Revenue stacking assessment for DSO services

August 2024 | Open Networks

DOCUMENT CONTROL

Authorities

Version	Issue Date	Authorisation	Comments
1	26 June 2024	Open Networks Steering group	

Related documents

Reference 1	Product Alignment report – Flexibility Products Technical Working Group

Change history

Version	Description
1	Revenue stacking assessment for new DSO services

Distribution

Published on ENA website

TABLE OF CONTENTS

1 Introduction

About ENA

Energy Networks Association represents the companies which operate the electricity wires, gas pipes and energy system in the UK and Ireland.

We help our members meet the challenge of delivering electricity and gas to communities across the UK and Ireland safely, sustainably and reliably.

Our members include every major electricity and gas network operator in the UK and Ireland. This includes independent operators National Grid ESO, which operates the electricity system in Great Britain, and National Grid, which operates the gas system in Great Britain. Our affiliate membership also includes companies with an interest in energy, including Heathrow Airport and Network Rail.

We help our members to:

- Create smart grids, ensuring our networks are prepared for more renewable generation than ever before, decentralised sources of energy, more electric vehicles, and heat pumps. Learn more about our Open Networks programme.
- Create the world's first zero-carbon gas grid, by speeding up the switch from natural gas to hydrogen. Learn more about our Gas Goes Green programme.
- Innovate. We're supporting over £450m of innovation investment to support customers, connections and more.
- Be safe. We bring our industry together to improve safety and reduce workforce and public injury.
- Manage our networks. We support our members manage, create and maintain a vast array of electricity codes, standards and regulations which support the day-to-day operation of our energy networks.

Together, the energy networks are keeping your energy flowing, supporting our economy through jobs and investment and preparing for a net zero future.

About Open Networks

Britain’s energy landscape is changing, and new smart technologies are changing the way we interact with the energy system. Our Open Networks programme is transforming the way our energy networks operate. New smart technologies are challenging the traditional way we generate, consume and manage electricity, and the energy networks are making sure that these changes benefit everyone.

ENA’s Open Networks programme is key to enabling the delivery of Net Zero by:

- opening local flexibility markets to demand response, renewable energy and new low-carbon technology and removing barriers to participation
- opening data to allow these flexible resources to identify the best locations to invest
- delivering efficiencies between the network companies to plan and operate secure efficient networks

We’re helping transition to a smart, flexible system that connects large-scale energy generation right down to the solar panels and electric vehicles installed in homes, businesses, and communities right across the country. This is often referred to as the smart grid.

The Open Networks programme has brought together the nine electricity grid operators in the UK and Ireland to work together to standardise customer experiences and align processes to make connecting to the networks as easy as possible and bring record amounts of renewable distributed energy resources – such as wind and solar panels – to the local electricity grid.

The pace of change Open Networks is delivering is unprecedented in the industry, and to make sure the transformation of the networks becomes a reality, we have created three workstreams under Open Networks to progress the delivery of the smart grid.

2023 Open Networks programme Workstreams

- Network Operation
- Market Development
- Planning and Network Development

Our members and associates

Membership of Energy Networks Association is open to all owners and operators of energy networks in the UK.

- Companies which operate smaller networks or are licence holders in the islands around the UK and Ireland can be associates of ENA too. This gives them access to the expertise and knowledge available through ENA.
- Companies and organisations with an interest in the UK transmission and distribution market are now able to directly benefit from the work of ENA through associate status.

ENA members

ENA associates

- Chubu
- EEA
- Guernsey Electricity Ltd
- Heathrow Airport
- Jersey Electricity
- Manx Electricity Authority
- Network Rail
- TEPCO

About Cornwall Insight

Getting to grips with the intricacies embedded in an energy market can be a daunting task. There is a wealth of information online to help you keep up-to-date with the latest developments, but finding what you are looking for and understanding the impact for your business can be tough. That's where Cornwall Insight comes in, providing independent and objective expertise. You can ensure your business stays ahead of the game by taking advantage of our:

- Publications – Covering the full breadth of the GB energy industry, our reports and publications will help you keep pace with the fast moving, complex and multi-faceted markets by collating all the "must-know" developments and breaking-down complex topics
- Market research and insight – Providing you with comprehensive appraisals of the energy landscape helping you track, understand and respond to industry developments; effectively budget for fluctuating costs and charges; and understand the best route to market for your power
- Training, events, and forums – From new starters to industry veterans, our training courses will ensure your team has the right knowledge and skills to support your business growth ambitions
- Consultancy – Energy market knowledge and expertise utilised to provide you with a deep insight to help you prove your business strategies are viable

For more information about us and our services contact us on *enquiries@cornwall-insight.com* or contact us on 01603 604400.

2 About this report

Energy Networks Association (ENA), as part of its Open Networks programme, has developed a new suite of flexibility products under its 2023 Products Alignment programme. These services have been developed throughout 2023, where the ENA Open Networks Flexibility Products Technical Working Group (FPTWG) collaborated with industry to establish a more-detailed definition of the parameters for flexibility services procured by the distribution network companies. The work resulted in five new aligned flexibility products that are being implemented throughout the GB flexibility services market in 2024.

Distribution Network Operators (DNOs) are evolving to become more active Distribution System Operators (DSOs). As part of rolling out these services for the new DSOs, ENA is researching how the new services can integrate with other market opportunities for flexibility service providers (i.e. 'service stacking'), notably flexibility services offered by National Grid Electricity System Operator (ESO).

Cornwall Insight ("we") have been commissioned to conduct this piece of research. This has built on our work conducted with National Grid Electricity Distribution (NGED) in 2023, which provided a holistic stacking assessment of a wide range of flexibility services and revenue streams available to Flexibility Service Providers (FSPs), and our previous report with ENA on DNO Flexibility Service Revenue Stacking in 2020.

3 Executive Summary

In this report, we detail the findings of our stacking assessment for the new suite of five services developed by ENA against other available revenue streams. Details of the five new services being implemented across the DSOs can be found in ENA's report Flexibility Products Review and Alignment published in February 2024, which we refer to widely throughout this report.

Approach

Revenue stacking broadly refers to the ability for FSPs to contract across multiple revenue streams to both maximise their own revenues as well as their benefit to the electricity system. However, there are multiple types of stacking which can be subdivided into revenue 'splitting', 'jumping' and 'co-delivering'. This investigation has specifically focussed on the ability to 'split' and 'jump' between services and does not consider 'co-delivering' in detail. We discuss these stacking definitions and our approach in more detail later but at a high level:

- Splitting reflects the ability to earn revenue from different streams at the same time using part of an asset's capacity (e.g. a 10MW asset offers 7MW to one service and 2MW to a second, while retaining 1MW in reserve in case of technical issues)
- Jumping reflects the ability to earn revenue from the same asset from different streams at different (adjacent) times (e.g. a 10MW asset offers 9MW to service one between 3pm and 7pm and then offers 9MW to service two between 7pm and 11pm, while retaining 1MW in reserve)

An in-depth assessment of co-delivery is beyond the scope of this report, but we have discussed co-delivery of services at a high level later in the report. Unlike splitting and jumping, co-delivering refers to the ability to deliver multiple services and earn revenue from the same MW in the same time period. This report includes a description of the current state of stacking and the challenges associated with co-delivery. Co-delivery remains an important consideration for FSPs when stacking services, in addition to revenue splitting and jumping.

There is no single source definitively setting out the interaction between services and how these would be concurrently provided by FSPs. To assess the 'stackability' of services, we look at each combination of the new

DSO services and key wider flexibility revenue streams available to FSPs and assess whether they are 'implicitly' or 'explicitly' stackable or unstackable. This is the same framework used for our recent research provided to NGED. Explicit and implicit stacking are summarised below, with expanded discussion in Section four.

- Explicitly stackable – service terms, rules, guidance, wider industry barriers, or clear market/ technological reasons render services stackable
- Implicitly stackable – based on our understanding of market rules, regulations and processes, the services are likely to be stackable without significant issue or barriers, and there are no service terms such as exclusivity that would prevent stacking

By cross examining the headline designs of the new DSO services with the range of relevant ESO services and wider revenue streams available to FSPs, we have assessed the ability of FSPs to stack one service with another.

The ability of FSPs to revenue stack with the five new DSO services also depends on which of the individual product variants DSOs choose to implement for their networks. We understand DSOs are each procuring a different range of services and are using different product variants, depending on the needs of their network. This means that the stacking options available for FSPs will be highly locational. However, despite some divergence between DSOs regarding implementation, the fundamentals remain the same and do not undermine the benefits of standardisation.

Key findings

The standardisation brought by the new products and their rollout is designed to make it easier for FSPs to identify how and where their assets can participate in DSO flexibility services to realise value alongside other revenue streams. Our stacking assessment shows a wide range of opportunities for FSPs to stack the new DSO services alongside wider revenue streams available to them. Again however, the stackability varies between each of the new DSO services and the various product variants being implemented.

Service combination

The combination of service offerings has a significant impact on how FSPs can engage with DSOs, which in turn impacts stacking opportunities. Through our investigation, we have identified that:

- Revenue jumping remains a more readily available option for stacking services than revenue splitting. The delivery or availability for one DSO or ESO service is unlikely to impede the ability to participate in another DSO or ESO service in the adjacent time periods (with a few exceptions that we detail later)
- Alignment of new DSO service delivery periods with settlement periods and Electricity Forward Agreement (EFA) blocks supports the ability to jump between services with minimum waiting periods
- Exclusivity clauses that inhibit stacking are diminishing across the services assessed in this report
- Revenue splitting appears to be widely available for the new DSO services; however, there are more limitations here compared to revenue jumping depending on the combination of services being provided. Notably, providing a DSO service which requires real-time (or close to real-time) utilisation remains unviable to split with most ESO flexibility services
- While splitting remains widely available, it is limited to provision in the same direction. For example, the FSP must turn up in both services at the same time or vice versa. This means that FSPs typically cannot stack services that require the asset to change output or demand in different directions, in the same time period

- FSPs are more readily able to stack DSO services with pre-scheduled utilisation or availability with ESO services. This enables FSPs to participate in ESO auctions with knowledge of available volumes, as well as comply with key requirements such as submitting accurate Final Physical Notifications at Gate Closure (or equivalent), a requirement for many ESO services
- Co-delivery remains complex and potentially challenging, both in principle and in its practical implementation. It will benefit from further industry debate to enable a consensus to be formed on when it is acceptable. This will enable it to be explicitly accommodated in scheme designs
- The ability to honour Capacity Market agreement obligations is a key consideration. Currently, DSO services are not a listed Relevant Balancing Service (RBS) – RBS are services where their delivery during a CM-relevant System Stress Event is discounted from a provider's obligation under the CM, therefore ensuring the provider is not penalised under the CM for having not delivered due to providing another service. FSPs need to assess any risk of providing DSO services against any CM agreements in place. This can be considered a special form of co-delivery

We note that the result of our assessment may indicate that a combination can be stacked, but this does not mean FSPs will choose to participate in this way. Individual optimisation decisions will come down to each FSP and technology type, along with the characteristics of their assets and portfolio.

Baselining

Baselining determines the starting point from which flexibility service provision is measured and is used as the basis for calculating payments. It is a key aspect of the implementation of stacking, and there are several approaches that can be used. We have found that:

- The choice of baseline methodology for each service sits with the DSO. Although a choice of baselining approach provides flexibility in assessing different FSP assets, the methodologies used for each service also has the potential to vary across regions. If operating in multiple regions, FSPs will need to consider the differences in the baselining approach when stacking services to determine the level from which they will be paid
- There is no indication that a consensus has been reached, either via the ENA's Open Networks programme or elsewhere, that particular methodologies should be paired with particular DSO products

When service stacking, FSPs need to understand the baselining approaches being used by both the DSO and the ESO. While the baselining method does not necessarily impede an FSP's ability to stack services (although this depends on the baselining approach used which we discuss later in the report here), the interactions between baselines when providing multiple services and the possibility that delivering one service alters the baseline for another service is an important consideration for both FSPs and system operators procuring for services. FSPs would benefit from more clarity regarding baselining approaches and the potential impacts and considerations when service stacking, as presently the onus is on the FSPs to determine interactions.

Recommendations

We summarise some of our key recommendation in the table below, which are detailed further in Section 7.

Figure 1: Summary of recommendations

Area	Recommendations
Service and stacking guidance	Make clear what can and can't be stacked to reduce ambiguity. For implicitly stackable combinations, prepare guidance/ service descriptions setting out explicit guidance.
Continuous Monitoring and Improvement of the implementation of services by DSOs	Identify common barriers and solutions in the implementation of the services and remove barriers that arise to improve the revenue stacking opportunities for FSPs. Consider the FSP perspective and changes required for revenue optimisation as the new services are rolled out. Seek out opportunities for improved alignment/ commonality in the way DSOs utilise the new suite, based on participant feedback.
Wider industry discussion on co-delivery	Clarity over when and how co-delivery is acceptable and should work alongside splitting and jumping. ENA, DSOs, ESO and stakeholders should work together to determine when co-delivery may be beneficial to both FSPs and the networks, and to provide clarity or guidance of when this can or can't be achieved. If barriers are identified for co-delivering services where there are potential benefits, these barriers should be investigated and removed.
CM Relevant Balancing Services	Explicitly state whether the suite of DSO services should be added to the Relevant Balancing Services (RBS) for the Capacity Market (CM), and if not, clarify when providing DSO services would risk CM delivery. This would resolve any ambiguity concerning obligations, payments, and penalties that may arise when a FSP participates in both concurrently.
Baselining Methodology and guidance	Provide further guidance and common DSO approaches to baselining methodologies to enable DSOs and FSPs to accurately consider implicitly stackable revenue combinations, and whether guidance/ service descriptions can be prepared to set out explicit guidance for FSPs. Consider further enhancements to the work undertaken to date (e.g., ENA *portal*) based on feedback from FSPs/ DSOs. This could include for example, identifying a consistent baseline methodology for each service across all DSOs.

The remainder of this report details the findings of our stacking assessment for the new suite of DSO services. This includes the following:

- Our assessment of stacking opportunities with the new DSO services, detailing our headline stacking tables alongside the key findings of our research
- Individual DSO service assessments, detailing the identified stacking opportunities for each of the DSO services, the reasons behind the assessments, and considerations for FSPs
- Baselining considerations when service stacking, where we detail the current approaches adopted across the market and the considerations when service stacking
- Summary and next steps, where we summarise our findings and recommendations for next steps

4 Assessment of stacking opportunities

This section details our headline findings from our stacking assessment of the new DSO services against wider revenue streams available to flexible assets. The new DSO services in the scope of this assessment include:

- Peak Reduction
- Scheduled Utilisation
- Operational Utilisation
- Scheduled Availability + Operational Utilisation
- Variable Availability + Operational Utilisation

These services are described in more detail in Section 5 of our report. Our stacking assessment looks at the ability to stack these new services with a range of key wider revenue streams available to FSPs.

We detail our approach to the assessment, the key trends and findings observed throughout our research, and what this means from the perspective of FSPs operating in the market. It is primarily an evaluation of stacking and interoperability between revenue types, rather than a detailed assessment and recommendation of commercial stacking and optimisation for FSPs.

This assessment is intended to provide an overview of the general ability to stack the new services. However, the optimal view of how revenues can be stacked, and consequential trading and optimisation decisions, will ultimately vary by each FSP and technology type, along with the characteristics of their assets and portfolio. There are therefore wider considerations for FSPs when considering detailed stacking options when seeking to optimise asset revenues. Further details of how services can be stacked are found in Section 0 which looks at each of the five DSO flexibility products in more detail.

Our approach

This report has been compiled using our understanding of the new suite of flexibility products and engagement with ENA. The stacking assessment is focussed on the product descriptions and designs detailed in ENA's Flexibility Products Review and Alignment report published in February 2024. We include views regarding the stackability of each of the products and headline variants outlined in ENA's report. However, we note that there are variations to the implementation approach by each of the DSOs, notably the specific products variants being rolled out. We comment on how different DSOs are implementing the services throughout this report at a high level.

We also draw on our understanding of the wider revenue flexibility streams available, supplemented by primary research of the details and service terms of this wide range of key balancing services and flexible revenue streams available to distributed energy resources (DER). We have verified the findings, and the set of wider revenue streams assessed, through collaboration and engagement with industry stakeholders, particularly ENA, members of their Flexibility Products Technical Working Group, alongside the ESO.

While, in general terms, the industry refers to the ability of assets to stack revenues or the stacking of different revenue streams, there are nuances to how and when assets can earn revenues from each of these services co-optimally. For the purpose of this report, we have assessed the stacking of revenues under two of the common stacking definitions:

- **'Splitting'** – earning revenue and being able to deliver multiple services from the same asset in the same time period, but not from the same MW. The asset can provide different MWs at the same time, providing the ability of the asset to deliver in all contracted service(s) is not impeded

- **'Jumping'** – earning revenue from the same asset and the same MW, but during adjacent or different time periods

We have focussed on revenue splitting and jumping in line with ENA's near-term requirements, as these are the most common ways in which FSPs stack revenues across services. In our recent report for NGED, we also assessed the co-delivery of services. Co-delivery refers to being able to deliver multiple services and earn revenue from the same MW in the same time period. Our research with NGED found that there were many challenges with co-delivery, and that there needed to be a wider industry discussion about whether co-delivery should be achievable for FSPs on an intentional basis. As a result, a detailed assessment of co-delivery is not included. However, we do detail the current issues and challenges associated with co-delivery in more detail later in this report.

To assess the 'stackability' of services, we look at each combination of the new DSO services and key wider flexibility revenue streams available to FSPs and determine if and how they could be stacked with another individual service. However, we note that, in most instances, there is no single definition on the explicit interaction between services and how these would be concurrently provided by FSPs. Therefore, in order to distinguish between the different levels of clarity in stacking, we classify between services as follows:

- **Explicitly stackable** – service terms, rules, guidance, wider industry barriers, or clear market/ technological reasons render services stackable
- **Implicitly stackable** – based on our understanding of market rules, regulations and processes, the services are likely to be stackable without significant issue or barriers, and there are no service terms such as exclusivity that explicitly prevent stacking
- **Implicitly unstackable/ technical issues arise** – based on our understanding of market rules, regulations and processes, the services are likely to be unstackable, inter-operational challenges mean FSPs are unlikely to be able to or want to stack the services
- **Explicitly unstackable** – rules or guidance explicitly state that revenues cannot be stacked across services e.g. the service requires exclusivity from the provision of all other services for the duration of the agreed contract. Or otherwise, clear reason why the services cannot be stacked
- **N/A –** we have included this option where service splitting or jumping is not applicable. This is most notably for the Capacity Market which has some unique considerations, and a long-term product centered on a capacity (i.e. form of availability) payment. Revenues are not typically split or jumped between in a similar manner to other services. We explore this in more depth when discussing co-delivery

Within the five new DSO services, some contain product variants. These usually vary by having different timing of utilisation instructions; this can impact the ability to stack the services. We have therefore looked into the headline product variants for the services as detailed in ENA's Flexibility Products Review and Alignment report.

Individual DSOs are taking a different approach to implementation of the services throughout 2024 and variations are discussed at a high level, along with considerations for stacking. We have not assessed every DSO's complete set of proposed products, but commonality of the services results in an assessment that is broadly applicable across the DSOs.

The views regarding stacking are our best view at the time of drafting (May 2024) based on our understanding of service terms, potential operability challenges, industry rules, and industry practice where other information is less available. Where new ESO services are included in the tables, information has been taken from latest service designs or direction taken from similar recently developed services. While we consider the tables and

information presented to be an informed view of stacking arrangements, there may be instances where industry views or experience deviate from our own including due to specific asset circumstances.

DSO service requirements

The new suite of standard flexibility products developed by ENA will be rolled out by the six GB DSOs in 2024.

Each of the DSOs have varying flexibility needs and requirements due to the physical characteristics of their networks; DSO services are inherently locational. Each service procured by each DSO is only tendered in the specific locations for which they are required. Therefore, FSPs will only be able to participate in the service(s) should they be situated in a location within the relevant DNO region being tendered for.

The service uptake for each DSO, as indicated by the DSOs themselves, is shown in the table below:

Figure 2: Overview of DSO service implementation as observed May 2024

	Peak Reduction	Scheduled Utilisation	Operational Utilisation	Scheduled Availability + Operational Utilisation	Variable Availability + Operational Utilisation
ENW					
UKPN					
NPG					
NGED					
SSEN					
SPEN					

Source: *References*: [2], [3], [4], [5], [6], [7], [8]

Findings for revenue stacking

Here we detail the headline findings from our stacking assessment. Figure 3 details the key for our stacking tables including what each of the colour assessments mean for service stacking. Figure 4 shows our analysis of revenue jumping, while Figure 5 shows our assessment of revenue splitting.

We have assessed stacking combinations of each of the new DSO services (including their product variants detailed in ENAs report on service designs) against key wider revenue streams available to FSPs. This includes the wholesale market alongside ESO services covering energy balancing, system security, thermal constraint management, reserve, and frequency response. Although not detailed in this report, key service descriptions and designs can be found in our recent report for NGED as discussed previously.

Figure 3: Key for flexibility service stacking tables (applicable to splitting and jumping)

Key		Short explanation
	Explicitly unstackable	Service terms, rules, guidance, wider industry barriers, or clear market/ technological reasons render services unstackable.
	Implicitly unstackable	While not explicit in the service terms or guidance, something (e.g. operational or contractual conflicts) implicitly means FSPs either can't or would unlikely attempt to stack the services.
	Implicitly stackable	While not explicit in the service terms or guidance, it is likely that FSPs would be able to, or choose to, stack these services.
	Explicitly stackable	Service terms, rules, guidance, or clear market/ technological reasons means they are stackable.
	N/A	This is specifically for the CM which has some unique considerations which we explore separately when considering co-delivery of services.

Jumping of services

This figure outlines whether services can be delivered by jumping from one service to another in adjacent or nearby settlement periods. This typically has a greater stacking ability. Limitations typically arise when a service has long or enduring delivery windows, are written into connection agreements, or registration and/ or the ability to participate in one market excludes an asset from another market (e.g. Demand Flexibility Service). Section 5 contains details and reasoning behind the stacking assessments for the service combinations. The column headers link to each of the respective sections containing details.

Figure 4: Ability to jump different services

	Service jumping	Scheduled Utilisation	Peak Reduction	Operational Utilisation**		Scheduled Availability + Operational Utilisation		Variable Availability + Operational Utilisation		
				2 min & 15 min	Week ahead	2 min	Day ahead	2 min & 15 min	Day ahead	Week ahead
Energy balancing & system security	Wholesale market									
	Balancing Mechanism									
	NIV Chasing/ imbalance									
	Capacity Market	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Demand Flexibility Service*									
Thermal	Local Constraint Market									
	MW Dispatch Service									
Reserve services	Short Term Operating Reserve									
	Slow Reserve									
	Quick Reserve									
	Balancing Reserve									
Frequency response	Dynamic Containment									
	Dynamic Moderation									
	Dynamic Regulation									
	Static Firm Frequency Response									

*Our assessment of DFS is based on the service design for winter 2023-24 and guidance published in December 2023. However, we note that in a DFS update from the ESO, it identified enabling stacking as a critical area for improvement. In a webinar in June 2024 the ESO said it is looking to allow service stacking with the CM and DSO services for winter 2024-25.

**Operational Utilisation parameters (notably real time variants) mean FSPs may not get foresight of when they will be required, inhibiting jumping. However, we note OU may be implemented by DSOs to replace the historic 'Restore' product, restoring or supporting the network following an unplanned fault. ESO service terms typically include provisions for unavailability due to unforeseen technical circumstances, which may mean that FSPs can provide OU provided the ESO service allows for unavailability. However, we understand Restore has historically not been viewed stackable in this way, and ability to stack OU may depend on what the DSO is using the product for.

Splitting of services

This table summarises the ability of different services to be delivered by the same asset but different MW in the same settlement period. Section 5 contains details and reasoning behind the stacking assessments. The column headers link to each of the respective sections containing details.

Figure 5: Ability to split different services

	Service splitting*	Scheduled Utilisation	Peak Reduction	Operational Utilisation		Scheduled Availability + Operational Utilisation		Variable Availability + Operational Utilisation		
				2min & 15 min	Week-ahead	2 min	Day-ahead	2 min & 15 min	Day-ahead	Week-ahead
Energy balancing & system security	Wholesale market									
	Balancing Mechanism									
	NIV Chasing/ imbalance									
	Capacity Market	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Reserve services Thermal	Demand Flexibility Service**									
	Local Constraint Market									
	MW Dispatch Service									
	Short Term Operating Reserve									
Frequency response	Slow Reserve									
	Quick Reserve									
	Balancing Reserve									
	Dynamic Containment									
	Dynamic Moderation									
	Dynamic Regulation									
	Static Firm Frequency Response									

***Note:** while many services are assessed as being implicitly splitable, this is currently only applicable when providing services in the same direction. At present, we have not assessed any of the applicable services as being splitable when providing services in opposing directions.

**Our assessment of DFS is based on the service design for winter 2023-24 and guidance published in December 2023. However, we note that in a DFS update from the ESO, it identified enabling stacking as a critical area for improvement. In a webinar in June 2024 the ESO said it is looking to allow service stacking with the CM and DSO services for winter 2024-25.

Key findings for stacking new DSO services

By cross examining the headline designs of the new DSO services with the range of relevant ESO services and or wider revenue streams, there are a number of key findings and trends to highlight from our research concerning stacking.

Revenue jumping findings

Revenue jumping remains a more readily available option for stacking services than revenue splitting. There are fewer potential delivery considerations for FSPs when looking at options to jump between services, as the delivery or availability for one DSO or ESO service is unlikely to impede the ability to dispatch into another DSO or ESO service in adjacent time periods. Our findings regarding revenue jumping include:

- The new DSO services have typically moved to delivery (availability or utilisation) periods that align with settlement period or EFA blocks, which supports alignment with the approach taken for many ESO services. This supports the ability to jump between services with minimum waiting periods. However, although utilisation or availability periods may have a settlement period of EFA block granularity, it is unclear how DSOs will implement these services and if they will seek or favour FSPs able to provide across multiple periods
- ESO services which contain strict exclusivity clauses (e.g. Demand Flexibility Service (DFS)) remain an issue regarding revenue jumping and splitting. However, these clauses now appear to be limited to a few services. We note that for DFS, the ESO in its latest proposals is looking to enable service stacking with the Capacity Market (CM) and DSO services for winter 2024-25
- DSO services which have pre-scheduled utilisation or availability periods (i.e. known ahead of real time, preferably at least one hour before the start of a Settlement Period or even day-ahead) are also more readily jumpable. This is because, when jumping, it is important for FSPs to know when they will (or could) be utilised in order to reliably move between services. In the absence of any pre-defined utilisation periods or availability windows (i.e. the real time Operational Utilisation variant), an FSP risks being called on by the DSO when choosing to provide another service
- ESO services which are ‘evergreen’ – meaning they are a permanent requirement for an FSP (e.g. MW Dispatch is written into an FSP’s connection agreement) – raise additional considerations for FSPs. However, Primacy Rules that were developed in 2023 have helped to be able to stack the MW Dispatch service with DSO services. For MW Dispatch, Open Networks Primacy rules state the DNO flexible services hold priority over the ESO Transmission Constraint Management service (with MW Dispatch used as an example), and, therefore, FSPs are able capture revenue from both DSO and ESO services as a result via service jumping (but not splitting)
- Although jumping remains more readily available, there is still some interpretation regarding service rules and requirements in order for FSPs to confidently stack services. The ESO’s Local Constraint Market service (LCM) is an example where the service is procured over a longer term (six-month agreements), but the service’s ability for FSPs to declare availability/ unavailability a day in advance or price themselves out the market aids jumping, while ESO documentation has clarified that providers can participate with other services as long as it’s not in the same Settlement Period
- Being able to jump requires clarity over availability or utilisation periods. ESO or DSO services where instruction is not known in advance (at least day-ahead) can create challenges in planning service delivery via jumping. The DSO Operational Utilisation Product, specifically variants with real time instructions, is an example where there is no clear indication of whether an FSP will know what periods they may be called upon. However, the impact will depend on how DSOs plan to use the service, with the service seen as similar to the previous Restore product which looks to restore or support the network following an unplanned fault

Revenue splitting findings

Revenue splitting appears to be widely available for the new DSO services. However, this remains limited to FSPs providing services in the same direction, while stackability also varies between the DSO services as highlighted in our stacking assessment in this report. Our key findings regarding splitting include:

- DSO services which have pre-scheduled utilisation or availability are more readily able to split with ESO revenues. This is because by knowing availability, FSPs are able to participate in ESO auctions, many of which are day-ahead, with greater certainty over any spare volumes available. By knowing utilisation in advance, it further allows FSPs to comply with the rules of many ESO services which either require Physical Notifications to be submitted by Gate Closure (for BM Units) or an equivalent for non-BM units via another platform (e.g. the Ancillary Services Dispatch platform)
- Key to splitting DSO services with ESO services is whether or not each of the DSOs allows for 'over-delivery'. Many ESO services are based on real time utilisation, such as the BM, dynamic frequency response services, and the new reserve services. Therefore, if called upon by the ESO, an FSP is likely to over-deliver against any DSO service (assuming services are being provided in the same direction). This is because with the DSO services, FSPs often pre-agree to deliver a certain volume in a specific time period, and an ESO instruction will send them beyond the DSOs requirements. During research for this report, we discussed this issue with the members of the FPTWG, where the DSOs clarified that over-delivery of DSO services is currently acceptable across all regions. However, this could change in the future should it result in adverse consequences due to much greater volumes of service delivery than planned
- Real time instructions from the DSO are prohibitive to service splitting. DSO services with 2-minute or 15-minute response times (i.e. real time instruction) are not typically compatible with splitting with ESO services. This is because ESO services (notably including the BM, dynamic frequency services, and new reserve services) often require physical notifications (PNs) at Gate Closure for BM Units or equivalent for non-BM Units for baselining purposes. Therefore, real time DSO instruction will impact the position of the FSP against the ESO's expectation. Furthermore, there are likely to be operational challenges in responding to both real-time instructions from both the ESO and DSO in the same time periods, with challenges against measuring delivery against either service
- Opposite direction services are typically not splitable between ESO and DSO services. Although our stacking tables in this report do not strictly distinguish between the direction of the services being provided (i.e. upward or downward generation or demand), this will be an important consideration for FSPs when determining which services to trade (in order to optimise revenue opportunities for their assets). In most circumstances, we consider that an FSP would not be able to contract for a DSO service which required it to move in a certain direction, and at the same time contract for an ESO service potentially requiring it to move in the opposite. This would likely result in under-delivery against a DSO service if instructed by the ESO. At present, we have not assessed any of the applicable services in this report as being splitable when providing services in opposing directions.
- Some ESO services continue to have strict exclusivity clauses about revenue splitting, examples include the DFS and LCM services. As discussed, this is anticipated to change for DFS from winter 2024-25 where the ESO has proposed to open up the service to stacking with the CM and DSO services, but this is yet to be implemented
- Service delivery requirements can also prevent service splitting. For example, if an asset is switched off for one service it cannot split volume to provide another. MW dispatch is an example of this, where participating assets are required turn-down generation to zero

Other key findings for service stacking

There are several wider key findings we have identified I throughout our research, including:

- Visibility of the ability to stack services still lacks clarity in many instances. There remains an onus on FSPs to review and interpret legal text or operational conflicts/ misalignment between services. In the absence of clear guidance, this can make it difficult for FSPs to determine which services can be stacked when optimisation their assets. An example of where this is improving is stacking guidance for ESO services procured on the Enduring Auction Capability platform, and recent proposals from the ESO to allow stacking of DFS with the CM and DSO services with guidance on how they intend it to work
- Stacking with DSO services is inherently locational. As discussed, understand DSOs are each procuring a slightly different range of the services, and are using different product variants depending on the needs of the network. This means that the stacking options available for FSPs are highly locational, depending on the needs of the network where assets are located and the product variants used by the DSO
- Although we may have assessed certain services to be stackable (based on services designs and rules), in practice it may be the case that some services are rarely stacked. This can be because the specific DSO or ESO services are trying to achieve different outcomes or will benefit different technologies. An example of this is the DSO's Peak Reduction which appears to benefit demand reduction, whereas the ESO's MW dispatch is for generation turn down. Furthermore, some of the new DSO service descriptions indicate they will benefit FSPs which cannot respond quickly to market signals (notably Scheduled Utilisation and potentially Peak Reduction), whereas many ESO services require assets which can respond quickly, such as battery storage in frequency response services

Furthermore, there remain several wider industry rules and service requirements which mean that explicit stacking capabilities are not clear or impact FSPs views on revenue stacking. These include:

- DSO service volumes are not considered in Applicable Balancing Service Volume Data. This means that delivering a DSO service will result in the FSP (or balancing responsible party) being in imbalance if it is unable to trade its wholesale position to reflect activities undertaken
- Grid Code and BSC requirements for BM Units mean that accurate FPNs must be submitted at gate closure (i.e. an hour before the start of each SP), and any deviations from this not as a result of an ESO instruction means an FSP is in breach of their BM obligations. This remains prohibitive for FSPs operating BMUs to participate in any DSO services with real time instructions, due to the fact that a real time DSO instruction would force the BMU to deviate from its FPN which would not be allowed
- DSO services are not Relevant Balance Services (RBS) for the purpose of the Capacity Market. The RBS's allow delivery during a CM-relevant System Stress Event to be discounted from provider's obligation under the CM, ensuring the provider is not penalised under the CM for having not fully delivered (because it was providing another service). As a wide range of FSPs look seek to secure CM agreements, this may prove prohibitive to FSPs taking up the new DSO services should they believe there is a risk of CM non-delivery. We note this risk will usually be relatively low, while many DSO services that operate in the same direction as the CM may limit or mitigate the risk. We explore this further later in this section here
- Interaction with Enduring Auction Capability rules for the stacking of bids will likely be of interest to FSPs. FSPs will need to look at EAC rules, because it is a key marketplace for providers, and interpret them as best as possible to determine whether or not they can stack with DSO services. In the absence of direct guidance, FSPs may act conservatively and apply EAC stacking rules more broadly to DSO services (i.e. interpret as not being able to stack, or only move in certain directions)

In reality, many services are implicitly able to be stacked together in some form but require FSPs or aggregators to make commercial decisions about the services they wish to pursue to maximise profitability. Therefore, this places the onus on FSPs to identify any operational challenges in splitting or jumping of different services.

We also note that stacking DSO services with other DSO services is not part of this assessment. In most instances, we would not expect FSPs to commonly seek to stack DSO services together due to the highly locational aspect of DSO services, while DSOs are unlikely to procure two services in the same area. However, this could be a consideration in the future.

Flexibility Service Provider perspective

There are a wide range of different types of FSPs with a breadth of strategies for maximising their customer portfolios and optimising revenue streams. FSPs also have varying risk appetites which will impact how they engage in and prioritise different services.

For new DSO services being able to stack (i.e. either splitting or jumping in this report) between revenue streams as a result of service designs and rules (as considered in this report) is one of the key considerations; however, it does not mean that the FSP will decide to stack the services in their trading and optimisation strategies.

Some key additional considerations from an FSP's perspective include:

- **Location** – DSOs only procure for flexibility if there is a requirement in a specific location. Due to the highly locational nature of DSO services, FSPs will only be able to stack with DSO services should they be situated in a location where there is a need. The requirements also vary over time, meaning FSPs need to ensure they track DSO tenders to ensure they compete when opportunities arise
- **Technology types** – the technology or the technologies an FSP is operating in its portfolio must be capable of entering the services. As discussed previously, certain DSO services may be implemented to attract a particular technology type (e.g. slow responding demand reduction), whereas an ESO service such as frequency response is more likely to see battery storage. However, the importance of services being technology agnostic is important as the types of FSPs change in the future
- **Risk appetite** – delivering multiple services must not create risk which doesn't yield the level of reward required. There is an element of interpretation when it comes to stacking DSO services with ESO services with limited concrete guidance on what can or can't be done. FSPs may perceive a risk when stacking services in the absence of guidance and will want to avoid any potential penalties for non-delivery. Furthermore, honouring Capacity Market obligations will also be key as DSO services are not a listed Relevant Balancing Service. FSPs will need to assess any risk of providing DSO services against any CM agreements in place
- **Price, liquidity, and transparency** – FSPs are more likely to focus on the markets with the greatest revenue potential, as well as markets which are liquid and transparent. As ESO services typically have a large market size with good levels of liquidity, these are likely to remain a key focus for FSPs. The typically smaller size requirements for DSO services, combined with them being both locational and potentially temporarily procured in any given location, means that how FSPs who are operating large portfolios (or aggregated units) view the ability to 'split' will be important, as the DSO service may only utilise a small part of their overall unit capacity
- **Competition with the Balancing Mechanism** – there is a growing number of FSPs gaining access to the Balancing Mechanism, with the ESO improving its dispatch processes (e.g. Open Balancing Platform) and market participants such as Virtual Lead Parties and aggregation/ optimisation parties looking to this revenue stream. The BM has strict requirements for submitting Final Physical Notifications at Gate Closure and any real time response to DSO services will likely be in breach of these requirements
- **Knowing the value of flexibility** – the value of flexibility is often not known far in advance of the event but based on on-the-day system conditions. Many of the DSO services see their prices set 'at trade' for both utilisation and availability. The time of procurement will likely impact an FSP's approach and

pricing. Some FSPs may see value on fixing the value of their flexibility further in advance, however, others may see this as a risk and instead focus on short-term markets. We note that some of the new DSO services allow for availability to be refined closer to the event, while utilisation instructions can be known in advance (e.g. week-ahead or day-ahead) which will act to support FSPs in stacking with ESO services that procure closer to real time (i.e. mostly day-ahead)

- **Administrative burden** – stacking can require a detailed knowledge of the rules and regulations (including baselining and performance monitoring requirements), while participation in DSO services requires additional sign-up requirements, market tracking and platform registration. Depending on how DSOs choose to implement the services, there may continue to be (more minor) differences between services in different DNO regions which FSPs will need to understand. There is also an administrative burden on FSPs entering ESO services with strict requirements, pre-qualification and metering data requirements. The more services in which FSPs engage, the greater the burden

Co-delivery considerations

In the context of flexibility service provision, co-delivery can be thought of as the ability of an asset to earn revenue from the same unit of capacity in multiple revenue streams in both the same time period and direction. For example, participation in a DSO service and the wholesale market, or participation in a DSO service and the Capacity Market.

The “same time period and direction” in the description above elude to simplicity when discussing co-delivery. However, as noted earlier and in our previous work, the area rapidly becomes complex. Setting aside technical asset considerations, this is because

- There is no acknowledgement that, as a high-level principle, co-delivery is an acceptable practice where it is technically possible. There remains good reason in many instances why co-delivering should not be acceptable, however, there are instances where co-delivery could be beneficial but service requirements or rules will need to adapt to accommodate this
- Co-delivery is more nuanced than the “same time period and direction” caveat implies, because variations include the potential to earn revenues from different streams but in opposite directions, or be co-available for services but not necessarily utilised in either or both. These complex interactions can mean that, in practice, co-delivering is challenging to implement
- Service and scheme guidance documents lack clarity on co-delivery (in part driven by the points above) and this leads FSPs to reach implicit conclusions about combinations of revenue streams
- Where co-delivery is possible, the lack of explicit guidance leaves the question of an asset’s starting point for revenue calculation open to interpretation
- Special cases exist, such as the ability to earn revenue from the Capacity Market, while retaining the ability to participate in, and earn revenue from a DSO service (in the same time period and direction). However, DSO services are not Relevant Balancing Services for the purpose of the CM, which we discuss later in this section here

The combination of these factors means that in general, there are currently few situations where the ability to co-deliver is easily identifiable and can be undertaken with confidence by the FSP. This report focusses on the ability to jump between, or split capacity across revenue streams. We describe the position between the Capacity Market and DSO services below. There is scope for a wider industry debate to reach a consensus on the principle of co-delivery and when it is acceptable. This would pave the way for individual scheme structures to explicitly accommodate the practice where principles allow. As a result, the better clarity should enable better

decision making on asset deployment, leading to more efficient system operation and better value for money for consumers.

Capacity Market interactions

The Capacity Market is a key revenue stream for many FSPs, giving participants the opportunity to secure a degree of revenue certainty as CM agreements are typically for one or 15 years. CM payments are made on a £/kW basis, paid monthly across the year. FSPs with agreement are required to deliver their 'derated' capacity (i.e. capacity under agreement) during a System Stress Event. CM units are also required to meet three Satisfactory Performance Days tests over the winter period, demonstrating the FSPs ability to meet its obligation over a single settlement period; FSPs choose these three SPDs.

With the CM typically being an important revenue stream for many FSPs, its interaction with the revised suite of DSO services is important. The design of the CM means it is generally possible to stack it with the majority of other revenue streams. However, this is typically limited to ESO services and the BM, due to CM participants' obligations being reduced in line with any requirements to deliver flexibility under a defined list of Relevant Balancing Services (RBS). This list is regularly reviewed to reflect the launch of new services.

However, these defined RBS are presently limited to ESO services, with DSO services currently excluded. While an FSP might choose to stack the CM with DSO service revenues, the provider could be exposed to CM penalties payments for under-delivery if called upon for two services at once. There is no obligation not to provide other services under the CM but providing a service that is not covered by Relevant Balancing Services could expose a CM provider to penalties should a CM Stress Event occur.

The risk of CM (or DSO) non-delivery will vary depending on the DSO service being provided. A DSO service that results in the FSP delivering on their CM obligation due to it being in the same direction (by increasing generation or reducing demand) will mean risk is minimised or even null; however, providing a DSO service to reduce generation or increase demand would more likely pose a risk. The risk would be greatest when System Stress Events are more likely (i.e. winter peaks). Interactions with CM baselining should also be considered by FSPs, notably for demand side response units. This is because delivering a DSO service (notably turning down demand) could impact the baseline that the ESO uses to assess an FSPs delivery against its CM obligation.

However, CM Stress Events are likely to be limited and asset owners might consider the risk of participating in certain other services to not impede its ability to deliver a CM obligation (e.g. if the service is in the same direction). However, this would not constitute service splitting or jumping, and fall more in line with co-delivery (or co-availability).

Summary & next section

In this section we have covered our overall stacking assessment and key findings from our research. The following section explores our stacking assessments in further detail, including individual service assessments for the new DSO services and reasons for their stackability with each of the wider revenue streams available to FSPs.

5 Individual DSO service assessments

This section considers each of the new flexibility services (or products) in detail, outlining what they are, key service parameters, and our assessment of their stackability against wider system services and revenue streams available to FSPs. The six Distribution Service Operators (DSOs) in GB are listed below, with five out of these six publishing documentation covering the implementation of the new DSO flexible services as follows:

- Electricity North West (ENW) – "Distribution Flexibility Services Procurement Statement"
- UK Power Networks (UKPN) – "Flexibility Services Procurement Statement"
- Northern Powergrid (NPG) – "Distribution Flexibility Services Procurement Statement: 2024-25"
- National Grid Electricity Distribution (NGED) – "Distribution Flexibility Services Procurement Statement: 2024-25"
- Scottish and Southern Electricity Networks (SSEN) – "Distribution Flexibility Services Procurement Statement: 2024-25"
- Scottish Power Energy Networks (SPEN) – Procurement Statement for SP Distribution PLC and SP Manweb PLC

We also comment, at a high level, as to how each of the DSOs are planning to implement the new suite of services.

Peak Reduction

Product summary

The Peak Reduction (PR) service is where an FSP contracts to reduce its electricity usage during a set period or periods (usually times of overall peak demand) regularly the term of the contract. This response can soften the high peaks in daily demand and prevent networks going beyond firm capacity limits

- Derived from historical product "Sustain" with similar essential function and parameters
- FSPs likely to benefit: End-users or storage assets with capacity to reduce usage during typical peak demand periods on a regular basis
- ENA use example: "This product could also be used to reduce a sites overall electricity consumption across the year, specifically during high peak periods"

Figure 6: Service overview for Peak Reduction

Example purpose	Delivery Period	Payment for	Key delivery requirements	Product variants	DSOs currently indicating procurement
E.g. Manage peaks in demand	Settlement period(s)	Utilisation only (£/MWh)	Minimum utilisation time: 30 mins	N/A	ENW, UKPN

Source: *References*: [1], [2], [3], [4]

UKPN and ENW are the DSOs who have actively indicated their interest in procuring the Peak Reduction service. UKPN intend to procure the service in through biannual invitations to tender, procuring flexibility 0.5-3 years ahead of required delivery, to enable reinforcement deferral. ENW have not indicated any details in how they plan to procure the service.

Options for stacking

Peak Reduction, as described by ENA, has been designed for "long-term energy efficiency activities", which may be carried out over a year to reduce electricity consumption. Based on the service definition, Peak Reduction is likely to be highly stackable with most ESO services. However, this will depend on how each DSO implements the service, when it is procured for, and the allowance for DSO service over-delivery.

As the service is designed to reduce long-term electricity consumption over peak periods, it is likely that expected delivery volumes will be known far in advance. However, this will depend on when the service volumes are agreed which is current set as 'at trade'. Further participation via splitting and revenue jumping in ESO services (which often procure at the day-ahead stage) should broadly be achievable by knowing the delivery requirements in advance. However, when splitting revenues any further instruction from the ESO will likely result in over-delivery of the Peak Reduction service. We understand that over-delivery is currently acceptable with the DSOs, which should enable service splitting for many ESO services. However, rules of DSO service over-delivery should continue to be monitored by FSPs to ensure there is no breach of any service rules. We note that for many this has been assessed as 'implicitly stackable' because it requires interpretation from FSPs of the rules and requirements.

Provided utilisation is known in advance, FSPs should be able to trade in the wholesale market, and even capture additional revenue while avoiding imbalance, as well as participate in the BM – as FSPs should be able to submit accurate FPNs to the ESO.

Furthermore, Peak Reduction utilisation periods align to settlement periods, enabling short-term revenue jumping but this may depend on the number of settlement periods within a day for which the DSO requires the service (i.e. the shorter the procurement time, the more quickly FSPs can revenue jump).

The ability to split revenues when providing Peak Reduction is also likely to be limited to providing ESO services in the same direction (i.e. likely to be demand reduction) – as utilisation from the ESO in the opposite direction may counteract the service being offered to the DSO. Therefore, reserve services in the 'negative' direction, and high frequency response services, are likely to not be splitable with Peak Reduction.

Peak Reduction is also not a Relevant Balancing Service for the purpose of the Capacity Market (as discussed in Section 4 here), meaning FSPs will need to determine any risk of non-delivery in the CM when contracting for Peak Reduction. We note Peak Reduction is typically aimed at reducing demand, as stated in ENA's Flexibility Products Review and Alignment report, which would be the same direction as is required under the Capacity Market (i.e. demand turn down). While this could mean that, in theory, Peak Reduction and CM could be stacked well together, we note delivering a Peak Reduction contract may impact a demand response FSP's baseline with regards to the Capacity Market (and therefore ability to deliver). As Peak Reduction is a service required over peak periods on a regular basis over a long period of time, it is very possible that Peak Reduction would lower an FSPs ability to provide capacity into the CM and deliver. However, an FSP could limit this risk by only offering partial capacity into Peak Reduction and/ or the CM – so that it can ensure delivery on its CM obligations at all times.

Figure 7: Service stacking summary for Peak Reduction (see Figure 3 for key)

Peak Reduction Product	Splitting Summary	Jumping summary	Notes
Wholesale market			Provided volumes are known in advance this should enable wholesale trading without causing imbalance, and accurate FPNs to be submitted for BM. For splitting, it's only viable for same direction services. DSO over-delivery is likely.
Balancing Mechanism			
NIV Chasing/ imbalance			
Capacity Market	N/A	N/A	Peak Reduction is not a Relevant Balancing Service. However, the long-term nature of the product and fact it's for demand reduction means there is likely to be some compatibility with CM delivery, but with several key considerations.
Demand Flexibility Service (DFS)*			Services contain relatively strict exclusivity clauses or are not compatible with Peak Reduction (notably for revenue splitting). MW dispatch is for generation turn-down to zero, limiting splitting ability and likely to be for different FSPs to those providing Peak Reduction. LCM does not permit stacking with any other service in the same settlement period, while DFS rules state providers cannot be providing any other services including the CM and DSO services. Service jumping more readily available, except for DFS due to the prohibition on providing other services. LCM markets allows FSPs to declare unavailability for any SPs it is not available a day in advance, while MW dispatch is subject to Primacy Rules giving priority to the DSO.
MW Dispatch Service			
Local Constraint Market (LCM)			
Short Term Operating Reserve			Committed STOR has strict service terms to be available for service windows, and PN's for purpose of baselining must be equal to or less than zero. But as Peak Reduction is for long-term demand reduction, which would have PNs below zero, FSPs may be able to stack with STOR for further demand reduction. STOR allows for service jumping.
Slow Reserve			Provided Peak Reduction volumes are known in advance this should enable participation in ESO response and reserve services on the Enduring Auction Platform. For splitting, it only appears viable for same direction services (in this case positive reserve or low frequency response), DSO over-delivery is likely which we understand is currently acceptable with DSOs. There should not be many or any limitations on service jumping.
Quick Reserve			
Balancing Reserve			
Dynamic Containment			
Dynamic Moderation			
Dynamic Regulation			
Static Firm Frequency Response (FFR)			Static FFR is procured day-ahead and Peak Reduction should be known in advance of this in order to plan for FFR participation. For splitting, FFR activities would need to be in same direction and would likely cause DSO over-delivery. We note currently FFR does not see demand side response.

***We note that for DFS, the ESO in its latest proposals is looking to enable service stacking with the CM and DSO services for winter 2024-25.**

Scheduled Utilisation

Product summary

Scheduled Utilisation (SU) delivers pre-agreed flexibility for specific period or periods on an ad hoc basis. This product will benefit FSPs that cannot respond in real-time or near to real-time (i.e. the day of delivery), alongside more flexible providers. The service sees service parameters agreed the day- or week-ahead of delivery. Scheduled Utilisation has two distinct versions, “Settlement Periods” where the delivery period begins and ends aligned with a market standard settlement period, or “Specific Periods” where delivery period can begin and end at any time.

- DSOs have indicated procurement of this service to manage a variety of needs, with network companies saying the product will be used to replace a variety of previously procured services (including historical dynamic, sustain and secure products)
- FSPs likely to benefit: FSPs that cannot respond in real-time or near to real-time, alongside more flexible providers
- ENA use example: “This service can be used by the Network Companies to manage seasonal peak demands and defer network reinforcement”

Figure 8: Service overview for Scheduled Utilisation

Example purpose	Delivery period	Payment for	Key delivery requirements	Product variants	DSOs currently indicating procurement
Manage seasonal peak demands and defer network reinforcement	Settlement Periods or Specific Periods (i.e. blocks)	Utilisation achieved only (£/MWh)	Continuous, stable reduction over delivery period (≥30 mins)	Two variants with different a Utilisation Period: 'Settlement Periods' or 'Specific Periods'	UKPN, NGED, NPg, SPEN, SSEN

Source: References: [1], [4], [5], [6], [7], [8]

All DSOs, apart from ENW, have indicated that they wish to procure this service but with differences in the implementation approach. NGED, NPG and UKPN have indicated using the “settlement periods” version of the service. SSEN and NGED have indicated plans to use the “specific periods” version of the service to procure flexibility with some looking to agree a trade up to a month ahead of delivery (SPEN) or a week ahead (NGED), and others procuring on a day-ahead basis (UKPN).

Options for stacking

Scheduled Utilisation, as described by ENA, has been designed to manage seasonal peaks in demand or defer network reinforcement. However, each DSOs may use the product to manage different network needs.

Based on the service definition, Scheduled Utilisation is likely to be highly stackable with most ESO services; however, this will depend on how each DSO implements the service, when it is procured for, and the allowance for DSO service over-delivery.

As the service is scheduled, it is likely that expected delivery volumes will be known in advance. The point at which volumes are known will depend on when the service volumes are agreed which is current set as ‘at trade’, where DSOs have indicated a range of approaches from day-ahead to month-ahead procurement. By knowing the delivery requirements in advance, further service participation via splitting and revenue jumping in ESO services (which often procure at the day-ahead stage) should broadly be achievable.

However, when splitting revenues any further instruction from the ESO will likely result in over-delivery of the Scheduled Utilisation service. We understand that over-delivery is currently widely accepted across the DSOs, which should enable splitting with many ESO services. However, rules of DSO service over-delivery should continue to be monitored by FSPs to ensure there is no breach of any service rules. Therefore, for many service combinations we have given an assessment of 'implicitly stackable'.

Provided utilisation is known in advance, FSPs should be able to trade in the wholesale market and even capture additional revenue while avoiding imbalance, and participate in the BM – as FSPs should be able to submit accurate FPNs to the ESO and comply with Grid Code or BSC requirements.

Furthermore, Scheduled Utilisation periods should align to settlement periods or EFA blocks (according to ENA's designs), enabling short-term revenue jumping, but this may depend on the number of settlement periods within a day for which the DSO requires the service.

The ability to split revenues when providing Scheduled Utilisation also appears to be limited to providing ESO services in the same direction – as utilisation from the ESO in the opposite direction may counteract the service being offered to the DSO. For example, if looking at demand reduction, reserve services in the 'negative' direction, and 'high' frequency response services, would not be splitable.

Some ESO services contain explicit rules or exclusivity clauses making stacking with any DSO service unviable. This is notably for DFS (where stacking rules are subject to change for winter 2024-25), and LCM (which only restricts service splitting).

Scheduled Utilisation is also not a Relevant Balancing Service for the purpose of the Capacity Market (as discussed in Section 4), therefore FSPs will need to determine any risk of non-delivery in the CM when contracting for Scheduled Utilisation. The direction of the Scheduled Utilisation product will have an impact; if demand turn up or generation turn down is required, this is likely to risk CM delivery in a System Stress Event. We note delivering a Scheduled Utilisation contract may also impact a demand response FSP's baseline with regards to the Capacity Market (and therefore ability to deliver). Therefore, it is possible that Scheduled Utilisation would lower an FSPs ability to provide capacity into the CM and deliver. However, an FSP could limit this risk by only offering partial capacity into Scheduled utilisation and/ or the CM – so that it can ensure delivery on its CM obligations at all times.

Figure 9: Stacking summary for Scheduled Utilisation (see Figure 3 for key)

Scheduled Utilisation Product	Splitting Summary	Jumping summary	Notes
Wholesale market			Provided volumes are known in advance this should enable wholesale trading without the FSP or balancing responsible party being exposed to imbalance charges, and accurate FPNs to be submitted for BM. For splitting, it only appears viable for same direction services. DSO over-delivery is likely.
Balancing Mechanism			
NIV Chasing/ imbalance			
Capacity Market	N/A	N/A	Scheduled Utilisation is not a Relevant Balancing Service. In instances where Scheduled Utilisation is in same direction as CM obligation, then it's unlikely to impede CM delivery. However, there are several considerations FSPs including impact on CM baseline.
Demand Flexibility Service*			Services contain relatively strict exclusivity clauses or are not compatible with Scheduled Utilisation (notably for revenue splitting). MW dispatch is for generation turn-down to zero, limiting splitting ability. LCM does not permit stacking with any other service in the same settlement period, while DFS rules state providers cannot be providing any other services including the CM and DSO services. Service jumping more readily available, except for DFS due to the prohibition on providing other services. LCM markets allows FSPs to declare unavailability for any SPs it is not available a day in advance, while MW dispatch is subject to Primacy Rules giving priority to the DSO.
MW Dispatch Service			
Local Constraint Market			
Short Term Operating Reserve			Committed STOR has strict service terms to be available for service windows, and PNs for purpose of baselining must be equal to or less than zero. Although there could be limited circumstance for splitting, instances for splitting may be rare and limited to demand reduction. STOR allows for service jumping.
Slow Reserve			Provided Scheduled Utilisation volumes are known in advance this should enable participation in ESO response and reserve services on the Enduring Auction Platform. For splitting, it only appears viable for same direction services (i.e. positive versus negative reserve, and high and low reserve products). DSO service over-delivery is likely which we understand is currently acceptable. There should not be many or any limitations on service jumping.
Quick Reserve			
Balancing Reserve			
Dynamic Containment			
Dynamic Moderation			
Dynamic Regulation			
Firm Frequency Response - Static only			Static FFR is procured day-ahead and Scheduled Utilisation should be known in advance of this in order to plan for FFR participation. For splitting, FFR activities would need to be in same direction and would likely cause DSO over-delivery.

***We note that for DFS, the ESO in its latest proposals is looking to enable service stacking with the CM and DSO services for winter 2024-25.**

Operational Utilisation

Product summary

Operational Utilisation (OU) offers flexibility in real time (same day) or week-ahead. This product allows for a DSO to agree on trade parameters (price and period of provision) ahead of time through monthly, weekly, or day-ahead tenders but with instructions issued either in real time, with a 2-minute or 15-minute response notice, or week-ahead response time. The assets can be dispatched, as per instruction, for the required level of service based upon real-time network measurement data. Therefore, a DSO does not pay for flexibility it does not need (or an FSP does not provide an unnecessary reduction), compared to Scheduled Utilisation where reduction volume is set at the point of trade.

- Derived from historical product "Restore" with same essential function and parameters
- FSPs likely to benefit: FSPs able to respond quickly (for 2 minute and 15 minute product variants). Week-ahead service may benefit FSPs less able to respond quickly
- ENA use example: "A DNO may utilise this product in order to restore network supplies following an unplanned outage/fault where the regulatory funding does not allow for availability payments e.g. customer interruptions"

Figure 10: Service overview for Operational Utilisation

Example purpose	Delivery period	Payment for	Key delivery requirements	Product variants	DSOs currently indicating procurement
Restore network supplies following an unplanned outage/ fault	Minutes	Utilisation only (£/MWh)	Continuous delivery, either real-time response or week-ahead, minimum utilisation 30 mins	Three variants with different response times: ≤ 2 mins, ≤15 mins, and week-ahead	SSEN, ENW, NGED, SPEN

Source: *References*: [1], [2], [3], [6], [7], [8]

Currently, ENW, SSEN, SPEN and NGED have stated they will specifically offer Operational Utilisation. We understand this will be tendered for within month or the week ahead of delivery to agree trade parameters, but with real time instructions issued for utilisation. Examples of the use cases include SSEN, which has stated their intention to use Operational Utilisation for any real time unexpected requirements for flexibility, but that this will ideally be fully procured through the Scheduled Availability + Operational Utilisation products. While, NGED have indicated that Operational Utilisation will replace the historical "restore" product for the version of the product which demands a 15-minute response time. ENW expect to offer the service with monthly tenders occurring for FSPs to engage with and trade.

Options for stacking

Operational Utilisation has been designed for use cases where flexibility delivered is agreed close to real time, with utilisation instructions either 2 minutes, 15 minutes, or a week ahead of delivery. Based on ENA's defined parameters (i.e. no availability windows), it appears that FSPs providing the service will not have much foresight of when they might be called upon (the exception being week ahead response).

Service variants which require real time utilisation instructions (2- or 15-minute response) appear more challenging to stack for several reasons. Notably, any FSP which is BM participating will not be able to provide

Operation Utilisation with 2- or 15-minute response due to the requirement to submit accurate FNPs at Gate Closure. Deviating from this FPN for the purpose of providing a DSO service will result in the FSP breaching its BM obligations. This barrier is similar to many other ESO services for both BM and non-BM units, with many using a baseline of the FPN (or equivalent) as part of the service. Real time response will also create technical delivery challenges; responding to real time signals from both the ESO and DSO would likely provide challenging and not be possible and make measuring performance against each of the services difficult.

Real-time utilisation also causes challenges for FSPs to trade on the wholesale market to match their delivered volumes (wholesale trades can be made up to the start of a settlement period), meaning the FSP, or balancing responsible party, may be exposed to imbalance charges for any instructed volumes. This is because DSO services are not included in Applicable Balancing Services Volume Data.

However, for the week-ahead variant, the Operational Utilisation is slightly more readily stackable. This is because FSPs would be able to submit accurate FPNs for the BM or baseline positions to ESO services. However, there are reasons why week-ahead Operational Utilisation may still be challenging to stack with ESO services, such as the 'minutes' utilisation period potentially not aligning to ESO delivery periods (i.e. settlement periods or EFA blocks) and making jumping less efficient, and that the nature of the service being to manage network faults or restore the network. And similar to previously discussed services, delivery of ESO service would need to be in the same direction as the DSO service and could result in DSO over-delivery, which we understand is widely acceptable across DNOs at present. The ability to stack will therefore depend on what product variant each of the DSOs implements.

Regarding revenue jumping, the week-ahead service should be readily jumpable between most services. However, for real-time variants it is unclear how jumpable the service is. This is because under the service descriptions FSPs may not know when they may be called on to deliver Operational Utilisation, in the absence of advanced availability windows or pre-determined utilisation periods. This may create risk when entering into ESO services, particularly if the DSO agreements are over any extended period.

We also note that Operational Utilisation may be used to restore network supplies following an unplanned outage or fault (i.e. akin to the previous Restore product), in which case the FSP may not be able to provide service to the ESO due to the conditions on the distribution network. Many ESO service terms have provisions for unavailability; for example, Dynamic Response service terms have provisions for 'unplanned outage or other unforeseen technical circumstances'. In this instance, an FSP may be able to provide Operational Utilisation to restore the network, but this will come down to individual service terms and whether the ESO allows for service unavailability for an unplanned network outage while supporting the DSO in restoring supplies. Delivering OU under these circumstances would constitute revenue jumping rather than splitting as the ESO service would not be delivered or paid for.

Furthermore, regarding MW dispatch, established Primacy rules for the service exclude the historic Restore product. Therefore, should the Operational Utilisation product be used to replace Restore as some DSOs have specified, stacking with MW Dispatch is likely to be limited, particularly for real time product variants.

Operational Utilisation is also not a Relevant Balancing Service for the purpose of the Capacity Market (as discussed in Section 4 here), therefore FSPs will need to determine any risk of non-delivery in the CM when contracting for Operational Utilisation.

Figure 11: Stacking summary for Operational Utilisation (see Figure 3 for key)

Operational Utilisation Product	Splitting Summary		Jumping summary		Notes
	2 min & 15 min	Week ahead	2 min & 15 min	Week ahead	
Wholesale market					Real-time instructions mean accurate wholesale market optimisation is challenging, but week-ahead service more readily stackable. Jumping is more achievable, but real-time utilisation without pre-agreed availability creates challenges in trading wholesale markets.
Balancing Mechanism					Close to real time instructions would result in deviating from FPN, prohibiting splitting. Week-ahead variant more likely to comply with BM requirements, but actions need to be in same direction and result in DSO over-delivery.
NIV Chasing/ imbalance					Active NIV chasing is challenging for real-time utilisation, although providing service will put FSP (or balancing responsible party) into imbalance anyway as service is not in ABSVD.
Capacity Market	N/A	N/A	N/A	N/A	Operational Utilisation is not a Relevant Balancing Service. In instances where Operational Utilisation is in same direction as CM obligation, then co-delivery may be possible. but there will be carefully considered for FSPs.
Demand Flexibility Service*					MW dispatch is for generation turn-down to zero, limiting splitting ability. LCM does not permit stacking with any other service in the same settlement period, while DFS rules state providers cannot be providing any other services including the CM and DSO services. Real time Operational Utilisation also creates additional challenges as it may impede ESOs service delivery. Service jumping is not currently available for DFS due to the prohibition on providing other services. Jumping may not be viable for real time MW dispatch due to Primacy rules excluding the 'Restore' product. LCM markets allows FSPs to declare unavailability for any SPs it is not available a day in advance.
MW Dispatch Service					
Local Constraint Market					
Short Term Operating Reserve					Committed STOR has strict service availability requirements, and PN's for purpose of baselining must be equal to or less than zero. There could be limited circumstance for splitting week-ahead DSO product, but real-time instructions risk STOR delivery. STOR allows for service jumping, but unknown DSO real-time delivery requirement could create challenges.
Slow Reserve					Real time utilisation of DSO service would impact 60-min/ FPN baselining requirement for ESO services, prohibiting splitting.

Operational Utilisation Product	Splitting Summary		Jumping summary		Notes
	2 min & 15 min	Week ahead	2 min & 15 min	Week ahead	
Quick Reserve					For 'week-ahead' DSO service, this should theoretically enable splitting, however, this may depend on the precise service implementation by each DSO, such as aligning delivery periods. For splitting, it only appears to be viable for same direction services. DSO service over-delivery is likely which we understand is currently acceptable. There should not be many limitations on service jumping for week-ahead product, but real time variant could create risks if FSPs don't know then they will be used.
Balancing Reserve					
Dynamic Containment					
Dynamic Moderation					
Dynamic Regulation					
Firm Frequency Response - Static only					Real time DSO instruction inhibits FFR participation in same time period with numerous risks and challenges. DSO real-time delivery requirement could also create challenges for jumping should the FSP not have visibility of when the DSO might instruct them.

***We note that for DFS, the ESO in its latest proposals is looking to enable service stacking with the CM and DSO services for winter 2024-25.**

Scheduled Availability + Operational Utilisation

Product summary

This service is uses operational utilisation but with the added feature of procuring, ahead of time, the assured availability of an FSP to deliver operational utilisation for pre-defined periods if required. This availability will be defined at the point of procurement and cannot be modified once the contract has been agreed. The FSP will then be dispatched for the required level of service at either the day-ahead stage or with 2-minute notice. This service helps ensure that a DSO only pays utilisation rates for flexibility procured for the need of the network, presenting overall cost savings even when paying for availability. It equally allows for FSPs to receive availability payment and then engage with another service if that capacity isn't needed by the DSO in the contracted period(s).

- Derived from historical product "Dynamic" with same essential function and parameters
- FSPs likely to benefit: A wide range of FSPs may benefit; faster response product variants will benefit more flexible FSPs, while the day-ahead variant will also benefit slower responding assets
- ENA use example: "An example use case for this product is when a DNO is planning for sufficiency of flexible services contracts based upon short-medium range forecasting of network constraints."

Figure 12: Service overview for Scheduled Availability + Operational Utilisation

Example purpose	Delivery period	Payment for	Key delivery requirements	Product variants	DSOs currently indicating procurement
Planning for flexibility based upon short-medium range forecasting of network constraints	Settlement Period availability, Minutes for utilisation	Availability (£/MW/h) & Utilisation (£/MWh)	Response time ≤ 2 mins or day-ahead; ≥30 mins continuous delivery minimum. Ensure availability for contracted windows	Two variants with different response times: ≤ 2 mins and day-ahead	UKPN, NGED, SSEN

Source: References: [1], [4], [6]

UKPN has indicated procuring its Scheduled Availability at the same time it procures its Peak Reduction product, in biannual tender processes with long term contracts procuring availably ~0.5-3 years ahead of expected delivery. NGED indicate procuring the service to provide long-term availability over the seasonal peaks and troughs, of winter and summer respectively. This will provide greater security against unexpected faults with NGED procuring the Scheduled Utilisation product to manage all expected electricity imbalance periods.

Options for stacking

Our stacking assessment for Scheduled Availability + Operational Utilisation (SA+OU) shares many of the same stacking characteristics as both Schedules Utilisation and Operational Utilisation. SA+OU has been designed so that DSOs can procure flexibility ahead of time but only call on FSPs based on actual needs of the networks.

The variant which has a real time (2 minute) instruction, shares many stacking features of operational utilisation. Any FSP which is BM participating will not be able to provide SA+OU with 2-minute response due to the requirement to submit accurate FNPs at Gate Closure. Deviating from this FPN for the purpose of providing a DSO service will result in the FSP breaching its BM obligations. This barrier is similar to many other ESO services for both BM and non-BM units, with many using a baseline of the FPN (or equivalent) as part of the service. Real time response will also create technical delivery challenges; responding to real time signals from both the ESO and DSO would likely provide challenging and not be possible and make measuring performance against each of the services difficult.

Real-time utilisation also causes challenges for FSPs to trade on the wholesale market to match their delivered volumes (wholesale trades can be made up to the start of a settlement period), meaning the FSP, or balancing responsible party, may incur imbalance charges for any instructed volumes. This is because DSO services are not included in Applicable Balancing Services Volume Data.

However, for the day-ahead variant, the SA+OU is more readily stackable. This is because FSPs would be able to submit accurate FPNs for the BM or baseline positions to ESO services. However, there are reasons why day-ahead SA+OU may still be challenging to stack with ESO services, such as the ‘minutes’ utilisation period potentially not aligning to ESO delivery periods (i.e. settlement periods or EFA blocks) and making jumping less efficient, and day-ahead utilisation instructions will need to time well with the ESO’s day-ahead auctions so FSPs can plan their activities. Similar to previously discussed services, delivery of ESO service would need to be in the same direction as the DSO service and could result in DSO over-delivery. We understand that over-delivery is currently widely accepted across the DSOs, which should enable service splitting for many ESO services. However, rules of DSO service over-delivery should continue to be monitored by FSPs to ensure there is no breach of any service rules. The ability to stack may therefore depend on how each DSO implements the service.

Furthermore, for the day-ahead variant, we note it equally enables FSPs to receive availability payments and then engage with another service if that capacity isn't needed by the DSO in the contracted period(s). This is a positive aspect of the service that may be attractive to FSPs.

Regarding revenue jumping, the day-ahead service should be readily jumpable between most services. Furthermore, the real-time variant should also be readily jumpable across most ESO services. This is because the inclusion of advanced availability windows (which are across settlement periods) means that FSPs can plan their delivery in ESO markets with foresight of DSO requirements. This does, however, depend on when the utilisation is instructed, where knowing utilisation before ESO day-ahead auctions will be beneficial.

Scheduled Availability + Operational Utilisation is also not a Relevant Balancing Service for the purpose of the Capacity Market (as discussed in Section 4 here), therefore FSPs will need to determine any risk of non-delivery in the CM when contracting for SA+OU. The direction of the SA+OU product will have an impact; if demand turn up or generation turn down is required, this is likely to risk CM delivery in a System Stress Event. We note delivering a SA+OU contract may also impact a demand response FSP's baseline with regards to the Capacity Market (and therefore ability to deliver). Therefore, it is possible that SA+OU would lower an FSPs ability to provide capacity into the CM and deliver. However, an FSP could limit this risk by only offering partial capacity into SA+OU and/ or the CM – so that it can always ensure delivery on its CM obligations.

Figure 13: Stacking summary for Scheduled Availability + Operational Utilisation (see Figure 3 for key)

Scheduled Availability + Operational Utilisation Product	Splitting Summary		Jumping summary		Notes
	2 min	DA	2 min	DA	
Wholesale market					Real-time instructions (2min) mean accurate wholesale market optimisation is challenging, but day-ahead more readily splitable. Jumping is more stackable particularly with availability known in advance.
Balancing Mechanism					Close to real time instructions would result in deviating from FPN, prohibiting splitting. Day-ahead variant more likely to comply with BM requirements, but actions need to be in same direction and result in DSO over-delivery.
NIV Chasing/ imbalance					Active NIV chasing is challenging in same SPs that real-time DSO utilisation occurs, although DSO utilisation will put FSP (or balancing responsible party) into imbalance anyway as service is not in ABSVD. Scope to split with day-ahead service
Capacity Market	N/A	N/A	N/A	N/A	SA+OU is not a Relevant Balancing Service. In instances where SA+OU is in same direction as CM obligation, then it's unlikely to impede CM delivery. However, this will need to be carefully considered by FSPs including impact on CM baseline.
Demand Flexibility Service*					MW dispatch is for generation turn-down to zero, limiting splitting ability. LCM does not permit stacking with any other service in the same settlement period, while DFS rules state

Scheduled Availability + Operational Utilisation Product	Splitting Summary		Jumping summary		Notes
	2 min	DA	2 min	DA	
MW Dispatch Service					providers cannot be providing any other services including the CM and DSO services. Real time SA+OU creates additional challenges as it may impede ESO requirements. Service jumping more readily available, except for DFS due to the prohibition on other services. LCM markets allows FSPs to declare unavailability for any SPs it is not available a day in advance, while MW dispatch is subject to Primacy Rules giving priority to the DSO.
Local Constraint Market					
STOR					Committed STOR has strict service availability requirements, and PN's for purpose of baselining must be equal to or less than zero. There could be limited circumstance for splitting day-ahead DSO product, but real-time variant risks STOR delivery. STOR allows for service jumping.
Slow Reserve					Real time utilisation of DSO service would impact 60-min/ FPN baselining requirement for ESO services, prohibiting splitting. For 'day-ahead' DSO service, this should theoretically enable splitting, however, this may depend on the precise service implementation, such as aligning delivery periods and time of day-ahead instructions. For splitting, it only appears to be viable for same direction services. DSO service over-delivery is likely which we understand is currently acceptable with the DSOs. There should not be many limitations on service jumping.
Quick Reserve					
Balancing Reserve					
Dynamic Containment					
Dynamic Moderation					
Dynamic Regulation					
FFR – Static only					Real time DSO instruction inhibits FFR participation in same time period with numerous risks and challenges. Where availability and utilisation is known further in advance, splitting is more achievable but may depend on precise DSO requirements (e.g. utilisation/ availability length, and time of day-ahead instructions).

***We note that for DFS, the ESO in its latest proposals is looking to enable service stacking with the CM and DSO services for winter 2024-25.**

Variable Availability + Operational Utilisation

Product summary

This service builds further on Operational Utilisation by allowing DSO to procure a greater level of contracted available capacity and then refine the requirement closer to the event. Availability requirement can be refined by a DSO month or a week ahead of delivery.

This allows DSOs to further maintain flexible redundancy in case of unexpected faults or planned but disruptive activity further in advance, without needing to pay higher availability or utilisation payment rates, and for FSPs to engage with flexible services by opting in to a long-term availability service and receive the associate payments.

- Derived from historical product “Secure” with the same essential function and parameters
- FSPs likely to benefit: A wide range of FSPs may benefit; faster response product variants will benefit more flexible FSPs, while the day-ahead and week-ahead variants will also benefit slower responding assets
- ENA use example: “An example use case for this product is when a DNO is planning for sufficiency of flexible services contracts based upon long range forecasting of network constraints.”

Figure 14: Service overview for Variable Availability + Operational Utilisation

Example purpose	Delivery period	Payment for	Key delivery requirements	Product variants	DSOs currently indicating procurement
Planning for sufficient flexibility based upon long range forecasting of network constraints.	Settlement Period availability, Minutes for utilisation	Availability (£/MW/h) & Utilisation (£/MWh)	Real time, day-ahead, or week-ahead response; ≥30 mins continuous delivery minimum. Ensure availability for contracted windows	Three variants with different response times: ≤ 2 mins, ≤15 mins, day-ahead and week-ahead	ENW, SSEN

Source: References: [1], [2], [3], [7], [8]

Procurement indications

ENW indicate procuring Variable Availability + Operational Utilisation (VA+OU) in long term contracts agreed through biannual tender processes at the same time as its Peak Reduction contracts. SSEN has indicated offering the service in long-term tenders for availability, with refinements occurring on a month-ahead and week-ahead basis, combining the flexibility procured from this product with its planned use of the services Scheduled Utilisation and Scheduled Availability + Operational Utilisation.

Options for stacking

Our stacking assessment for VA+OU is very similar to Scheduled Availability + Operational Utilisation. The key difference is that VA+OU has greater service flexibility in that availability can be refined close to the time of delivery (although only refined by the DSO and not by the FSP).

The product variants which have a real time (2 or 15 minute) instruction are more challenging to stack in terms of revenue splitting. Any FSP which is BM participating will not be able to provide VA+OU with real time response due to the requirement to submit accurate FNPs at Gate Closure. This barrier is similar to many other ESO services for both BM and non-BM units, with many using a baseline of the FPN (or equivalent) as part of

the service. Real time response will also create technical delivery challenges; responding to real time signals from both the ESO and DSO would likely provide challenging and not be possible and make measuring performance against each of the services difficult.

Real-time utilisation also causes challenges for FSPs to trade on the wholesale market to match their delivered volumes (wholesale trades can be made up to the start of a settlement period), meaning the FSP (or balancing responsible party) will be exposed to imbalance charges for any instructed volumes. This is because DSO services are not included in Applicable Balancing Services Volume Data.

However, for the day-ahead and week-ahead variants, the VA+OU is more readily stackable. This is because FSPs would be able to submit accurate FPNs for the BM or baseline positions to ESO services. However, there are reasons why day-ahead VA+OU may still be challenging to stack with ESO services, such as the 'minutes' utilisation period potentially not aligning to ESO delivery periods (i.e. settlement periods or EFA blocks) and making jumping less efficient, and day-ahead utilisation instructions will need to time well with the ESO's day-ahead auctions so FSPs can plan their activities. Similar to previously discussed services, delivery of ESO service would need to be in the same direction as the DSO service and could result in DSO over-delivery. We understand that over-delivery is currently widely accepted across the DSOs, which should enable service splitting for many ESO services. However, rules of DSO service over-delivery should continue to be monitored by FSPs to ensure there is no breach of any service rules. The ability to stack may therefore depend on how each DSO implements the service.

Furthermore, for the day-ahead and week-ahead variants, we note it equally enables FSPs to receive availability payments and then engage with another service if that capacity isn't needed by the DSO in the contracted period(s). This is a positive aspect of the service that may be attractive to FSPs.

Regarding revenue jumping, the day-ahead and week-ahead service should be readily jumpable between most services. Furthermore, real-time variants should also be readily jumpable across most ESO services. This is because the inclusion of advanced availability windows (which are across settlement periods) means that FSPs can plan their delivery in ESO markets with foresight of DSO requirements. This does, however, depend on when utilisation is instructed, where knowing utilisation before ESO day-ahead auctions will be beneficial.

We also note that the variable availability aspect of the product should support FSPs to maximise their activities in other markets, as when they are likely not needed for DSO services, they can use the spare capacity to provide other services.

Variable Availability + Operational Utilisation is also not a Relevant Balancing Service for the purpose of the Capacity Market (as discussed in Section 4 here), therefore FSPs will need to determine any risk of non-delivery in the CM when contracting for Scheduled Utilisation. As with SA+OU, the direction of the VA+OU product will have an impact; if demand turn up or generation turn down is required, this is likely to risk CM delivery in a System Stress Event. We note delivering a VA+OU contract may also impact a demand response FSP's baseline with regards to the Capacity Market (and therefore ability to deliver). Therefore, it is possible that VA+OU would lower an FSPs ability to provide capacity into the CM and deliver. However, an FSP could limit this risk by only offering partial capacity into VA+OU and/ or the CM – so that it can always ensure delivery on its CM obligations.

Figure 15: Stacking summary for Variable Availability + Operational Utilisation (see Figure 3 for key)

Variable Availability + Operational Utilisation Product	Splitting Summary		Jumping summary		Notes
	2 min & 15 min	DA & WA	2 min & 15 min	DA & WA	
Wholesale market					Real-time instructions (2-min) mean accurate wholesale market optimisation is challenging, but day-ahead more readily splitable. Jumping is more stackable particularly with availability known in advance.
Balancing Mechanism					Close to real time instructions would result in deviating from FPN, prohibiting splitting. Day-ahead and week-ahead variants more likely to comply with BM requirements, but actions need to be in same direction and could result in DSO over-delivery.
NIV Chasing/ imbalance					Active NIV chasing challenging in same SPs that real-time DSO utilisation occurs, although this will put FSP into imbalance anyway as service is not in ABSVD. Scope to split with day-ahead and week-ahead service.
Capacity Market	N/A	N/A	N/A	N/A	VA+OU is not a Relevant Balancing Service. In instances where VA+OU is in same direction as CM obligation, then it's unlikely to impede CM delivery. However, this will need to be carefully considered by FSPs including baseline impacts.
Demand Flexibility Service*					MW dispatch is for generation turn-down to zero, limiting splitting ability. LCM does not permit stacking with any other service in the same settlement period, while DFS rules state providers cannot be providing any other services including the CM and DSO services. Real time VA+OU creates additional challenges as it may impede ESO requirements. Service jumping more readily available, except for DFS due to the prohibition on other services. LCM markets allows FSPs to declare unavailability for any SPs it is not available a day in advance, while MW dispatch is subject to Primacy Rules giving priority to the DSO.
MW Dispatch Service					
Local Constraint Market					
STOR					Committed STOR has strict service availability requirements, and PN's for purpose of baselining must be equal to or less than zero. There could be limited circumstance for splitting day-ahead/ week-ahead DSO product, but real-time variant risks STOR delivery. STOR allows for service jumping.

Variable Availability + Operational Utilisation Product	Splitting Summary		Jumping summary		Notes
	2 min & 15 min	DA & WA	2 min & 15 min	DA & WA	
Slow Reserve					Real time utilisation of DSO service would impact 60-min/ FPN baselining requirement for ESO services, prohibiting splitting. For day-ahead/ week-ahead DSO service, this should theoretically enable splitting. However, this may depend on the precise service implementation, such as aligning delivery periods and time of day-ahead instructions. For splitting, only viable for same direction services. DSO service over-delivery is likely which we understand is currently acceptable with the DSOs. There should not be many limitations on service jumping.
Quick Reserve					
Balancing Reserve					
Dynamic Containment					
Dynamic Moderation					
Dynamic Regulation					
FFR – Static only					Real time DSO instruction inhibits FFR participation in same time period with numerous risks and challenges. Where availability/ utilisation is known further in advance, splitting is more achievable but may depend on precise DSO requirements (e.g. availability/ utilisation length, and time of day-ahead instructions).

*We note that for DFS, the ESO in its latest proposals is looking to enable service stacking with the CM and DSO services for winter 2024-25.

Summary & next section

In this section we have covered the detail behind our stacking assessment for the new suite of DSO services. One of the considerations when service stacking and achieving revenues for flexibility is the approach to 'baselining' used for each of the services. The next section, at a high level, looks at the key baselining approaches used for flexibility services and discusses some of the key considerations for services stacking.

6 Baselining considerations when service stacking

Baselining is a key consideration of the commercial aspect of flexibility services. The baseline is defined as the volume of electricity demand or generation which is expected to have come from a FSP if they were not providing flexibility; the watermark from which a change in demand or generation is measured. The difference between the baseline and the actual metered volume during the period of service provision is the volume of flexibility that the FSP has provided and will be compensated for.

Determining this volume correctly is important to DSOs, the ESO and FSPs to ensure both the correct amount of flexibility is procured and is properly rewarded. Equally, effective and transparent baselining is necessary for FSP to judge how it can stack flexibility services.

For stacking, understanding the counterfactual that is being used by a DSO or the ESO to measure flexibility is crucial to an FSP effectively managing its obligations when providing flexible services. The need for different methodologies is due to both the needs of the system operator procuring the service and the different characteristics of the FSPs providing the flexibility. Determining an appropriate baseline is an important but sometimes complex task; it can impact the ability for assets to stack services. To ensure fairness and accuracy in baselining, a standardised approach covering a broad range of methodologies is required.

ENA Open Networks has developed a set of standard baselining methodologies for DSOs to use when procuring flexibility. This is designed to ensure alignment in service for FSPs and provide DSOs with a set of standardised baseline methodologies that FSPs can be familiar with. These methodologies are:

Figure 16: Standardised DSO baseline methodology descriptions

Methodology	Description	Example use(s)
Mid 8-in-10	A rolling historical baseline which uses data from the “middle” of the last 8 of 10 days	FSPs with a regular weekly profile
Mid 8-in-10 with Same Day Adjustment	A rolling historical baseline which uses data from the “middle” of the last 8 of 10 days, but also applies a “same day adjustment”.	FSPs with a regular weekly profile but with adjustment to allow for provision of other flexibility services
Mid X-in-Y	A custom rolling historical baseline, where the user can choose how many days to consider and what length of same day adjustment to use.	FSPs providing a long-term regular flexibility service (e.g. Peak Reduction)
Nominated	A nominated baseline, which allows the user to input the self-declared baseline of the asset in advance of the flexibility dispatch event.	Bespoke methodology for FSPs with highly irregular profiles
Zero	A baseline which assumes that the asset is not operating except for when providing a flexible service.	FSPs who have zero baseline

Source: *References*: [3]

Choice of which baselining methodology is used is the prerogative of the DSOs. There is no indication that ENA Open Networks has designed the methodologies to be paired with specific products, instead allowing optionality for a range of FSPs to be accurately baselined by DSOs based on the information that is best available.

Across ESO and DSO flexibility services (as well as the wholesale market), there are a wide range of baselining approaches that are used. While we have detailed the common DSO baselining methodologies in the above table, we also show the various baselining methods used by the ESO in Figure 19 in the appendix.

The combination of baselining methodologies being used across two services being stacked is an important consideration, as it determines that amount which the FSP is being paid for each service. This in turn impacts whether or not an asset is deemed to be splitting or co-delivering services, as well as impact whether or not an asset is deemed to be over-delivering on a service. However, we note that while baselining is an important consideration, wider service requirements (as per service terms) remain paramount as to whether or not two services can be stacked.

The below table lists the key baselining approaches used across DSO and ESO services, and some of the key considerations that need to be thought about when service stacking.

Figure 17: Baselining methodologies and considerations for service stacking

Baselining method	Description & current uses	Key considerations for service stacking
Historical baselines	Based on historical averages. Used for DFS, Capacity Market (DSR only), DSO services.	• Historic baselines essentially lock the FSP into the level from which it will be measured for payments based on previous behaviour, unless the historic baseline contains an adjustment mechanism to reflect the provision of other services • Key to stacking is whether the system operator (i.e. DSO or ESO) is happy that if the FSP deviates from this historic baseline on the day to provide another service, provided it doesn't impede the asset's ability to deliver the service(s) • A key consideration for the DSO (or ESO) in this method is whether it is looking for a change in output/ demand compared the current level (i.e. manage real time network conditions), or if it is looking from a change in output/ demand compared to 'normal' or 'historic' levels (i.e. potentially to manage medium/ longer-term network needs) • The historic baseline does not typically impact the ability for an FSP to provide another service by itself (based on our assessment in this report), but instead will impact what the FSP is paid for. The ability to stack a DSO service with ESO services is more impacted here by whether or not the utilisation of the asset is pre-scheduled (allowing visibility to enter into ESO flexibility services) or required to dispatch in real-time (less compatible with ESO services). If an FSP has committed to a DSO service and chooses to stack with another ESO service, it could result in the FSP overdelivering when using a historic baseline (assuming it is not adjusted for provision of another service). Alternatively, it could result in co-delivery (double payment, which has several wider challenges and considerations), depending on the baseline methodology used by the ESO • A further consideration is the impact that providing other services will have on the FSP's baseline over the period for which the historic baseline is set. If an FSP is regularly providing other services, it can impact its historic baseline and ability to meet the service requirements. We note historical baselines may use 'adjustments' which can reflect activities outside an asset's normal operating behaviour (e.g. providing other flexibility services). This is used in some instances across industry (e.g. proposed changes to the DFS service suggests excluding 'event days' from its historic baseline, while DSO services have a concept of 'non-active' days • Other benefits of historic baseline include that it's accessible for a wide range of FSPs, such as demand response units and small-scale FSPs without sophisticated (e.g. real-time) metering requirements
Zero baselines	Requires a starting position of zero. STOR (for generation), DSO services, Capacity Market (for generation)	• Zero baselines have several important considerations for service stacking, but similar to historic baselines this does not impact an asset's ability to stack services alone but instead depends on wider service requirements. The baseline, however, will impact what the FSP is paid for and whether or not it might be 'splitting' or 'co-delivering' services (noting co-delivery has wider challenges) • A zero baseline can inhibit service stacking, particularly if it is enforced. An example of this is the ESO's STOR service, which requires generators to have a zero baseline (demonstrated via Physical

Baselining method	Description & current uses	Key considerations for service stacking
		Notifications). This can prevent FSPs from being able to deliver another service as it is only allowed to deviate from zero at the instruction of the ESO • However, zero baselines could support stacking if the system operator (DSO or ESO) is OK with the FSP deviating from the baseline for provision of another service, or if the service(s) has pre-scheduled utilisation. In this instance, a zero baseline may result in co-delivery (being paid for two services) and/ or over-deliver of one service. However, this will depend on the baselining method of both service(s) being provided and whether the FSP is attempting to co-deliver (noting co-delivery has some wider considerations and challenges) • Other considerations include that zero baselines are typically easy to implement/ monitor and can benefit non-dispatchable assets. However, it is often not suitable for some technology types depending on the use case (e.g. DSR will typically be consuming and not at zero), while it may not be suitable for services with multiple directions (i.e. only suitable for generation turn-up or demand turn up)
Final Physical Notification or equivalent	Operational baseline declared 1-hour before start of delivery period. BM, dynamic response services, Balancing Reserve, Slow Reserve, Quick Reserve	• Many ESO services use Final Physical Notifications (FPNs) for baselining purposes. This requires assets to submit their Operational Baseline at Gate Closure (i.e. 1-hour before the start of each Settlement Period). For registered BMUs, this is done via the normal BM data submissions, whereas for non-BMUs an equivalent is submitted via another platform (e.g. the Ancillary Services Dispatch platform (ASDP)) • The common use of FPNs for baselining purposes has a significant impact on the stacking of services. While there are lots of reasons and benefits for using FPNs, they effectively lock an asset into position just ahead of real time. This means the asset can only deviate from this position due to an ESO instruction, but deviating from this position due to a DSO instruction is prohibited. FPNs therefore hinder the ability to stack with real time DSO services (i.e. where DSOs need to issue real-time instructions) • FPNs are, in our assessment, compatible with stacking for many pre-scheduled DSO services. Provided an FSP knows what they are delivering to the DSO ahead of FPN submission (and preferably prior to the ESOs flexibility auctions too), then they should be able to deliver two services in the same time period (i.e. usually resulting in service splitting). However, this requires the ESO to allow a non-zero baseline, and delivery of the ESO service can result in over-delivery of the DSO service as discussed elsewhere in this report • Other benefits of using the FPN approach are that it (i) provides good visibility for the system operator of FSPs positions close to (but still prior to) real time, and (ii) can be used for a wide range of technologies and the practice is embedded in industry arrangements. We note that any asset that is BM participating must submit FPNs every half-hour regardless of whether they are participating in other services; this can impact the ability of many FSPs to stack with real-time DSO services at any time

Baselining method	Description & current uses	Key considerations for service stacking
Nominated baseline	Baseline based on expected/ forecast operation profile of asset ahead of time (similar/ same as the FPN requirement described above) DSO services, Local Constraint Market	• Nominated baselines are very similar to FPNs as described above. They are effectively a forecast of the generation or demand profile of an FSP in the absence of any flexibility service activity. DSOs can use this profile to calculate the deviation of the metered data from the planned profile • Many of the considerations for nominated baselines are similar to those of FPNs. However, DSOs may use nominated baselines differently to FPNs, such as requiring nominations further in advance of delivery (e.g. at the point of trade) • When stacking DSO with ESO services, a nomination baseline for DSO services can be compatible with service stacking. However, the ability to stack is still dependent on wider service requirements while the baselining method will impact the level of flexibility measured for the service and so payment received • In the case of pre-scheduled DSO services, a nomination baseline should be compatible with most ESO services and would likely result in service splitting, but potentially also over-delivery of the DSO service. We would assume an FSP would nominate its baseline based on its typical profile. If accepted for a pre-scheduled DSO service, it enables the FSP to provide accurate baselines if providing further services for the ESO (i.e. enable accurate FPNs to be submitted). However, this will depend on when the service is scheduled and when the nomination baseline is provided • Due to the nomination being based on a 'forecast' of the FSPs typical profile, delivery of a second service on top of the DSO service would result in over-delivery (as discussed elsewhere in this report) • Other benefits of nomination baselines include (i) the ability for the FSP to position its assets as desired for the delivery window, (ii) good visibility for a system operator of an asset's expected operating profile, and (iii) applicability to wide range of asset types. However, they require accurate forecasts, and the timing of nomination is key for FSPs engaging in other markets
Real time/ dynamic baseline	Baseline based on real-time position of the asset. Static Firm Frequency Response, MW dispatch	• Real time baselines have the potential to deliver highly accurate baselines when delivering services but require sophisticated metering requirements not viable for all FSPs • A real-time baseline can benefit service stacking as it inherently takes into consideration the position of the asset immediately prior to the event. This means that, should an FSP participate in a DSO service, delivery of that service should not inhibit measuring delivery of another service that uses real-time baselining. However, as discussed, this could result in over-delivery of the DSO service • The interaction between baselining methodologies between two services being stacked is important to consider. Interactions can become complex if two services both use real time baselining. If two services are activated at the same time, then the FSP may get paid for both services for the same MWs (i.e. co-delivery). If the services are activated at different but overlapping time periods, then while real-time baselining enables accurate measurement of the second service activated, there could be an over-delivery of the first service. Baselines could be adjusted for the provision of other services; however, this would likely be complex to implement

Baselining method	Description & current uses	Key considerations for service stacking
		• Other benefits include that real-time baselining is reflective of an FSPs actual position, negating the need for forecasting by FSPs. But we note that real-time baselines have onerous metering/ operational data requirements, and depending on what a particular system operator is procuring for, may not be reflective of the FSP's typical behaviour if providing multiple services

7 Summary and next steps

In this report we have explored the ability of flexible service providers (FSPs) to stack revenue streams from services being procured by Distribution System Operators (DSOs) and other, more-established revenue streams, primarily those for flexibility services procured by the Electricity System Operator (ESO).

There has, and continues to be, much progress in the area, with more information being available to FSPs as a result of the ENA Open Networks programme and as each DSO rolls out the new services during 2024.

For many combinations, there remains no single source of information setting out explicitly the ability of one DSO service to be stacked in a particular manner with another service. Each FSP will need to consider the benefits and risks for their technology, together with the available details for revenue stream(s) it wishes to participate in before deciding on its approach.

In Figure 18 we summarise a number of areas that have arisen from the research for this report, where further development will provide increased visibility of acceptable stacking combinations and enhance the provision of services by FSPs to procuring DSOs.

Figure 18: Aspects of flexibility stacking for further consideration and development

Area	Suggested next step(s)
Service and stacking guidance	Make clear what can and can't be stacked to reduce ambiguity . For implicitly stackable combinations, prepare guidance/ service descriptions setting out explicit guidance.
Barriers to service stacking	Monitor and track DSO service implementation to ensure close alignment, identify common barriers and solutions. Look for new barriers that have arisen.
Flexibility provider perspective	Engage with FSPs during/ after 2024 roll-out to assess experience of accessing stacking services, suggested improvements. This could also be an opportunity for improved alignment/ commonality in the way DSOs utilise the suite.
Wider industry discussion on co-delivery	Clarity over when and how co-delivery is acceptable and should work alongside splitting and jumping. ENA, DSOs, ESO and stakeholders should work together to determine when co-delivery may be beneficial to both FSPs and the networks, and to provide clarity or guidance of when this can or can't be achieved. If barriers are identified for co-delivering services where there are potential benefits, these barriers should be investigated and removed.
Success metrics	Publish market results (e.g. ulitisation volumes) as transparently as possible. This will enable FSPs can see the value in the services and ultimately aid decision making by FSPs (over which to participate in) and DSOs (over which to offer and evolve)
CM Relevant Balancing Services	Explicitly state whether the suite of DSO services should be added to the Relevant Balancing Services (RBS) for the Capacity Market (CM), and if not, clarify when providing DSO services would risk CM delivery. This would resolve any ambiguity concerning obligations, payments, and penalties that may arise when a FSP participates in both concurrently.
Baselining Methodology and guidance	Provide further guidance and common DSO approaches to baselining methodologies to enable DSOs and FSPs to accurately consider implicitly stackable revenue combinations and whether guidance/ service descriptions can be prepared to set out explicit guidance for FSPs. Consider further enhancements to the work undertaken to date (e.g., ENA *portal*) based on feedback from FSPs/ DSOs. This could include for example, identifying a consistent baseline methodology for each service across all DSOs.
Implications for over-delivery	Improved clarity in relation to DSO-procured services relating to over-delivery, would enable FSPs to make better informed decisions in relation to other revenue streams (e.g. ESO service participation, if in line with goals/ requirements for both services). During research for this report, we discussed this with the members of the Open Networks workgroup, where the DNOs clarified that over-delivery of DSO services is currently acceptable across all regions; however, this could change in future should it result in adverse consequences due to much greater.

Area	Suggested next step(s)
Non-firm connections	Setting aside the challenges associated with service delivery from a non-firm connection, improved, explicit clarity over participation by non-firm connections would be a positive addition to the suite of information available.
Clarity on Primacy rules with the new suite of DSO services	Currently, Primacy rules have only been formalised for voltage management, thermal constraint, and system inertia instructions in the BM and the ESO's Transmission Constraint Management service procurement for all DNO products except Restore. Work on Primacy should continue with the new suite of DSO services.
	Specifically, we note in the near-term that clarity is needed over the treatment of Operational Utilisation under current Primcay rules. This is because the current rules refer to the historic Restore product for which Operation Utilisation may replace (depending on the DNO and how they use the service).

8 Appendix

ESO baselining approaches

Figure 19: National Grid ESO baselining methodologies for balancing services

Market/ service	Baseline method
Wholesale market	Effectively a zero baseline. Asset measured against contracted position - Energy Contract Volume Notifications
Balancing Mechanism	Physical notifications - Final PNs submitted at gate closure (1-hour before delivery)
NIV Chasing/ imbalance	Effectively baselined against wholesale contracted position.
Capacity Market	For generation, effectively a zero baseline is used. For demand - six-week baseline of historical demand data used. 16 data points are used in calculating the DSR baseline. Baseline is adjusted for provision of balancing services
Short Term Operating Reserve	BM STOR - physical notification with a zero baseline required
Firm Frequency Response - Static only	Effectively real time baseline - output or demand measured immediately prior to the Relevant Frequency Incident .
Local Constraint Market	A nominated baseline is used for LCM (providing immediately after bidding (day-ahead or intra-day as appropriate)
MW Dispatch Service	Delivery is measured from the point of instruction (effectively real time baseline)
Demand Flexibility Service	Historical baseline (unadjusted), using 60-day window with a selection of most recent days used.
Slow Reserve	Yet to be approved, the Quick Reserve Technical and Procurement Service Design has proposed the use of Final Physical Notifications for baselining. Slow Reserve is expected to be the same.
Quick Reserve	
Balancing Reserve	Final Physical Notifications submitted at gate closure (1-hour before delivery).
Dynamic Containment	Physical notifications for BMUs - Submission of Operational Baseline. Final PNs submitted at gate closure (1-hour before delivery). Non-BMUs to provide equivalent via a Non-BM Data Submission.
Dynamic Moderation	
Dynamic Regulation	

References

- [1] *Flexibility Products Review and Alignment Document: v1.0* - Energy Networks Association Open Networks, February 2024, https://www.energynetworks.org/assets/images/2023/Aug/on-flexibility-products-alignment-(feb-2024).pdf?1709046737
- [2] *Flexible Services and Parameters* - Electricity North West, May 2024, https://www.enwl.co.uk/globalassets/future-energy/flexibility-hub/document-library/helpful-guides/flexible-services-products-and-parameters-may-2024.pdf
- [3] *Distribution Flexibility Services Procurement Statement* - Electricity North West, March 2024, https://www.enwl.co.uk/globalassets/future-energy/flexibility-hub/document-library/ofgem-dfp-reporting/distribution-flexibility-procurement-statement-march-2024.pdf
- [4] *Flexibility Product Update* - UK Power Networks, March 2024, https://d1lf1oz5vvdb9r.cloudfront.net/app/uploads/2024/03/Products-Update_240228.pdf
- [5] *Distribution Flexibility Services Procurement Statement* - Northern Powergrid, April 2024, https://www.northernpowergrid.com/downloads/59658
- [6] *Distribution Flexibility Services Procurement Statement* - National Grid Electricity Distribution, April 2024, https://www.nationalgrid.co.uk/downloads-view-reciteme/662358
- [7] *Distribution Flexibility Services Procurement Statement* - Scottish and Southern Electricity Networks, March 2024, https://www.ssen.co.uk/globalassets/our-services/flexibility-services-document-library/slc31e-reports--statements/ssen-c31e-flexibility-services-procurement-statement-2024---final.pdf
- [8] *Service Terms – Active Power Services (Flexible Power): v2.0* - Scottish and Southern Electricity Networks, February 2024, https://www.ssen.co.uk/globalassets/our-services/flexibility-services-document-library/service-documentation/ssen-service-terms-aligned-to-fsa-flexible-power-v2.1.pdf

Visit our website to find out more about Open Networks

Energy Networks Association
4 More London Riverside
London SE1 2AU
t. +44 (0)20 7706 5100

w. energynetworks.org
@EnergyNetworks