



Autumn Markets Forum

Markets Roadmap: What next?

18th November 2021
NGESO Markets

Agenda

- Markets Roadmap
- Response
- Reserve
- Stability Market Design NIA
- Q&A
- Feedback

Markets Roadmap

Our ambition is to design market arrangements that facilitate security of supply at the lowest sustainable cost for customers, while enabling the transition to Net Zero.

- We published our [Markets Roadmap](#) at end of March 2021, which received positive feedback from our stakeholders. The publication provides transparency for our plans to deliver market change.
 - Sets out our development and design principles for how we will shape future market arrangements.
 - Communicates our vision for what 2025 and beyond could look like across these markets, and our plans that move us towards this vision.



Markets Roadmap

- Markets Roadmap will be an annual one-stop-shop document complementing the information shared via our other publications and ESO business plans.
- We are aiming to publish the second version of Markets Roadmap towards the end February 2022.
- The Roadmap explores the existing seven market areas, and:
 - Explains how the markets for different products operate.
 - Investigates direction of travel and future trends.
 - Focuses on the interactions between ESO and wider industry markets that we see as being important to deliver coordinated change.

Response

Reserve

Stability

Thermal

Voltage

Restoration

**Balancing
Mechanism**

Response Reform Recap

- New frequency response products have been designed to replace the existing services
- Three new response services:
 - **Dynamic Containment – DC** (Low frequency launched Oct 2020, High frequency launched Nov 2021)
 - **Dynamic Regulation – DR** (expected to launch on EPEX platform - March 2022)
 - **Dynamic Moderation – DM** (expected to launch on EPEX platform - April 2022)








Dynamic Moderation & Dynamic Regulation



Consultation support:

- Service Terms video
- 1-2-1s on consultation documents

DM and DR Procurement Overview

-  **Procurement:** DM and DR will be procured alongside DC on the existing platform via day-ahead auctions at 14.30, with delivery by EFA blocks
-  **Payment:** All services will be settled on a pay-as-clear basis
-  **Unit cap:** Initially, there will be a unit cap of 50MW for both DM and DR
-  **Volume cap:** Each product will have a volume cap of 100MW, e.g. 100MW DML and 100MW DMH
-  **Bidding:** All the bidding capabilities from the DC auctions, such as linked families and looping, will be available for DM and DR ([more information](#))
-  **Stacking:** For Day 1, participants will be able to deliver only one of the three services (DC, DM, or DR) per EFA block
-  **Co-optimisation:** Future co-optimisation of services is currently under review

Stacking and Looping Bids

- **'Stacking'** is defined as the simultaneous delivery, or simultaneous availability to deliver, more than one frequency response **service** by a single unit
- No conditional acceptance
- Stacking options **for the same EFA period** are the following:
 - Stacking with BM - **allowed**
 - Stacking Low and High products within the same service – **allowed**
 - Stacking across different services – **not allowed**
- **'Looping'** can be used to link bids from the same unit but between different **products**, with the requirement that both products are cleared, or neither
- There is conditional acceptance of blocks
- Looping options **for the same EFA period**:
 - Looping Low and High products within the same service – **allowed**
 - Looping across different services – **not allowed**
- Looping different services is only allowed on different EFA periods
- More information on Looping rules can be found on the DC website

With the current service design, stacking across different services is not allowed and looping different services is only possible on different EFA periods

DM & DR – Next Steps

Consultation support:

- Consultation overview webinar – 23 November
- Consultation technical deep dive webinar – 30 November
- For 1-2-1s, contact: box.futureofbalancingservices@nationalgrideso.com

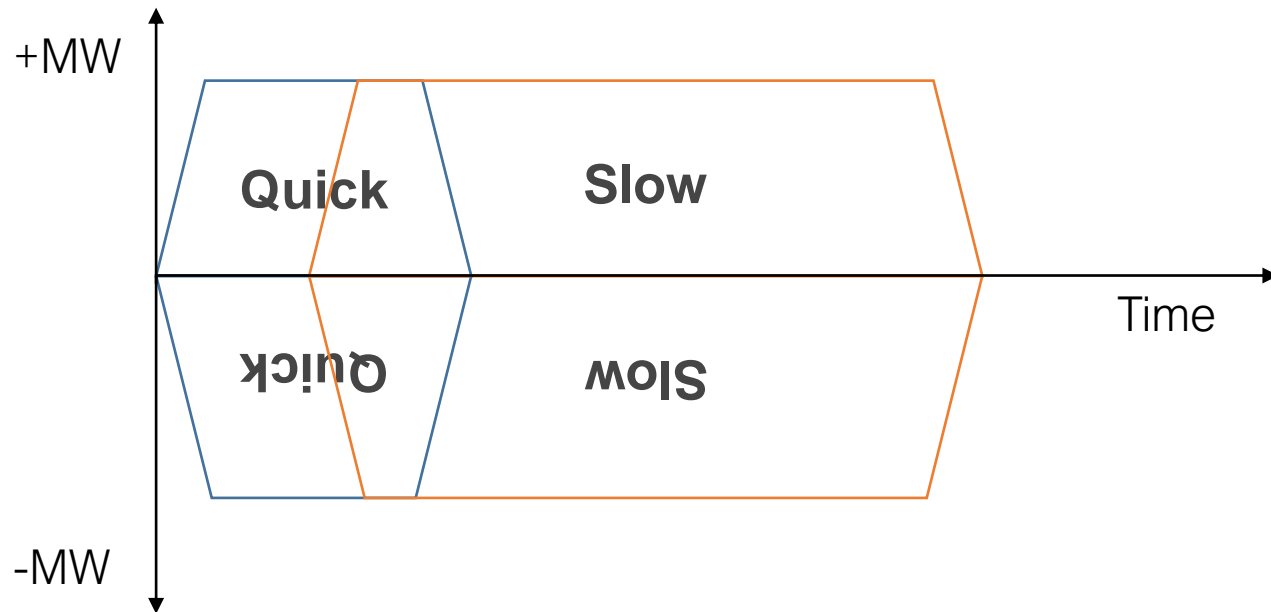
For more information including links to register for webinars and the consultation documents, please see the DM and DR webpages

Reserve Reform Recap

- To reach net zero, we need competitive markets which unlock new flexibility and secure the future operation of the electricity system
- New Reserve products are being designed to replace the existing services: STOR and Fast Reserve
- Four products are earmarked for development:
 - Quick Reserve (Positive & Negative)
 - Slow Reserve (Positive and Negative)

New Reserve Products

- Negative Slow Reserve (NSR) is the first product to launch in Spring 2022, followed by Positive Slow Reserve (PSR) and Quick Reserves



Quick Reserve:

Full output within 60s of instruction.
2-minute minimum activation time
20-minute maximum activation time

Slow Reserve:

Full output within 15 minutes
Up to 30-minute minimum activation time
120-minute maximum activation time

NSR - Delivery

- In our webinar on 04 November, we shared some enablers which need to be in place on Day 1 for NSR service development:
 - IT infrastructure upgrades are required, including scheduling and dispatch processes for negative reserves
 - A baselining solution needs to be developed for visibility and control of non-BM assets
- We would like to share our minded-to product and service design for Day 1, launching Spring 2022
- More NSR functionality will be delivered in later product releases

NSR – Product Design

- To provide post-fault coverage for mitigating large demand losses on the system (e.g. interconnector trips)
- To provide downward flexibility during low-demand periods

Product Criteria	Specification
Minimum Unit Size	1MW
Full Activation Time	Full output at 15 minutes from instruction
Minimum Activation Time	Up to 30 minutes, as specified by providers
Maximum Activation Time	A minimum of 120 minutes
Maximum Recovery Period	A maximum of 30 minutes

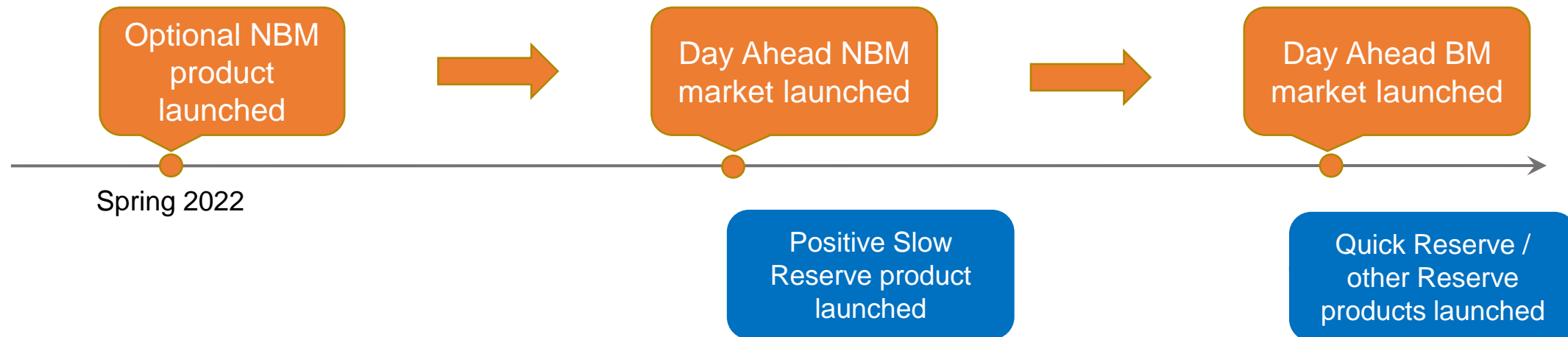
NSR – Day 1 Service Design

Product Criteria	Day 1 - Spring 2022	Day 2
Market Window	Optional windows only	Contracted availability windows + optional service
Availability Pricing	N/A*	Pay-as-clear (Day-ahead)
Utilisation Pricing	Pay-as-bid (Within-day)	No Change
Dispatch Solution	BM – BOAs Non-BM - ASDP	No Change
Linking of Bids	No linking of bids between products or procurement windows	To be reviewed
Stacking	No stacking with other ancillary services	To be reviewed
Operational Metering	1Hz	No Change
Performance Metering	1-minute	No Change
Aggregation rules	GSP Group	No Change
Baselining	60-minute nomination baseline	Further Engagement

*Availability pricing will be introduced as part of the product backlog which will deliver a day-ahead availability auction.

NSR – Agile Release Schedule

- NSR Release 1 will launch an optional service on Day 1
- Additional NSR functionality will be delivered in later releases alongside development of Positive Slow Reserve and other new Reserve products



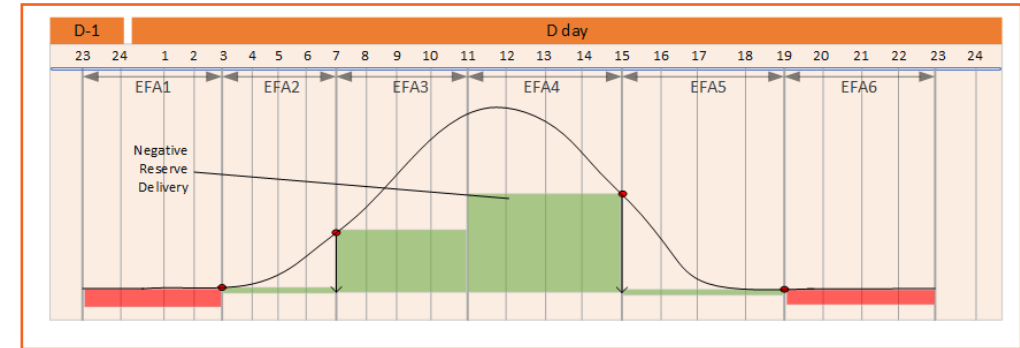
Signaling Our Requirement for Downward Flexibility

- There is a 24/7 requirement for negative reserves
- Volume requirements are being driven by the largest secured demand losses, including interconnectors when exporting from GB
- North Sea Link 1400MW, IFA-2 1000MW, Britned 1000MW
- A more granular forecast of requirements will be shared ahead of NSR launch
- As with Optional Downward Flexibility Management (ODFM), NSR could also be utilised during low-demand days, as experienced during the Covid-19 pandemic

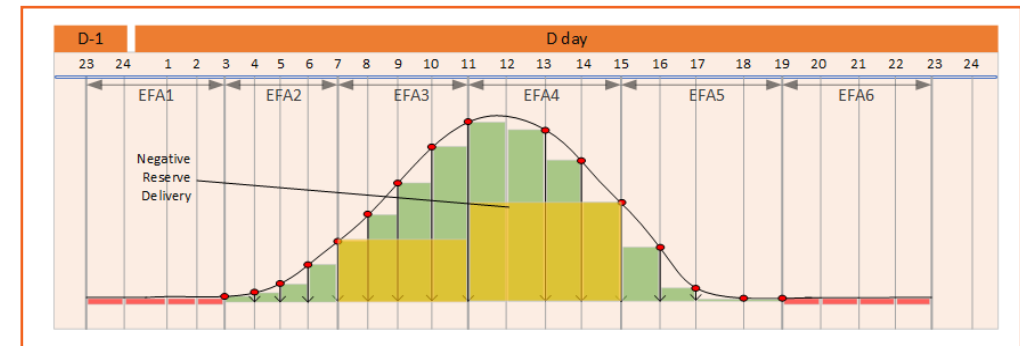
NSR – Procurement Window Options

- Length of windows will determine the capacity which some market participants can offer throughout the day
- Our aim is to attract new market entrants to enhance market depth, increase liquidity and reduce costs
- Impacts on ESO systems and ENCC situational awareness must also be considered

4-hour service window



1-hour service window



NSR – Next Steps

- Provide detail of functionality for Release 1 in December 2021, including a launch date for EBGL A18 consultation
- We also aim to provide an estimate for Release 2 as soon as possible

Grid Stability - Background

Historical

Where are we coming from?



Historically, stability was provided as a by-product of generation.

Today

Where are we today?



Rapid growth in renewables, retirements of synchronous generation and changes to the structure of demand will result in heavier reliance on proactive system stability management by the ESO.

The management of grid stability has become increasingly expensive and we are exploring new commercial options for stability services

Future

Where are we going?



The ESO has set an ambitious target to be capable of running the GB system on zero-carbon electricity by 2025.

We need to define the optimal design for a potential future stability market.



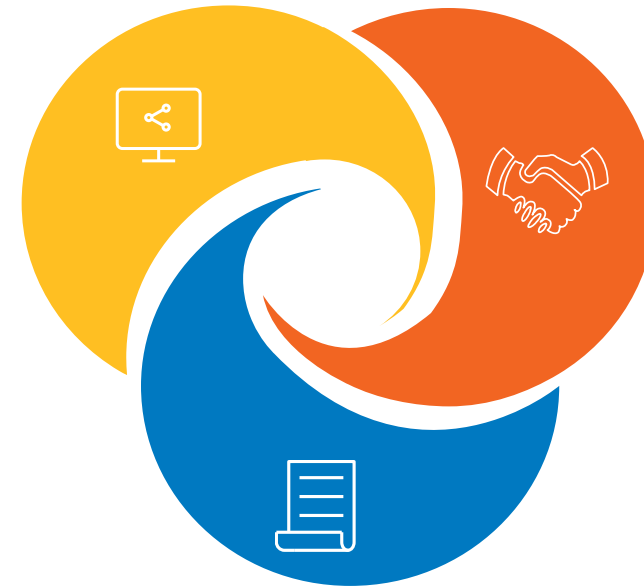
Purpose of stability market design NIA project

As the system decarbonises, it loses the inherent sources of stability that it once relied on. We need to procure this shortfall in stability from alternative sources. However, the optimal market design for procuring such services is not yet known.

- The Stability Market Design project is a research innovation project, looking at how to optimise a potential market for stability through a mix of long- and short-term procurement
- We are looking to work with our customers and stakeholders to develop and assess various design options, aiming to reach a high-level recommendation by March 2022

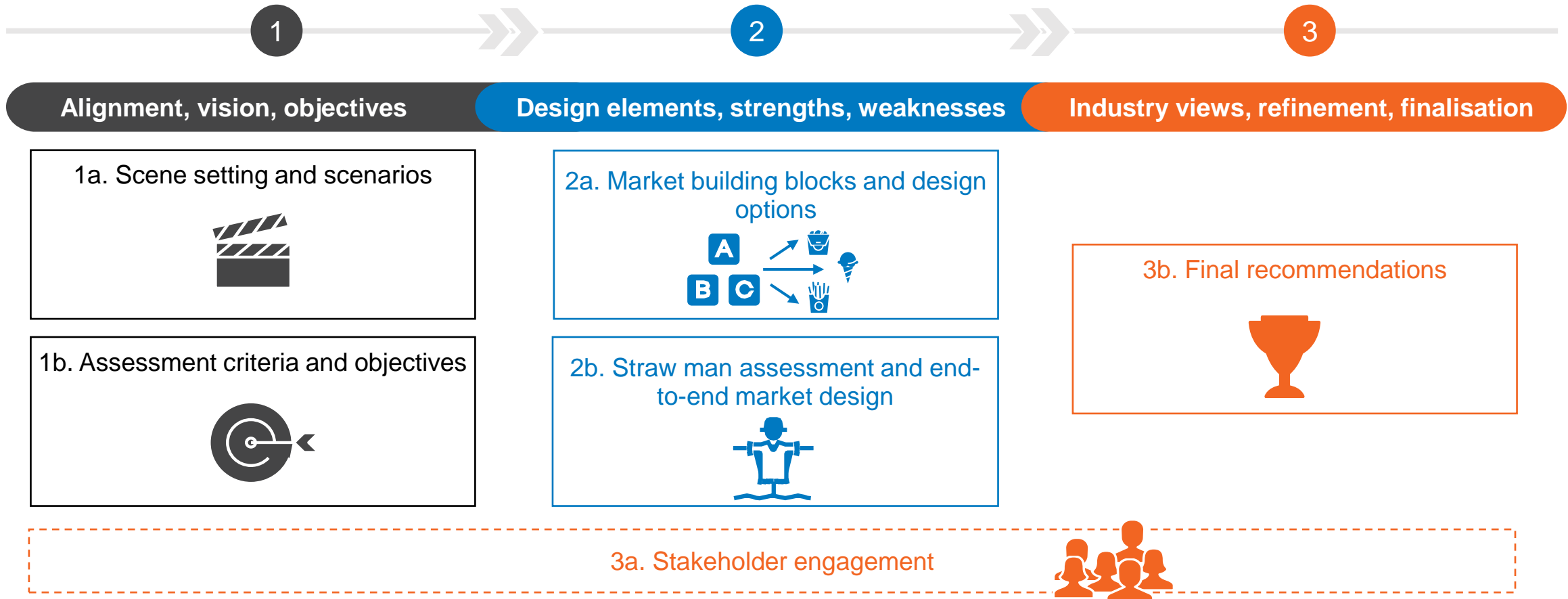
Innovation project,
study-based

Engaging with
wider industry



Started in Sept
2021 - aim to finish
by March 2022

Core scope of work and overview of activities



Stability Market objectives framework

Primary objectives

Ensuring **cost-effective provision** of services needed to **maintain system stability and security** in the interest of consumers and to be able to operate a zero-carbon grid.

Secondary objectives



Practical: ease of implementation, operation and transition



Enduring (stable): suitable and adaptable to future challenges



Freedom of choice: giving freedom in the market, ensuring liquidity and mitigating market power.



Transparent: visibility of service values and clear procurement decisions



Investable: respecting existing and supporting efficient future investments



Level-playing field: Providing fairness to providers and being non-discriminatory between technologies with equivalent capabilities.

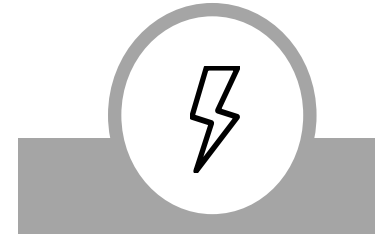
Stability Market Building blocks



Timeframe



**Pricing
mechanism**



Eligibility



Bundling

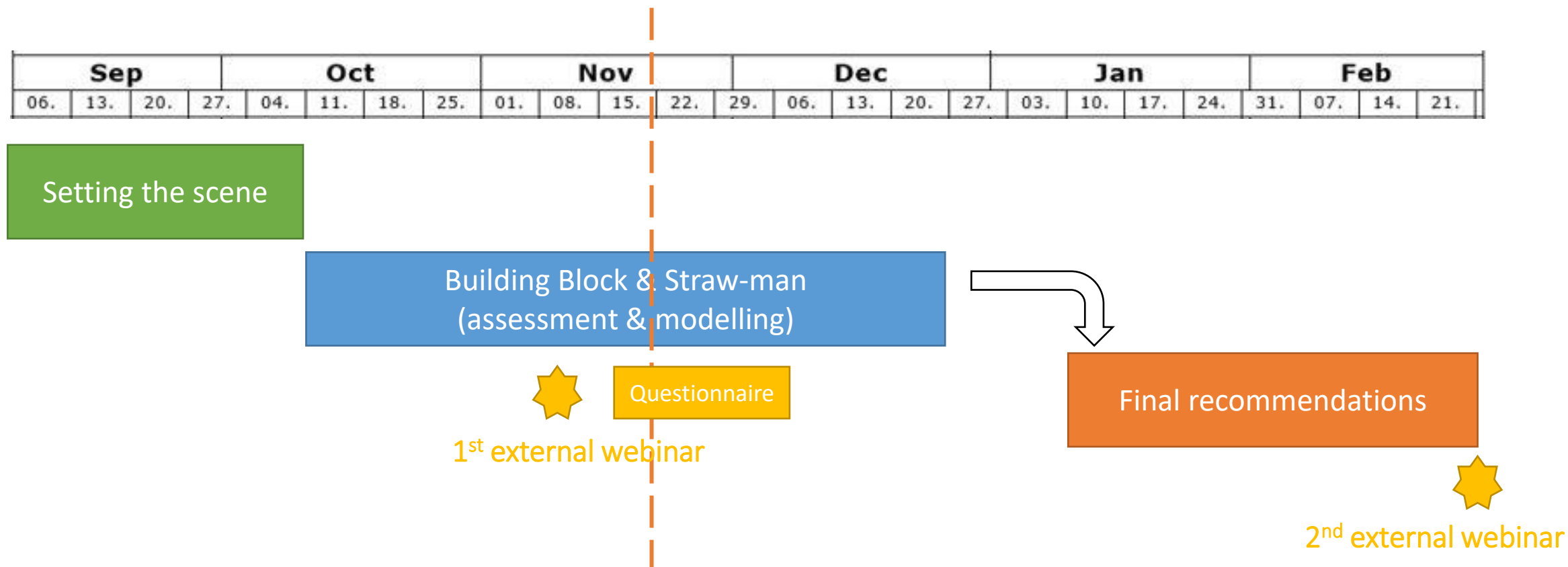


**National &
locational spec.**



Product definition

Stability Market project timeline



- The questionnaire and the recording of our 1st webinar are available: <https://www.nationalgrideso.com/future-energy/projects/stability-market-design>

Contact us

If you have questions or comments about Reserve or Response product reform, please contact us at .box.futureofbalancingservices.com

Stability Market Design

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Q&A

Q&A

- **Are the markets on agenda slide really separate? As volumes of requirement increase so would (you'd expect) the interaction between them.**
- There are many interactions between our operability requirements and between the markets that we run to procure these requirements. Our Operability Strategy Report and Markets Roadmap both aim to highlight these interactions, and our markets need to be designed to reflect these interactions. Of course interactions are not just between ESO markets, we also need to consider wider market and policy interactions, e.g. wholesale market, CM, CFD, DSO markets etc. Our Net Zero Market Reform programme and our Markets Roadmap publication will be working to more clearly identify these interactions, so we design markets that are optimised across the whole system.
- **What does 'lowest sustainable cost' mean in this context?**
- Our markets aim to deliver lowest cost for consumers, both now and in the future. This is driven through competition, but also transparency and investor certainty. This is a difficult metric to define, and we are working hard to tighten our market design principles so we can both achieve this lowest cost ambition, but also so we can track our performance against it.
- **Could you also publish a rolling roadmap or tracker - perhaps monthly updates - because the delivery dates keep moving. Elexon did this for EU Network Code implementation.**
- Good idea, we have a monthly future of balancing service newsletter, this could form part of this, we will look into it.

Q&A

- **To what extent will DC, DR and DM be stackable?**
- Stacking with the BM and stacking low frequency and high frequency products within the same service are allowed for “day one”. Stacking across different services (DC, DM and DR) will not be permitted for "day one". Detailed examples of the different bidding options can be found in the slides of the consultation overview webinar which have been published on the DM and DR pages on the [ESO website](#).
- **While designing level playing field, is NG considering some kind of engagement or early dialogue with OEMs / technology providers/ supply chain stakeholder so services can be procured on time**
- Yes, this is a good idea. We will take this into consideration, we recognise how crucial it is to have a supply chain primed and ready.
- **Can you please explain why we are unable to stack, for example DCL and DMH? They are responses in different directions.**
- For the "day one" launch, we are focusing on embedding the services to allow us to test the performance of the product alongside the rest of the control room's toolkit in a safe, controlled manner. We're introducing new services onto the system, as a prudent system operator we want to ensure that the performance of the service as designed is delivered by participants and operates as expected, hence starting without stacking across different services. Our auction capability is being developed under our RIIO-2 business plan and we will be exploring optimisation through that.
- **Will aggregated distributed resources be able to take part?**
- [Assuming this refers to DM and DR] If they pass testing and are within the GSP group regarding aggregation, and they are above the 1MW threshold. The technical details of the service can be found in the consultation documents on the DM and DR pages on the [ESO website](#).

Q&A

- **Has a decision been made about closure of FFR? can you give us an update on what the plan is?**
- We will be steadily reducing the volume of FFR procured as we increase the volume of our new services. We acknowledge there will be a period of time where FFR and the new response services will be procured in parallel, and that is a conscious decision we are making to ensure the system is secured. To find out more information on our volume requirements during the next few months, please access the monthly Market Information Reports, which are available on the ESO Data Portal.
- **Is NSR going to replace ODFM for next year?**
- Whilst NSR is a different product for post-fault frequency recovery rather than energy balancing, we foresee NSR being used in low demand days if that is the most economic solution.
- **So day 1 is ODFM?**
- No, it's a different service and will be used more frequently.
- **Why is it pay as bid? I thought ESO was moving to pay as clear for services that are competitive. You refer to "real price of energy" why is this different in one market than another?**
- PAB for utilisation as we believe that the Pricing Proposal allows for it, once Ofgem agree it. This aligns with the BM, which is PAB and is the route for optional for BM. PAC will be used for availability.

Q&A

- **Is NSR going to move to EFA block procurement?**
- Not sure yet, we are still exploring how we structure service windows.

- **What interactions have you had with industry since original proposal & what analysis has been shared?**
- We ran a consultation in March, several workshops in May. Requirements analysis has been done to understand how much negative reserve we need to maintain system security, this will be shared as part of our procurement strategy.

- **Reserve and Response products - will Power Available signal be integrated into the product design?**
- Not on Day 1, but it would be good to explore this with industry and our internal teams, as part of our product backlog and future development.

- **I hope you realise an optional market for BM assets is commercially pointless**
- BMUs will continue to offer downward flexibility through existing Bids and Offers so there won't be a separate optional market for BMUs. Non-BM participants will submit optional bids through ASDP.

- **Will negative STOR be used in preference to the BM or in price merit?**
- As with other services, we calculate the alternative cost to ensure services are procured and dispatched in merit order at lowest cost to the end consumer.

Q&A

- **Do we expect to see lower volumes of BM bids with the release of NSR?**
- BMUs will continue to offer downward flexibility through existing Bids and Offers.

- **How do you anticipate the negative and positive reserve products will impact BM markets? I imagine you've done some analysis**
- Products will be used for balancing where they are economic, however as the requirement is for post-fault this should have less of an impact. We will keep under review.

- **The operational transparency forum has discussed issues with NGENSO relying on reserve from assets behind B6. Is that going to be a problem for assets wanted to participate in new reserve markets?**
- No because they are turned down, but this may be an issue for positive reserve products.

- **Surely the first objective of a stability market is that it delivers network stability - market stability is surely a function of that. What are the tests and process aspects to ensure that?**
- This is included in our primary objective for Stability Market Design; our aim is to "maintain system security and stability". As part of the project, we will assess different market design options against this objective framework with a combination of qualitative and quantitative analysis.

- **What are the physical products to be traded in Stability Market?**
- We will be procuring inertia, short circuit level and dynamic voltage.

Q&A

- **With the rise of smart charging and V2G, interested in how EVs will be included in these new products?**
- Our stability requirements are assessed for the transmission system for which transmission system solutions are most effective. Solutions at lower voltages in the distribution network are less effective due to high impedance between transmission and distribution system. DER (including EVs), depending on their location on the network may have limited impact on the transmission system. Depending on the location of our system needs which is the highest transmission system voltage, we do not see DER solutions to effectively address our transmission system stability issues. It is expected that any potential stability provider will be required to meet all requirements of GC0137 that will be shortly incorporated into the GB Grid Code.
- **If eligibility for stability is not uniform for all users then there is no level playing field**
- As part of the objectives for a potential future stability market we aim to review eligibility criteria and ensure technology neutrality, but also to ensure the most efficient solution.
- **Plenty of conferences are happening in a hybrid way. Energy UK and Renewable UK have done that recently. Some shared learnings could be undertaken maybe?**
- We aim to hold the next Markets Forum in person and will reach out to Energy UK and RUK to understand how their hybrid events have worked. We will adopt any best practice.
- **Will these new services use PAS or are you creating a new system - considering your go live dates we don't really have any time to build these new systems.**
- Use PAS/ASDP.

Q&A

- **Having a 120min max run duration for Negative STOR rules out pretty much all batteries, why would you limit who can participate?**
- Products are designed first and foremost to meet operability needs, we are not designing products to access certain technologies. We need a product that is at least 89 minutes long to cover the longest possible time for accessing alternative energy through BM warming. If batteries have sufficient energy then they are welcome to participate.
- **Fundamentally it is not logically consistent to salami-slice inherent capabilities of synchronous generation & state - "cannot be stacked". Self evidently they can, its a question of selection/priority**
- For the purposes of the service design, we are not permitting stacking of products at this time.
- **Will NSR be delivered in time to secure against the low demand days that ODFM was used for i.e. bank holidays?**
- The main driver for the NSR volumes is large demand losses rather than low demand conditions, but we are aiming to deliver in time for this.
- **The other thing that's becoming more fluid is how quickly network req. change priorities over what services are needed. Identify & transitioning the service mix non-trivial & needs to be in mkt design**
- Thanks - first and foremost when we are thinking about products we are looking to provide least cost operational solutions for our control room. We constantly evaluate the fluidity of the evolving operational landscape and how we optimise between existing and any gaps for future products.

Q&A

- **Will NSR participants benefit from both Availability/Utilisation payments like current STOR?**
- On day 1, the service will be an optional-only service which will pay for utilisation only. A day-ahead auction which will pay providers for availability will be delivered as priority for day 2.

- **Do you think a real-time D-1 stability market is needed to prevent panic buying and large shifting of the generation stack at higher prices in the BM?**
- We are exploring the possibility of a short-term stability market as part of our innovation project.

- **Is there any consideration of relaxing/reconsidering the technical requirements to allow the growing amount of aggregated distributed resources to take part?**
- We will be further developing ancillary services; the first step is to deliver the "day one" requirements for response and reserve that enable our operational colleagues to use the service, and for industry to take part in the service. We have certain parameters in place to meet operational needs, but it's likely that some elements of the services can be adjusted once we've used them in an operational environment. Changes/improvements to services are data driven i.e. performance of the service and of providers' ability to meet the specification, and based on feedback from operational colleagues in the ESO and from industry.

Q&A

- **Operability distortions mentioned by ESO - these are being caused/exacerbated in part by ESO itself not contracting on the same basis from all users - different contractual terms for different users**
- Part of our core strategy is delivering Competition everywhere and this is paramount as we design our enduring suite of products. Standardisation and mechanisms to deliver this is key. We utilise standard framework terms for the delivery of ancillary services
- **Existing STOR tends to be left behind unused as reserve in favour of higher priced BM units, would the same be true for NSR?**
- We run plant in merit order so long as we can continue to access sufficient Reserve MW post-fault within the required timescales. This means that we may sometimes synchronise more expensive plant at longer notice to be able to maintain access to contracted Reserve in real-time. The same may be true for NSR and will interlink with our requirements and procurement strategy.

Thank you