Static Firm Frequency Response

Participation Guidance v1.0 - March 2023

ESO

Static Firm Frequency Response

This Provider Guidance is designed to provide information to new, existing and transitioning providers of the Static Firm Frequency Response (FFR) Service, in complement to the SFFR Contractual Documents: Service Terms, Procurement Rules and the Balancing Services Glossary. In the event of any conflict or inconsistency between this document and the Contractual Documents, the latter shall prevail.

The **Static Firm Frequency Response (SFFR) service** makes up part of the ESO's suite of Response Services. Together these services work to control system frequency through pre and post fault conditions keeping the frequency within our licence obligations around 50Hz. SFFR provides post fault delivery when system frequency passes below a "trigger point" of 49.7Hz. When frequency reaches this trigger point the contracted SFFR units must ramp to their contracted output within 30 seconds and continue delivering at this contracted output until the end of the Maximum Response Period (30 minutes).

The ESO ran an EBGL Article 18 consultation which concluded on 28 October 2022. The consultation proposed to change how the SFFR service was procured: to move from monthly tender of the service where the tenders were on a Pay as Bid basis to a day ahead auction which would be Pay as Clear. To enable this change a new set of contractual documents for the service was required, these new contractual documents followed the same format as the new dynamic frequency suite (DC DM and DR). This change was approved by Ofgem on 10 February. These terms and the new tender process will be live on the 1st of April 2023.

This guidance is published to support the onboarding to the new terms by existing and potential SFFR providers as well as providing additional information on participation in SFFR auctions.

This document will be updated outside of the Response Reform annual development cycle to allow for more frequent updates.

Service description

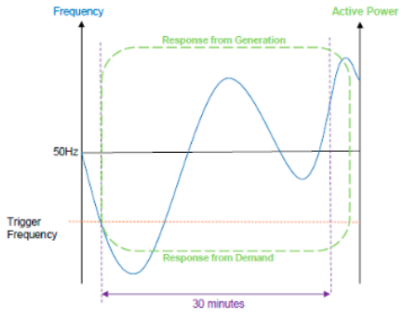
FFR is the change in active power delivered as a response to a change in system frequency. This change in active power could either be from its initial state or a predicted demand level (baseline). FFR can be non-dynamic or dynamic as follows:

Non-Dynamic (also referred to as Static) frequency response is typically a discrete service triggered at a defined frequency deviation.

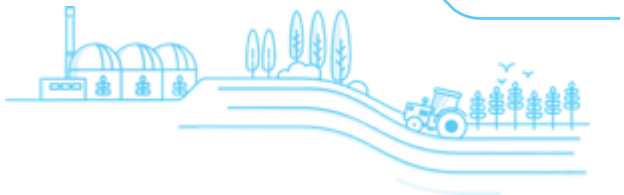
Table 1– Response Timescale for a Non-Dynamic Service

Contracted Response	Delivery timescale
Secondary timescale	30s – 30min

Figure 1- Example of a Non-Dynamic Response to a Varying Frequency



Contents



Guidance

SFFR Auction – Pre Auction Preparation

Prior to participating in SFFR auctions you will need to complete the following actions:

1. **SFFR tender submission provider details spreadsheet.**

   The SFFR tender submission provider details spreadsheet needs to be submitted by the provider prior to first bid submission for the auctions. Once you have submitted the SFFR Tender submission provider details spreadsheet for the SFFR auctions you will **not need** to submit this again unless you are making any amendments such as adding new units, changing tested MWs and any change of email addresses.

Note: The SFFR Tender submission provider details spreadsheet is used for the validation of tender submitted via the dedicated .box. Please note that information provided in SMP and in the Tender submission must exactly match, this includes formatting matches such as capitalisations and spacing.

2. **Single market Platfom (SMP) registration**

   Providers are required to register themselves along with units and assets on SMP and sign up to the contractual terms. The details registered on the Single Market Platform will be those used to set up the Auction with prequalified Units, this information will include MW capacity and Unit ID.

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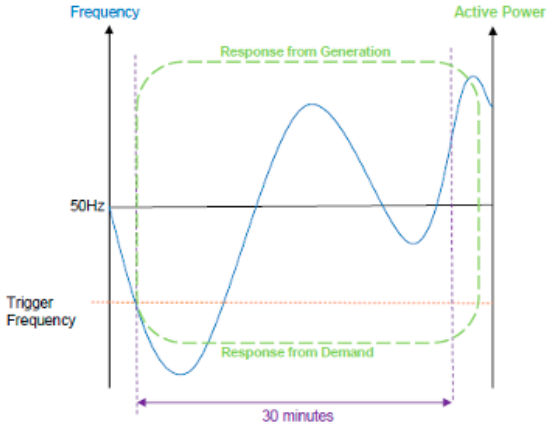


Single Markets Platform (SMP) - Onboarding

Prior to participating in frequency services all assets will need onboard using the Single Markets Platform.

The Single Markets Platform is a portal that aims to provide frictionless access to ESO markets through APIs which support the onboarding process for ESO markets.

To participate in the SFFR daily auctions providers must be registered on SMP. SMP allows the provider to register all the assets used top provide the service and allocate them either singularly or aggregated to a Unit ID, to aid with this API functionality for bulk uploading of large asset portfolios for is available for providers. SMP has Docusign to allow digital signing of the contractual documents

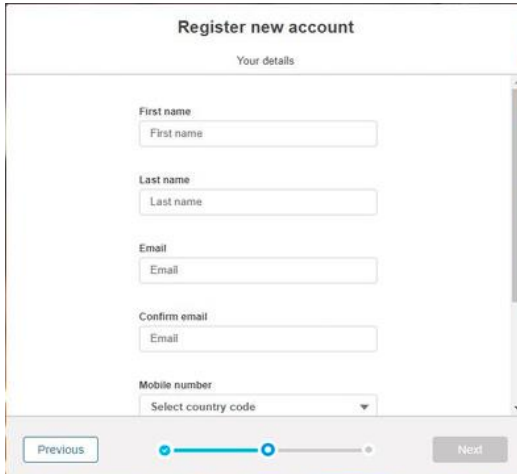
SMP registration for SFFR consists of the following:

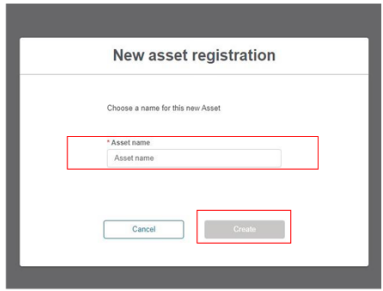
- Provider registration
- Unit registration / asset details
- Uploading documentation e.g. testing reports
- Signing up to the SFFR contractual terms

Comprehensive guidance on how to use the SMP and API bulk uploading of assets can be found on the ESO website

https://www.nationalgrideso.com/industry-information/balancing-services/single-markets-platform

Example





The SMP APIs

API	NGESO Endpoint	Purpose	Submit	Maximum	Immediate Return	Batch Return
Authenticate	Authenticate	Request token to be used in the headers for API Calls	Username Password	NA	JWT OATH Token	NA
Manage Asset	Create	Create new Asset	JSON Payload	1000 Assets	Transaction ID	Success Notification OR list of errors
Manage Unit	Create	Create new Unit	JSON Payload	1 Unit 1000 Aligned Assets	Transaction ID	Success Notification OR list of errors
Get Transaction Status	Transaction Status	Retrieve status of a submitted Payload	JSON Payload	1 Transaction ID	Status of submitted Payload	NA

Static FFR Testing

Prior to participating in frequency services all assets will need to have passed the pre qualification testing found in the Non Dynamic section of the Firm Frequency Response Balancing Service testing Guidance

Asset testing consists of 2 types of tests, the duration test and activation and ramping to full response. These tests are designed to show that the asset can deliver the service in line the individual service design specifiactions.

These tests can be conducted on an individual assets level or as an aggregated unit.

Asset testing is signed off by a Independent Technical Expert appointed by the Provider and the completed test report is then sent to the ESO by uploading onto Single Markets Platform

FFR Testing Guidance

Example of the service design that testing will confirm that the asset can deliver

Appendix D – Non-Dynamic Test Assessment

Paste test results in to Non-dynamic Excel Analysis Tool – published with User Guide.

Check results against Pass Criteria

- 'An acceptable frequency injection profile is used'.
- The relay (or equivalent) activates at the correct contracted trigger frequency and within the permitted tolerance (±0.01Hz).
- Sustain the response for the 30 minutes. Response volume is assessed as the minimum response observed from 30 seconds to 30 minutes following relay trigger.
- The standard deviation of active power error over a 30 minute period must not exceed 2.5% of the contracted active power change. (Standard deviation is calculated from 30 seconds to 30 minutes following relay trigger).

Appendix E – Non-Dynamic Test Certificate Template

Please use this Test Certificate format and submit to NGESO, along with the test data and CV of the ITE employed by the prospective response provider.

Prospective Response Provider Company Details

Prospective Response Provider Company name	
Primary contact name	
Contact number /s	
Email address	

Contract Details

Contract ID	
Service type	
Asset type, e.g. diesel generator, battery etc	
Unit make up, e.g. single or aggregated	
Aggregation methodology (if appropriate)	
Unit location / ID	
Test date	

Static Service Details

Contracted MW	
Contracted response time	30 seconds
Contracted duration	30 mins
Trigger Frequency Setting	49.7Hz

Test Results

Pass Criteria	Pass / Fail	Comment
An acceptable frequency injection profile is used.	Pass / Fail	
The relay operating point of the plant/unit(s) occurs at the correct contracted trigger frequency and within the permitted tolerance (±0.01Hz).	Pass / Fail	See Figure 1 for sample showing close up of the frequency at which relay operates
The response is sustained for 30 minutes.	Pass / Fail	

Auction information

The SFFR auctions will be run daily at **11:30**, the Auction Gate Closure is **11:00**. Any bids submitted after 11:00 will be **rejected** for that days auction.

Providers are required to send their bids to the specified .box (see bid submissions section for details), providers can submit bids up to 14 days in advance whilst retaining the option to resubmit bids up to gate closure on the day of the auction.

All bids must use the correct SFFR bid submission file and format (csv). Bids received in the incorrect file type and/or format will be rejected and will require resubmission.

Submitted bids will receive a rejection notification if the bid file is rejected with information on why the bid has failed to be processed. Providers will then have the opportunity to amend and resubmit ahead of gate closure. Bids submitted very close to gate closure may not leave sufficient time to act on any rejection notification and resubmit an amended bid.

Providers wishing to withdraw bids should change the MW volume to Zero (0) and resubmit the SFFR bid submission file, this will not affect other previously submitted bids from the same file that are not to be withdrawn.

Example screenshot of the bid submission template

	A	B	C	D	E	F	G	H
1	Auction_Day	Auction_Month	Auction_Year	Unit	Provider	Volume	Price	EFA
2	22	3	2023	ABC-1	ABC Energy	9.26	70.1	1
3	23	3	2023	ABC-1	ABC Energy	5.25	0.76	6
4	24	3	2023	ABC-1	ABC Energy	1.1	16.32	5
5	25	3	2023	ABC-1	ABC Energy	0.1	150.37	3
6	28	3	2023	ABC-2	ABC Energy	30.21	7.55	2

Bids are submitted on a £/MW/Hr basis and providers can only submit **one bid** per EFA block for each unit. To be able to bid a unit into all 6 EFA blocks you will need to submit 6 bids in the Tender submission file identifying which EFA block the bid relates to in column H (EFA). Bids spanning multiple EFA blocks are not permitted in the SFFR auction.

Bid Submissions

- Please be advised that all providers are required to send their bids to box.sffrbidsubmission@nationalgrideso.com
- The email should contain a .csv attachment and the subject line must read “SFFR Auction Bid Submission"
- The bid submission tool will conduct a validation process of the .csv file. Once this process has been completed, an automated response will be sent within 5-7 minutes, indicating whether the file has been accepted or rejected
- It is important to keep in mind that the file may be rejected for various reasons, which will be highlighted in subsequent slides
- Please check that any additional lines at the bottom of the csv file have been removed. Notepad++ can be used for this
- Please send the SFFR Tender submission provider details spreadsheet prior to bid submission. Failure to do this will result in the csv file failing validation
- NOTE : The aforementioned email address and subject line must be strictly adhered to in order to receive an automated response

CSV specification

- To ensure compliance with the submission requirements, please be advised that the .csv file must comprise of 8 columns in the following order: Auction_Day, Auction_Month, Auction_Year, Unit, Provider, Volume, Price, EFA. It is essential that the columns are in the same order as demonstrated in the example .csv file.
    - Please note that the auction day is the date of the auction and not the day of service delivery, e.g. for an auction being run on the 21st March submission the auction date is 21

- The data types for each column are detailed in the table in the next slide to facilitate accurate and consistent data submission. Please ensure that the data types for each column align with the specifications outlined in the tables to avoid the possibility of rejection during the validation process.

Example screenshot of the bid submission template

A	B	C	D	E	F	G	H
Auction_Day	Auction_Month	Auction_Year	Unit	Provider	Volume	Price	EFA
28	2	2023	ABC-1	ABC Energy	9	70	1
28	2	2023	ABC-1	ABC Energy	5.25	80	6
28	2	2023	ABC-1	ABC Energy	8	90	5

CSV specification

Columns	Data type	Minimum or min length	Maximum or max length
Auction_Day	Integer	1	31
Auction_Month	Integer	1	12
Auction_Year	Integer	2023	-
Unit	String	5	10
Provider	String	5	50
Volume	Float	1 (0 if the bid needs to be withdrawn)	-
Price	Float	0.01	-
EFA	Integer	1	6

Error Codes

Case	Overview	Automated Response	Error Message
1	Incorrect subject line	No response expected	**NA**
2	No attachment	No attachment found	**There is either no attachment with your email or the attachment is in an unsupported format. Please recheck and add your bid submissions in .csv format**
3	Attachment that is not a CSV	Invalid attachment found	**No valid file found. Please upload the correct file type (CSV)**
4	Invalid dates. For example : 32/03/2023	Dates submitted are not valid	**[{"Validation Error":"Integer 32 exceeds maximum value of 31.","Value":32,"Column":"[0].Auction_Day"}]**

Error Codes

Case	Overview	Automated Response	Error Message
5	£0 bids submitted	Bid Price submitted is not valid	[{"Validation Error":"Float 0.0 is less than minimum value of 0.01.","Value":0.0,"Column":"[0].Price" }]
6	Invalid EFA blocks. For example : 7	EFA blocks are invalid	[{"Validation Error":"Integer 7 exceeds maximum value of 6.","Value":7,"Column":"[0].EFA"}]
7	No blank fields (null values)	Null values found	The file has null/blank values and/or a blank row at the end of the file, please review and resubmit
8	Email address not registered to unit	Email used for Bid submission is not valid	Email address “email address” is not permitted to submit bids for “Unit ID”
9	UTF-BOM formatted file	Invalid file type	One or more of the files submitted is encoded as UTF-8-BOM please encode as UTF-8 and resubmit

Error Codes

Case	Overview	Automated Response	Error Message
10	Unit ID is not registered	Email used for Bid submission is not valid	**“Unit ID” is not a registered unit**
11	Bid volume exceeds capacity	List of bids where the volume bid exceeds registered	**Volume submitted for “Unit ID” is greater than the registered volume. Also, the details in the error message will point to which row it is**
12	Bid submitted too soon (prior to auction opening time)	List of bids where the bid is invalid	**The date submitted is not for an open auction. Also, the details in the error message will point to which row it is**
13	Bid submitted too late (post auction closing time)	List of bids where the bid is invalid	**The date submitted is not for an open auction. Also, the details in the error message will point to which row it is**

Results

Once the daily SFFR auctions have concluded the results will be uploaded on to the Data Portal in a machine readable format.

The publication of the results on SFFR daily auction will form the contact award and delivery obligations for accepted bids. Providers will not receive any other notification that they have been awarded a contact other than the auction results being published in a machine readable format on the ESO data portal.

Results will be published on the ESO Data Portal before the Auction Closing Time as defined in the Procurement Rules as 17:00 although the ESO will aim to publish soon as practible after after the auction assessment process has been run at 11:30.

The link to the SFFR results on the Data Portal can be found here: https://data.nationalgrideso.com/ancillary-services/static-firm-frequency-response-auction-results

Date	Provider	Unit	Delivery Start	Delivery End	EFA	Service	Status	Volume	Accepted	Price	Clearing P	Technolog	Location	Rank
22/03/2023	Provider 1	Unit-1	21/03/2023 23:00	22/03/2023 03:00	1	SFFR	Accepted	20	20	1.5	4.5	Bio Fuel	AGG	6
22/03/2023	Provider 2	Unit-2	21/03/2023 23:00	22/03/2023 03:00	1	SFFR	Accepted	20	20	1.9	4.5	Bio Fuel	AGG	11
22/03/2023	Provider 3	Unit-3	21/03/2023 23:00	22/03/2023 03:00	1	SFFR	Accepted	10	10	2	4.5	DSF: Load	AGG	16
22/03/2023	Provider 4	Unit-4	21/03/2023 23:00	22/03/2023 03:00	1	SFFR	Accepted	11	11	2.5	4.5	DSF: Load	AGG	10
22/03/2023	Provider 5	Unit-5	21/03/2023 23:00	22/03/2023 03:00	1	SFFR	Accepted	20	20	3.75	4.5	Diesel	AGG	13
22/03/2023	Provider 6	Unit-6	21/03/2023 23:00	22/03/2023 03:00	1	SFFR	Accepted	11	11	4	4.5	DSF: Load	AGG	8
22/03/2023	Provider 7	Unit-7	21/03/2023 23:00	22/03/2023 03:00	1	SFFR	Accepted	1	1	4.3	4.5	DSF: Load	AGG	4
22/03/2023	Provider 8	Unit-8	21/03/2023 23:00	22/03/2023 03:00	1	SFFR	Accepted	20	20	4.5	4.5	Bio Fuel	AGG	1

Static FFR – Useful Links

Below are the website links to the following information:

Contractual Documentation

SFFR Service Terms

SFFR Procurement Rules

SFFR Bid summission and provider templates

Testing

FFR Testing Guidance

SFFR Testing Analysis Tool

FFR Test Injection Profiles

Results

ESO Data Portal - SFFR Results Page

Single Market platform

Single Markets Platform Guidance and User Guides

SMP - API Detailed Specification