Frequency response products
Market information report

Monthly report

Published December 2021

Contents

Preamble

The report covers essential information related to procurement of frequency response products, such as month ahead tender for Firm Frequency Response (FFR) and day ahead auction for Dynamic Containment Low and High Frequency (DC-LF and DC-HF). We provide our forecast requirements for these products and give guidance on how to participate in the tenders and auctions. We will also provide the latest updates related to our new suite of response products.

Firm Frequency Response monthly tender

This section provides information to FFR providers on the requirement for the tender (TR 145) for delivery in February 2022 and onwards.

Key Points - FFR

This section of Market Information Report is relevant for tenders submitted in January 2022 for delivery in **February 2022.**

Tenders from eligible service providers for Firm Frequency Response should be submitted on **Wednesday 5th January 2022**

(2nd business day) for all tenders.

National Grid ESO will notify service providers of the outcome of the tender assessment, and preliminary nominations, by **Wednesday 19th January 2022** (12th business day).

From January 2018, non-compliant tenders will be rejected prior to assessment.

Providers must use the template provided in the **Coupa** system to tender in for FFR. Use of any other template or submissions via e-mail will not be accepted.

In line with the standardisation outlined in the Product Road Map, procurement of FFR will only take place across the standard 6 EFA blocks. Tenders must therefore only start, and end, at the following times: 2300, 0300 0700 1100 1500 1900. Submitted tenders must have a minimum window availability of 4 hours in line with EFA blocks.

Please note that this is a month ahead only tender. Tenders should therefore be submitted for February 2022 delivery.

A presentation that summarises the FFR results can be found here.

Real-time data i.e. demand and frequency data, over the last 60 minutes can now be found on the Realtime Extranet section on the National Grid website. Historic frequency data as far back as 2014 can also be accessed for GB data at 1 second resolution.

Requirements for February (TR 145)

As System Operator, we are required to operate the system economically and efficiently. The liquidity in the FFR market has initially decreased following the introduction of Dynamic Containment (DC). In TR144 we accepted all the dynamic FFR which cost us less than the alternative actions, please refer to paragraph below regarding changes to our published requirement. In TR144 static volume was accepted which cost us less than the alternative actions.

As a prudent system operator we seek to optimise our requirements to ensure system security at least cost. As we transition to new response products we are therefore applying a procurement strategy to our PSH dynamic requirements, and next month require 300MW for dynamic FFR during EFA 1-4 and up to 550MW during EFA 5-6. This is the same requirement as in the previous Market Information Report as there is operational benefit in optimising across the services of which FFR only forms part of our total frequency requirement.

The last auction for DLH and LFS was on the 26th November for service delivery until the 3rd December.

Image 1: FFR requirements for February 2022.

Month	EFA block	Dynamic Response Required (MW)			Static Response Required (MW)
		Primary	Secondary	High	Secondary
FEB 2022 onwards	EFA 1	300	300	300	250
	EFA 2	300	300	300	250
	EFA 3	300	300	300	250
	EFA 4	300	300	300	250
	EFA 5	550	550	550	250
	EFA 6	550	550	550	250

Procurement Rules

Testing

Providers are required to have successfully passed FFR testing of their asset by the National Grid Generator Compliance Team prior to tendering in for month ahead delivery. If tendering to provide an FFR service starting on 1st February 2022, the unit must have passed testing prior to the tender submission window closing on the 1st business day in January 2022. Tenders that do not meet this requirement will be deemed non-compliant and automatically rejected.

Limiting tenders

Providers are limited to submitting 3 tenders per unit, per tender period. A tender period is considered to be; month ahead, quarter ahead and per season. All-or-nothing bids will be considered as 1 tender submission.

EFA Block Procurement

For providers wishing to start a tender on the last day of the previous month, these tenders cannot start earlier than 2300 or they will be deemed as non-compliant.

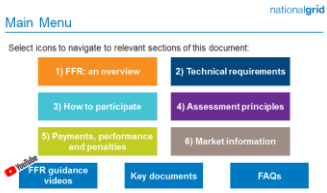
The minimum requirement across each specific EFA block will determine how much volume will be procured for each of the 6 daily 4-hour blocks.

Any outstanding shape will be satisfied, where necessary, closer to real time by the Electricity National Control Centre.

Key Points - FFR

Response BOA and Holding Volume and Cost
This information is in Appendix 7 of the adjoining excel file.

FFR service Overview



Product Roadmap

This document sets out the actions to be taken forward for frequency response and reserve.

Results Publication – TR140 onwards

Key Points - FFR

Response BOA and Holding Volume and Cost
This information is in Appendix 7 of the adjoining excel file.

FFR service Overview

Product Roadmap

This document sets out the actions to be taken forward for frequency response and reserve.

From TR140 onwards the unit location will be detailed as part of the results that are published in the FFR Post Tender Report. The locational details consist of the first 4 characters of the postcode for single units that are 1 MW or greater. We will be sending out further clarity regarding how assets that are 1 MW or greater that are part of aggregated units will be reported.

Enhanced Frequency Response (EFR)

100% of EFR is included in the requirements from July 2018.

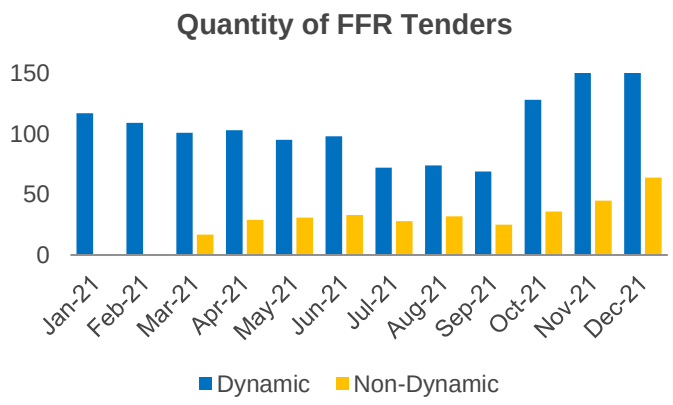
January 2022 FFR Delivery

162 active FFR contracts are due to provide FFR in January 2022. These contracts are made up of:

- **104** dynamic contracts
- **58** non-dynamic contracts

The chart below displays the number of tenders submitted in the FFR market for the last 12 months by service type.

Image 2: Quantity of FFR Tenders



Tender rejection codes

The table below provides guidance as to the reasons why a tender has been rejected. They can be matched against the numbers in the 'Reason Code' section of the Post Tender Report.

No.	FFR Reason Code	Comment
1	Beneficial	While the price submitted was considered beneficial, on this occasion this tender was not accepted for one of the following reasons: **1.2.** There was no outstanding requirement **1.3.** The desired volume against the National Grid procurement strategy for future tender months had already been satisfied **1.4.** This tender formed part of an all-or-nothing group which did not collectively deliver enough benefit to be considered
2	Price not beneficial across tendered period	The price submitted was too high and did not provide any contract benefit against alternative actions including the mandatory and optional market.
3	Does not meet tender prerequisites	Please refer to the 'Technical Parameters' section using the following link to determine the criteria necessary to participate in the FFR market https://www.nationalgrid.com/uk/electricity/balancing-services/frequency-response-services/firm-frequency-response
4	Multiple tenders received for the same unit	Only the most valuable tender(s) of the total group of submitted tenders was considered.

Dynamic Containment

This section provides information on requirements for Dynamic Containment Low Frequency (DC-LF) and Dynamic Containment High Frequency (DC-HF). These requirements are indicative based and subject to change.

DC-LF Requirements for February 2022

Image 3 contains indicative requirements based on our expectations for demand, inertia and infeed loss sizes in February.

The DC-LF requirements table presents the % of the time that there will be a need for the service. This is split into 300MW volume bands in the first two columns of the table, with the remaining columns in the table setting out the indicative % of the time that the requirement will be in that volume band for that respective EFA across February. The final column is the overall % of the month that the DC-LF requirement will be in that band for the month of February.

For example, the first table shows that in February the indicative EFA 1 requirement is between 1MW and 300 MW for 5% of the month, between 301MW-600MW for 35% of the month and between 601MW-900MW for 40% of the month. We do not foresee any 0MW requirement EFA1 periods in February. As a further example, our indicative analysis shows that for 30% of February we expect the DC-LF requirement to be between 301MW-600MW.

Image 3: DC-LF requirements for February 2022

DC-low		EFA						
From (MW)	To (MW)	1	2	3	4	5	6	All-day
0	0	0%	0%	20%	20%	15%	0%	10%
1	300	5%	5%	40%	20%	40%	30%	20%
301	600	35%	30%	20%	45%	40%	30%	30%
601	900	40%	50%	15%	5%	5%	40%	30%
901	1200	20%	20%	5%	10%	0%	0%	10%
1201	1500	0%	0%	0%	0%	0%	0%	0%

Image 4 contains indicative requirements based on our expectations for demand, inertia and infeed loss sizes for Summer 2022. For example, EFA5 DC-LF Requirements for Summer 2022 are expected to never be zero, between 1MW and 300MW 20% of the time, between 301MW and 600MW 60% of the time, between 601MW and 900MW 10% of the time. The DC-L requirement will be higher in summer due to lower demand and inertia, higher embedded generation and the end of the Enhanced Frequency Response (EFR) service.

Image 4: Typical DC-LF requirements for Summer 2022

DC-low		EFA						
From (MW)	To (MW)	1	2	3	4	5	6	All-day
0	0	0%	0%	0%	0%	0%	0%	0%
1	300	0%	0%	15%	15%	20%	0%	10%
301	600	5%	10%	35%	30%	60%	5%	25%
601	900	80%	75%	30%	30%	10%	85%	50%
901	1200	15%	15%	15%	25%	15%	10%	15%
1201	1500	0%	0%	5%	5%	0%	0%	0%

DC-HF Requirements for February 2022

The DC-HF requirements in Image 5 are indicative requirements based on our expectations for demand, inertia and outfeed loss sizes in February. We aim to buy enough DC-HF to manage the largest outfeed losses on the system

There are no 0MW DC-HF requirement periods in February. For 70% of the month the DC-HF requirement will be between 1MW-300MW. The peak requirement will be between 301MW and 600MW and generally occurs during lower demand/inertia EFA blocks where more DC-HF is required to manage large outfeed loss risks.

Image 5: DC-HF requirements for February 2022

DC-high		EFA						
From (MW)	To (MW)	1	2	3	4	5	6	All-day
0	0	0%	0%	0%	0%	0%	0%	0%
1	300	25%	20%	90%	95%	100%	80%	70%
301	600	75%	80%	10%	5%	0%	20%	30%
601	900	0%	0%	0%	0%	0%	0%	0%
901	1200	0%	0%	0%	0%	0%	0%	0%
1201	1500	0%	0%	0%	0%	0%	0%	0%

Image 6 contains the typical requirements for Summer 2022. It should be noted that there is more uncertainty in our typical requirements for DC-HF than for DC-LF. This is due to increased uncertainty in our expectations of demand, inertia and outfeed loss size. However it is expected that the DC-HF requirement will increase in summer due to lower demand and inertia, higher embedded generation and the end of the Enhanced Frequency Response (EFR) service.

Image 6: Typical DC-HF requirements for Summer 2022

DC-high		EFA						
From (MW)	To (MW)	1	2	3	4	5	6	All-day
0	0	0%	0%	0%	0%	0%	0%	0%
1	300	0%	0%	0%	0%	0%	0%	0%
301	600	10%	30%	90%	90%	90%	30%	60%
601	900	90%	70%	10%	10%	10%	70%	40%
901	1200	0%	0%	0%	0%	0%	0%	0%
1201	1500	0%	0%	0%	0%	0%	0%	0%

Dynamic Moderation and Dynamic Regulation

This section provides information on developments related to our new suite of products.

Please refer to **Dynamic Moderation page** and **Dynamic Regulation page** for details related to the new suite of products.

In order to implement the new product suite and minimise overholding of response volumes, it will be necessary to gradually reduce our long-term procurement of the existing P, S and H dynamic products. We will continue to hold monthly FFR tenders for month ahead volume and we will communicate how we will manage the transition from the existing mix of products into the new product suite. Please sign up for **updates** for future balancing services.

Frequency response procurement strategy

This section describes how we will transtion to our new suite of dynamic frequency response products

Summary

- We are in a period of transition where both old and new frequency response products are being procured at the same time.
- Our end state is to meet our pre- and post-fault frequency response needs with the new suite of dynamic products (Containment, Moderation and Regulation).
- A key milestone is the phasing-out of monthly FFR P, S, H dynamic tenders. This will happen gradually over 2022 as we launch, grow, and establish the new pre-fault dynamic frequency response products (DM, DR).
- In the monthly Market Information Report (MIR) we will provide updates on our transition plan. We know that a successful transition relies on clear and timely signals to the market to facilitate growth and competition in our new markets.
- Mandatory frequency response (MFR) will remain in our toolkit during this transition and until such a time when DC, DM & DR can be procured intra-day. We will keep you updated with our plans and progress on this separate milestone.

Pre-fault frequency response

Today – we rely on a range of products to meet our needs, including monthly tendered FFR (dynamic and static), legacy EFR contracts (ending in 2022), mandatory frequency response (MFR).

Target – we aim to meet our needs using Dynamic Regulation and Dynamic Moderation while retaining the option to instruct additional MFR when required.

Post-fault frequency response

Today – we rely on Dynamic Containment to meet our needs, with some additional services including static response on interconnectors, secondary-only static procured through monthly FFR and mandatory services like limited frequency sensitive mode (LFSM).

Target – DC will be our primary market for meeting post-fault needs supported by products developed under the Reserve Reform programme.

Quantity of pre-fault frequency response

The amount of pre-fault frequency response (in MW) that we need varies over time.

Today – our pre-fault needs are for a minimum of 550MW of dynamic response. This quantity is based on the current mix of products and our operational policy. It is met via a mixture of monthly FFR and real-time MFR.

Target – the new suite of pre-fault products is more efficient and we expect that our minimum requirement will be 300MW, split between DR and DM.

As we transition to the new pre-fault services we can expect the total market size (in MW) of pre-fault frequency response to decrease to approximately 300MW compared to 550MW today.

Appendix 1 FFR February 2022 Requirements

For month ahead only, except for circumstances where there is a specific dynamic requirement, the requirement will be taken from either dynamic or non-dynamic providers where deemed economic to do so. This means that any requirement found in the non-dynamic market may be procured in the dynamic market if considered more beneficial. With no primary non-dynamic market in existence, procurement of this volume across any EFA block will instead be taken from the dynamic market.

In the move to standard EFA block window durations, the minimum of the total requirement across each EFA block outlines the level to be procured. In light of this transition, the minimum dynamic requirement remains a key component to be satisfied and outstanding volume against this will continue to be procured for operational purposes.

Month	EFA block	Dynamic Response Required (MW)			Static Response Required (MW)
		Primary	Secondary	High	Secondary
DEC 2021 onwards	EFA 1	300	300	300	250
	EFA 2	300	300	300	250
	EFA 3	300	300	300	250
	EFA 4	300	300	300	250
	EFA 5	550	550	550	250
	EFA 6	550	550	550	250

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