Demand Side Flexibility Routes to Market Review

Stage 2: prioritisation

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Contents

Executive Summary

This report updates our progress on stage 2 of the NESO Routes to Market Review for Demand Side Flexibility. In this second stage, we report on the outcomes of our engagement with industry and set out our approach to prioritising the removal of barriers for demand side flexibility to participate in NESO markets.

Industry response to our questionnaire published for stage 1 in June 2024 informed our work in this stage. We elaborated our barriers matrix which outlines the barriers to participation, and we improved our understanding of the archetypes (technology capabilities and market sectors). Industry feedback guided our formulation of evaluation criteria to help prioritise the barriers for further analysis and ultimate mitigation.

The application of these criteria led us to identify five services which will be prioritised to enable participation by demand side flexibility. These are the Balancing Mechanism, Slow Reserve, Balancing Reserve, Static Recovery and the Demand Flexibility Service. Demand turn up has also been identified as a cross cutting priority theme that is impacted across a number of services.

Two of these services (Slow Reserve and Static Recovery) are not yet released, and there is a renewed focus on ensuring their design easily admits participation by demand side flexibility from their launch.

This report sets out how NESO will tackle barriers across NESO markets. We will be collaborating with Elexon as the Market Facilitator, DNOs, Ofgem and DESNZ on resolving barriers across all markets and value streams for demand side flexibility. A key indicator for success will be seeing a material increase in volume of demand side flexibility participating in our services.

We will be holding a webinar and Q&A on the 29th January to present a summary and next steps.

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Executive Summary – Prioritisation

Barrier Pool
- Barriers including feedback from stage 1

Distinguish "requirements" vs "barriers"
- Some technical parameters are critical for our system security, thus they are not "barriers", for example, Time to Full Delivery.

Prioritise services based on value
- Services are prioritised based on their "Value" for both NESO and participants.
- Barriers related with retiring services (such as STOR and Static FFR) will be deprioritised. Efforts will be made on ensuring their replacements are inclusive instead.

Filter out barriers outside NESO remit
- "External Coordination" criteria will be used to separate barriers outside NESO's direct control as it is not in NESO's gift to decide the priority, we will collaborate with relevant parties to influence.

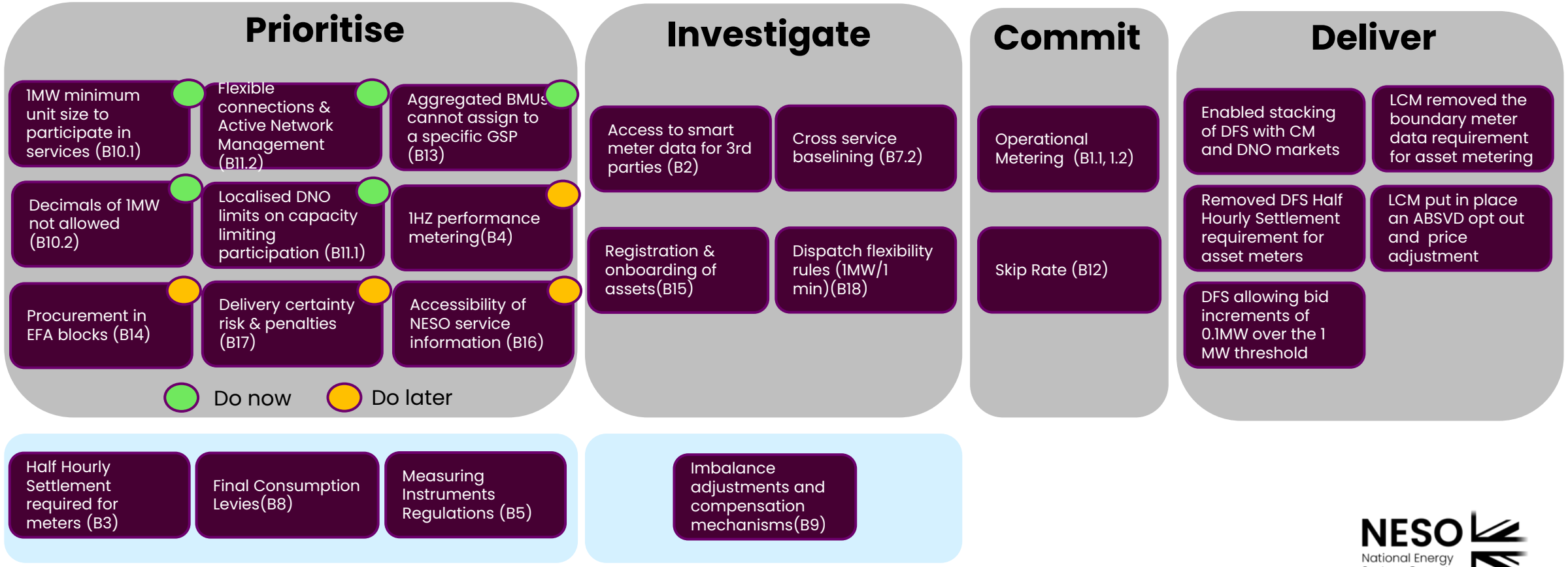
Filter out barriers already in Investigate/ Commit stage
- The barriers in Investigate/ Commit stage have been prioritised, no need to re-prioritise them.

Categorise barriers into "do now" or "do later"
- Depending on the importance of the barrier to the five prioritised services.

Final prioritisation result
- Barriers identified as "do now" will be prioritised for further investigation.

Executive Summary - Barriers

In the table below we have outlined where each of the identified “priority” barriers sits across our barrier removal process. We have also outlined whether NESO is in direct control of solving the barriers(or some of the options to solve the barriers) or whether the barrier is outside of our direct control, and where we can influence, such as policy, regulation or codes.



Introduction

Routes to market review objective

This report is a part of the second stage of the NESO Routes to Market Review for Demand Side Flexibility, that seeks to remove barriers for demand side flexibility in our flexibility markets.

Our definition of Demand Side Flexibility refers to flexibility across all consumer groups (domestic, industrial, commercial, and public sectors). It incorporates assets and technologies that can increase, decrease, shift demand for, and store electricity.

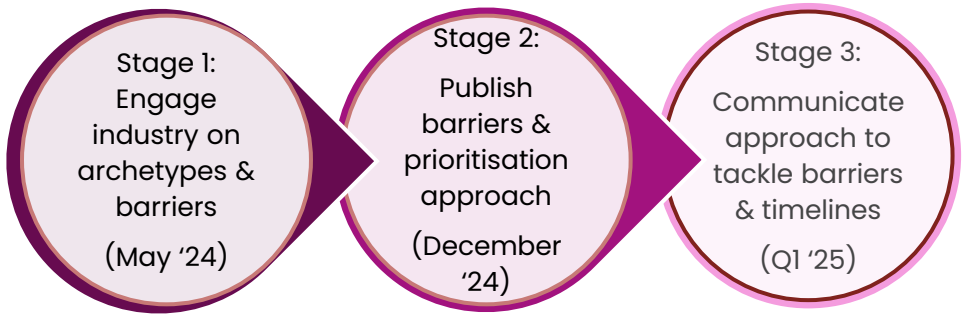
The "Enabling Demand Side Flexibility in NESO Markets" report outlines that identifying and removing barriers is a strategic priority for NESO. Our Clean Power 2030 advice to Government highlighted that we need to ensure that demand side flexibility is enabled to participate in markets where it can meet system operability needs.

This review aims to identify and prioritise barriers, set out our approach to removing them and timeframes for doing so. A key indicator for success will be seeing a material increase in volume of demand side flexibility participating in our services.

Stage 1 – identifying barriers

For stage 1, we developed a set of "archetypes" and mapped the known barriers.

- We then published the archetypes and barriers as part of this "stage 1" review to get industry input on the barriers and associated archetypes.
- We also published a questionnaire in order to get feedback on barriers, archetypes and prioritisation.
- Routes to Market Review Stage 1 published documents:
  - Summary document
  - Archetypes
  - Barriers matrix
  - ESO Service Requirements



Stage 1 Feedback

Stakeholder engagement

In stage 1 of this review, we published a questionnaire with 5 overarching questions in relation to barriers, archetype assumptions & prioritisation, which closed at the end of June.

- We had a total of 16 responses to the questionnaire. This industry engagement ran in parallel with the Flexibility Market Strategy call for input (CFI).
- We held a Q&A session with industry on 5 June 2024 about the Flexibility Market Strategy CFI and included Q&A on the Routes to Market Review.
- We spoke to a number of organisations in 1 to 1 calls about both the CFI and Routes to Market Review, as well as to two industry representative bodies and their members.

We engaged with a wide range of stakeholders across the industry including suppliers, aggregators/VLPs, DNOs, industry representative bodies, technology developers and service providers. We have also been engaging with Ofgem and DESNZ policy teams throughout this process.

NESO actions: Following feedback to simplify our engagement with stakeholders on demand side flexibility and barriers, we will be engaging via the Power Responsive programme going forwards in order to provide a single channel for coordinating communications.

Barriers

There was broad agreement with the barriers published in the barriers matrix in stage 1. Increased transparency provided in stage 1 around barriers was well received and there is a strong desire to see action and outcomes to remove barriers.

We received additional feedback on barriers and pain points we had not outlined in our matrix, as well as more information to help our understanding of known barriers.

NESO actions: Additional barriers have been added to our barriers list. A better understanding of root causes and nature of barriers is helping us to identify and deliver solutions.

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Stage 1 Feedback

Archetypes

We received feedback on specific technology capabilities to improve our understanding. There is also a desire for us to develop a more detailed understanding of "archetypes" including consumer groups and specific technologies, especially in the non-domestic sector. There was also feedback that we need to better understand household and business drivers and not conflate these with technology capabilities. We also received specific feedback on the need to include Customer Load Active System Service(CLASS) in this review.

NESO actions: We are not updating the archetypes for stage 2, and plan to expand our analysis and insight into more specific consumers groups and technologies going forwards, particularly in the non-domestic sector. The Crowdflex project has developed a more detailed understanding of the nature of flexibility from a range of domestic archetypes. For the purposes of this review, we are not including CLASS in scope of demand side flexibility, as the nature and characteristics of CLASS are significantly different to that of demand side flexibility archetypes.

Prioritisation

We received feedback both on how we should prioritise as well as on specific priority markets from stakeholders. Generally speaking, the priority for stakeholders was for us to unlock services where demand side flexibility is ideally suited to participate today, and where removing barriers is least complex.

The Demand Flexibility Service (DFS) & Local Constraints Market (LCM), as well as the Balancing Mechanism (BM), Slow Reserve (SR), Static Fast Frequency Response (FFR) and Short-Term Operating Reserve (STOR) where all seen as priority services to further unlock access.

Generally speaking, stakeholders saw Dynamic Response as target markets (for some demand side technologies) in the coming years but not a top priority currently.

Feedback on how we prioritise included feedback that we should be focused on barriers that exist across multiple services and that we should focus on quick wins.

Some respondents want us to communicate our plan, be transparent about progress, and deliver quickly, even if this isn't fully in line with their own priorities. Other feedback suggested that our focus should be mainly on barriers that are fully within NESO's control.

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Stage 1 Feedback

NESO actions: We have taken feedback on how we prioritise into consideration in our approach to prioritisation, which you can find more information on in the next section.

We have taken forward actions to further unlock DFS and LCM in recent months by removing barriers including enabling stacking of DFS with the capacity market and DNO markets, removing barriers for asset meters in DFS and LCM, and putting in place a an ABSVD opt out and price adjustment mechanism for LCM to further enable demand turn up flexibility.

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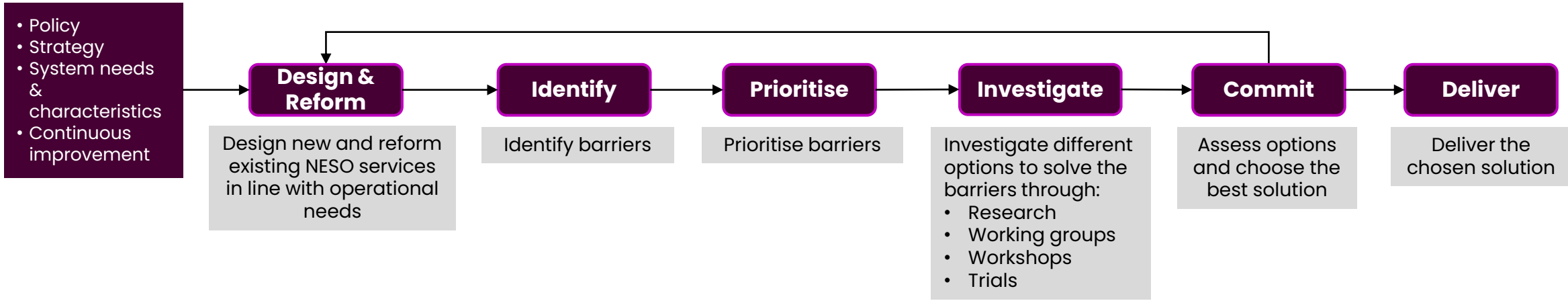
Barrier Removal Process

Stage 1 of this review focused on identifying barriers, while stage 2 is focusing on prioritisation. We have developed an overarching process for identifying, prioritising and removing barriers from our services. We have presented this at a high level below.



We will introduce our iterative stakeholder-led process for removing barriers to stakeholders in a Power Responsive webinar in the new year. This process includes stakeholder involvement and engagement across the process stages, ensuring that we are identifying, prioritising and progressing the removal of barriers alongside stakeholders, in a transparent and collaborative manner.

Prioritisation Approach

Based on stakeholder feedback, we initially formulated five evaluation criteria against which we would assess actions to remove barriers to participation by demand side flexibility in ancillary service markets. These five evaluation criteria are outlined in the table on the right.

While applying these criteria, we were also mindful that not all flexibility services are suitable for participation by all providers. Some barriers to participation are in fact core system security requirements (such as "time to full delivery"), and these requirements will necessarily remain as part of the service design. However, other barriers can be mitigated to allow for wider participation.

Criteria	Description
Value	Action unlocks a large quantity of cost-effective provision that is valuable to NESO and provides a valuable route to market for demand side flexibility providers.
Cost and Effort	Action can be achieved within a reasonable time and budget (considering also participant costs)
Internal Alignment	Action supports an existing NESO commitment, and/or does not adversely impact an ongoing NESO activity or initiative
Strategic Environment	Action endures and remains useful in the context of government policy, evolving system needs, and future market strategy
External Coordination	Action can be implemented with little dependency or impact on DNOs, Ofgem, Elexon, and other industry bodies

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Service Prioritisation

We considered initially the first of the evaluation criteria (i.e., Value). This revealed a priority with respect to services. Ancillary services delivering bulk energy generally bring more value to NESO, while services that mainly deliver frequency control broadly have an existing supply sufficient for future needs, and therefore their barriers are generally lower priority for attention.

As a result, we will focus on the five services highlighted in the table to the right. This service-first approach will help to avoid that all services become only "partially unblocked".

Not in scope: STOR will be retired at the end of 2025. Static FFR will be replaced by Static Recovery in 2026, and we aim to begin stakeholder engagement on the design of Static Recovery in 2025. LCM is planned be retired at the end of 2025. Throughout 2025, we will continue to develop a coherent approach to managing thermal constraints.

Frequency	• Dynamic Containment • Dynamic Moderation • Dynamic Regulation • **Static Recovery** • Quick Reserve
Frequency + Energy	• **Slow Reserve** • **Balancing Reserve** • **Balancing Mechanism**
Energy	• **Demand Flexibility Service**

- Shorter response time
- Faster ramping
- Shorter duration
- Shorter recovery time
- Smaller energy volume

- Longer response time
- Slower ramping
- Longer duration
- Longer recovery time
- Larger energy volume

Our ancillary services can be plotted on a spectrum between frequency and energy. Some services (such as the dynamic frequency response services) are focused primarily on managing frequency, while other services useful for proactively managing bulk energy imbalance and transmission constraints. Service such as slow reserve and the balancing mechanism are in the middle of this spectrum.

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Prioritised Services

Demand Flexibility Service	Slow Reserve	Static Recovery
DFS has removed a number of barriers in the most recent service design(November ' 2024) including: • opening up stacking of the service with the Capacity Market and DSO services which was highlighted as the biggest barrier for DFS, • removing the need for consumers participating with asset metering to have their boundary meter settled half hourly • allowing bid increments of 0.1MW over the 1 MW service threshold. We are aware that accessing boundary meter data can still be challenging for aggregators participating with asset metering. We are exploring the feasibility of directly accessing the boundary smart meter data so that aggregators needn't have access. We will continue to engage on the future of DFS including on expanded functionality such as demand turn up.	Slow Reserve is a new service that will replace STOR in 2025. We have reviewed the draft service requirements that were previously communicated in order to better align them with our objectives of mitigating barriers to participation by demand side flexibility. Changes include amendments to operational metering, from 1 second(1HZ) to 15 seconds read frequency, which was the greatest barrier for Slow Reserve highlighted in stage 1 of this Routes to Market Review. We published the proposed service design in November. Please sign up for the Future of Balancing Services Newsletter to be kept up to date.	Static Recovery will be a new service in 2026, and will replace Static FFR. Service requirements will take into consideration the barriers that have been highlighted through this review for Static FFR, in order to better align them with our objectives of mitigating barriers to participation by demand side flexibility. While response times for dynamic response services (DC, DW, DR) are likely to be beyond the capabilities of a lot of demand side flexibility archetypes currently, we consider that the 30 seconds response time for static response is likely to be achievable by certain demand side flexibility archetypes. There is already demand side flexibility participating on Static FFR today.

Prioritised services

Balancing Mechanism	Balancing Reserve
The Balancing Mechanism is a key priority for suppliers and VLPs, and we are looking to enable much greater access. The independent metering review of operational metering will conclude in early 2025 and will recommend optimised metering requirements for aggregated assets, providing clarity around expectations of metering for the future of real-time balancing markets and providing clear routes to market for smaller-scale flexible assets. We are also migrating BM registration to the Single Markets Platform(SMP), as well as making a number of changes to our registration processes to better enabler high volumes of small scales assets. Skip rates have been a highlighted concern for demand side flexibility, and we have a rage of initiatives ongoing focusing on the issue. The BSC requirements for Half Hourly Settlement of meters to participate in the BM is the current biggest blocker to demand side flexibility in the BM, and we are supportive of initiatives to bring the gap to MHHS. We are also investigating how further small-scale trials can better enable us to be aware of and mitigate any future barriers that may arise for high volumes of demand side flexibility in the BM.	Balancing Reserve(BR), which secures reserve to be dispatched through the BM , has many of the same barriers as the BM. Any amendments to BM operational metering requirements will also benefit BR. In the meantime, units that are accepted for BM participation with less granular operational metering at the sub asset level(through the relaxed operational metering initiative), can also participate in BR. BR dispatch flexibility rules, which require units to be able to dispatch its contracted quantity in one or multiple consecutive increments of 1MW for ramping periods of 1 minute, are currently being reviewed with the aim of finding a balance between opening up participation and securing operational needs that best delivers value to the end consumer.

Barrier Prioritisation Summary

A summary of the identified barriers for the prioritised services is presented below. This represents the barriers that we presented in stage 1 of this review as well as additional barriers added following engagement with stakeholders. . The full description of barriers can be found in the appendix.

Services	DFS	Slow Reserve	Balancing Reserve	Static FFR	Balancing Mechanism	Cross cutting
Barriers	Access to smart meter data for 3rd parties (B2) ☆		Operational metering(B1.1)	EFA blocks(B14)	Operational metering(B1.1)	cross service baselining (B7.2) ☆
		Imbalance adjustments and compensation mechanisms (B9) ⇧ ☆	Imbalance adjustments and compensation mechanisms (B9) ⇧ ☆	1HZ performance metering(B4)	Imbalance adjustments and compensation mechanisms (B9) ⇧ ☆	Delivery certainty risk & penalties for not meeting 100%/no tolerances(B17)
		Half hourly settlement required for phase 1(BM)(B3) ☆			Half Hourly Settlement required for meters(B3) ☆	Sites with non-firm/flexible connections & ANM(B11.2) ☆
	1MW minimum unit size(B10.1)	1MW minimum unit size(B10.1)	1MW minimum unit size(B10.1)	1MW minimum unit size(B10.1)	1MW minimum unit size(B10.1)	Measuring Instruments Regulations (MIR)(B5) ☆
		No decimalisation - we only allow whole MW increments (B10.2)	No decimalisation - we only allow whole MW increments (B10.2)	No decimalisation - we only allow whole MW increments (B10.2)	No decimalisation - we only allow whole MW increments (B10.2)	Registration & onboarding of assets(B15)
			Dispatch flexibility rules (1MW/1 min) (B18)		Skip rate(B12)	NESO service information, standards, policies visibility and accessibility (B16)
					Aggregated BMUs cannot assign to a specific GSP (B13)	⇧ Final consumption levies for DTU(B8) ☆
						Localised DNO limits on capacity limiting DTU participation (B11.1) ⇧ ☆

☆ Barriers outside of NESOs direct control

⇧ Demand turn up (DTU) specific barriers

Barrier Prioritisation

NESO Prioritisation

We next considered the “External Coordination” criteria, to separate those barriers whose solutions are more fully under NESO’s direct control, from those where the barrier is outside of our direct control, and where we can influence, such as policy, regulation or codes.

We then categorised the barriers within NESO’s control into “do now” or “do later” categories, depending on the importance of the barrier to the five prioritised services. “Do now” means we will initiate a project to begin the “investigate” stage imminently. We will continually update stakeholders on the status and priority of “do later” barriers as part of our iterative barrier removal process.

The barriers identified as “do now” will be prioritised for further investigation, especially against the “Cost/Effort”, “Internal Alignment”, and “Strategic Environment” criteria.

Stakeholder Prioritisation

While we have taken stakeholder prioritisation feedback into consideration in our service and barrier prioritisation, we will see further input from stakeholders on how we have prioritised against the relevant criteria in a workshop next year.

Demand Turn Up

We want to highlight that demand turn up across our services faces particular common challenges that we aim to focus on. This is true for current services such as the Balancing Mechanism, Balancing Reserve and LCM, as well as services in design such as Negative Slow Reserve, and any future services where demand turn up can help meet system operational needs.

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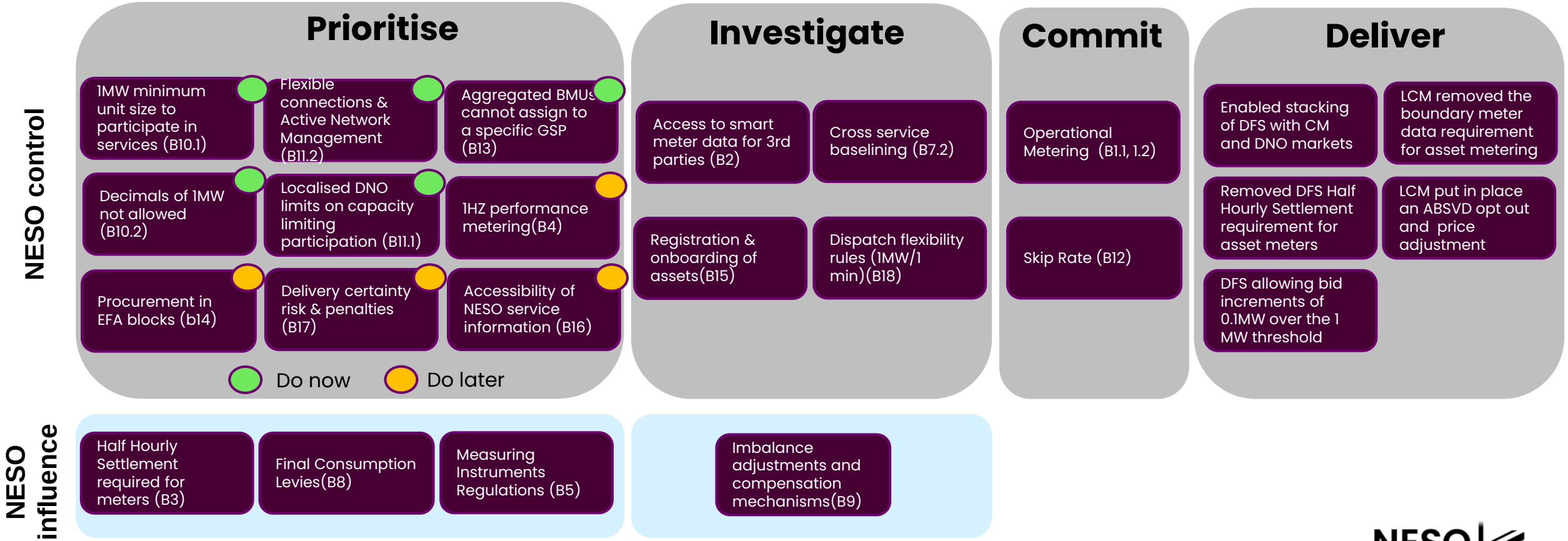
Barrier Summary

In the table below we have outlined where each of the identified "priority" barriers sits across our barrier removal process. We have also outlined whether NESO is in direct control of solving the barriers(or some of the options to solve the barriers) or whether the barrier is outside of our direct control, and where we can influence, such as policy, regulation or codes.



Whilst we do not control the route causes of some of the barriers in the "NESO control" category, we can take actions to mitigate these challenges and so have added these into the "NESO control" category, and set out our prioritisation of these.

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Barrier Prioritisation

We have mapped out the identified barriers in this review across our barrier removal process. For barriers which are in NESO remit and have not yet progressed to the Assess or Commit stage of the process and require prioritisation, we have qualitatively assessed these barriers utilising the prioritisation framework presented on page 11, and prioritised as "do now" and "do later". The high-level rationale for this prioritisation is presented below. Detailed scoring card can be found in the appendix.

Barrier	Priority	Summary assessment
1MW minimum unit size to participate in services	Do now	This is a particularly high barriers for new market entrants and emerging technologies. Considerations for removing across all services include technology capability, code changes and settlement systems.
Decimals of 1MW not allowed	Do now	Linked to the 1MW minimum restriction, enabling units and bids in decimals of whole MWs will enable emerging providers and technologies to maximise utilisation of their capacities, particularly in scenarios where we undertake location procurement of response and reserve.
Aggregated BMUs cannot assign to a specific GSP	Do now	As locational challenges continue to emerge on the system, we need to better utilise and enable aggregated units to solve these problems and be rewarded for doing so.
Flexible connections & Active Network Management	Do now	Flexible connections and Active Network Management are likely to be a significant feature of the system going forwards, and we need to have clear approaches processes and for enabling demand side flexibility with such connection agreements.
Localised DNO limits on capacity limiting participation	Do now	Flexible demand increasing demand outside of traditional network planning and diversity assumptions poses risks to the distribution network. Limits on demand turn up based on planning assumptions rather than operational data risk the ability for consumers to benefit for low cost electricity and represent a barrier for demand side flexibility participation in flexibility markets.
Procurement in EFA blocks & 1HZ performance metering	Do later	This is a current challenge for Static FFR but we plan to reform this service and will begin engagement in 2025 on Static Recovery. We will take EFA block procurement & performance metering challenges into consideration. While EFA blocks & performance metering restrict demand side flexibility participation, there is demand side flexibility participating in Static FFR currently.
Limited tolerances in service delivery penalties	Do later	This is a broad area for investigation but does not pose a specific barrier stopping large volumes of demand side flexibility participating in our services today.
Accessibility of NESO service information	Do later	It is more a pain point than blocker to entry. We take this feedback into consideration to build on our activity in relation to general communication and presentation of information.

"Do now" means we will initiate a project to begin the "investigate" stage imminently. We will continually update stakeholders on the status and priority of "do later" barriers as part of our iterative barrier removal process.

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Priority Barriers- Do Now

Barrier	Number	Relevant Services	Current Activities	Proposed new activities	Responsible
1MW minimum unit size to participate in services	B10.1	All except LCM	• The Balancing Programme have engaged with stakeholders through the Technology Advisory Council(TAC) to gauge feedback on making changes to enable sub MW dispatch	• Assess the strategic rationale and feasibility of reducing the 1MW participation threshold across services, including an assessment of the benefits of reducing this, as well as the systems, processes and code changes that would be required.	NESO/Codes
Only allow bids in whole MW increments and do not allow decimals of 1MW	B10.2	All except DFS and LCM	• The Balancing Programme have engaged with stakeholders through the Technology Advisory Council(TAC) to gauge feedback on making changes to enable sub MW dispatch	• Linked to the above assessment	NESO/Codes
Aggregated BMUs cannot assign to a specific GSP	B13	BM	• We collect locational information in an aggregator impact matrix during registration, but do not currently use this information for dispatch decision making	• Investigate options to utilise information provided by aggregated units to allow them to allocate to specific GSPs. Likes with investigations for sub MW/decimalisation and locational procurement.	NESO
Localised DNO limits on capacity limiting participation	B11.1	LCM	• Working with DNOs to assessment impacts and mitigations • Introduction of Primacy rules through Open Networks to put rules in place to manage NESO and DNO conflicts	• Coordinate & feed into RESP planning, assumptions and approach • Coordinate and influence connections reforms for demand	DNOs
Flexible connections & Active Network Management	B11.2	All	• We have a site by site process in place to assess ANM impact and feasibility of participating in NESO services	• Coordination with the RESP planning, assumptions and approach • Develop a consistent methodology for assessing sites/assets with flexible connections & ANM	DNO/Site or asset owner

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Priority Barriers- Do Later

Barrier	Number	Relevant Services	Current Activities	Proposed new activities	Responsible
Visibility and accessibility of NESO service information, standards and policies	B16	All	• NESO Service information is currently shared in the Power Responsive Annual Report and Market Roadmap. We will make continuous improvements on the information we share	• Work with Market Facilitator to explore the idea of having a single data portal for all NESO and DNO services information	NESO
Delivery certainty risk & penalties for not meeting 100%/no tolerances	B17	All		• International best practice research • Review penalty rules, coordinate with DNOs where possible	NESO
Procurement in EFA blocks	B14	Static FFR and DC, DM, DR		• Inform service design of Static Recovery and dynamic response reform	NESO
1HZ performance metering	B4	Static FFR		• Inform service design of Static Recovery	NESO

Barriers under Investigation

Barrier	Number	Relevant Services	Current Activities	Proposed new activities	Responsible
Access to smart meter data for 3rd parties	B2	DFS	• We are assessing the feasibility of accessing and utilising smart meter data to remove this challenge, which includes assessment of relevant data protection legislation, systems and process requirements through our DER Visibility Programme	• Depending on assessment, implement solution(s), and/or await industry solutions (Consumer consent solution, Smart meter data repository etc)	Smart meter data access and consenting process limitations are a policy issue (Ofgem/DCC)
Cross service baselining	B7.2	All	• We are participating in the Open Networks technical working group on baselining • We are undertaking an internal baselining review	• Develop and maintain NESO baselining policy • Support CM baseline review	NESO, plus coordination with DNOs, Elexon and Government
Dispatch flexibility rules (1MW/1 min)	B18	Balancing Reserve	• Dispatch flexibility rules are currently being reviewed with the aim of enabling greater participation in the service		NESO
Registration & onboarding of assets	B15	All	• We are migrating the registration of all our balancing services to the Single Markets Platform	• We will be making a number of changes to our registration processes to better enabler high volumes of small scales assets • Explore business case for DFS registration to go to MPAN level • We will coordinate with the design and build of the Flexibility Market Asset Register (FMAR)	NESO

Committed Barriers

Barrier	Number	Relevant Services	Current Activities	Proposed new activities	Responsible
Operational Metering	B1.1, B1.2	BM, BR, QR	• Independent review of operational metering for the BM • Amendments to proposed Slow Reserve requirements	• Develop and maintain NESO metering standards policy	NESO
Skip Rate	B12	BM	• Skip rates have a rage of initiatives ongoing focusing on the issue., including Balancing Programme activity such as the 4 short term actions.	• Assessment of skip rate activities to ensure that future assets(including demand side flexibility) are in scope of actions and skip rate analysis	NESO

Barriers Not in Our Direct Control

Barrier	Number	Relevant Services	Current Activities	Proposed new activities	Responsible
Imbalance adjustments and compensation mechanisms	B9	All	- we are supporting Issue Group 114 - LCM has introduced an ABSVD opt out and price adjustment mechanism, that can feed learnings into Issue Group 114.		Policy/Codes
Half Hourly Settlement required for meters	B3	BM, BR, Phase 1 QR & SR	- (External) A BSC code modification(P483) has been raised to resolve this issue. - We have removed HHS requirements from DFS and LCM	- Support BSC code modification process	Balancing & Settlement Code (Elexon)
Measuring Instruments Regulations	B5	All	- Engaging with Government and Industry		Government
Final consumption levies	B8	All with demand turn up	- Feed into NESO position and influencing on final consumption levies on electricity demand.		Government

Next steps

Enabling Demand Side Flexibility in NESO Markets

This review is a part of the "Identify and remove barriers" workstream, as outlined in the ***Enabling Demand Side Flexibility in NESO Markets*** publication, which is published alongside this review.

The *Enabling Demand Side Flexibility in NESO Markets* publication is a response to the urgent need to mobilise demand side flexibility in NESO markets as GB shifts towards a greener future. It explores the no regret market reform actions which can be taken in the medium term to strengthen the explicit market signals for demand side flexibility and remove barriers.

Stage 2 engagement

We would like to hear your feedback on this stage 2 report, and we will be holding an online webinar and Q &A session on the 29th of January. Please sign up here.

We also welcome 1 to 1 discussions and written feedback so please reach out to the team at flexibilitystrategy@nationalenergyso.com .

Routes to Market Review Stage 3

We aim to conclude this review by initiating our proposed iterative barrier removal process and publishing a stage 3 report. This will lay out our approach to tackling barriers and process for doing so. This will include a further breakdown of each of the activities being undertaken to remove the prioritised barriers, an update on where each of the barriers sits in our barrier removal process, and how we will engage and collaborate with stakeholders regularly as part of this iterative process. We expect to publish stage 3 of this review in Quarter 1 2025.

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Appendices

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Service barriers change log

Service	Change
Demand Flexibility Service	No change to RAG – barriers removed has lead to reduced challenges to participation. While smart meter data access can be overcome, It does affect some consumer groups and we have retained the orange status for aggregators & VLPs for this reason.
Local Constraint Market	All changed to green due to progress made in removing barriers. While final consumption levies remain as a challenge to enabling demand to compete on a level playing field with supply side technologies, we believe green is a fair reflection of the accessibility of LCM.
Slow Reserve	RAG has been updated to orange for most archetypes and green for supplier lead I&C flexibility. This is due to proposed changes to operational metering requirements which were seen as the biggest barrier. Orange status is due to challenge with Phase 1 Slow Reserve being open to BM participants only and associated HHS challenges, and with industry challenges related to imbalance adjustments affecting Negative Slow Reserve for non suppliers.
STOR	Deleted as being retired in 2025
Balancing Reserve	Updated to orange for BSC parties, as operational metering remains a challenge, but parities can participate in Balancing Reserve if they are accepted for BM participation with less granular operational metering at the sub asset level through the relaxed operational metering initiative.
Quick Reserve	No change
Static FFR	No change
Dynamic Response - DC/DM/DR	No change
Balancing Mechanism	No change

Service barriers summary V2

Services Demand side flexibility[1]		DFS	LCM	Slow Reserve	Balancing Reserve	Quick Reserve	Static FFR	Dynamic Regulation	Dynamic Moderation	Dynamic Containment	Balancing Mechanism
Domestic consumer	Supplier	🟢	🟢	🟡	🟡	🔴	🟡	🔴	🔴	🔴	🟡
	Virtual Lead Party (VLP)	🟡	🟢	🟡	🟡	🔴	🟡	🔴	🔴	🔴	🟡
	Non VLP aggregator	🟡	🟢	🟡	⚫	🔴	🟡	🔴	🔴	🔴	⚫
Non Domestic consumer	Supplier	🟢	🟢	🟢	🟡	🔴	🟡	🔴	🔴	🔴	🟡
	Virtual Lead Party (VLP)	🟢	🟢	🟡	🟡	🔴	🟡	🔴	🔴	🔴	🟡
	Non VLP aggregator	🟢	🟢	🟡	⚫	🔴	🟡	🔴	🔴	🔴	⚫

🟢 Not aware of any insurmountable barriers

🟡 Barriers or design requirements are likely stopping some of the market

🔴 Barriers or design requirements are stopping all of the market

⚫ Not capable of participating in service

[1] We have simplified how we present the "archetypes" in the summary by removing technologies. This is because even at an individual technology level, there are considerable differences in capabilities, such as metering, speed of response and communication technologies. Our previous approach also didn't incorporate aggregation of different technologies.

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Current Service Barrier Summary

Services	DFS	LCM	Slow Reserve	Balancing Reserve	Quick Reserve	Static FFR	DC/DM/DR	Balancing Mechanism	Cross cutting
Barriers	Access to smart meter data for 3rd parties (B2) ☆	Final consumption levies(B8) ⇧ ☆		Operational metering(B1.1)	Operational metering(B1.2)	EFA blocks(B14)	EFA Blocks(B14)	Operational metering(B1.1)	Cross service baselining (B7.2) ☆
			Imbalance adjustments and compensation mechanisms (B9) ⇧ ☆	Imbalance adjustments and compensation mechanisms (B9) ⇧ ☆	Imbalance adjustments and compensation mechanisms (B9) ⇧ ☆	1HZ performance metering(B4)	Lack of aggregated metering approaches (B6)	Imbalance adjustments and compensation mechanisms (B9) ⇧ ☆	Delivery certainty risk & penalties for not meeting 100%/no tolerances(B17)
			Half hourly settlement required for phase 1(BM)(B3) ☆		Half hourly settlement required for phase 1(BM)(B3) ☆		Operational baseline 1 hour in advance (B7.1)	Half Hourly Settlement required for meters(B3) ☆	Flexible connections & Active Network Management (B11.2) ☆
	1MW minimum unit size(B10.1)		1MW minimum unit size(B10.1)	1MW minimum unit size(B10.1)	1MW minimum unit size(B10.1)	1MW minimum unit size(B10.1)	1MW minimum unit size(B10.1)	1MW minimum unit size(B10.1)	Measuring Instruments Regulations (MIR)(B5) ☆
			No decimalisation - we only allow whole MW increments (B10.2)	No decimalisation - we only allow whole MW increments (B10.2)	No decimalisation - we only allow whole MW increments (B10.2)	No decimalisation - we only allow whole MW increments (B10.2)	No decimalisation - we only allow whole MW increments (B10.2)	No decimalisation - we only allow whole MW increments (B10.2)	Registration & onboarding of assets(B15)
		Localised DNO limits on capacity limiting participation (B11.1) ⇧ ☆		Dispatch flexibility rules (1MW/1 min) (B18)				Skip rate(B12)	NESO service information, standards, policies visibility and accessibility (B16)
								Aggregated BMUs cannot assign to a specific GSP (B13)	

☆ Barriers outside of NESOs direct control

⇧ Demand turn up (DTU) specific barriers

Barriers Description

Barrier	Number	Relevant Services	Description	Responsible
Operational Metering	B1.1, B1.2	BM, BR, QR	Operational metering gives the control room operational visibility of flexible assets, whether whilst delivering a contracted ESO service or 24/7(BM). The default BM operational metering standard of 1Hz frequency, 1 % accuracy, 5 second latency are seen as over specified, particularly for small scale and aggregated flexibility units who can technically meet most of ESOs flexibility needs, but the operational metering standards haven't been designed for the characteristics of these asset classes(small scale, distributed, aggregated etc). These default BM operational metering standards also apply to Balancing Reserve and Quick Reserve.	NESO
Access to smart meter data for 3rd parties	B2	DFS	We require boundary smart meter data for assets that are participating through asset metering, for the purposes of performance monitoring. While non aggregators have the potential to access smart meter data either directly as a DCC "Other User" or via an intermediary, the consumer consenting process is challenging for some consumers and therefore they are not able to allow access this data.	Consenting process limitations are a policy issue (Ofgem/DCC)
Half Hourly Settlement required for meters	B3	BM, BR, Phase 1 QR & SR	Half Hourly Settlement of meters is a requirement for demand side flexibility to participate in many services. For the balancing mechanism and services governed by BSC rules(BR, BM, Ph1 QR &SR), half hourly settlement is a requirement as set out in the BSC. Suppliers face limitations in the numbers of customers they can settle half hourly during elective half hourly settlement, and aggregators have no control or visibility.	Balancing & Settlement Code (Elexon)
Performance Metering	B4	Static FFR	Performance metering is used by NESO to assess the delivery of a service by a provider. Static FFR requires 1 second performance metering.	NESO

Barriers Description

Barrier	Number	Relevant Services	Description	Responsible
Measuring Instruments Regulations	B5	All	The Measuring Instruments Regulations 2016 outlines the requirements for metering(measuring instruments). There are concerns that these regulations do not align with the EV Smart Charge Points Regulations, and that they contain provisions that are not suitable for asset and embedded metering that is increasingly being used in demand side flexibility in markets.	Government
Lack of aggregated metering approaches for Dynamic Response	B6	DC, DM, DR	Flexibility providers believe they can meet the requirements of some dynamic response services, but that the metering approach for aggregated small scale assets is not suitable and represents a barrier.	NESO
Operational baseline 1 hour in advance for DC, DM, DR	B7.1	DC, DM, DR	For Dynamic Response services we require an operational baseline to be submitted 1 hour in advance of delivery. This represents a challenge for demand side flexibility (and other assets) due to the uncertainty of operations for such sites or assets.	NESO
Cross service baselining	B7.2	All	Baselining methodologies differ across NESO services and this represents a barrier to stacking and interoperability for flexible resources across NESO services. This challenge is exacerbated by baselining methodologies varying for DSO service and deviation volumes in the wholesale market for VLPs.	NESO, plus coordination with DNOs, Elexon and Government for (DSO, Wholesale, Capacity market)
Final consumption levies	B8	All with demand turn up	Final consumption levies are applied to all final consumption on a volumetric basis. These levies recover the cost of Government policy schemes such as CFDs, ROCs, FITs. These charges are applied to demand turn up flexibility. These charges are not applied to supply side and licenced storage operators which makes demand turn up flexibility less competitive due to the addition levy cost incurred.	Government

Barriers Description

Barrier	Number	Relevant Services	Description	Responsibility
Imbalance adjustments and compensation mechanisms	B9	All	Imbalance adjustments to supplier positions for providing balancing services were introduced in 2002 (P71), to encourage balancing responsible parties to provide balancing services. Since then a number of codes changes have been undertaken to try and coordinate supplier, VLP and non VLP aggregator balancing responsibilities and associated impacts. BSC Issue Group 114 is seeking to coordinate cross markets solutions and consistency.	Policy/Codes
1MW minimum unit size to participate in services	B10.1	All except LCM	Providers are required to bid at least 1MW of capacity to participate In a service, sometimes at a locational(GSP group) level.	NESO/Code
Only allow bids in whole MW increments and do not allow decimals of 1MW	B10.2	All except DFS and LCM	Providers are required to bid in 1MW increments of capacity to participate In a service.	NESO/Codes
Localised DNO limits on capacity limiting participation	B11.1	LCM	DNOs are concerned that demand turn up flexibility actions could cause issues on their networks due to demand exceeding distribution capacity. This has resulted in some DNOs imposing locational limitations(100kW in GSP) on demand turn up flexibility in LCM. .	DNOs
Flexible connections & Active Network Management	B11.2	All	Sites that have flexible connections or Active Network Management systems in place can be restricted from participating in NESO services depending on their connection agreement terms or ANM activation.	DNO/site or asset owner

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Barriers Description

Barrier	Number	Relevant Services	Description	Responsibility
Skip Rate	B12	BM	Assets in the BM believe they are being “skipped” over and not being dispatch in merit order.	NESO
Aggregated BMUs cannot assign to a specific GSP	B13	BM	Aggregated BMUs cannot be assigned to a specific GSP, which means they cannot contribute to locational requirements, and will sometimes be ruled out because of locational constraints that may not be impacted by their location. Aggregators submit an “aggregator impact matrix” which maps a GSP Group level aggregation down into individual GSPs. This information is not currently used in dispatch decision making.	NESO
Procurement in EFA blocks	B14	Static FFR and DC, DM, DR	Procurement windows for some services are in EFA block windows(4 hour windows). This aligns with typical traditional wholesale trading blocks for generation assets. The fluid nature of demand side flexibility assets means that 4 hour commitment blocks represent a significant barrier to participate due to the changing nature of the flexibility profile and potential duration and shape of flexibility availability.	NESO
Registration & onboarding of assets	B15	All	Onboarding and registration of assets is urgently a challenge for demand side flexibility, as our systems and processes haven’t been designed for very high volumes of small scale assets.	NESO
Visibility and accessibility of NESO service information, standards and policies	B16	All	Access to information and data on NESO services, standards and policies is often difficult for service providers to find and access, particularly newer market entrants.	NESO

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Barriers Description

Barrier	Number	Relevant Services	Description	Responsibility
Delivery certainty risk & penalties for not meeting 100%/no tolerances	B17	All	Some demand side flexibility providers are concerned about penalties and a lack of tolerances for not meeting 100% of committed capacity for services.	NESO
dispatch flexibility rules (1MW/1 min)	B18	BR	Dispatch flexibility rules require units to be able to dispatch contracted quantity in one or multiple consecutive increments of 1MW for ramping periods of 1 minute.	NESO

Service Prioritisation Key Considerations

We proposed, based on Industry feedback, that we should initially prioritise services delivering the most value to system balancing and where stakeholders believe the majority of "archetypes" can already satisfy service needs and participate with relatively minor changes.

Service Requirements	Service	Consideration
Frequency • Short response time • Fast ramping • Short duration • Short recovery	Dynamic Containment	• Relatively low industry priority • Competitive market with steady ESO requirement
	Dynamic Moderation	• Relatively low industry priority • Competitive market with steady ESO requirement
	Dynamic Regulation	• Relatively low industry priority • C need is likely increasing in future
	Static FFR/Static Recovery	• High industry interest & good technical fit • ESO planned reform of service
	Quick Reserve	• Technically challenging to meet service requirement • Lowering technical requirements would likely lower ESO need for this service
Frequency + Energy	Slow Reserve	• Very high industry interest & good technical fit • STOR is carbon intensive currently , low carbon flex resources need to be enabled
	Balancing Reserve	• Similar requirements to BM
	Balancing Mechanism	• Very high industry interest subject to operational metering • Carbon intensive currently, low carbon flex resources need to be enabled
Energy • Long notice period • Slow ramping • Long duration • Long recovery	Demand Flexibility Service	• Service designed to activate demand side flexibility, high industry interest & good technical fit • Growing within day flex volume ahead of MWHHS

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Barrier Prioritisation Scoring card

Barrier	Value	Cost	Internal Alignment	Strategic Environment	External Coordination	Total
1MW minimum unit size to participate in services	2	1	3	3	2	11
Decimals of 1MW not allowed	2	2	3	3	2	12
Accessibility of NESO service information	1	3	1	1	3	9
Localised DNO limits on capacity limiting participation	3	2	3	3	1	12
Penalty lack of tolerance	1	2	1	1	2	7
Flexible connections & Active Network Management	3	1	2	3	2	11
Procurement in EFA blocks	2	2	1	2	2	9
Aggregated BMUs cannot assign to a specific GSP	2	2	1	3	3	11
1Hz Performance Metering	2	3	1	1	2	9

Value:	3= high benefit	1= low benefit
Cost:	3= low effort	1= high effort
Internal alignment:	3= strong alignment	1= weak alignment
Strategic alignment:	3= strong alignment	1= weak alignment
Stakeholder impact:	3= low impact	1= high impact

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