# **Balancing Reserve**

Market Participants Guide

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## **Onboarding** Guide for Market Participants

### 1. Onboarding Steps

## Single Market Platform (SMP) Registration

- 1. Login to SMP
- 2. Register their Asset(s)
- 3. Create the Unit(s)
- 4. Submit BMU ID(s)

The user guide / videos for the above can be found at <u>Single Markets Platform | National Grid</u> <u>ESO</u>

### Asset/Unit Pre-qualification on Single Market Platform (SMP)

- 1. Submit Pre-qualification application to National Grid Contracts Team
- 2. Receive Form C from the National Grid Contracts Team

# 3. Receive Unit Pre-qualified notification from the National Grid Contracts Team

The user guide / video for submitting prequalification application can be found at <u>Single</u> <u>Markets Platform | National Grid ESO</u>

### Additional Onboarding Requirements for Balancing Reserve

• Market Participants need to:

1. Provide their Admin correspondence email address to National Grid Contracts Team

2. Provide their Auction correspondence email address to National Grid Contracts Team

3. Provide their Company Name as found on SMP to National Grid Contracts Team

4. IP Address(es) they will use to connect to the Balancing Reserve API – we need this information so we can whitelist the IP Address(es)

National Grid will supply necessary details on how to connect to the Balancing Reserve API.

### 2. Onboarding Data Flow





## **Bid Submission Guide for Market Participants**

Option 1: Provider UI

1.1 One-time User-access setup

This user guide provides step by step instructions on how to login to the National Grid Balancing Reserve Provider Portal / UI.

Please note this is the first version of the user guide and further cosmetic enhancements are likely to occur as we go along.

Open a browser and paste the below link:

https://apps.powerapps.com/play/e/31d97878-d4ad-4d47-9bbc-ba0cffb1fa85/a/a2ee9ae9-89d3-4adb-be3e-82cbf6b9bb92?tenantId=f98a6a53-25f3-4212-901c-c7787fcd3495

The above link is for the testing environment. We will update the live link once the Balancing Reserve product is live

It will ask you to Sign in. Enter your registered email address (you should have received one from the NG Account Manager) and click on the Next button:



You will be prompted to enter the Password (you should have received one from the NG Account Manager). Enter the password and click on the Sign In button



Select the multi factor authentication as shown below





WARNING: This is a National Grid system. You must be authorised to use this system and your use is strictly limited to the extent of that authorisation. Unauthorised access to any program or data held on this system may be a criminal offence in the US under the Computer Fraud and Abuse Act 1996, and in the UK under the Computer Misuse Act 1990, If you are an employee or contractor of National Grid unauthorised access may also constitute a disciplinary offence. If you are unswere of your ebligations or level of authority do not continue and please contact your manager. Authorised users must familiarise themselves and comply with National Grid's information security policies and standards. Monitoring of the use of National Grid's systems will kee place where, and to the extent that. National Grid is permitted to do so lawfully.



#### 1.2 Bid Submission - Sell Order Upload Steps

Once you have selected the multi factor authentication, it will land you on the Provider Portal / UI's Home page as shown below

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Click on Upload Sell Order button to upload your Sell Order

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It will take you to the Upload Sell Order page where you can find some of the useful instructions you should consider before uploading a file.

#### Provider UI



Click on Attach file and select the Sell Order file you want to submit

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			4. In case of any validation failures, an email will be sent with validation error.						
			5. If multiple file are submitted for particular auction, only latest file will be considered.						
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Once the file is attached, click on the Run Data Validations to Proceed button



If the Data Validations are successful, you will see a successful message saying All data validations passed

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Now click on the Upload button



You will get the message Sell Order file Submitted successfully. You have now submitted the Sell Order file successfully

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## What actions / steps the Participants should take if the Data Validation fails

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Click on Upload Sell Order button to upload your Sell Order

It will take you to the Upload Sell Order page where you can find some of the useful instructions you should consider before uploading a file

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Click on Attach file and select the Sell Order file you want to submit

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Once the file is attached, click on the Run Data Validations to Proceed button

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If Data Validations fail, you should see a message saying Data validation failed. Kindly click on Failed Data Validation button to view records that failed validations. Click on Show Data Validation Error button

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It will open the Data Validation Error – Values that failed Schema Validations page and it would highlight all the errors in red. Click on each of those items to see the errors

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Make the necessary changes to the Sell Order file and upload the Sell Order file from the Home Page

## Steps to ensure correct .csv encoding for Sell Orders

The National Grid API and National Grid Provider Portal / UI uses UTF-8 encoding to validate the .csv files submitted by the Market Participants. It is therefore essential that the Market Participants verify the encoding on the .csv files they are submitting and making sure the .csv files are with correct encoding format i.e. UTF-8.

The below steps will guide the Market Participants on how they can verify if the .csv file they are submitting is in the correct format:

Once the sell order has been created and saved on your internal system, right click on the .csv file you want submit and then click 'Open With' and then select Notepad from the available options

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If it's not in UTF-8 format, you need to change the encoding before you submit the bid. To change the encoding, kindly open the same file in notepad and click on save as option in the file menu at the top

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Your file is now encoded in the correct format. To verify this, you can open the file on Notepad again as shown above and verify the encoding in the bottom right-hand corner shows UTF-8.

## How Market Participants can cancel a Bid

In order to cancel/withdraw a Sell order (Bid), the Market Participants need to upload a new Sell Order with 0 price and 0 MW Volume offered for all the Service Windows and all the BMU Units they want to cancel/withdraw.

Note: This new Sell Order file will supersede the previous submitted file as long as the new file passes the validations. Please note that the entire file will be superseded and not just individual rows.

#### Option 2: Via API

## Introduction

The aim is to provide a closer look at the APIs the National Grid Electricity System Operator (NG ESO) offers to enable Sell Order submission for the Balancing Reserve Auctions. This document aims to provide Market Participants with:

 An understanding of what is required to interact with the Balancing Reserve API

• An overview of the APIs published by the Balancing Reserve API

#### **Further information**

More information about Balancing Reserve, including the Balancing Reserve API, is available on the Balancing Reserve page of the NG ESO website.

To discuss opportunities offered by Balancing Reserve, please contact NG ESO via your account manager or email <u>Commercial.Operation@nationalgrideso.com</u>.

#### Page Break

#### **Overview**

All Transactions with the Balancing Reserve API are synchronous, with a web service request from the Market Participant resulting in a response payload from NG ESO.



## **Available Balancing Reserve API Calls**

Transaction	Туре	Purpose	Pre-requisites
Authenticate	Sync	Request an Authentication Token	None
Submit Sell Order	Sync	To submit a new Sell Order	Must have a valid authentication Token

## **Market Participant Infrastructure Requirements**

MP Infra structure	t Gateway	2) Internet	nternet way	NG ESO Infrastructure
	M P Interne	HTTPS Request	NG ESO Gate	Endpoint

# Item	Туре	Description
1 MP Client	Component	This is the Client Endpoint that will initiate a connection to the
<sup>1</sup> Endpoint	component	Balancing Reserve API.
		This is the Internet Gateway that provides connectivity between
		the Market Participant's Client Endpoint and the internet. It
, MP Internet	Component	should implement appropriate security measures.
<sup>2</sup> Gateway	Component	Note: NG ESO will need to know the IP address(es) of your
		Internet Gateway so they can whitelist them for access to the
		Balancing Reserve API
		This is the Internet Gateway that provides connectivity between
, NG ESO Internet	Component	the Balancing Reserve API and the Internet. It implements
<sup>S</sup> Gateway	component	security points and checks, including validating incoming flows
		are coming from known sources.
Balancing Reserve		This is the HTTPS endpoint that the Market Participant will
4 API Server	Component	connect to when initiating a call to the Balancing Reserve API. It
Endpoint		will enforce that the client is using TLS1.2 or later.
		This is an instance of a connection from Market Participant to
5 Poguest	Flow	Balancing Reserve API, for example to perform an
Request		authentication request or submit a transaction.

Page Break

## **API:** Authenticate

## **Overview**

Market Participant to make a call to Authenticate API to get JWT Token which can then be provided to authorise access to other Balancing Reserve APIs.



#	Dataflow	Transfer Type	Payload
0.1	Authentication Request	Request	Authentication Credentials
0.2	Authentication Response	Response	One of: • Authentication Error • Authentication Token

## **Specification**

#### Submission

The submission to the <b>PARAMETER</b>	the Authenticate API is a POST request made up of the following parameters: <b>DESCRIPTION</b>
client_id	Client ID for the Balancing Reserve API; provided by NG ESO for access during registration
client_secret	Client Secret for the Balancing Reserve API; provided by NG ESO as part of registration
grant_type	Grant being requested – always "password"
username	Market Participant's Balancing Reserve API Username; provided by NG ESO as part of registration
password	Market Participant's Balancing Reserve API Password; provided by NG ESO as part of registration
Scope	Scope for the Balancing Reserve API; provided by NG ESO as part of registration

#### Response

The Authentication API will response with a JSON Payload of the following format: Key Value

{

"token_type":	Always "Bearer"
"scope":	Will match the Scope provided
"expires_in":	Time to expiry of token
"ext_expires_in":	Time to expiry of token
"access_token":	The access token that can be used to authorise access to other Balancing Reserve API calls.

}

## **Payload Examples**

#### Submission Example

Rather than post a sample URL, we have included a sample CURL Request as that shows the required information clearly:

```
curl --location --request POST 'https://login.microsoftonline.com/f98a6a53-25f3-4212-
901c-c7787fcd3495/oauth2/v2.0/token'\
--header 'Content-Type: application/x-www-form-urlencoded'\
--header 'Cookie: fpc=AsOugKFV9eNChNiNJ4sd8jj2f-
MfAQAAA0c919oOAAAA; stsservicecookie=estsfd; x-ms-gateway-slice=estsfd'\
--data-urlencode 'client_id=my_client_id\
--data-urlencode 'client_secret=my_client_secret'\
--data-urlencode 'grant_type=password'\
--data-urlencode 'username=my_username'\
--data-urlencode 'password=my_password'\
--data-urlencode 'scope=my_scope'
```

#### Response Example

#### {

```
"token_type":"Bearer",
"scope":"api://57070dle-35df5-4e11-9d04-47033e3048be/BR_API"
"expires_in":4918,
"ext_expires_in":4918,
```

"access\_token":"eyJhbGciOiJIUzI1NiJ9.eyJ1bmlxdWVfbmFtZSIGI1NNUFVzZXJARW1haWxEb21haW4uQ29 tIiwiYXBwaWRhY3IiOiIxIiwic2NvcGUiOiJhcGk6Ly81NzA3MGQxZS0zNWRmNS00ZTExLTlkMDQtNDcwMzN1MzA0OG JlL1NNUF9BUEkiLCJncmFudF9UeXBIIjoiUGFzc3dvcmQiLCJhcHBpZCI6IjY3MD1lYjEyLTM10TUtNjd1Mi05ZDA0L Tc2ZjIzZWJjMDFiZSIsImlzcyI6IkVTTyIsImNsaWVudF9zZWNyZXQiOiJNeVN1Y3JldCIsImV4cCI6IjIwMjItMTEt MTdUMTA6Mjk6NDguNjI4WiIsImlhdCI6IjIwMjItMTEtMTdUMTA6Mjk6NDguNjI4WiIsImNsaWVudF9pZCI6Ik15Q2x pZW50SUQifQ.PZgKpDsrPS9mDMz8uIL6nMChn5QHs21hGhqTLNz6VGk"

## API: Submit Sell Order Overview

Once an Asynchronous Transaction has been submitted and accepted, the resulting Transaction ID can be used to query the status of the transaction. If the transaction has completed, this call will return the payload that would have been sent via the resulting Notify Call.



#	Dataflow	Transfer Type	Payload
1.1	Sell Order Request	Request	Sell Order JSON Array
1.2	Sell Order Response	Response	One of: File Accepted File Rejected

## **Specification**

#### Prerequisites

The Market Participant must

have a valid JWT token issued by the Authenticate API

#### Request

The request is a POST call with the Sell Order JSON array in the Request body, and the Authorisation JWT included in the headers. The payload of the request will be as follows:

```
[
  {
      <Sell Order Block>
    },
...
    {
      <Sell Order Block>
    }
]
```

For the key-value contents contained in a <Sell Order Block>, please see **Model – Sell Order** Response File Accepted If the upload passes basic format validation, the API will respond appropriately and pass onto the Balancing Reserve Auction Platform for further validation, and an internal reference generated and returned.

```
"Status" : "<Generated Reference> Submitted for Final Validation"
```

Note: Confirmation of final acceptance to the auction will be received via email.

#### **File Rejected**

}

If the upload fails basic format validation, the API will respond appropriately and pass onto the Balancing Reserve Auction Platform for further validation, and an internal reference generated and returned. Confirmation of final acceptance will be received via email.

```
"Status" : "File Failed Initial Validation",
"Errors" : "<Error List>"
}
```

## **Payload Examples**

#### Request

```
[
    {
        "User Defined Order ID": "1 ABC001 PBR",
        "BR Service Provider": "ABC Power Ltd",
        "BMU ID": "ABC001",
        "Service Type": "PBR",
"Service Start": "2023-02-24T09:00:00Z",
        "Service End": "2023-02-24T09:30:00Z",
        "Price": 35,
        "Volume": 75,
        "Linked Order": ""
    },
    {
        "User Defined Order ID": "2 ABC001 PBR",
        "BR Service Provider": "ABC Power Ltd",
        "BMU ID": "ABC001",
        "Service Type": "PBR",
        "Service Start": "2023-02-24T09:30:00Z",
        "Service End": "2023-02-24T10:00:00Z",
        "Price": 41.89,
        "Volume": 70,
        "Linked Order": "1_ABC001_PBR"
    }
]
```

#### Response – File Accepted for Further Validation

```
{
    "Status" : "Sell_Orders_ddw_24022023_090000.csv Submitted for Final
Validation"
}
Response - Failed Initial Validation
{
    "Status": "File Failed Initial Validation",
    "Errors": "/9 required key [Volume] not found\n/9 required key [Price] not
found\n "
}
```

## Model – Sell Order

INDEX: M/O specifies if it is Mandatory or Optional to provide value in the Payload					
M/O	Tag	Data Type	Example	Notes	
Μ	User Defined Order ID	Text(16)	2_ABC001_PBR	Unique Order Reference for that Sell Order Line	
Μ	BR Service Provider	Text(100)	ABC Power Ltd	Your Company Name as Registered with NG ESO	
М	BMU ID	Text(10)	BMU ID	"Asset", "Unit"	
М	Service Type	Text((3)	PBR	"PBR","NBR"	
Μ	Service Start	Date Time	2023-02- 24T09:30:00Z	Start Date Time of Settlement Period being bid for	
М	Service End	Date Time	2023-02- 24T10:00:00Z	End Date Time of Settlement Period being bid for	
М	Price	Number	41.89		
М	Volume	Integer	70		
0	Linked Order	Text(16)	1_ABC001_PBR	Only include if this Line is Linked to a previous order line	

## **Appendix A: General Errors**

table below includes the list of error codes, descriptions and details which can be received. HTTPS Error Code Issue Details The token has failed validation. This may be for one of the following reasons: Token was not generated by National Grid ESO 401 Unauthorized Invalid token Token has been modified so the signature fails validation Token has expired Token is incomplete The token provided does not have a valid grant for this application. This may be because you haven't 400 Bad Request Invalid Grant been granted access privileges for this API. Or Username or password Incorrect If there is issue with the Payload, e.g. Mandatory fields are missing or wrong, e.g. Invalid datatype 400 Bad Request **Bad Request** Parameter has invalid length/format 404 Not Found Not Found Wrong URL used 500 Internal Server An unknown error has occurred within the API **Internal Server Error** Error Endpoint. If this recurs, please contact support

Page Break

## **Appendix B: Version History**

Version	Date	Scope of Change
1.00	9 <sup>th</sup> Feb 2023	First External Release

When errors are encountered in an API request, a technical error payload will be sent. The table below includes the list of error codes, descriptions and details which can be received.