Short Term Operating Reserve (STOR)

Interactive Guidance

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Version control

Version	Date published	Page No.	Comments
1.0			

How to use this guide

- This document provides current and potential Short Term Operating Reserve (STOR) providers with clear, simple and transparent guidance on the service. It pulls together FAQs on the service and provides links to related documents, such as Standard Contract Terms (SCTs) and Market Information Reports.
- A menu button on each page allows access back to the main menu, or section menu where required:

- A toolbar runs along the bottom of every page, allowing for quick navigation to section menus. Coloured icons allow navigation to relevant sections of the document.

1. STOR: An overview	2. Technical requirements	3. How to participate	4. Assessment principles	5. Payments, performance and penalties	6. Market information

- Sections of the guidance are colour coded, for ease of use.

- Please contact commercial.operation@nationalgrid.com if you have any questions or feedback.

Note: icons on this page are for illustration only - links do not work.

Main menu

Select icons to navigate to relevant sections of this document:

1) STOR: An overview

2) Technical requirements

3) How to participate

4) Assessment principles

5) Payments, performance and penalties

6) Market information

Key documents

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1. STOR: An overview

What is STOR?	■ Short term operating reserve (STOR) provides National Grid with additional power when actual demand on the National Electricity Transmission Network is greater than forecast and / or there is unforeseen generation unavailability. ■ STOR can be provided by Balancing Mechanism (BM) and non-BM participants.
When does National Grid need STOR?	■ The requirement for STOR is dependent upon the demand profile at any time. ■ The STOR year starts in April, and is split into six seasons, which specify the Availability Windows where STOR is required each day.
How much STOR is needed?	■ National Grid aims to procure a minimum of 1800MW of STOR per year (subject to economics). ■ Forecasting demand is getting more difficult due to the growth of intermittent wind and solar generation. STOR is therefore being increasingly used to ensure that imbalances on the system can be managed.

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2. Technical requirements

Minimum Threshold	■ A STOR provider must be able to offer a minimum of 3 MW of generation or steady demand reduction. This can be aggregated from more than one site.
Response time	■ Providers should be able to respond to an instruction within a maximum of 240 minutes, although response times within 20 minutes are preferable.
Ability to sustain	■ A STOR provider must be able to sustain the response for a minimum of 2 hours and have a recovery period of not more than 1200 minutes.

- It is possible to provide other services outside of STOR contracted availability windows, as long as doing so does not interfere with the ability to deliver STOR.
- A STOR provider must be able to deliver at least 3 times per week.
- STOR Providers can tender in before new build assets are operational.

- STOR dispatch equipment consists of a STOR dispatch PC connected to a central server owned, operated and supplied by National Grid.
- The PC is connected to the Provider's metering equipment to allow the amount of Reserve provided from the contracted site(s) to be read each minute and communicated back to National Grid.

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3. How to participate

- 3.1. Prequalify and tender
- 3.2. Routes to market
- 3.3. STOR seasons
- 3.4. Availability windows
- 3.5. National Grid instruction
- 3.6. Metering arrangements
- 3.7. New build assets
- 3.8. Aggregators / agents

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3.1. How to participate: prequalify and tender

Prequalify for STOR	■ A STOR Framework Agreement must be entered into before submitting tenders for STOR. ■ Acceptance of any submitted tenders will then give effect to the Standard Contract Terms (SCTs) in force at the time. ■ There is no testing requirement because the STOR dispatch PC pulls the real-time metered data – but performance is monitored (see Section 5 of this document for details on performance monitoring).
Tender rounds	■ STOR is procured by National Grid via a competitive tender process with 3 tender rounds per year. ■ Each tender must contain all the required technical parameters associated with the service, as well as the price. Tenders are assessed by National Grid and either accepted or rejected; if accepted, the tender becomes binding on both parties. ■ Tenders can be for one or more STOR seasons, up to a total contracted period of 2 years.

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3.2. How to participate: routes to market

Committed Service

- **Both BM and non-BM providers can offer the Committed Service.**
- STOR provider must make the service available for all Availability Windows and the only acceptable reasons for unavailability is where the unit / site is technically unable to provide the service.
- If a tender is accepted, National Grid commits to buy all services offered.
- Declarations of Availability are made via OC2 for BM Reserve Providers

Flexible Service

- **The Flexible Service is only open to non-BM Reserve Providers.**
- Initial availability declarations for each week are made to National Grid no later than 10.00 hrs on the previous Tuesday. This is then finalised by no later than 10:00 on the previous Friday.
- Declarations of Availability are made via the STOR Dispatch system for non-BM Reserve Providers.
- National Grid is not obliged to accept and buy any of the services offered.

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3.3. How to participate: STOR seasons

- STOR year runs from April to April, currently in STOR Year 11.
- Each year is divided into 6 seasons and each season has 2 Availability Windows per day (except Season 2).
- STOR providers are required to be available to operate at the contracted MW level during Availability Windows.
- Optional STOR can be provided outside of these hours (Non-BM providers only).
- Tenders can be submitted for any or all seasons, up to two years.

Availability Window

Year 12 Seasons - 2018/19							
		WD		NWD		Indicative Hours	
Season	Dates	Start Time	End Time	Start Time	End Time	WD	NWD
1	05:00 on Sunday 1st April 2018 - 05:00 on Monday 30th April 2018	06:00	13:00	10:00	14:00	161.00	24.00
		19:00	21:30	19:30	21:30	57.50	12.00
2	05:00 on Monday 30th April 2018 - 05:00 on Monday 20th August 2018	06:30	14:00	10:30	13:30	705.00	54.00
		16:00	18:00	19:30	22:00	188.00	45.00
		19:30	22:00	00:00	00:00	235.00	
3	05:00 on Monday 20th August 2018 - 05:00 on Monday 20th September 2018	06:30	13:00	10:30	12:30	188.50	12.00
		16:00	21:00	19:30	21:30	145.00	12.00
4	05:00 on Monday 20th September 2018 - 05:00 on Monday 29th October 2018	06:00	13:00	10:30	13:00	210.00	12.50
		17:00	20:30	17:30	20:00	105.00	12.50
5	05:00 on Monday 29th October 2018 - 05:00 on Monday 28th January 2019	06:00	13:00	10:30	13:30	525.00	48.00
		16:00	20:30	16:00	19:30	337.50	56.00
6	05:00 on Monday 28th January 2019 - 05:00 on Monday 1st April 2019	06:00	13:00	10:30	13:00	378.00	22.50
		16:30	20:30	16:30	20:00	216.00	31.50
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3.4. How to participate: Availability Windows

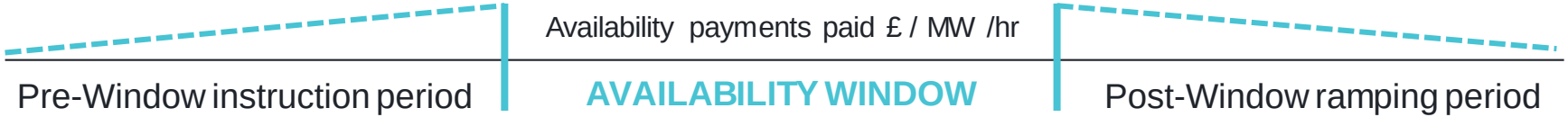
- The Availability Window is defined as being the period during which the Reserve Provider is required to be available to operate at its contracted MW. It is possible that a STOR Instruction may be issued before or after the availability window, in the pre and post-window periods.

Pre-Window instruction period

- Instruction may be issued prior to the Availability Window in order to achieve contracted MW by the time that the Availability Window starts.
- The Pre-Window instruction period is equal to the response time, which is the time that it will take a unit to reach the Contracted MW level after receiving an Instruction from National Grid.

Post-Window ramping period

- Where delivery of Contracted MW is up to the end, or close to the end, of the Availability Window, there may be energy delivered outside the Window whilst the unit is returning to its default state.
- The Post-Window Ramping Period is equal to the Cease Time: the time required for the unit/site to return to its default state, following the Instruction from National Grid.



3.5. How to participate: National Grid instruction

- All STOR Providers must start to provide STOR within the tendered response time and continue provision until the earliest of the following: i) National Grid issues a cease instruction; or ii) expiry of the Maximum Utilisation Period; or iii) the end of the Availability Window.

BM STOR Provider

- A BM provider will be instructed through the BM by way of Bid-Offer Acceptance.
- In preparation for a STOR window, all technical parameters and price information must be re-declared to mirror the parameters / prices which the Provider entered on the STOR tender sheets.

Non-BM Provider

- A Non-BM provider will have a bespoke monitoring and dispatch system commissioned and installed at National Grid's cost.
- This will be installed at the Provider's main office and will communicate with the National Grid Control Room.

STOR Dispatch Procedure

SRD user manual

SRD technical reference

3.6. How to participate: metering arrangements

BM STOR Provider

- Electronic Dispatch Logger (EDL) is the mechanism by which BM providers receive their instructions and exact requirements are specified in the Grid Code.
- BM Unit parameters that are monitored in the relevant periods to verify availability in line with the requirements of the STOR Contract are as follows:
  - Maximum Export Limit (MEL)
  - Physical Notification (PN)
  - Offer Price
  - Bid Price
  - Stable Export Limit
  - Dynamic Parameters (i.e. Run Up / Run Down rates etc.)

Non-BM STOR Provider

- The Reserve Provider must supply metering signals compatible with the STOR dispatch equipment and must be recorded on a minute by minute basis.
- Please refer to the Codes of Practice on Elexon's website for specific metering accuracy requirements:

Codes of Practice

3.7. How to participate: New build assets

- Providers may tender for STOR before the installation of an asset.
- In this case, a set of Mandatory Works Provisions are required to be agreed and included in the STOR Framework Agreement prior to the submission of the tender.

- Any subsequent acceptance of that STOR tender by National Grid will be conditional upon the unit or site successfully commissioning no later than the commencement of the STOR Contract.

- The STOR Provider is responsible for ensuring delivery against these works and notifying NG immediately of any issues or delays.
- Payment will commence from the start of provision of the STOR service.

- Where there is a delay in the Mandatory Works Provisions, a provider can provide National Grid with a Cure Plan.
- The Cure Plan will set out the proposed actions that the Reserve Provider intends to undertake to remedy the delays or, where this is not possible, specify a reasonable extension to the Works Programme.

3.8. How to participate: aggregators / agents

Agent

- Prospective STOR Providers can choose to use an Agent to administer their tender process and submit STOR tenders to National Grid on their behalf. However, the responsibility of signing up to a Framework Agreement sits with the Reserve Provider, not the Agent.

Aggregator

- The role of an Aggregator is to develop and operate multiple sites (STOR sub sites) and offer these to National Grid as single STOR site(s). Typically, an Aggregator will act on the behalf of one or more third party asset owners and hold the STOR contract.

	Aggregator	Agent
Sign Framework Agreement	✓	✗
Dispatch	✓	✗
Availability Declarations	✓	✓
Metering and Monitoring	✓	✗
Settlements	✓	Optional
Submit tenders	✓	✓

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4. Assessment Principles

Background:

- Frequency Response Providers have a maximum sustainability of approx. 30 minutes.
- In practice however, National Grid will seek to replace Frequency Response as soon as possible.
- This places a practical requirement for STOR in timescales of 20 minutes or less.

- STOR tender value depends on whether their response is less than or equal to the 20 minute threshold.
- Units with a response time of greater than 20 minutes have an implicit 'positioning fee' as National Grid has to run the unit in anticipation of, and not solely in reaction to, a system issue.

Main assessment:

Accepted tenders will be selected such that the total costs of the STOR tender(s) and operating the system are lower than without the selection of those tender(s). The assessment is made up of:

- Analysis of STOR tender cost against the cost of alternative reserve sources
- Assessment of the location of the STOR Unit(s) relative to limitations or outages on the system
- Other factors, such as historical reliability.

Click here for more details on the STOR tender assessment principles.

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5. Payments, Performance and Penalties

What payments are made for STOR?

- Availability – Paid for the hours in which the service has been made available. This will be entered as £/MW/Hr in the tender.
- Utilisation Fee – Paid for the energy delivered when instructed for STOR, including ramping volume. This will be entered as £/MWh in the tender.
- Optional Fee – Where STOR is utilised outside of the contracted windows, then the optional price is paid. The optional price does not need to be the same as the utilisation price. This will be entered as £/MWh in the tender.

What are the Performance Measures?

- A minimum of 90% of the contracted MW must be delivered by the end of the response period and across the instructed period else.
- Across each STOR season, a minimum 95% must be delivered in aggregate for all STOR instructions.
- Across the STOR year, a unit must be available for at least 85% of the Settlement Periods in its contracted windows.

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5. Payments, Performance and Penalties

What penalties are applied?	■ Where a unit triggers an Event of Default, it will not receive payment for most, or all of the relevant Availability Window. ■ In addition to no payment for individual Events of Default, a further penalty of up to 30% of the monthly availability payment will be deducted. ■ A full list of BM Events of Default can be found in this link. ■ A full list of NBM Events of Default can be found in this link.
Common penalties that are applied	■ CRSP – Failure to reach at least 90% of contracted MW in response time ■ CDEL – Failure to deliver at least 90% of energy across instructed window ■ IANU – Generation in Availability Window when not instructed for STOR. (some units will have a blip in metering which will trigger an IANU failure, a tolerance can be applied to remove this) ■ IBOD/RESP – Incorrect parameters entered by BM Units

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6. Market information

- The STOR Market Information Report aims to give current and potential STOR Providers an understanding of the STOR market, including future requirements and information on tenders accepted in previous rounds.
- Data contained within the Market Information Report is available in excel format.
- The Market Information Report is available on our website.
- Each year, a STOR Annual Report is published to the website.
- Results of each tender round are made public after assessment.

- All of the above information can be found at the following link:

Market Information and tender round results

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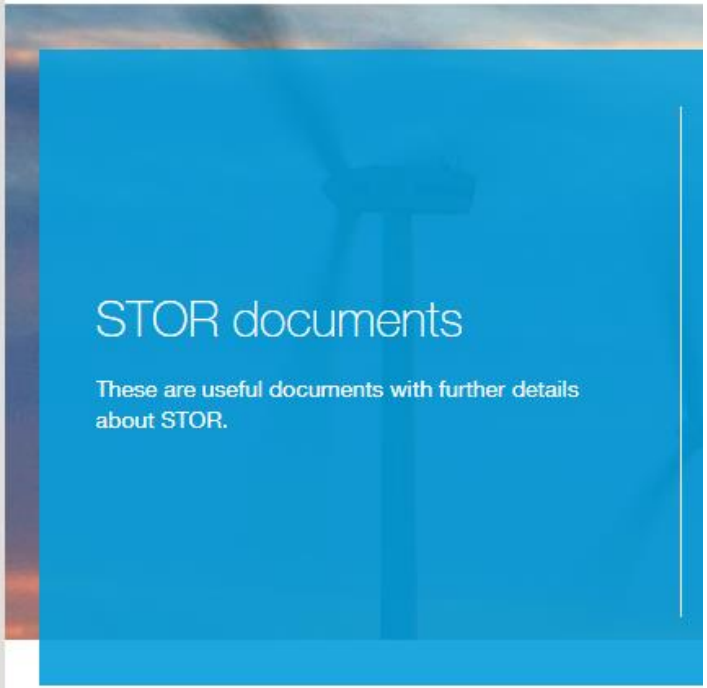
Key documents



General description of STOR service

STOR E-Tender guidance

STOR tender round dates - 2018

STOR Standard Contract Terms Issue 10