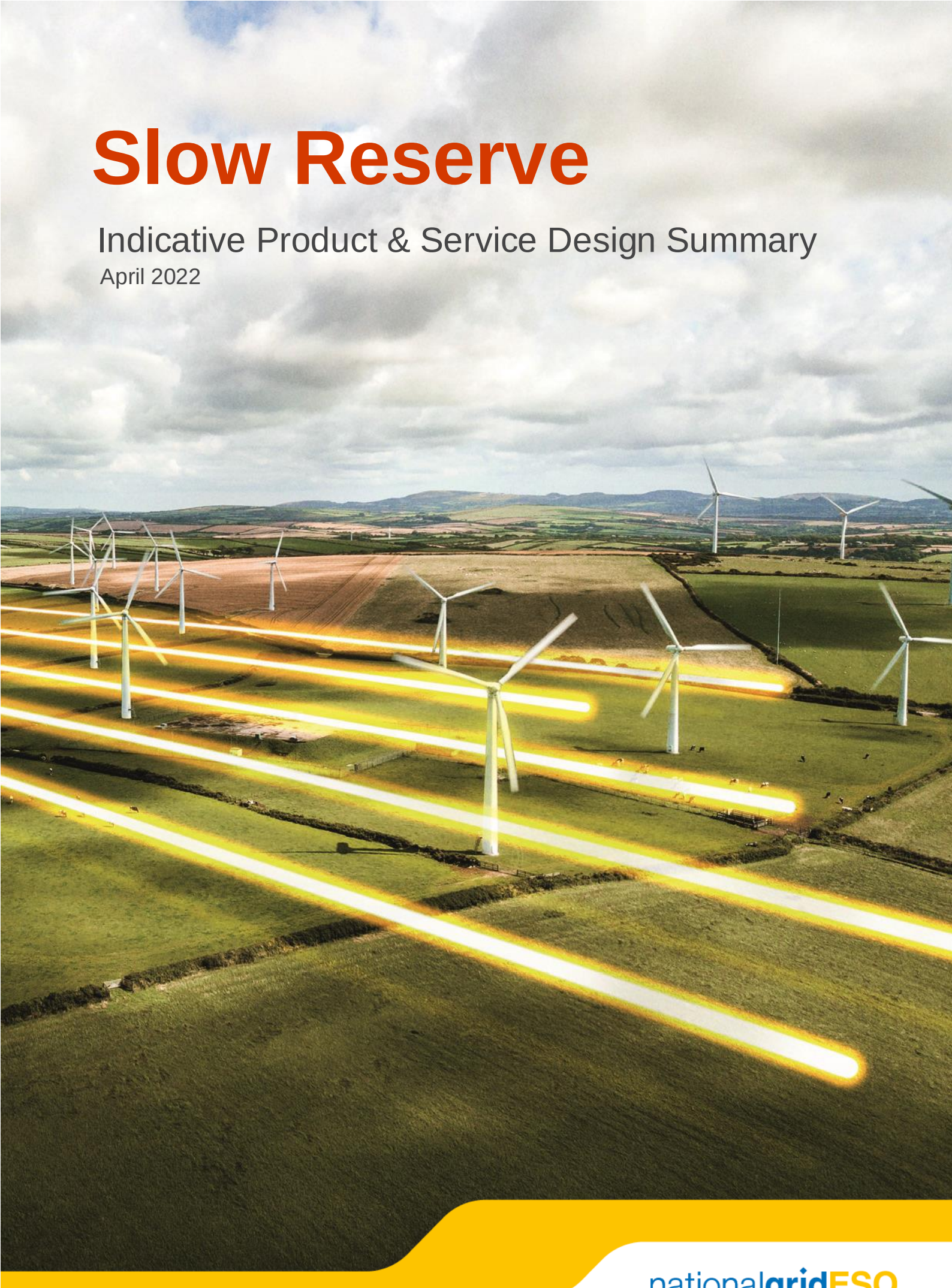
Slow Reserve

Indicative Product & Service Design Summary

April 2022



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1. Introduction

The Reserve Reform project is developing a suite of new products to ensure safe and secure operation of the network in a zero-carbon world. Our aim is to introduce standardised products which are transparent, fair and competitive for all technology types, ultimately promoting market depth and reducing costs to the end consumer.

This document seeks views on key elements of product and service design for the first two new products: Negative Slow Reserve (NSR) and Positive Slow Reserve (PSR). In parallel, we are working on the design for other Reserve products and will publish a similar summary of proposed service design as soon as possible to seek feedback from industry in the same way that we are for Slow Reserve.

Through this latest engagement, we want to showcase our thinking behind the Slow Reserve products and seek input on some elements still being defined.

We will be engaging with industry participants via a series of events where we will discuss our proposals in more detail. Any feedback will improve the design of our new products prior to launch.

All documentation on the Reserve Reform project can be found on the Future of Balancing Services webpage https://www.nationalgrideso.com/research-publications/future-balancing-services.

- Reserve Reform Project Delivery Update – February 2022
- Response & Reserve Webinar – November 2021
- Reserve Reform Product & Service Design – September 2021

We encourage you to use the attached Slow Reserve Feedback Proforma to provide any written feedback. Please attach the proforma and any questions to:

Email: box.futureofbalancingservices@nationalgrideso.com

2. Service Overview

Negative Slow Reserve (NSR) and Positive Slow Reserve (PSR) form part of a suite of new Reserve products which NGESO are developing to maintain the safe and secure operation of the network. Reserve is needed for frequency management when there is an imbalance between supply of energy and demand for energy. When instantaneous supply is not enough to meet the demand, the frequency falls; where supply outstrips demand, the frequency rises. Additional generation or demand is needed to re-establish this balance. Initially, this is provided by frequency response which initiates automatically according to system frequency. More information can be found on our new Response services Dynamic Containment, Dynamic Moderation and Dynamic Regulation on the ESO website. Reserve is then instructed to replace the energy delivered by frequency response in accordance with system requirements.

Both Slow Reserve (SR) services will be procured via a day-ahead auction to secure firm capacity (for the next Operational Day), termed the 'Firm Service', and within-day via the 'Optional Service' helping to mitigate the largest demand and generation losses on the network.

For Negative Slow Reserve, units are instructed to increase demand or decrease generation in full within 15 minutes. The inverse is true for Positive Slow Reserve. Slow Reserve is open to any technology with the ability to provide a net change in demand/generation of at least 1.0 MW.

Providers will be able to bid in their assets during one or more Service Windows via our dedicated auction platform. If successful in the daily auctions (for one or more Service Window) providers will be awarded a Firm Service contract for each separate Service Window (for the next Operational Day) and will be paid Availability Payments over the duration of each contracted Service Window, plus a Utilisation Payment if dispatched. Providers that have not secured a Firm Service contract can still offer their asset availability to NGESO on the Operational Day via the Optional Services and will be paid for Utilisation only.

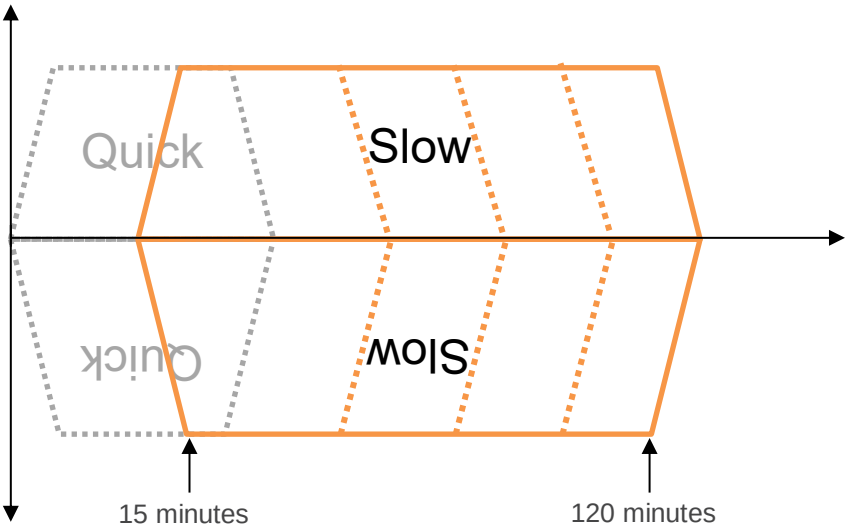


Figure 1: an indication of the Slow Reserve product durations and response times. Quick Reserve is still to be defined.

3. Service Parameters

Both Balancing Mechanism (BM) and non-BM participants with a connection to either the electricity transmission or distribution network will be eligible to provide Slow Reserve.

The contractual requirements for the SR services will be described more fully in the Service Terms, but the key elements are:

- Minimum 1.0MW capacity of generation reduction/increase or demand reduction/increase from any technology (which can be a single asset or an aggregated unit comprising more than one constituent asset)
- Slow Reserve Units must be able to:
    - Reach full activation (contracted MW) within 15 minutes of instruction (within specified ramp rates).
    - Be capable of sustaining full activation for a minimum of 120 minutes.
    - Specify a Maximum Recovery Period of no greater than 30 minutes to return to availability before NGESO can send another dispatch instruction.
- Units can be aggregated at GSP Group level to meet the 1.0MW minimum participation threshold
- Contracts will be awarded upon acceptance of bids (Firm Service) in whole MWs (minimum 1MW) submitted into the daily auction.
- Providers contracted for the Firm Service will receive an availability payment (£/MW/hour) and a utilisation payment (£/MWh) when dispatched.
- Non-BM participants will be instructed through our Ancillary Service Dispatch Platform (ASDP) /Platform for Ancillary Services (PAS) dispatch system in line with our current reserve products. BM participants will be dispatched via Bid Offer Acceptances (BOAs) through existing BM systems.
- Maximum allowed ramp-up rate for product delivery to be set at 100% of the contracted capacity per minute. For instantaneous ramping (for units that cannot ramp-up linearly), the unit cannot deliver more than 50% (or 1/2) of the contracted capacity in any 30 seconds periods of the delivery.

- Stacking with other ancillary services is not permitted under the Firm Service for the initial launch but will be kept under review.
- Providers will be required to submit 1Hz metering data for operational and performance purposes.
- Both BM and non-BM providers will have their energy position corrected through the ABSVD process.

4. Service Windows and the Firm & Optional Services

The Slow Reserve Operational Day will run from 23:00 – 23:00 to align with other ESO balancing services and will be broken down into a series of Service Windows. All Service Windows will be available to pre-qualified Slow Reserve Service Providers to submit bids for the Firm Service at day-ahead or the Optional Service within-day. Unlike the discrete Firm and Optional windows as currently in place for STOR, the new Reserve products will not differentiate each Service Window by service type so each time period will contain both the Firm and Optional services.

The number of Service windows in each Service Day and our requirements for the Firm Service will be published on our website ahead of the first auction opening. Window length, start and end times, plus firm procurement requirements will vary depending on system conditions and will be communicated to industry with notice via a Market Information Report. As the requirement for Slow Reserve may vary across different seasons, there may be periods during the day where NGESO has no requirement for the Firm Service. These periods will remain available for the Optional Service.

Daily procurement will be managed for each Service Window separately (no linked bids) and providers can bid in for any number of separate Service Windows. Some examples of service windows for illustrative purposes only.

Scenario A – 24-hour firm requirement

An example scenario where NGESO communicate a 24-hour firm requirement in 9 discrete service windows across an operational day. Service providers will be able to bid into an auction at day-ahead to secure contracts for the Firm Service or submit utilisation prices within-day for dispatch for the Optional Service.

Window No.	Window 1	Window 2	Window 3	Window 4	Window 5	Window 6	Window 7	Window 8	Window 9
Start Time	23:00	07:00	09:00	11:00	13:00	15:00	17:00	19:00	21:00
End Time	06:59	08:59	10:59	12:59	14:59	16:59	18:59	20:59	22:59
Firm Requirement	✓	✓	✓	✓	✓	✓	✓	✓	✓
Optional Service	✓	✓	✓	✓	✓	✓	✓	✓	✓

Scenario B – 10-hour firm requirement

An example scenario where NGESO communicate a 10-hour firm requirement in 9 discrete service windows across an operational day. Service providers will be able to bid into an auction at day-ahead to secure contracts for the Firm Service or submit utilisation prices within-day for dispatch for the Optional Service. Note, in windows where NGESO have no firm requirement, providers are still able to declare available and submit bids for the Optional Service.

Window No.	Window 1	Window 2	Window 3	Window 4	Window 5	Window 6	Window 7	Window 8	Window 9
Start Time	23:00	07:00	09:00	11:00	13:00	15:00	17:00	19:00	21:00
End Time	06:59	08:59	10:59	12:59	14:59	16:59	18:59	20:59	22:59
Firm Requirement			✓	✓	✓	✓	✓		
Optional Service	✓	✓	✓	✓	✓	✓	✓	✓	✓

Scenario C – 12-hour firm requirement

An example scenario where NGESO communicate a 12-hour firm requirement in 12 discrete service windows across an operational day. Service providers will be able to bid into an auction at day-ahead to secure contracts for the Firm Service or submit utilisation prices within-day for dispatch for the Optional Service. Note, in windows where NGESO have no firm requirement, providers are still able to declare available and submit bids for the Optional Service.

Window No.	Window 1	Window 2	Window 3	Window 4	Window 5	Window 6
Start Time	23:00	01:00	03:00	05:00	07:00	09:00
End Time	00:59	02:59	04:59	06:59	08:59	10:59
Firm Requirement	✓	✓	✓	✓		
Optional Service	✓	✓	✓	✓	✓	✓
Window No.	**Window 7**	**Window 8**	**Window 9**	**Window 10**	**Window 11**	**Window 12**
Start Time	11:00	13:00	15:00	17:00	19:00	21:00
End Time	12:59	14:59	16:59	18:59	20:59	22:59
Firm Requirement					✓	✓
Optional Service	✓	✓	✓	✓	✓	✓

Firm Service

Where there is a firm requirement in a Service Window, this will be defined by NGESO and published on the NGESO website. Where a service provider is contracted for a Service Window at day-ahead, this will be known as the Firm Service. Service Providers will be able to bid in their assets to the day-ahead auction for one or more Service Windows in an operational day and if successful, will be awarded a Firm Service contract for each discrete Service Window. This commits the asset to be available for the full duration of the contracted Service Window and Service Providers will be paid Availability Payments (pay-as-clear) over the duration of each contracted Service Window, and a Utilisation Payment (pay-as-bid) if dispatched.

Optional Service

Where NGESO do not specify a firm requirement for a Service Window at day-ahead or the service provider has been unsuccessful in their bids at day-ahead, non-BM providers will be able to submit utilisation-only bids for the Optional Service within-day. If Service Providers are dispatched under the Optional Service, they will receive a Utilisation Payment (pay-as-bid) only.

BM providers should continue to offer reserve to NGESO via the Balancing Mechanism and will be dispatched via Bid Offer Acceptances (BOAs).

5. Registration and pre-qualification

In line with the implementation of our recent dynamic response products, registration and pre-qualification for the new Slow Reserve services will be completed via NGESO's Single Market Platform (SMP), following these simple steps:

- Step 1 – participant requests registration as a Registered Service Provider (and associated user IDs)
- Step 2 – NGESO validates registration and issues user IDs (e*ntity is now a Registered Service Provider)*
- Step 3 - participant accedes to relevant contract documentation to facilitate Slow Reserve participation
- Step 4 – participant submits one or more assets for pre-qualification as an Eligible Unit
- Step 5 – NGESO undertakes any necessary validation
- Step 6 – participant allocates Eligible Assets to Slow Reserve Unit(s)
- Step 7 – Non-BM providers will be required to establish and complete the 'end to end' testing of the required web-based solution for communications with ESO via the Platform for Ancillary Services (PAS). Please refer to PAS specifications on our website for more information or contact the team box.support.pas@nationalgrid.com

  For the avoidance of doubt, BM Units follow the existing BM processes (no service-specific requirements)

- Step 8 – NGESO confirms completion of prequalification process and participants are assigned a login to the dedicated auction platform and can participate in Slow Reserve daily auctions

6. Daily Auctions

Requirements

The daily requirement for Positive and Negative Slow Reserve varies depending on the time of year. To reflect this, NGESO will publish separate Market Information Reports on our website which will set out the volume of each Slow Reserve product we will look to procure (Firm Service) each day.

Auction Platform

Slow Reserve auctions will be held on our new auction platform currently under development as part of the Enduring Auction Capability (EAC) project. We have assessed the impact of using an existing platform to deliver the day-ahead auction and concluded that the regret spend for developing such functionality on a legacy system is not in the best interests of consumers. We are currently providing requirements to the EAC project, which includes key auction design parameters such as: pay-as-clear methodology, overholding / underholding and curtailable bidding.

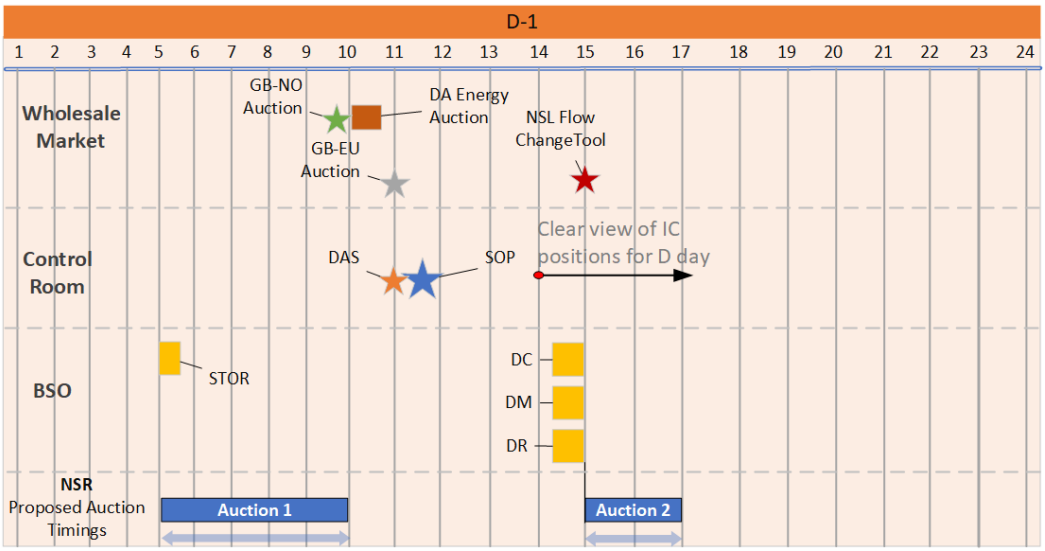
Auction Timing

We are currently assessing options for procuring the Firm Service at day-ahead. Our favoured proposal would be to hold two Slow Reserve auctions for each operational day – one in the morning to secure our base

requirement, another in the afternoon to fulfil any additional requirements once interconnector and trading positions are better-informed for the relevant operational day.

This solution would allow NGESO to secure the base requirement, which is not dependent on the position of the interconnectors, at the beginning of the day. Also, early knowledge of the auction outcome gives providers the chance to participate in alternative markets. As the second auction is closer to delivery, it enables participants to bid in the auction with a clearer view of their firm capacity available and allows full utilisation of their asset flexibility.

We would appreciate industry views on whether this proposal encourages or deters market participation.



Bid Submission

A Registered Service Provider can only participate in the daily auctions once they have completed pre-qualification. NGESO will grant access to the Auction Platform and provide log-in details for the Registered Provider or their nominated Agent.

The Registered Service Provider will then be able to offer its Unit(s) for the Slow Reserve Firm Service by submitting the required bid parameters to NGESO using the Auction Platform.

The auctions for each Service Day will open in advance – timings to be confirmed. Providers will be able to bid the same unit into both auctions (e.g., 10:00 and 15:00) for the same Service Day. If successful in the first auction, NGESO will automatically remove the relevant unit from the latter auction. If unsuccessful in the first auction, providers reserve the right to withdraw / amend bids for the afternoon auction.

Bids can be submitted, replaced, or withdrawn right up to auction closing time and shall reflect and be consistent with the Unit registration details (notably the maximum registered capacity).

Each Slow Reserve Bid will only include the availability price (£/MW/h), the volume (MW) (being a minimum of 1 MW and a maximum (MW) not exceeding the pre-qualified asset MW), confirmation if the bid is curtailable (the minimum capacity they are willing to accept) and any other additional parameter(s) as may be specified in the relevant Auction Rules.

To reiterate, each Unit can bid for one or more, or all of the Service Windows within an Operational Day. Multiple Bids will not be accepted in respect of any unit for the same Service Window. Linked bids are not permitted.

Assessment Principles

All Bids will be assessed in accordance with the published Assessment Principles which will closely mirror the existing STOR Assessment Principles, incorporating a buy curve (generated for each auction) setting the ESO willingness to pay based on the alternative cost.

All bids with be ranked in price ascending order against the buy curve to identify the marginal bid, considering curtailability and under or over holding criteria in order to arrive at the lowest overall cost for securing the required volume.

For more information on curtailability and overholding, please refer to the STOR Assessment Principles.

Auction Results

Auction results will be published after each auction on the ESO Data Portal. Exact timings will be confirmed and communicated in line with our auction platform development.

7. Availability Declarations

Once a contract has been awarded for the Firm Service, or the Service Provider wishes to declare themselves available for the Optional Service, they will be required to submit an availability declaration for the relevant unit.

For Non-BM providers these (re)declarations will be submitted into the normal PAS/ASDP route and must be submitted no later than ninety (90) minutes prior to each Slow Reserve Service Window.

Availability declarations must be submitted in accordance with the Service Terms and include;

- confirmation of MW available,
- a utilisation price (£/MWh)

For BM Service Providers, declarations must be made by way of Grid Code BM Unit Data submissions via EDL/EDT (or wider access equivalent), by no later than Gate Closure.

Declarations can be submitted ahead of time (either before, during or after auction/contract award) provided that the MW value in a Service Provider's contract (Firm Service) and availability declaration match. Where no (re)declaration has been submitted by the deadline, or the declared available MW value does not match the contracted MW, the unit will be assumed to be unavailable.

Unavailability for commercial or non-technical reasons is not permitted for the Firm Service.

8. Operational Baselines

An operational baseline is required from all Service Providers during all Service Windows when declared available for either the Firm or Optional Service. This provides operational visibility to NGESO and a datum against which to monitor performance post-event.

For initial launch, providers will be expected to provide a nomination baseline, equivalent to the Physical Notification in the BM. This is a forward-looking view of asset output and is locked in for the forthcoming two settlements at Gate Closure.

We are working with industry to explore alternative baselining methodologies which should remove barriers to entry for non-dedicated assets and technology types which are not suited to the PN approach.

Where the unit is BM participating, the Service Provider shall confirm to NGESO its Operational Baseline during Service Windows by submission of a Physical Notification in accordance with the Grid Code. The processes

and timings associated with PN submissions can be found in the Grid Code at Balancing Code No. 1 (BC1) pre Gate Closure process in particular BC1.4 and BC1.A.1.1.

Where the unit is not BM participating (non-BM), the Service Provider will be required to submit an operational baseline that conforms with the rules referenced above. A route for non-BM providers to submit operational baselines is still being established.

9. Metering

All providers will be required to submit data to NGESO for real time monitoring of service availability and post-event performance monitoring. This data is required by NGESO to ensure operational security of the network and to validate the performance where units are dispatched to deliver an instruction for the Firm and Optional Slow Reserve services.

Operational Metering

In line with frequency response services and the Balancing Mechanism, providers will be required to submit operational metering at a frequency of once per second (1Hz) with a latency of no greater than five (5) seconds. We are exploring opportunities to reduce this standard for sub-1MW aggregated portfolios through a dedicated Power Responsive working group.

BM providers should submit operational metering via the existing processes. Non-BM providers should submit operational metering via ASDP/PAS.

Performance Metering

Performance metering will also be specified at 1Hz granularity. This is important for validating ramping tolerances when performance monitoring post-event to ensure that units are not responding in a manner which is detrimental to frequency.

A route for all providers to submit performance metering is still being established.

10. Dispatch

Dispatch instructions to BM providers will be by way of Bid-Offer Acceptances via EDT/EDL and shall be acknowledged and accepted/rejected within normal BM timescales.

A Non-BM provider will be dispatched via the Platform for Ancillary Services (PAS) system and shall be accepted/rejected within two (2) minutes of receipt. Both Slow Reserve services will be dispatched and ceased manually by ENCC.

All Service Providers must start to provide the relevant service within the response time specified through prequalification and continue provision until the earliest of the following:

1. Issue by NGESO of a cease instruction
2. Expiry of the Maximum Activation Time (as specified through pre-qualification)

The considerations around service delivery beyond the end of a Service Window will be discussed at the first Show and Listen event.

11. Ramp Rates

We are considering the behaviour of participating Reserve assets during the ramping time to ensure that we avoid unwanted impacts on frequency quality. A relevant example is a large wind farm participating in Negative Slow Reserve. As an asynchronous generator, with potentially very fast intertrip capability, we want to prevent two scenarios:

a) The unit trips off immediately on receipt of a Reserve instruction, potentially damaging frequency quality or impacting Response.

b) The unit waits until the final moment to trip off to reach contracted capacity, giving little confidence to ENCC that the unit is going to reach full output within the ramping period.

It is proposed that within the ramping-to-instruction time, participating units must deliver Slow Reserve subject to the following restrictions:

a) For continuous ramping, the unit may not deliver at a rate greater than 100% of contracted capacity per minute (maximum ramp rates).

b) For instantaneous ramping, the unit may not deliver more than 50% of contracted capacity in any 30 seconds period of ramping.

c) The unit may not deliver at a rate less than 6.67% of contracted capacity per minute (minimum ramp rate).

d) The unit may start delivery immediately after accepting a dispatch instruction.

12. Payment

There are two forms of payment that NGESO will make for the Slow Reserve services.

Availability Payments

Where a Service Provider (BM and non-BM) secures a contract for the Firm Service, NGESO will make an Availability Payment subject to the relevant market clearing price (£/MW/h) for the Service Window covered by the Firm Service contract. Payments for availability are subject to performance monitoring.

Utilisation Payments

For each Slow Reserve instruction, non-BM providers will receive a payment for the energy delivered on a £/MWh basis if instructed to deliver the Firm service in a Service Window. Additionally, where NGESO instructs an Optional Service from a Non-BM Unit which is declared available for the Service Window, then it will pay for the energy delivered on a £/MWh basis. All Utilisation Payments will be calculated using the Utilisation Price on a pay-as-bid basis submitted by the Service Provider for the relevant Service Window. Utilisation payments will include the energy delivered in ramping towards and ramping from the instructed MW level.

For BM providers, energy delivered will be paid for through the Balancing Mechanism.

Availability payments and utilisation payments will be settled by NGESO monthly, subject to deductions for service delivery failures following performance monitoring.

ABSVD

NGESO shall apply delivered volumes within Applicable Balancing Services Volume Data (ABSVD) for both BM and non-BM units.

13. Performance Monitoring

NGESO will conduct regular performance monitoring of service delivery. Consequences of non-delivery and unavailability will be set out in full in the Service Terms covering the following:

Under-delivery

- Where a unit is contracted for the Firm Service, a minimum of 95% of the contracted MW must be delivered by the relevant unit throughout the instructed period. Failure to deliver will result in availability payments being withheld for the relevant Service Window.
- Utilisation payments for the Firm and Optional Services will be made for energy delivered.

Over-delivery

- Payments for availability and utilisation will be capped at 100% of the contracted MW (Firm Service) or declared MW (Optional Service).
- Where a unit delivers more than 20% above its contracted MW, availability payments will be withheld for the relevant Service Window.
- For the avoidance of doubt, where a unit delivers between 100% and 120% contracted MW, availability and utilisation payments will be made but will be capped at 100% contracted MW.

In addition to the performance penalties, NGESO will conduct regular performance monitoring over a greater period than the individual Service Window. There will be no further financial penalties associated with this performance monitoring, but NGESO reserve the right to withdraw a unit's prequalification status where a provider continues to deliver below their contracted MW. We would expect either a reproving test or revised base parameters (e.g., reduced maximum MW) before we would reconfirm prequalification status.

14. Active Network Management Schemes

Eligible Assets will not normally be registered by NGESO for participation in Slow Reserve if they have a condition in their DNO connection agreement whereby they are signed up to an Active Network management (ANM) Scheme / Flexibility Connection. However, NGESO will consider this on a case-by-case basis and may (at its sole discretion) enable such participation if there is reasonable evidence to demonstrate that the asset has very high forecasted availability (for example as shown by Curtailment Assessment Reports from DNOs). NGESO shall continue to keep this under review and any changes to this position shall be consulted on accordingly.