



Grid Code Review Panel

Thursday 14 December 2023

Online Meeting via Teams

WELCOME



Approval of Panel Minutes

Approval of Panel Minutes from the Meeting held
23 November 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	25/01/2024	GC0139 Code Administrator Chair to give a verbal update at January 2024 GCRP.
442	Open	European legislation: provide update covering interactions between GB and EU law with regard to the Grid Code.	28/09/2023	JW	TBC	European Frameworks team at ESO reached out to GCRP panel members to clarify the exact ask ahead of preparing a response. A response to be given to the Grid Code Review Panel in the new year- date to be confirmed.
450	Open	Investigate possibility of Connections Reform changing technical requirements of connectees to the Grid.	23/11/2023	JWe	TBC	We have published our final recommendations for connections reform on 5 December 2023. These can be viewed on the key documents tab in the December 2023 Final Recommendations section. We will now start a detailed process design and implementation phase, to conclude in January 2025. We encourage you to join us on 12 (in person) and 14 December (webinar) to learn more about our final recommendations for Connections Reform. These events will take place in Birmingham on 12 December and online on 14 December . You can also contact us with any reform specific queries at box.connectionsreform@nationalgrideso.com
451	Open	ESO to provide overview of HND to Grid Code Panel	23/11/2023	TB	25/01/2024	Update to be given at January panel meeting.
452	Open	Provide Panel with a summary of the current status of all GC0156 Related Electrical Standards and Documents.	23/11/2023	JW	14/12/2023	Completed via e-mail on 01/12/2023.



Chair's Update

Authority Decisions and Update (as at 05 December 2023)



Decisions Pending

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

Decisions Received since last Panel meeting

- ☐ [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%](#)

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>

New modifications submitted

Standard Governance





New Parameters for Storage *Grid Code Panel (GC0166)*

December 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

Problem Statement

Short Term
(Dispatch)

- How to get beyond the limitations of the 15 minute rule
- Increasing utilisation of limited duration assets in dispatch
- How can assets provide accurate technical limits to the ESO

Long Term
(Scheduling)

- How to utilise limited duration assets in planning timescales
- How to ensure best total value for consumers
- Provide the ESO confidence in the long-term management of risk

Communication
Mechanism

- What is the easiest way to send and receive data between the ESO and Limited Duration Assets

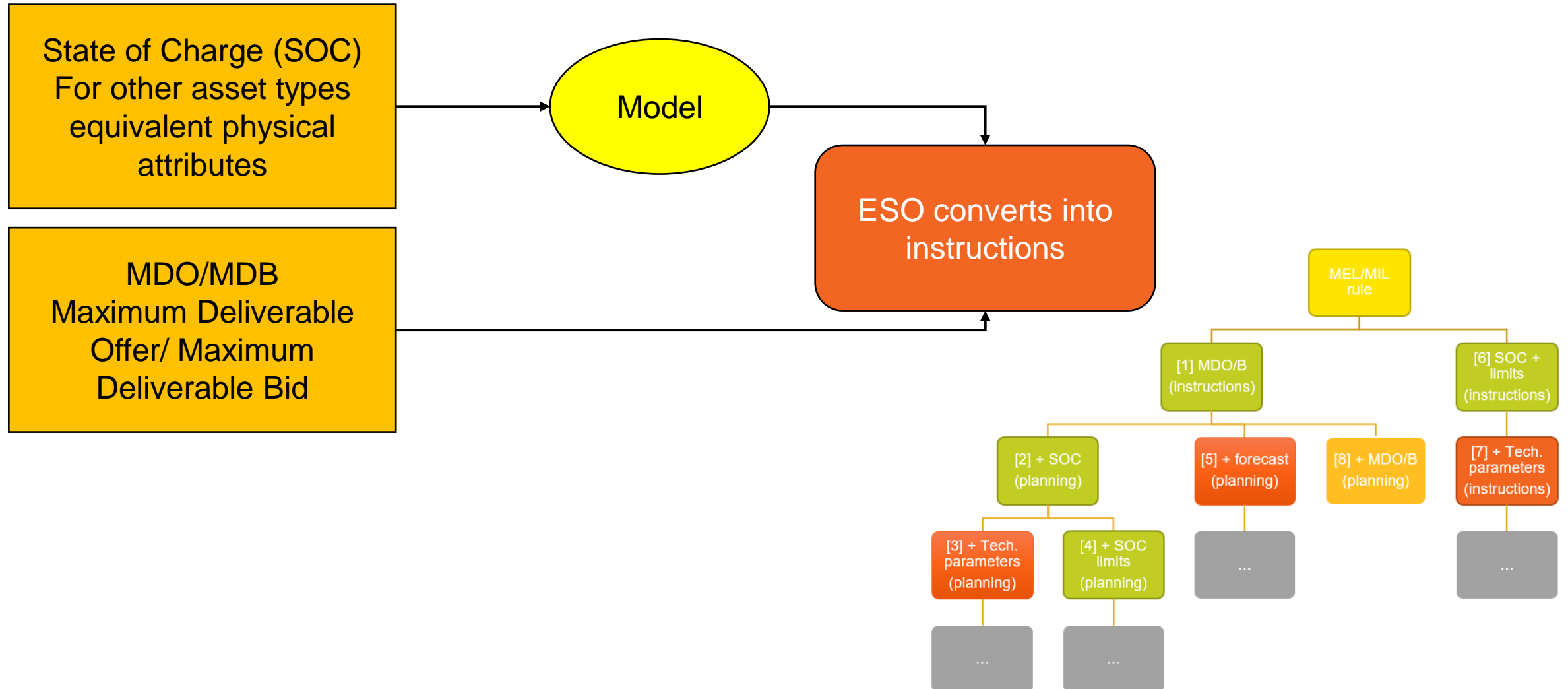
Current Situation



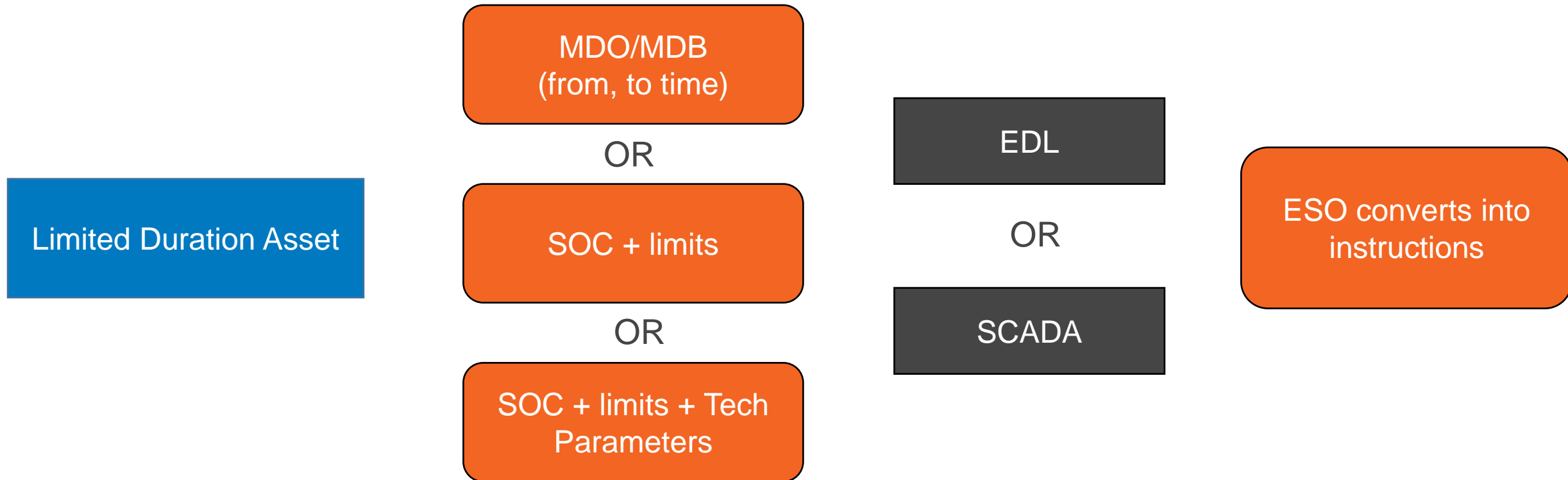
The “15 minute rule”

- 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 \(nationalgrideso.com\)](http://nationalgrideso.com)
- This rule has a number of shortcomings and so we have been engaging with industry on suggestions for new parameters that can be used to optimise the use of Limited Duration Assets

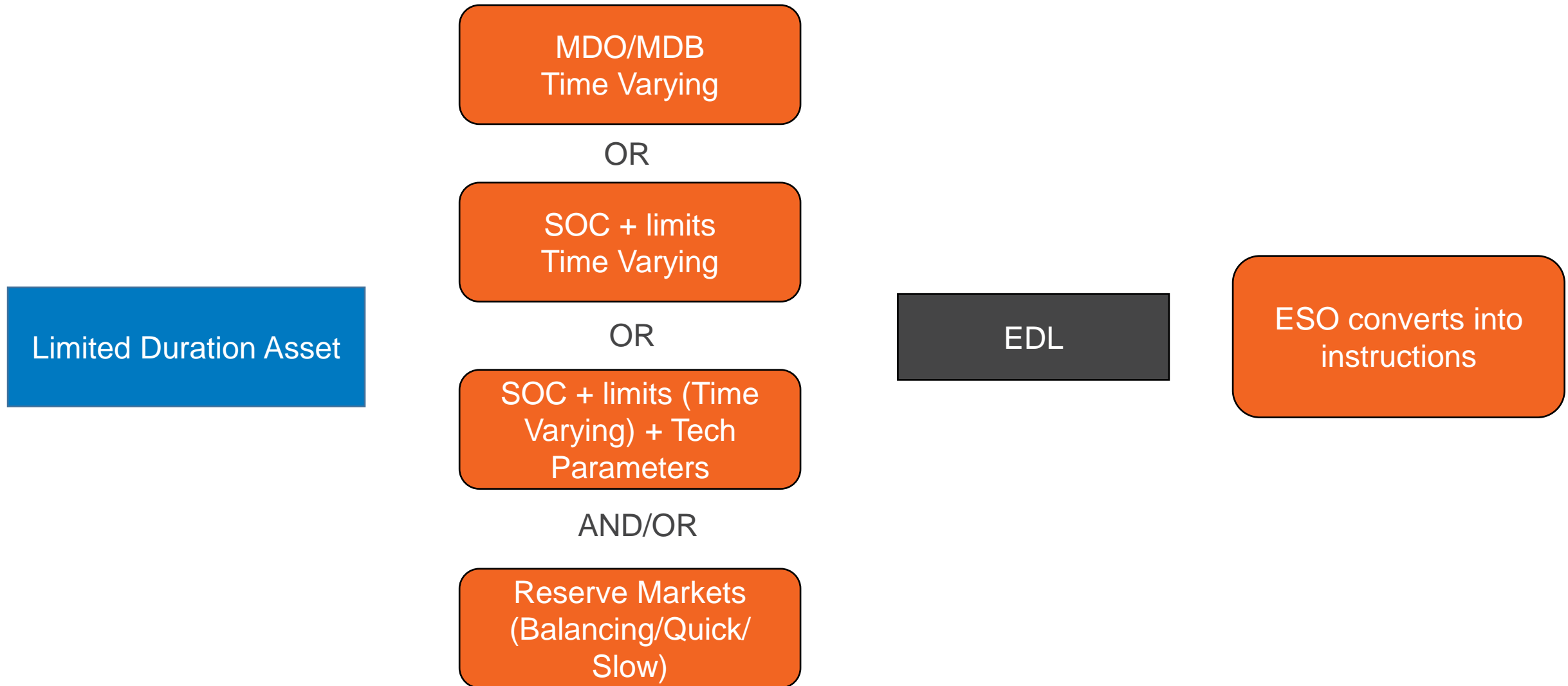
Parameters Discussed in detail so far



Solutions in Dispatch Timescales



Solutions in Scheduling Timescales



Critical Friend Feedback – GC0166

Code Administrator comments	Amendments made by the Proposer
Advised on Governance route	Proposer accepted all amendments made by the Code Administrator
Rewording for clarity and simplification	
Requested additional detail on the solution	
Provided timeline	

Timeline for GC0166 – Proposed Timeline - *Workgroup*

Milestone	Date	Milestone	Date
Modification presented to Panel	14 December 2023	Code Administrator Consultation (1 Month)	02 July 2024 to 02 August 2024
Workgroup Nominations (15 Working Days)	18 December 2023 to 11 January 2024	Draft Final Modification Report (DFMR) issued to Panel (5 working days)	14 August 2024
Workgroup 1 Workgroup 2 Workgroup 3 To discuss the proposal, analysis required and begin refining the solution.	01 February 2024 29 February 2024 28 March 2024	Panel undertake DFMR recommendation vote	22 August 2024
Workgroup Consultation (15 working days)	02 April 2024 to 23 April 2024	Final Modification Report issued to Panel to check votes recorded correctly	23 August 2024 – 30 August 2024
Workgroup 4 Workgroup 5 To review the Workgroup Consultation responses and to finalise the solution	14 May 2024 11 June 2024	Final Modification Report issued to Ofgem	02 September 2024
Workgroup report issued to Panel (5 working days)	19 June 2024	Ofgem decision	04 November 2024
Panel sign off that Workgroup Report has met its Terms of Reference	27 June 2024	Implementation Date	19 November 2024

GC0166 Proposed Terms of Reference

Workgroup Terms of Reference

- a) Implementation and costs
- b) Review draft legal text should it have been provided. If legal text is not submitted within the Grid Code Modification Proposal the Workgroup should be instructed to assist in the developing of the legal text
- c) Consider whether any further Industry experts or stakeholders should be invited to participate within the Workgroup to ensure that all potentially affected stakeholders have the opportunity to be represented in the Workgroup. Demonstrate what has been done to cover this clearly in the report
- d) Consider EBR implications

GC0166 – the asks of Panel

- **AGREE** that this Modification should follow Standard Governance (Ofgem decision) rather than the Self-Governance Criteria (Panel decision)
- **AGREE** that this Modification should proceed to Workgroup
- **AGREE** Workgroup Terms of Reference
- **NOTE** that there appear not to be any impacts on the Electricity Balancing Regulation (EBR) Article 18 terms and conditions held within the Grid Code
- **NOTE** the proposed timeline



Inflight Modification Updates

Jonathan Whitaker, Code Administrator

GC0117: Improving transparency and consistency of access arrangements across GB by the creation of a pan-GB commonality of Power Station requirements

	Workgroup Report issued to Panel	DFMR issued to Panel	FMR issued to Ofgem
Previous timeline	06 December 2023	14 February 2024	07 March 2024
New timeline	17 January 2024	13 March 2024	01 April 2024

Rationale: A further Workgroup required for actions to be completed and to ensure the Terms of Reference are met, so the Workgroup can complete their vote.

Workgroups Remaining: 1

Ask of Panel: Agree revised timeline



Panel Tracker

Jonathan Whitaker, Code Administrator

Prioritisation Stack

Grid Code - Prioritisation Stack



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



Workgroup Report

**GC0159: Introducing Competitively Appointed
Transmission Owners**

Catia Gomes (Chair)

Key points to note to the Panel

- This modification aims to introduce the concept of Competitively Appointed Transmission Owners (CATOs) to the Grid Code, based on the assumption that CATOs will be granted a Transmission License and will be categorised as an Onshore Transmission Owner.
- The Workgroup voted on the modification once the enabling legislation (Energy Bill 2023) was passed and received Royal Assent.
- The Workgroup agreed that Legislation is as expected, and all the work done within this modification is accurate and reflective of it.

Terms of Reference

The Workgroup concluded that they have met the Terms of Reference and the references can be located below:

Workgroup Term of Reference	Location in Workgroup Report (to be completed at Workgroup Report stage)
A) Implementation and costs;	Proposer's solution page 4
B) Review draft legal text should it have been provided. If legal text is not submitted within the Grid Code Modification Proposal the Workgroup should be instructed to assist in the developing of the legal text;	Legal Text Annex 6
C) Consider whether any further Industry experts or stakeholders should be invited to participate within the Workgroup to ensure that all potentially affected stakeholders have the opportunity to be represented in the Workgroup. Demonstrate what has been done to cover this clearly in the report;	Distribution list Annex 8
D) Consider EBR implications;	Interactions page 3
E) Consider interactions and impacts on wider Grid Code modifications in particular GC0103, GC0117 and GC0156 modifications; and	Interactions page 3
F) Consider the alignment with cross code impacts and their timelines.	Interactions page 3
G) Ensure that the proposed Grid Code changes effectively implement the CATO regime in a proportionate manner, adopting minimum necessary change.	Legal text Annex 6

Solution(s) and Workgroup Vote

Solution:

- The objective of this modification is to implement minimum changes to the Grid Code to facilitate the introduction of CATOs.

Summary of Workgroup Vote:

- The Workgroup concluded by majority that the GC0159 Original better facilitated the applicable Grid Code Objectives than the Baseline.

GC0159 – the asks of Panel

- **AGREE** that the Workgroup have met their Terms of Reference
- **AGREE** that this Modification can proceed to Code Administrator Consultation
- **NOTE** that this Modification does not impact the Electricity Balancing Regulation (EBR) Article 18 terms and conditions held within the Grid Code
- **NOTE** the ongoing timeline

GC0159 Next Steps

Milestone	Date
Code Administrator Consultation (1 month)	18 December 2023 to 5pm on 18 January 2024
Draft Final Modification Report issued to Panel	14 February 2024
Draft Final Modification Report presented to Panel	22 February 2024
Final Modification Report issued to Panel to check votes recorded correctly (5 working days)	27 February 2024 to 04 March 2024
Submission of Final Modification Report to Ofgem	26 March 2024 (in line with the other CATO mods)
Ofgem decision date	Expected Q2 2024
Implementation Date	10 WD after Authority decision



Draft Final Modification Report

GC0154: Incorporation of interconnector ramping requirements into the Grid Code as per SOGL Article 119

Jonathan Whitaker, Code Administrator

GC0154 - Solutions

Summary of solutions:

- The Original solution introduces to the Grid Code a new section on Interconnectors ramping, limiting it at 50MV/min
- The WAGCM1 solution introduces to the Grid Code a new section on Interconnectors ramping, limiting it at 100MV/min
- Both the Original and WAGCM1 address a required change as driven by SOGL, which is a European Network Code.
- There was a distinct difference of opinion within the Workgroup on the approach to the solution.

Code Administrator Consultation Responses

Summary of Code Administrator Consultation Responses :

Code Administrator Consultation was run from 06 October 2023 to 07 November 2023 and received 11 non-confidential responses and 0 confidential responses. There were a significant volume of comments made within the responses, but the key points were:

- Three respondents preferred the Original Proposal, seven respondents preferred WAGCM1, and one respondent had no preferred solution.
- Four respondents stated that they support the proposed implementation approach, with seven respondents not supporting the proposed implementation approach.
- Nine out of eleven respondents believed that GC0154 impacts the Electricity Balancing Regulation (EBR) Article 18 terms and conditions held within the Grid Code.

GC0154 – the asks of Panel

- **NOTE** that this Modification does 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

GC0154 – Next Steps

Milestone	Date
Final Modification Report issued to Panel to check votes recorded correctly	15 December 2023 – 22 December 2023
Submission of Final Modification Report to Ofgem	03 January 2024
Ofgem decision date	TBC
Implementation Date	10 WD after Authority Decision



Implementation Update

Grid Code Development Forum – Previous and Next

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

GCDF cancelled due to lack of agenda items.

10 January 2024 (Deadline for Agenda items - 3 January)

Final Agenda items TBC, but will include:

Non-material Grid Code clarification Housekeeping amendments

A presentation will be shared in relation to a number of non-material Grid Code Housekeeping changes (including ensuring consistency between the Connection Conditions and European Connection Conditions), in preparation for a Grid Code Modification that will be raised following the presentation.



Standing Items

- Distribution Code Panel update (Graeme Vincent)
- JESG Update (information only)
 - Meeting on 12 December cancelled due to lack of agenda items.
 - Next meeting – 09 January 2024

HND

West Coast T-point

Bi/Tri-lateral discussions with involved parties. OWF connecting to DC network at switching station. Still on-going.

Master Controller

Discussions yet to be had. Being set-up. Medium to long time before we expect explicit mods

SQSS

Putting together proposal for mod – expanding definition allowing for connection to multiple interface/grid entry points. Looking to take to panel in Jan



Updates on other industry codes



Electrical Standards

Electrical Standards and documentation Update

Haarith Dhorat

Correction to Gate Closure Period and BM Window

- The current version of the BETTA Despatch Guide states that the Gate Closure Period is 3.5 hours.
- This has been amended to 1 hour in the proposed version as well as subsequent amendments to the length of the BM Window to reflect the maximum length of a BOA.

Documents to update

[BETTA - Despatch Instruction Guide](#) - update section 2.4 with correct duration of Gate Closure Period and BM Window.

Rename Pathfinders to Network Services Procurement

- The ESO developed the Pathfinder programme to procure system services (Stability, Voltage and Constraint management).
- This was to ensure that the ESO will be able to meet the operability challenges as we move to a zero carbon future.
- A number of tenders have been completed under the Pathfinder programme, some of which are now in service and others to begin in the next few years.
- As we have now established routes to markets for these services, we are renaming Pathfinders to Network Services Procurement.
- To reflect this, minor updates have been made in several places in the BETTA Despatch Instruction Guide.

Background

Stability – instruction codes for Short Circuit Level

- The ESO procures stability services – previously through Pathfinders and going forward through dedicated stability markets.
- The main capabilities that are sought are inertia and short circuit level (SCL).
- The service is open to all forms of technologies – Pathfinders has awarded contracts to synchronous condensers/compensators as well as to Grid Forming Convertor (GFC) based solutions.
- For synchronous machines, inertia and SCL are provided together and inherently when the machine is synchronised to the network. However GFCs could separate the provision of inertia and SCL allowing flexibility to the ESO to specify what capability we require.
- We intend to implement a day ahead stability market where more GFC units may be contracted and foresee a need to access this flexibility.

What are we proposing?

- Use EDL reason codes to specifically instruct GFC based units to turn on/off SCL capability.

SCL – Unit instruct to turn on SCL capability

SCO – Unit instruct to turn on SCL capability

These codes would be issues by ESO control room based on system conditions and needs.

The current MNV and MNS codes will continue to be used to instruct GFC units for inertia delivery.

Documents to update

- The below Technical Standards of the Grid Code will need updating:

[EDL Instruction Interface – Valid Reason Codes](#) - add new codes to the list in section 2.

[BETTA - Despatch Instruction Guide](#) - a new section 4.5.3 will be added to outline how the reason codes would be issued.

Why change?

- New forms of technology that have flexibility in how they can operate will allow the ESO to better optimise what units are instructed for.
- We intend to implement a day ahead stability market where more GFC units may be contracted and foresee a better way to access this flexibility.

When we expect these changes to be in place

- The first GFC unit contracted under Pathfinder Phase 2 is due to go-live from Q1-24/25, with further units over the following months.
- An IT change to EDL is planned for May 2024 to add the two new codes.

Background

Voltage – instruction codes for switching between Static and Dynamic mode

- Through Pathfinders, ESO has contracted with a number of units for reactive power capability to allow the ESO to manage system voltage.
- The reactive power capability can be provided either as a Static service (Constant MVAR) or Dynamically (Constant Voltage)
- Some units may have the capability to operate in both modes which the ESO may choose to use based on system conditions.

What are we proposing?

- Edit the text in 4.5.1. of the BETTA Despatch Guide to set out how the current VQV and VQO codes would be used where a unit can operate in both static and dynamic modes.

VQV – Start deliver of static reactive power service

VQO – Cease static mode and start dynamic reactive power mode.

These codes would be issues by ESO control room based on system conditions and needs.

Where a unit can only operate in either mode, VQV shall be the code for service start, and VQO for service cease.

Documents to update

- The below Technical Standards of the Grid Code will need updating:

[BETTA - Despatch Instruction Guide](#) - update to text in 4.5.1.

Why change?

- Certain technologies may have the capability to operate in both static and dynamic reactive power modes, which provides flexibility to the ESO on which mode to use based on system needs and conditions.

When we expect these changes to be in place

- No IT changes are needed as the codes have been developed for use through EDL.
- ESO are currently tendering for new voltage services and considering reactive power markets which may suit technologies with this flexibility.



Any Other Business



Digitalised Code Management

Update

Teri Puddefoot

Process Update

4

ADAM
partners to
issue mini
tender

2

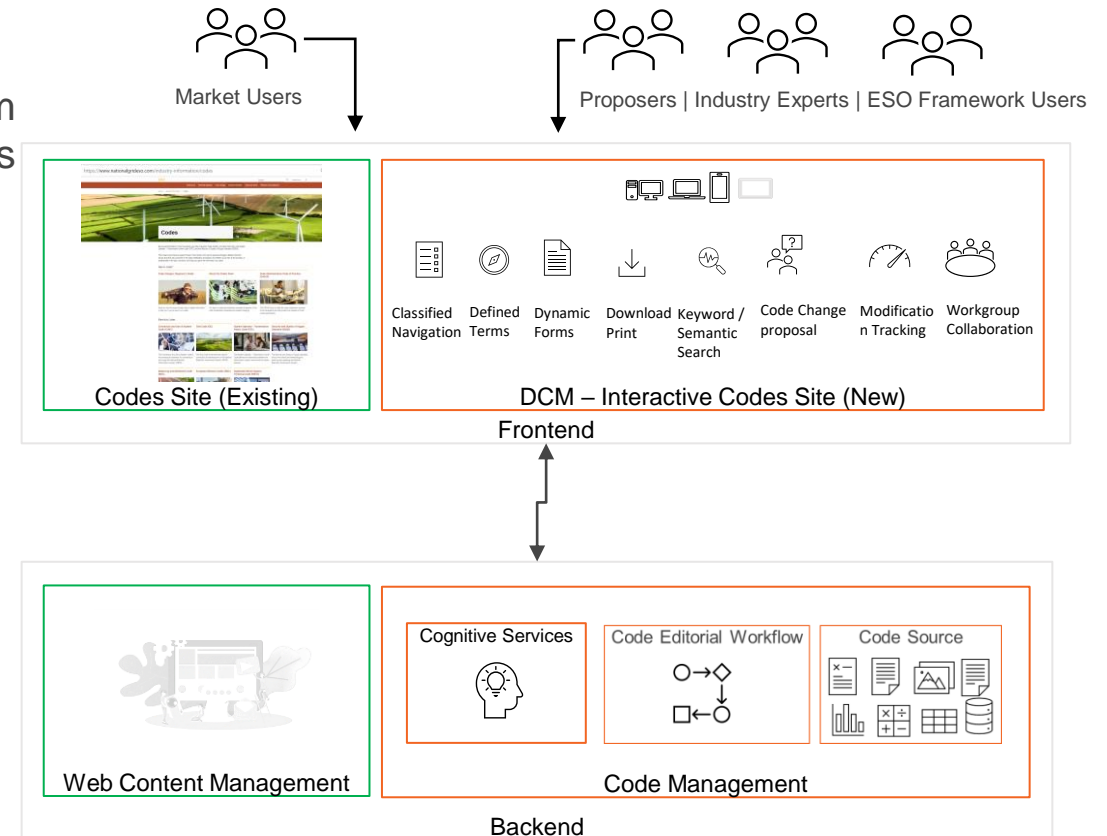
Suppliers taken
through to final
validation sessions

Project needs not
met by suppliers
and mini tender
cancelled

Project moved in-
house with
resource support
from suppliers

Digitalised Code Management – End Target Digital Solution

- Delivering best customer/user experience underpinning digital technologies
- Extending the existing codes website hosted on nationalgrideso.com to deliver interactive digital applications on web and mobile channels and multi-platform touch points
- New interactive web application that will deliver all the new features and existing content using Single Sign On and seamless look and feel
- Using Design Thinking concept to define the user experience that drives the technology selection for best user adoption
- Using de-coupled digital architecture to keep the user experience and technology changes independent of each other
- Technology design includes cloud native, omni channel and highly scalable solution
- Considering use of cognitive and controlled open AI concepts to take advantage of artificial intelligence
- Product development approach and agile ways of working suggested for the delivery. The rollout new application as a minimum viable product (MVP). The MVP to be scaled in phases



Legend: New Existing

MVP Functional Scope (Day 1) at high level

- 1. Design(UX) end to end customer/user experience for DCM that includes frontend and backend process for all personas**
- 2. Building a new DCM Frontend that includes:**
 - Digitalisation (Interactive Website) of Code Grid Code.
 - Digitalisation to include definitions and easy to access defined terms interactively
 - Hyperlinks to reference material and other codes to be available
 - Digitalisation of code to tidy up the formatting issues currently exists in Grid Code pdf
 - Digitalisation to include the forms as electronic/digital forms that can be downloaded
 - Any code changes that are published as per the current process to be reflected/updated to the digitalised new Frontend in real-time

Enduring Solution – Scope at high level

1. Cognitive Search

- Advanced Search functionality

2. DCM backend workflows - this includes all the related processes to continue as-is:

- Code change proposal process
- Code administration change process including all the existing tools to be used e.g. Word document, SharePoint, Outlook, Teams etc.
- Publishing Grid Code changes

Next Steps

- Workshops held with the project team to align on scope and MVP vision
- Iterative design sprints and testing
- Confirm enduring solution – What and when
- Continued work on Workflow and advanced search
- MVP 31st March 2024

Activities ahead of the next Panel Meeting

Modification Proposals to be submitted	10 January 2024
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Papers Day	17 January 2024
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Panel Meeting	25 January 2024 Faraday House
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Close



Jamie Webb

Acting Independent Chair, Grid Code Review Panel