of operation, utilisation of batteries increased by 290% and the volume of daily instructions to batteries also increased by 940%.

Dispatch rates have since tripled and the BM battery dispatches an average of 2.3 GWh per day. Additionally, it is worth noting that some batteries now earn 61% of their revenue from the Balancing Mechanism.



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While this progress is a positive first step, we must continue this work at pace. We are fully committed to delivering on the necessary changes needed to allow us to enable and operate a clean power system as set out within our commitments section above.

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# Analysis results and further refinements

To understand the scale of skips, NESO has been undertaking analysis and has commissioned supplementary independent analysis, to understand this issue in greater depth.

Our initial analysis shows the following snapshot of All BM skip rates as:

- **"All Balancing Mechanism Skip Rate" (BM skip)** – is between 20–25% for Offers and 25–30% for Bids across all technology from NESO's initial analysis<sup>1</sup>.

We accept that skips of *all types* within our control need to reduce. As the operator within these markets, this will involve changing our own balancing actions and systems to minimise these skips.

Below we have provided backgrounds to both sets of analysis as well as outlined the need for further refinement and analysis.

## Background to independent analysis by LCP Delta on Post System Action Skip Rates

NESO appointed LCP Delta to support us in understanding skip rates. This involved a historical review of post system action skip rates and how this impacted different assets within the balancing mechanism. LCP Delta focused its analysis mostly on batteries. LCP Delta acknowledge the limitations of the analysis (as set out in their report and all of which act to reduce the skip rate) and that further work needs to be done to assess / quantify the extent to which they reduce the reported skip rate,

LCP's analysis shows the following snapshot of post system action skip rates for batteries specifically as:

- **"Post System Action Skip Rates"** – 46% for Offers and 51% for Bids across all technology types and 81% for Offers and 77% for Bids amongst batteries, taken from LCP Delta's analysis.<sup>2</sup>

During its work, LCP Delta spoke to industry participants and concluded that there was no standard definition of skip rates or consistent way of measuring and reporting these given the complexity of including operational actions.

LCP Delta proposed a new methodology for a targeted measure of skips – the Post System Action Skip rate. Rather than providing a single number that covers all complex actions, the

<sup>1</sup> Initial data from period covering full days of 24/11–24–28/11/24. This measurement tool is in development, once refined the tool will be able to measure by technology type.

<sup>2</sup> LCP Delta BM Skip Rates Phase 2 Report, data range: 01/01/24–31/07/24.

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methodology is broken into steps, allocated to different types of operational actions. These five stages for the Post System Action Skip Rates are:

- Stage – 1: Remove volumes that are procured outside of the balancing mechanism.
- Stage – 2: Remove volumes that are infeasible or that cannot be accessed within balancing mechanism timescales.
- Stage – 3: Remove volumes that were not taken for Energy balancing only.
- Stage – 4: Remove unwind actions
- Stage – 5: Remove volumes that could not be accessed by the balancing team in the Control Room.

We were encouraged to note that LCP Delta’s analysis shows the introduction of the OBP in December 2023 improved Post System Action Skip Rates for Battery Storage offers and bids by 10% and 17%. Further improvements to our systems are planned to greater reduce the skip rates.

### **Background to further analysis by NESO on All BM Skip Rates**

NESO has been carrying out additional analysis which builds on the methodology for Post System Action Skip Rates.

Our methodology and measuring tool use the LCP Delta’s as a fundamental building block, before adding in additional operational actions – allowing us to begin to measure ‘All BM Skip’ rates. This follows the same process as above but takes *all available actions* into consideration in its calculation.

The analysis, method of measuring the two skip rate categories, our new tool being developed to measure progress, enables us to be transparent in how we are measuring skips. Further operational actions will be built into tool that is to be shared with industry to maintain transparency in our actions and data. This will allow our customers to hold us to account for our performance.

In addition to the tool, we will regularly publish both the All BM Skip Rate and Post System Action Skip Rate figures. Industry participants will therefore have a greater understanding of when or if their units were skipped and the relevant reasoning. We are committed to define if the skip is for an operational reason we haven’t yet built into the tool – or if it is truly a skip that shouldn’t have happened, and what we are doing to improve this.

### **Further analytical refinement and next steps**

LCP Delta’s analysis is a historic snapshot of skip rates and has shown these have decreased since 2023. The work outlined above conducted by NESO will provide further insights into All BM Skip Rates. NESO will be working to refine this analysis and associated measurement tools to include adjustments in the skip rates for additional operational actions not yet considered.

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## Next Steps

Recognising the urgent need to ensure our markets and systems can support a transitioning energy industry, we commit to working transparently and at pace to bring about the required changes.

As set out in our commitments, our overarching focus is to minimise all skips in our control and ensure industry has the required definitions and metrics in which to hold us to account on these changes.

We recognise that all technologies no matter the size, location or operating complexity, are critical to delivering a clean energy system and that our systems and processes need to evolve rapidly to utilise these assets more efficiently.

NESO thanks industry for holding us to account on this matter and will continue to work alongside stakeholders to develop processes that are transparent, fair and fit for all.

For a detailed roadmap of NESO's balancing programme, and programme of activity to specifically reduce skip rates, [please refer to the NESO website](#).