



Grid Code Review Panel

Thursday 23 November 2023

Online Meeting via Teams

WELCOME



Purpose of Panel & Duties of Panel Members

The **Panel** shall be the standing body to carry out the **functions** referred to in the Governance Rules (**GR3.1.1**)

Functions (GR.3.2)

The **Panel** shall endeavour at all times to operate:

- in an **efficient, economical and expeditious manner**, taking account of the complexity, importance and urgency of particular Modification Proposals; and
- With a view to ensuring that the **Grid Code** facilitates **achievement of the Grid Code Objectives**.

Duties of Panel Members & Alternates (GR.3.3)

1. Shall act **impartially** and in accordance with the requirements of the **Grid Code**; and
2. Shall not have any **conflicts of interest**.
Shall not be representative of, and shall act without undue regard to the particular interests of the persons or body of persons by whom he/she was appointed as Panel Member and any Related Person from time to time.

Approval of Panel Minutes

Approval of Panel Minutes from the Meeting held

26 October 2023



Action Log

Action No.	Status	Action	Date raised	Owner	Due	Comments and Updates
440	Open	Update on the status of GC0139 and remaining work required to be given to GCRP following completion of analysis and tender.	28/09/2023	TP	23/11/2023	Analysis is still ongoing so no update post analysis can be given at this stage. The next workgroup is on 18 January 2024, agenda is to review completed analysis, updated legal text and draft Workgroup consultation document. Propose to close.
441	Open	CATO legislation update to be given to the STC Panel	28/09/2023	DS	25/10/2023	Completed at October STC panel. Propose to close.
442	Open	European legislation: provide update covering interactions between GB and EU law with regard to the Grid Code.	28/09/2023	JW		European Frameworks team at ESO have reached out to GCRP panel members to clarify the exact ask ahead of preparing a response.
443	Open	Add HND Subgroup update into monthly slide pack for GCRP.	28/09/2023	JW	23/11/2023	HND update added into GCRP slide pack. Propose to close.
444	Open	Energy Code Reform Update to be given by Code Administrator to the STC Panel	28/09/2023	SC	25/10/2023	Completed at October STC panel by Deborah Spencer STC Panel Secretary. Propose to close.
445	Open	JW to check if a representative from the Code Administrator can attend the cross-code workgroup.	26/10/2023	JW	23/11/2023	Sarah Carter will attend to represent the Code Administrator. Propose to close.
446	Open	Terms of Reference for GC0163 to be shared with GCRP via e-mail.	26/10/2023	JW	31/10/2023	Completed. Propose to close.
447	Open	JW to report back to panel on modification timelines.	26/10/2023	JW	23/11/2023	Update as part of 'challenges to modification progress' agenda item at November GCRP. Propose to close.
448	Open	Code Administrator to internally review process for reviewing legal text prior to submission to panel and report to panel	26/10/2023	JW	23/11/2023	JW to give verbal update at November GCRP. Propose to close.
449	Open	Tony Johnson/Code Administrator to circulate GC0156 associated documents with GCRP.	26/10/2023	TJ/JW	23/11/2023	Documents circulated with GCRP papers.



Chair's Update

Authority Decisions and Update (as at 15 November 2023)



Decisions Pending

- ☐ [GC0156: Facilitating the Implementation of the Electricity System Restoration Standard](#)

Decisions Received since last Panel meeting

- ☐ None

Received Final Modification Reports since last Panel Meeting

- ☐ None

The Authority's publication on decisions can be found on their website below:

<https://www.ofgem.gov.uk/publications/code-modificationmodification-proposals-ofgem-decision-expected-publication-dates-timetable>



Inflight Modification Updates

Jonathan Whitaker, Code Administrator

GC0159: Introducing Competitively Appointed Transmission Owners Timeline Update

	Workgroup Report issued to Panel	DFMR issued to Panel	FMR issued to Ofgem
Previous timeline	16 November 2023	17 January 2024	7 February 2024
New timeline	6 December 2023	14 February 2024	26 March 2024

Rationale: A new timeline after the legislation delay. Legislation has now been passed by Parliament and received Royal Assent on the 26th of October 2023. The timeline is aligned with the other CATO mods, with all FMRs to the Authority on the same day.

Workgroups Remaining: 2




Ask of Panel: Agree revised timeline



Panel Tracker

Jonathan Whitaker, Code Administrator

Prioritisation Stack

Grid Code - Prioritisation Stack   			
Mod Number	Previous Priority No:	Priority No	Title
GC0162	2	1	Changes to OC6 to amend the operational timings for the delivery of the additional demand reduction above 20%, with a focus between 20% and 40%
GC0139	3	2	Enhanced Planning Data Exchange to Facilitate Whole System Planning
GC0117	4	3	Improving transparency and consistency of access arrangements across GB by the creation of a pan-GB commonality of PGM requirements
GC0154	5	4	Incorporation of interconnector ramping requirements into the Grid Code as per SOGL Article 119
GC0155	6	5	Clarification of Fault Ride Through Technical Requirements
GC0163	N/A	6	GB Grid Forming (GBGF) - Removal of Virtual Impedance restriction
GC0164	N/A	7	Simplification of Operating Code No.2
GC0103	6	8	The introduction of harmonised Applicable Electrical Standards in GB to ensure compliance with the EU Connection Codes
GC0159	7	9	Introducing Competitively Appointed Transmission Owners
GC0140	8	10	Grid Code Sandbox: enabling derogation from certain obligations to support small-scale trials of innovative propositions

Draft Final Modification Report

GC0162: Changes to OC6 to amend the operational timings for the delivery of the additional demand reduction above 20%, with a focus between 20% and 40%

Jonathan Whitaker, Code Administrator

GC0162 - Solution

Solution/summary of solutions:

- The solution will amend wording within OC6 of the Grid Code. This will allow changes to the operational timing requirements to implement Demand Disconnection between 20% and 40% of Demand.
- It also clarifies that all the 5% Demand blocks referred to in OC6 are actually Demand blocks between 4% and 6%, in line with operational practices.
- Some other changes to legal text are also proposed to clarify the implementation of the revised arrangements

Code Administrator Consultation Responses

Summary of Code Administrator Consultation Responses :

Code Administrator Consultation was run from 14 October 2023 to 14 November 2023 and received 2 non-confidential responses. Key points were:

- All respondents were supportive of the implementation approach.
- All respondents stated that the Original Proposal better facilitates objectives a, c and d.
- One respondent said they support the NGESO view that other sections of OC6 should be reviewed in the near future to reflect the current position for demand reduction, e.g. the process and criteria for calculation of demand disconnection blocks, the potential overlap between manual and automatic demand disconnection blocks etc.

GC0162 – the asks of Panel

- **NOTE** that this Modification does not impact the Electricity Balancing Regulation (EBR) Article 18 terms and conditions held within the Grid Code
- **VOTE** whether or not to recommend implementation
- **NOTE** next steps

GC0162 – Next Steps

Milestone	Date
Final Modification Report issued to Panel to check votes recorded correctly	23 November (14.00 – 16.00)
Submission of Final Modification Report to Ofgem	23 November (17.00)
Ofgem decision date	TBC
Implementation Date	10 Business Days from Authority decision

Grid Code Development Forum – Previous and Next

1 November 2023

EDT Data Submission – Contingency Trial with SSE

A presentation was shared giving an overview of a trial that the ESO is currently undertaking with SSE to establish a contingency process for EDT data submission.

Digitalised Whole System Technical Code – ASR (Alignment, Simplification & Rationalisation) Workstream

An overview of the ASR (Alignment, Simplification and Rationalisation) workstream of the dWSTC (Digitalised Whole System Technical Code) Project was provided which included an update following the submission of the Grid Code Modification (GC0164), which proposes the simplification of Operating Code No.2, with discussions in relation to the possible next sections of the Grid Code that could benefit from simplification.

Proposed changes to the Grid Code in the treatment of Embedded Small Power Stations with a Bilateral Embedded Generation Agreement (BEGA)

A presentation was shared detailing proposed changes to the Grid Code in respect of the compliance process for Embedded Small Power Stations with a Bilateral Embedded Generation Agreement (BEGA)

22 November 2023 (Deadline for Agenda items - 15 November)

Final Agenda items TBC



Standing Items

- Distribution Code Panel update (Graeme Vincent)
- JESG Update (information only)
 - Previous meeting – 14 November - Cancelled
 - Next meeting – 12 December 2023
- Holistic Network Design Subgroup (Terry Baldwin)



Updates on other industry codes

Challenges to Modification Progress

	Aug		Sep		Oct	
	Count	Mods affected	Count	Mods affected	Count	Mods affected
Legislation Delay	0	-	1	GC0159	0	-
Analysis Delay	2	GC0103 GC0117	1	GC0139	1	GC0117
Legal Text Delay	2	GC0139 GC0155	0	-	1	GC0154

Horizon Scan

Lead Code	Industry	Codes Affected	Legislative, Regulatory or Industry Change Overview	Published Content	Key Contact	Last Updated	Proposed Modifications Expected
Grid Code	Electricity	Grid Code	<p>Connections Reform</p> <p>All responses to our Connections Reform consultation are now being reviewed, and we're working with stakeholder governance groups to refine our final proposals for implementing and transitioning to a new model.</p> <p>ESO expect to publish our final recommendations and implementation plan by the end of November 2023. We will then start a transition and implementation phase, to conclude in spring/summer 2025</p>	https://www.nationalgrideso.com/industry-information/connections/connections-reform		Nov-23	May-24
Grid Code	Electricity	Grid Code, CUSC, and STC	<p>FSO mods are coming around Q2.</p> <p>The FSO will be established in 2024, with new roles and capability being introduced in a phased approach. Secondary legislation is required; therefore, specific timelines are subject to change.</p>	https://www.nationalgrideso.com/what-we-do/becoming-future-system-operator-fso		Nov-23	Apr-24
Grid Code	Electricity	Grid Code, CUSC, and STC	<p>Grid Forming</p> <p>GB Grid Forming- to provide the necessary guidance on the Compliance Process of Grid Forming technology following Grid Code Modification GC0137 "Minimum Specification Required for Provision of GB Grid Forming (GBGF) Capability" as shown on the ESO's Grid Code Issue 6 Revision 17 as published on 4 September 2023.</p>	https://www.nationalgrideso.com/document/278491/download		Nov-23	Apr-24
Grid Code	Electricity	Grid Code, CUSC, and STC	<p>The Offshore Coordination Project has been set up by the ESO with support from Ofgem and the Department for Business, Energy & Industrial Strategy.</p> <p>Offshore wind has been identified as a critical technology in achieving net zero greenhouse gas emissions by 2050. In order to help realise this target, a step-change in both the speed and scale of deployment of offshore wind is required.</p> <p>One SQSS raised, expect late Q1 2024 we will know relevant GC mods that will be required.</p>	ESO Offshore Coordination Project Page	box.OffshoreCoord@nationalgridESO.com	Nov-23	Mar-24
Grid Code	Electricity	Grid Code (CUSC for fax instructions)	<p>The Balancing Programme was established to develop the balancing capabilities that the Electricity National Control Centre needs to deliver reliable and secure system operation, facilitate competition everywhere and meet the ESO's ambition for net-zero carbon operability. The following elements are expected to start to land from January BSC Issues Group (relating to Optimisers giving instruction recommendations); Storage and Batteries (MDV and MDP) and the use of Faxes to instruct.</p> <p>(Nov-23; Liaising with Balancing Programme to ascertain Code Change requirements)</p>	Balancing Programme website		Nov-23	Jan-24
Grid Code	Electricity	Grid Code	<p>As Great Britain's (GB) power system moves towards net zero carbon operation, the number of Inverter-Based Resources (IBR) is expected to increase and the amount of synchronous generation in the grid to decline which will significantly change the characteristics of the GB network. These changes give rise to the potential control interactions between the devices across the network leading to risks of oscillations and inverter stability. Electromagnetic Transient (EMT) analysis is important for investigating the dynamics of converters, control interactions between the devices in the network, detecting system oscillations, commutation failure analysis, inverter stability analysis and identifying transient phenomena such as Transient Over Voltage (ToV). ESO is suggesting a Grid Code change that mandates generators to provide EMT models for their plants</p>		jay.ramachandran@nationalgrideso.com	Aug-23	Dec-23



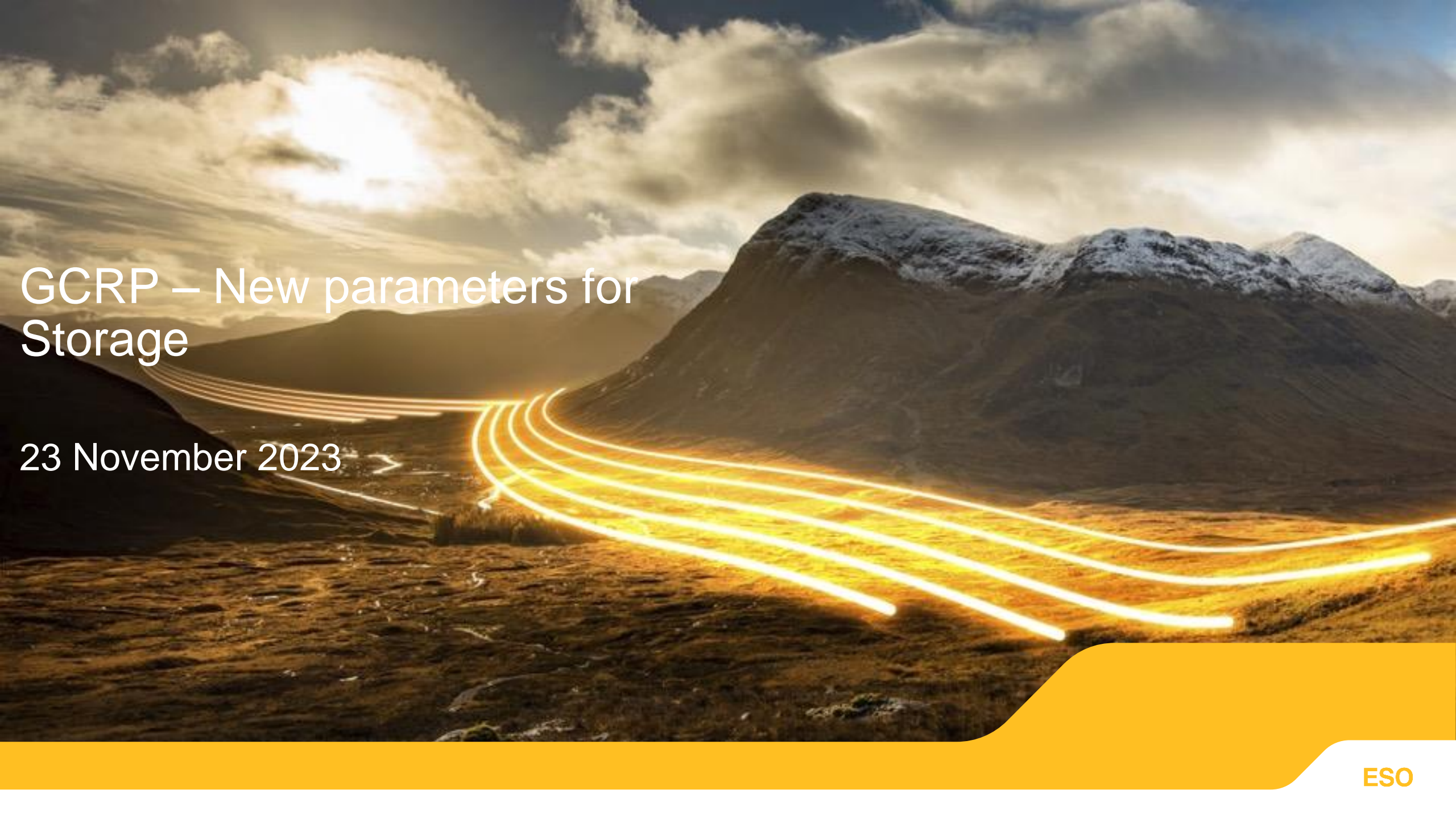
Electrical Standards

Electrical Standards and documentation Update

Tony Johnson



Any Other Business



GCRP – New parameters for Storage

23 November 2023

Background

The Balancing Programme

- The ESO has initiated a programme to update the tools and capabilities within the control room in readiness for net-zero operation
- Details of the programme can be found at the following location [Balancing programme | ESO \(nationalgrideso.com\)](https://nationalgrideso.com/balancing-programme)
- The programme holds quarterly face-2-face reviews (all are invited to attend)
- In addition, the programme has been holding a number of forums that meet on a more regular basis to discuss specific topics
- One forum covers Storage – we have held six meetings to date and the forum has 80 signed up members
- From this forum there have been a number of suggestions for new parameters that can be used to optimise the dispatch of Storage units
- Today we would like to take you through the discussions held to date

Current situation

The “15 minute rule”

- The ESO cannot be sure of the available energy from a storage unit
- To overcome this we use the “15 minute rule”
- The ESO will not issue an instruction beyond 15 minutes and uses the Maximum Import Limit (MIL) and Maximum Export Limit (MEL) to determine the amount of energy that can be safely dispatched
- After issuing an instruction the ESO waits for a redeclaration of MIL/MEL before issuing another instruction
- This advice is contained in the following document [Stacking with BM \(nationalgrideso.com\)](https://nationalgrideso.com/stacking-with-bm)
- This rule has a number of shortcomings and so we have received a number of suggestions from industry to address these concerns

Options map for future changes

Control room operates on 3 time-frames:

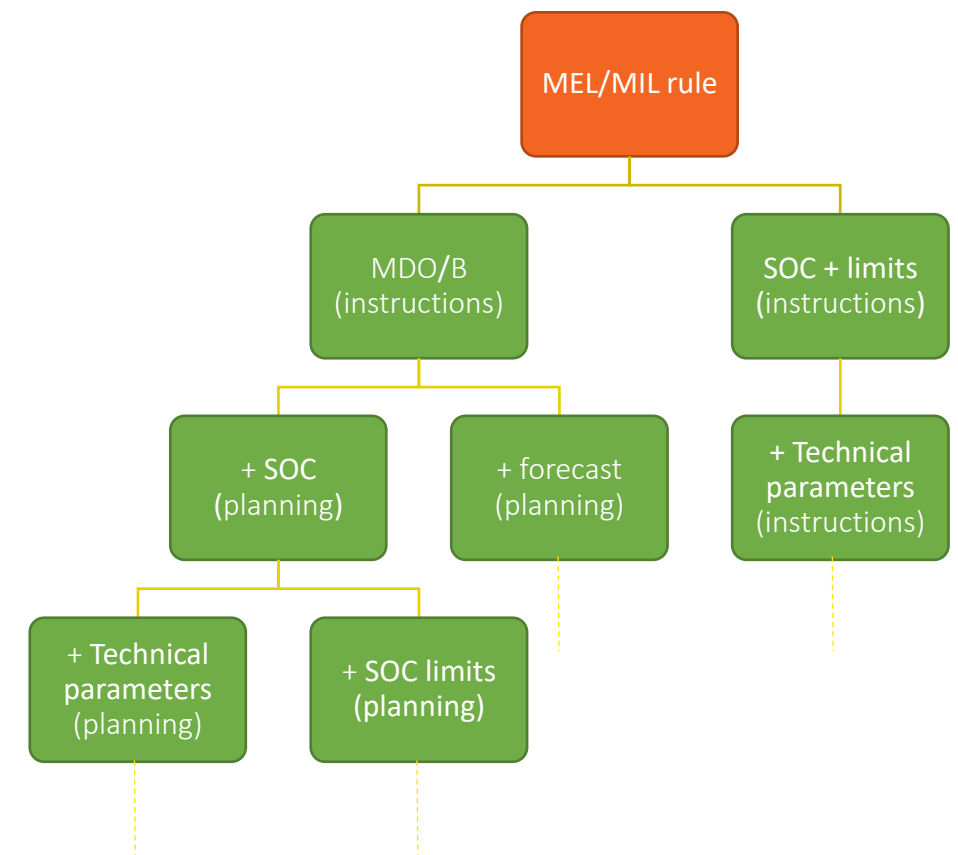
- system planning (48 to 4h ahead or real-time)
- dispatch (4h ahead)
- instructions (a few minutes ahead)

Parameters for instructions

- decoupling from MEL/MIL
- better estimates of asset capability
- more efficient operation

Parameters for system planning

- remove uncertainty in planning



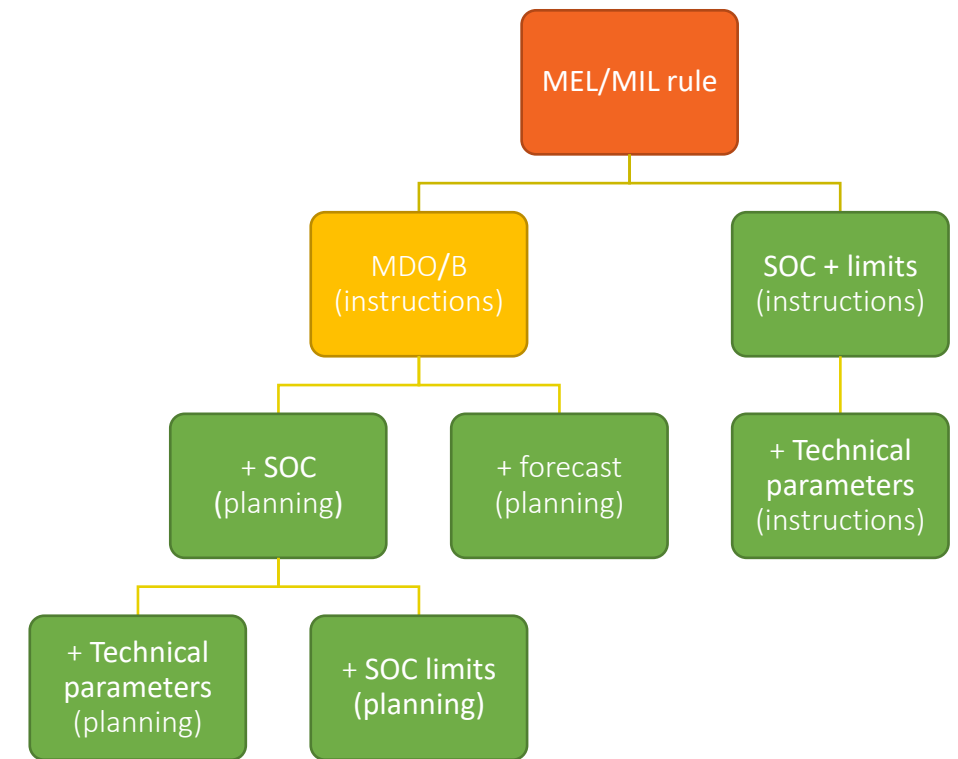
MDO/B – (renamed from MDVE/I)

Maximum Delivery Offer / Bid

- amount of energy available for offers/bids
- time varying parameter?

How it could work:

- (1) Asset operator submits MDO/B (e.g. 5/5MWh for import/export from 19:22 to 20:15)
- (2) ESO dispatches asset (e.g. 1MWh of export from 19:45 to 19:50)
- (3) ESO keeps track of remainder of energy (e.g. 5/4MWh) up to 20:15
- (4) Asset operator may update MDO/B to reflect change of SoC (e.g. 6.1/4 MWh from 19:50 to 20:15) or ESO could issue further instructions



- This approach decouples energy available from MEL/MIL
- Allows provider to indicate available energy for BOAs in the short-term
- May accommodate aggregations of storage / non-storage assets
- Frequency of data submission on asset charge/discharge dependent on design

SOC + limits (for instructions)

SOC

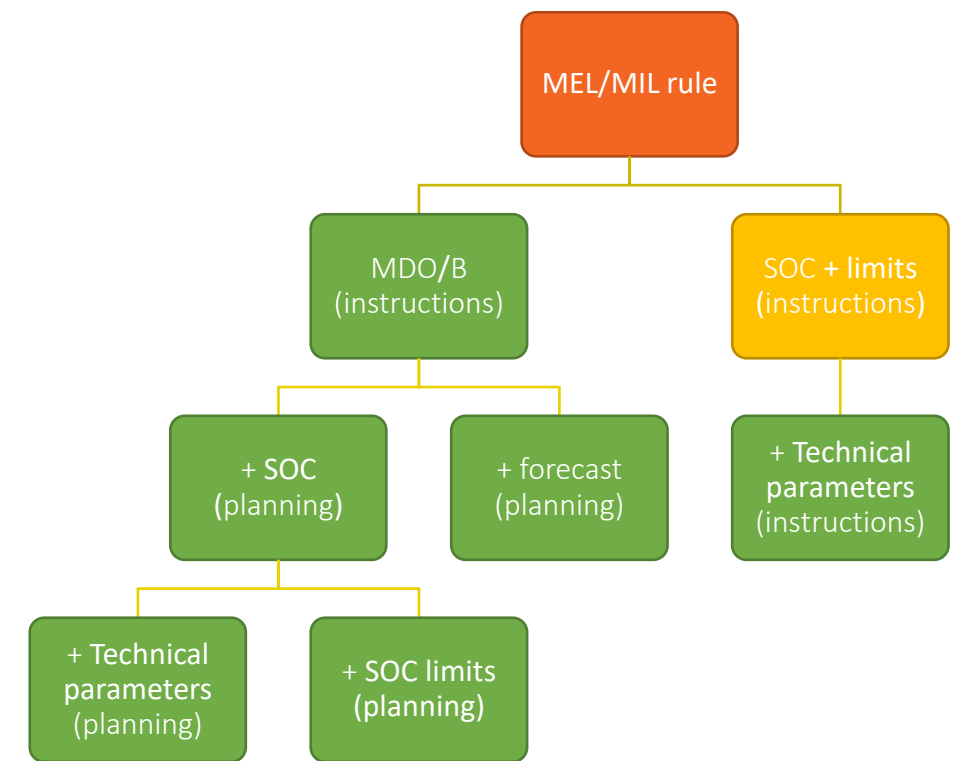
- state-of-charge at a given point in time

SOC limits

- bounds within which SoC should remain (similar definitions to MDO/B possible)

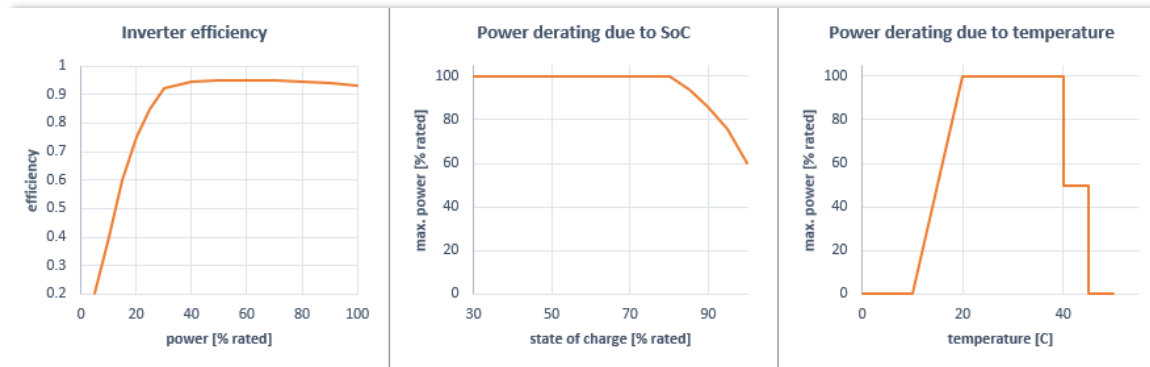
How it could work:

- ESO would have a clear indication of asset capability
- ESO could infer what is available for bids/offers based on SOC/SOC limits but requires some assumptions about underlying model that describes a BMU
- underlying models would have to be agreed with asset operators – process could get complicated
- might not work for aggregated assets

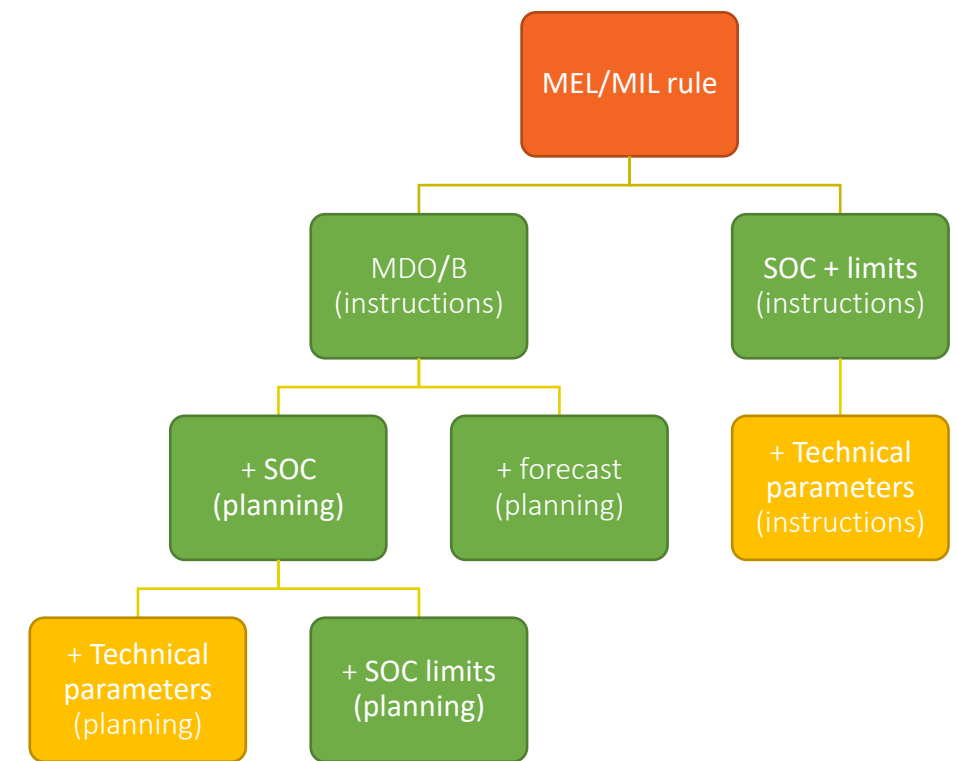


Provision of technical parameters

- Parameters may either be used for instructions (would affect BOA volumes) or for planning (rough estimates)
- Possible confidentiality concerns – would we need a process for updating outside BM?
- Underlying models may still not be good enough (e.g. battery storage has varying efficiency, may have power derated as function of SoC and temperature)

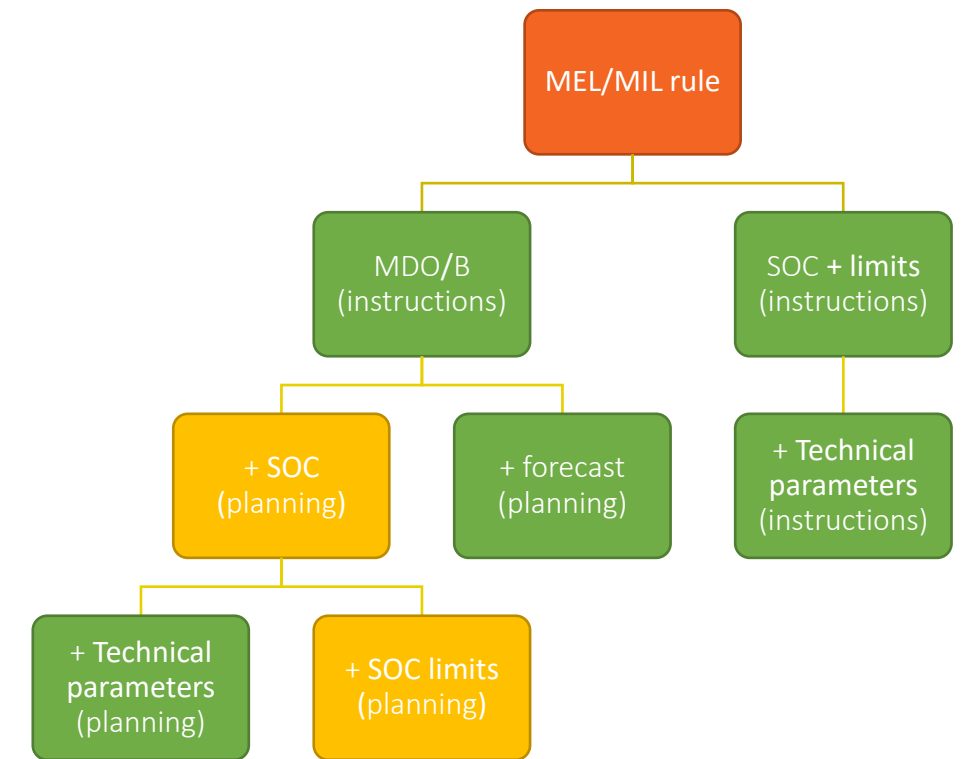


- Different parameters may be relevant for different assets and additional metering data (e.g. storage co-located with renewables or demand response) might be needed to use a model – ESO handling such complexity might not be possible or appropriate



SOC + limits (for planning)

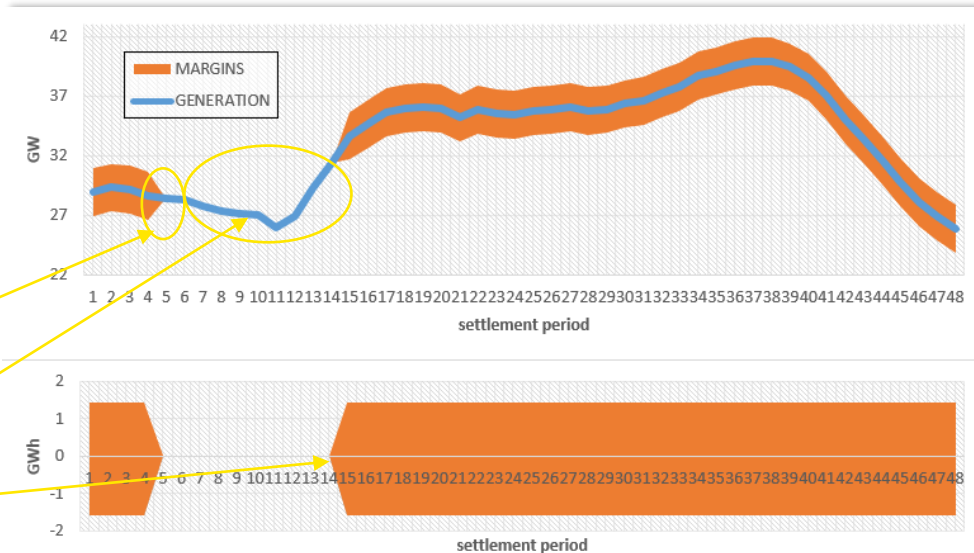
- SOC (to determine current asset state) + SOC limits (within the asset is allowed to move) > ESO assumes asset availability
- Should give the ESO as good as view of possible for asset contractual commitments (e.g. DSO contracts in the future) and restrictions in asset operation arising due to those such commitments
- Current ESO contracts are already known
- Even if the limits are accurate the ESO would have to make assumptions about asset availability in BM
- Should the ESO be able to schedule assets?



Asset unavailable to ensure sufficient energy level for service

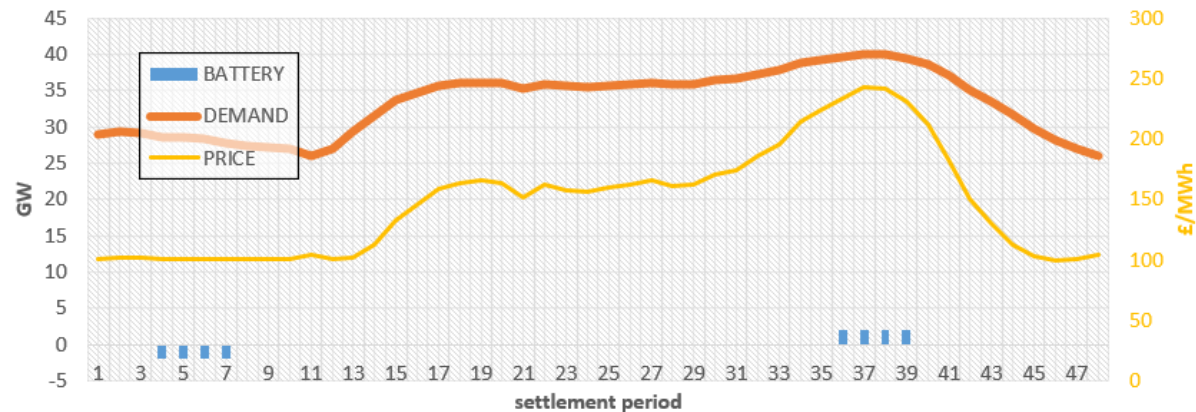
Asset doing DC (both ways)

What if asset was utilised?

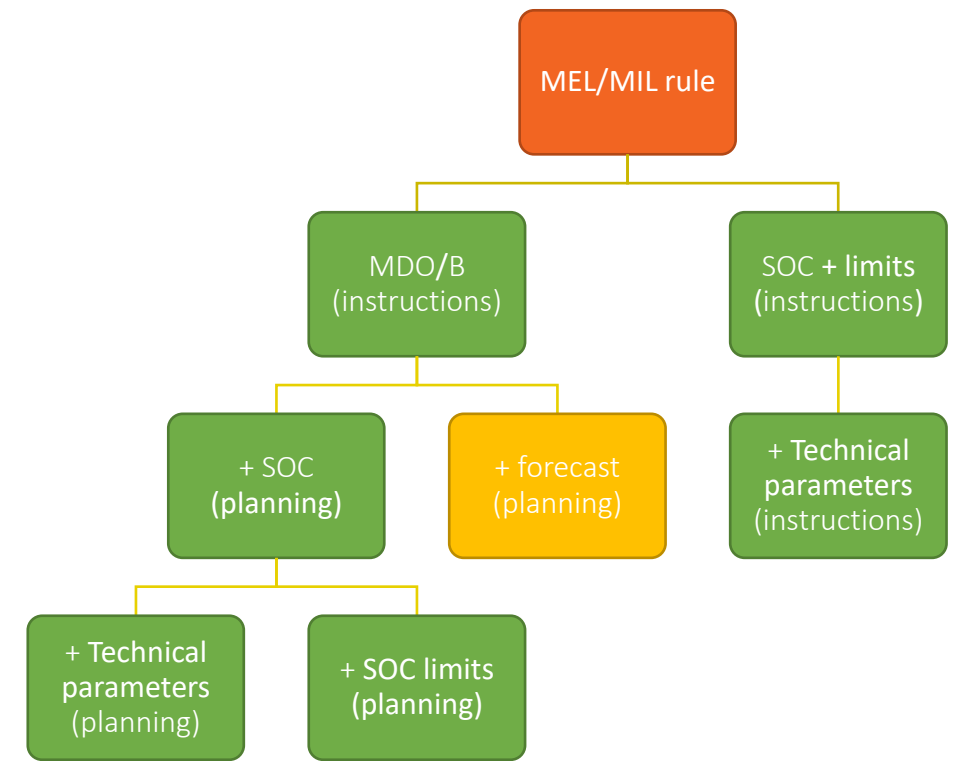


Asset operator forecasts

- In this case asset availability is set based on a best-view forecast from the asset-operator.
- It is reasonable to assume asset operators plan based on price forecasts and estimates on utilisation – would the forecasts be usable?



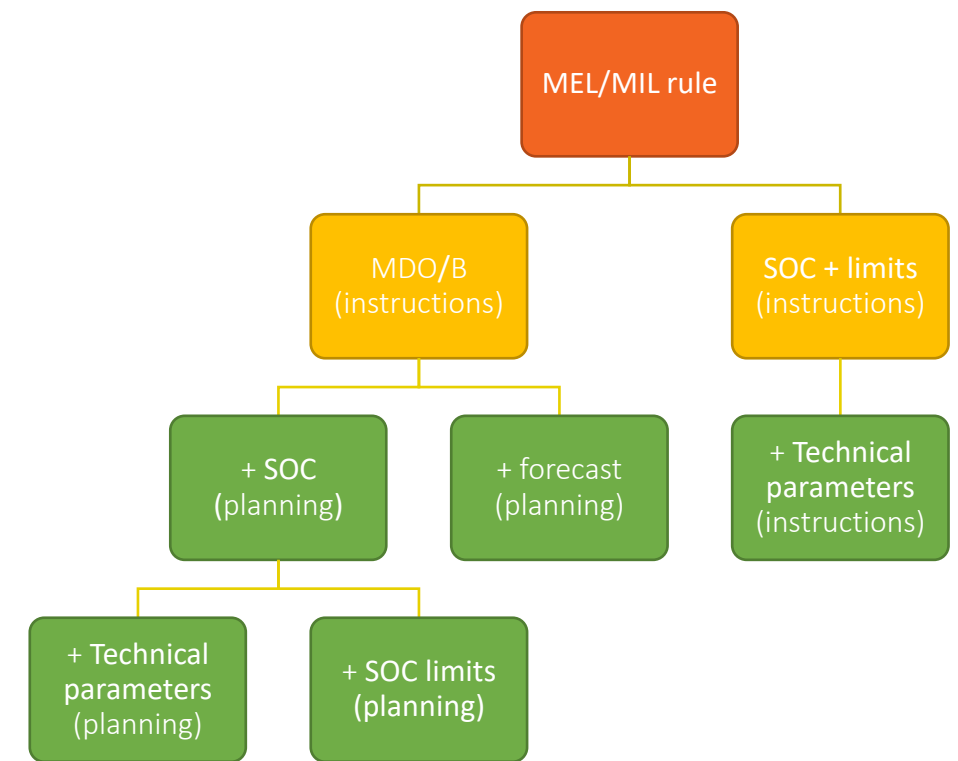
- Challenging to ensure a common derivation methodology (understand underlying assumptions) or check validity of data
- ESO would still have to make assumptions about whether the asset is available in the BM



Operational metering (non-EDL) approach

MDO/B or SOC-based data

- receive via SCADA
- data should be sufficient to indicate available energy for BOAs
- duration of time over which energy is available should also be defined (either assumed or via additional data)
- no concerns over existing comms usage (EDL)
- possible concerns over quality of data



Activities ahead of the next Panel Meeting

Modification Proposals to be submitted	29 November 2023
Papers Day	06 December 2023
Panel Meeting	14 December 2023 Teams Meeting

Close



Jamie Webb

Acting Independent Chair, Grid Code Review Panel