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**Dear Industry Colleagues**

## **STATE OF CHARGE MANAGEMENT GUIDENCE FOR FFR PROVIDERS**

### **Background**

With the increase in storage assets entering the Firm Frequency Response (FFR) market, providers have asked for guidance in regard to what action they are allowed to take regarding managing the State of Charge (SoC) of their asset(s). National Grid's initial position was that assets are not permitted to use the dead band ( $\pm 0.015\text{Hz}$ ) to manage SoC but we would look at ways to assist with SoC management that do not negatively impact the network.

Two workshops were held in December and February with a selection of interested industry parties to identify and review possible approaches. We have used these approaches to model various operational scenarios and identify any positive and negative impacts on system frequency, and whether the methodology was able to effectively manage State of Charge.

### **Summary of analysis**

The SOC modelling involved simulating events with modified FFR envelopes to allow SOC management either by charging in the frequency deadband or by over-delivery of response. The outputs of this analysis showed that introducing these approaches could:

1. Reduce the maximum amount of response available in the event of a fault on the system
2. Cause frequency disturbances following an event
3. Result in an overall increase in frequency response requirements

Therefore we conclude that battery storage providers must continue to adhere to the FFR envelope as defined in their contracts, and should either:

- Withhold a fraction of the battery's total capacity from being contracted to use for SOC management; this capacity can be then used to charge or discharge the battery depending on its SOC
- Use the battery asset as part of a wider portfolio of mixed technology assets so that the asset can be removed from providing response entirely and utilise other assets (either another battery cell or alternative technology to deliver response in its place while the SOC is restored to its optimum level)

SOC management will continue to be investigated in the design process of the new services currently under development as part of the Future of balancing services:

<https://www.nationalgrid.com/uk/electricity/balancing-services/future-balancing-services>

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Rob Smith', written in a cursive style.

**Rob Smith**

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