

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 [Single Markets Platform | National Grid ESO](#)

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

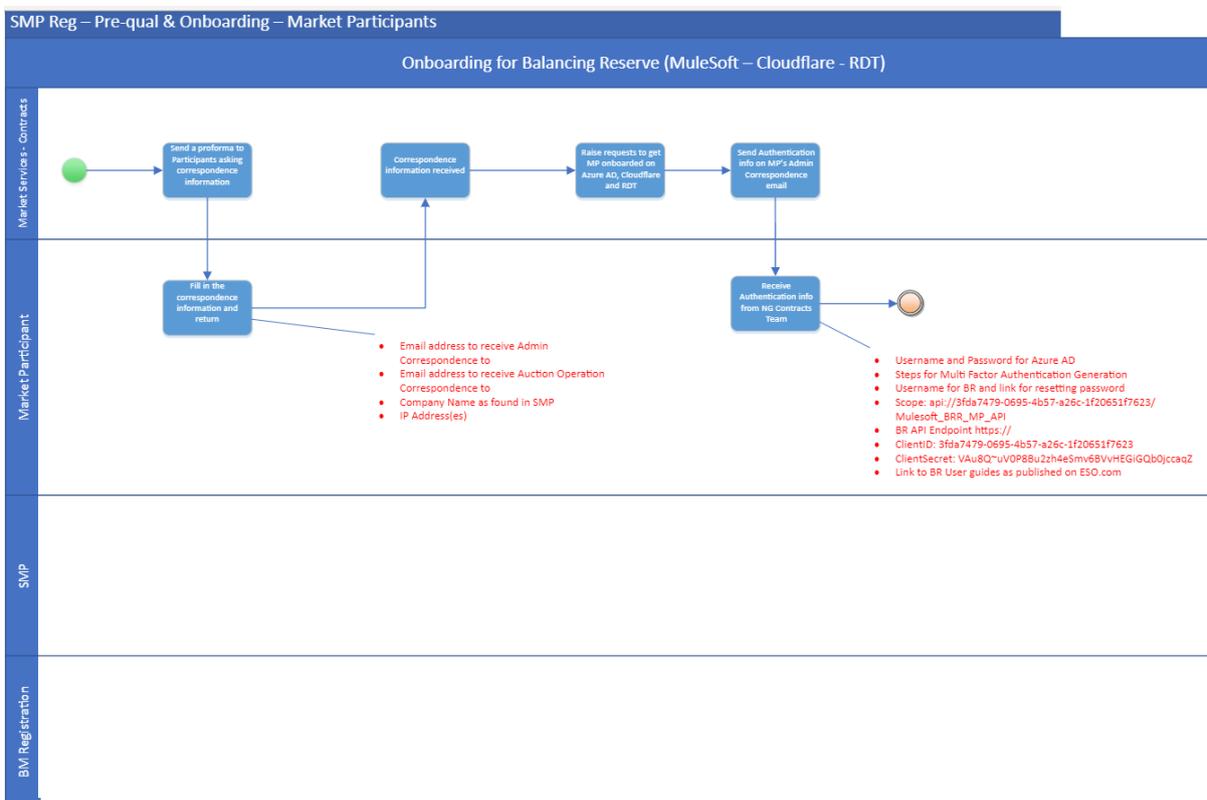
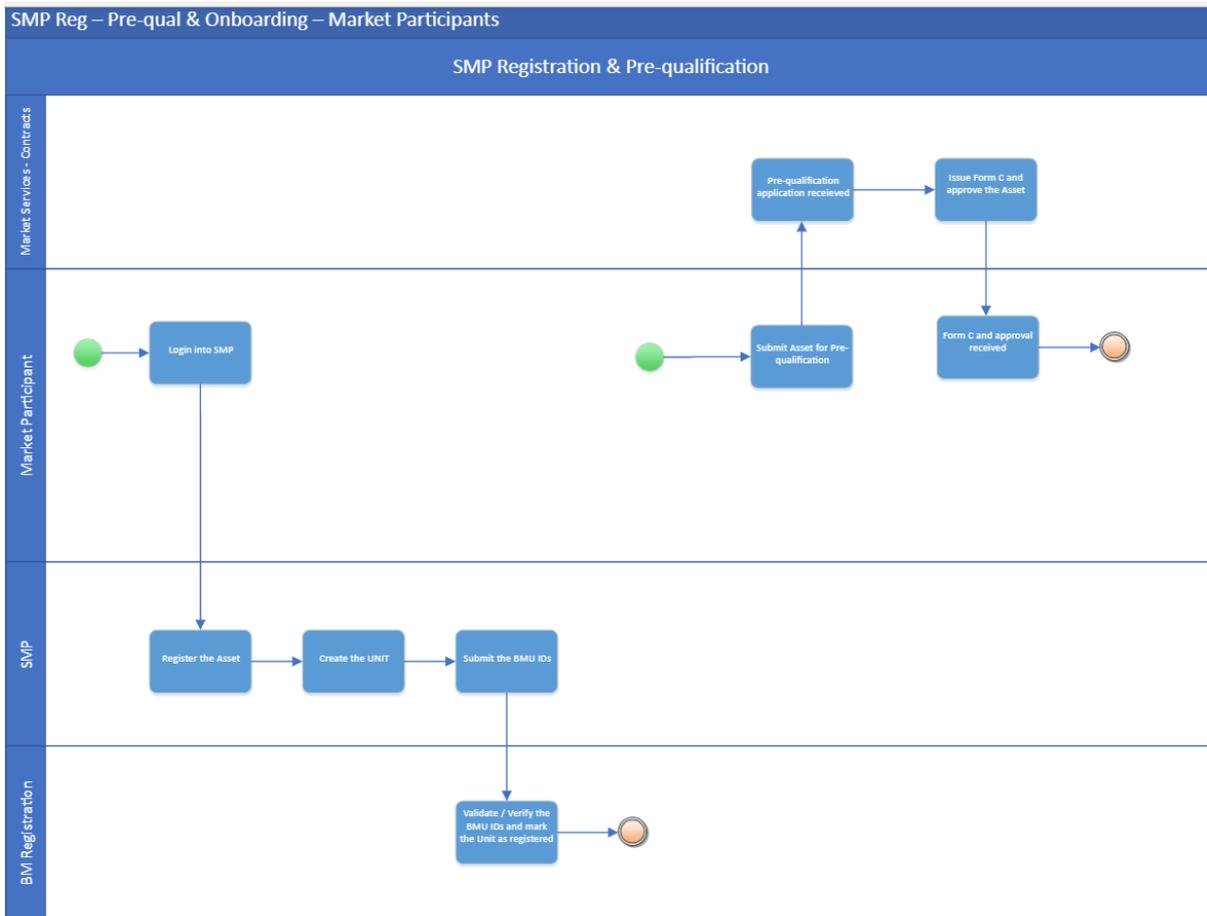
The user guide / video for submitting prequalification application can be found at [Single Markets Platform | National Grid ESO](#)

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.

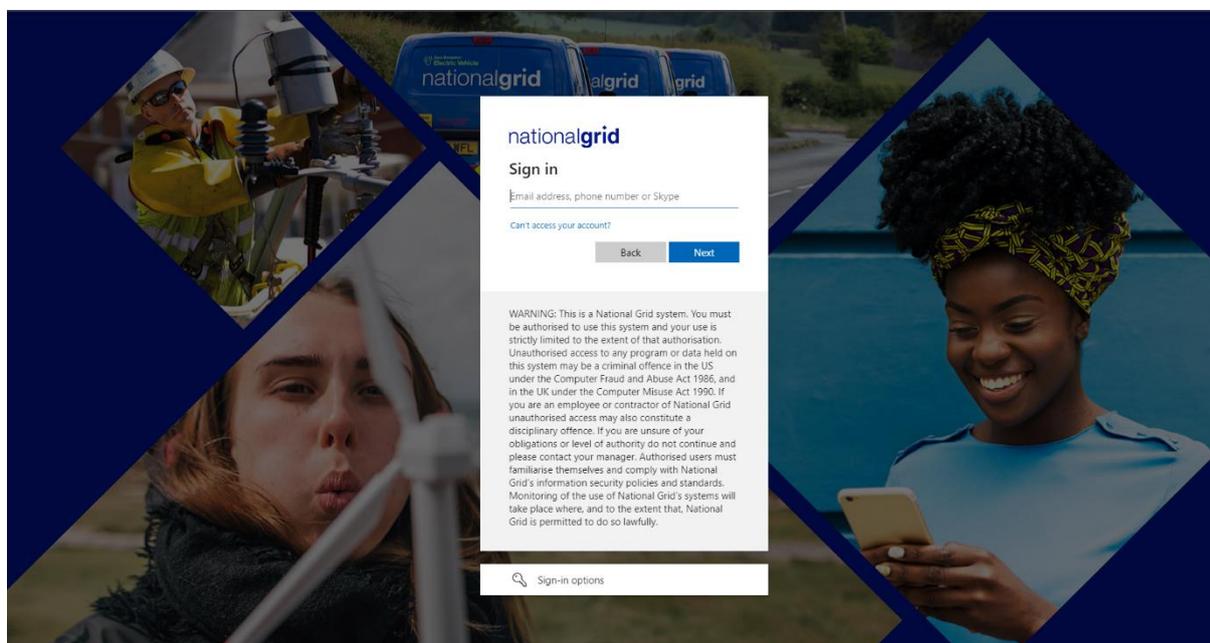
Please note this is the first version of the user guide and further cosmetic enhancements are likely to occur as we go along.

Open a browser and paste the below link:

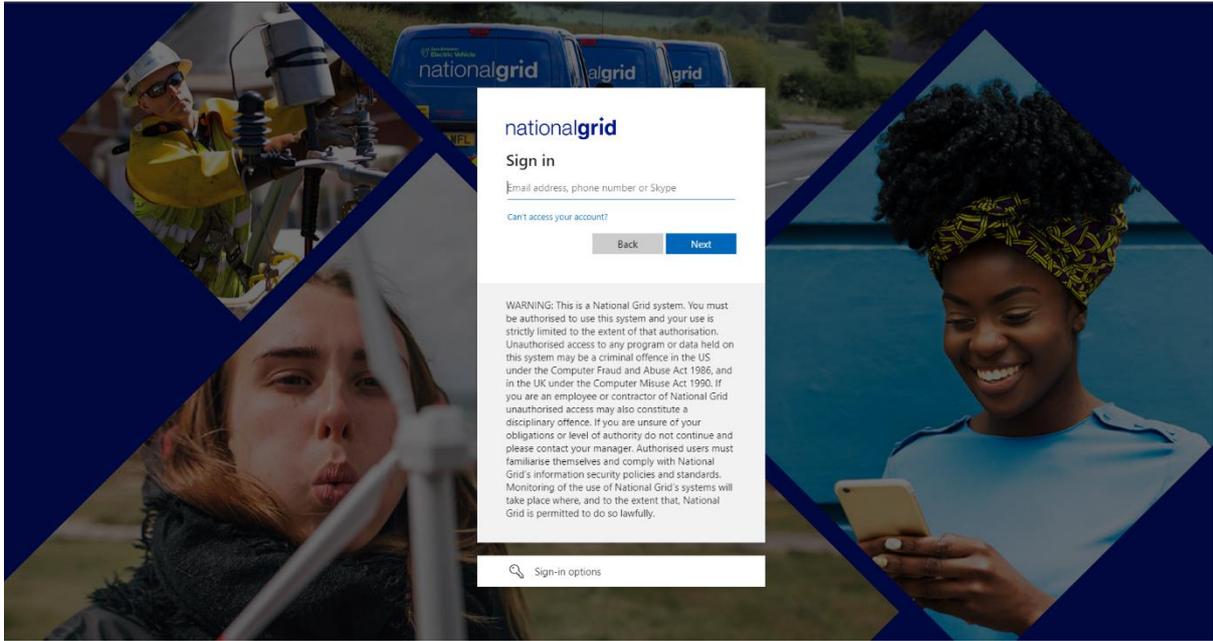
<https://apps.powerapps.com/play/e/31d97878-d4ad-4d47-9bbc-ba0cffb1fa85/a/a2ee9ae9-89d3-4adb-be3e-82cbf6b9bb92?tenantid=f98a6a53-25f3-4212-901c-c7787fcd3495>

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

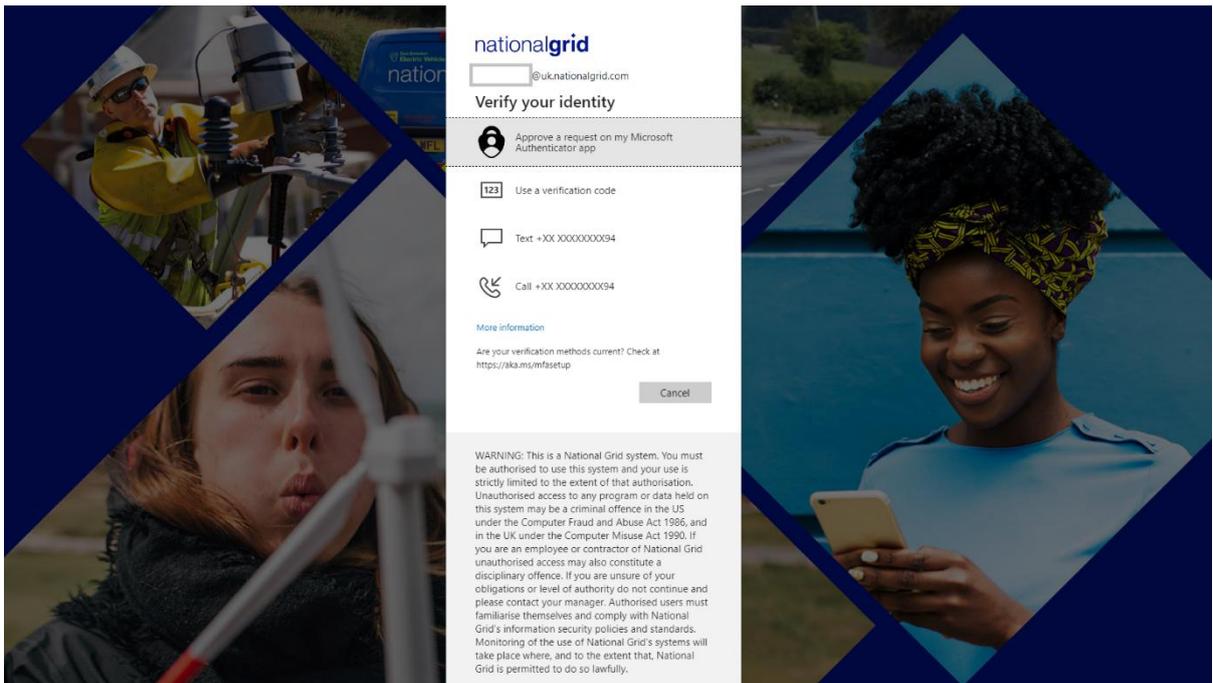
It will ask you to Sign in. Enter your registered email address (you should have received one from the NG Account Manager) and click on the Next button:



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



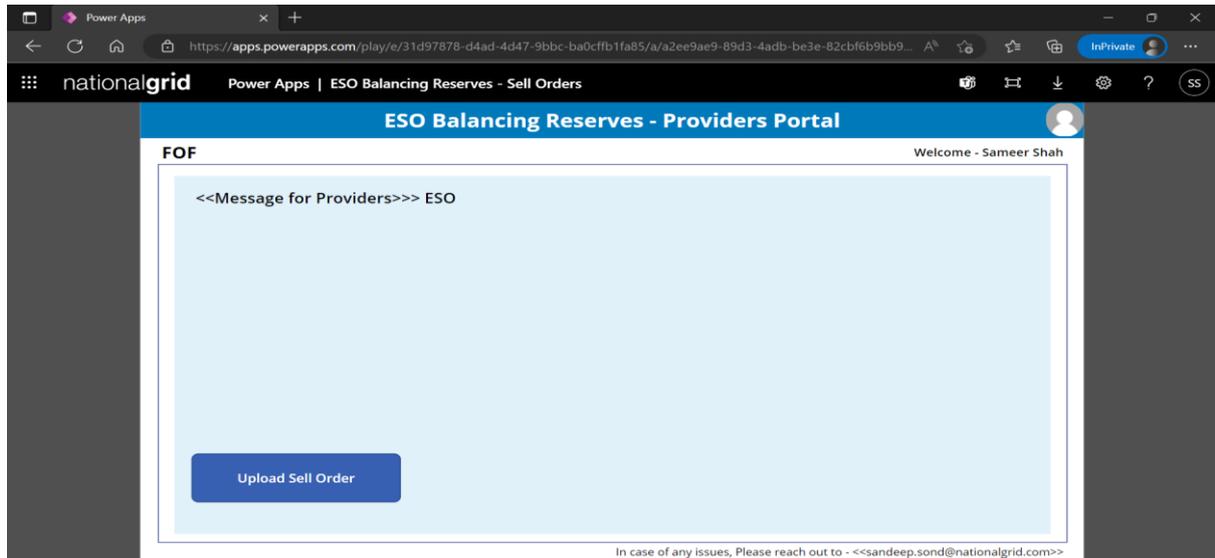
Select the multi factor authentication as shown below



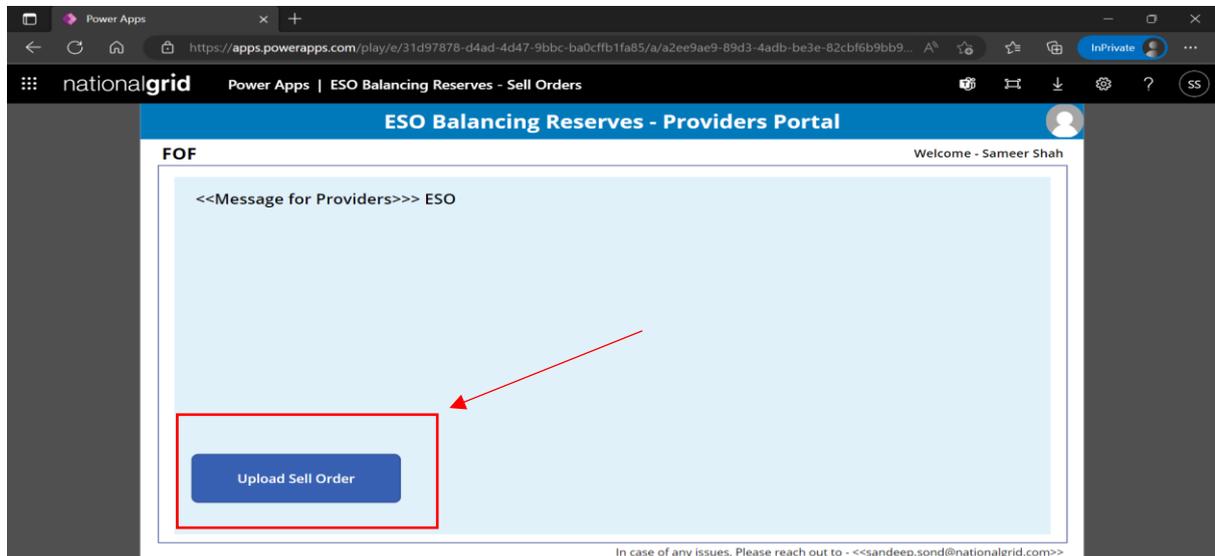
1.2 Bid Submission - Sell Order Upload Steps

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

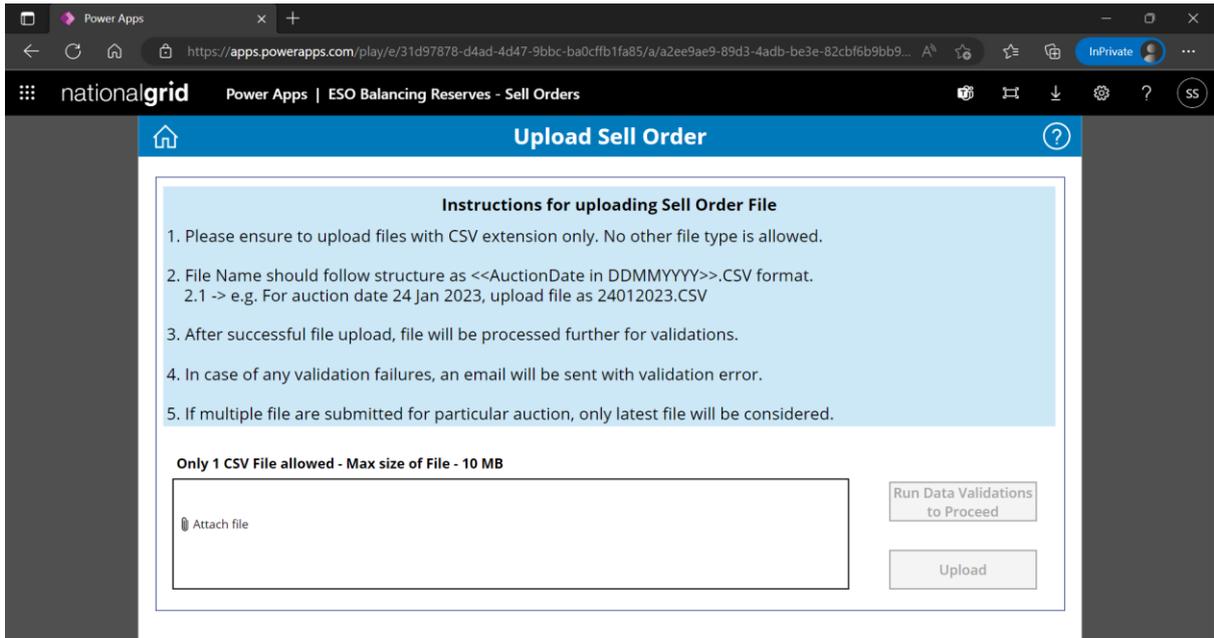
Provider UI



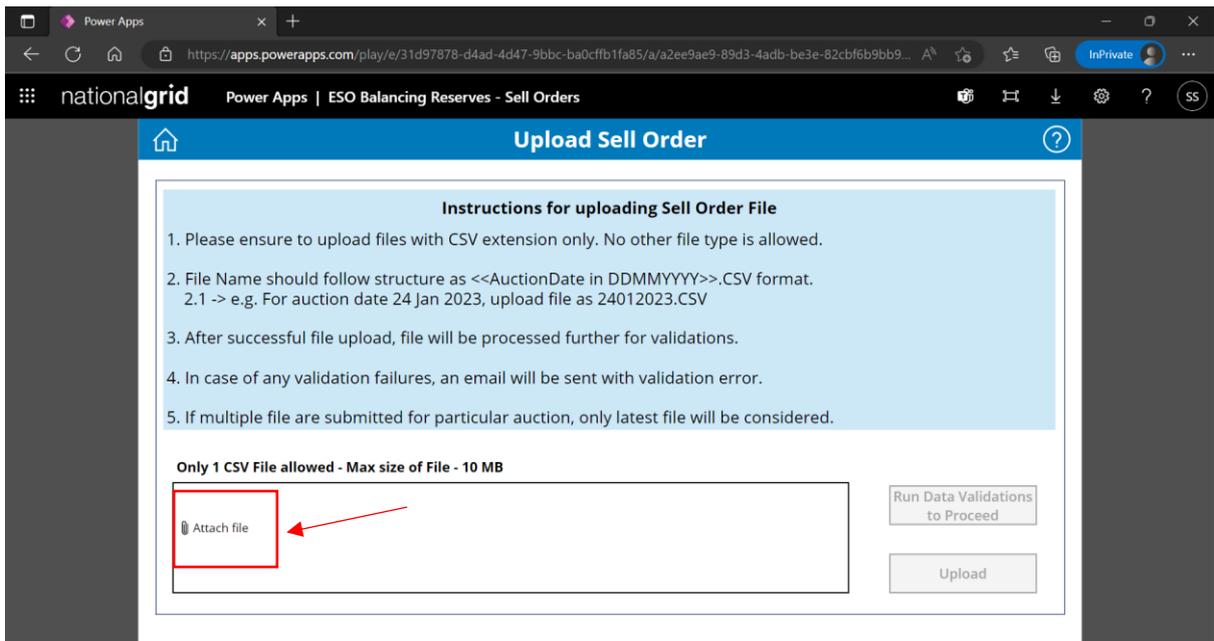
Click on Upload Sell Order button to upload your Sell Order



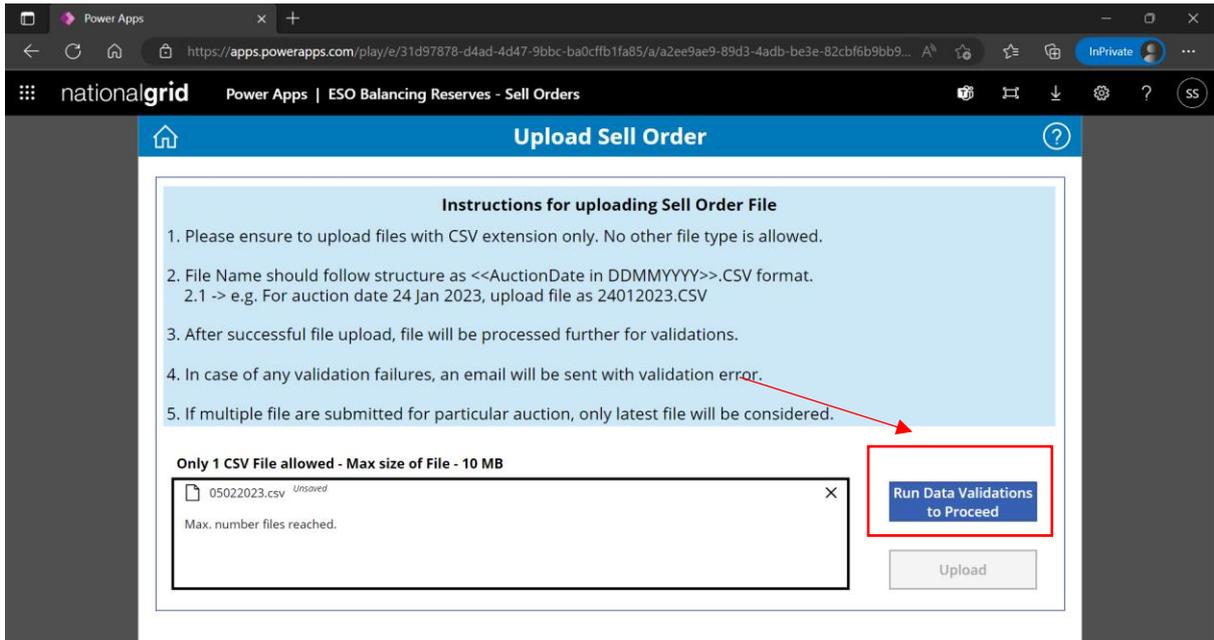
It will take you to the Upload Sell Order page where you can find some of the useful instructions you should consider before uploading a file.



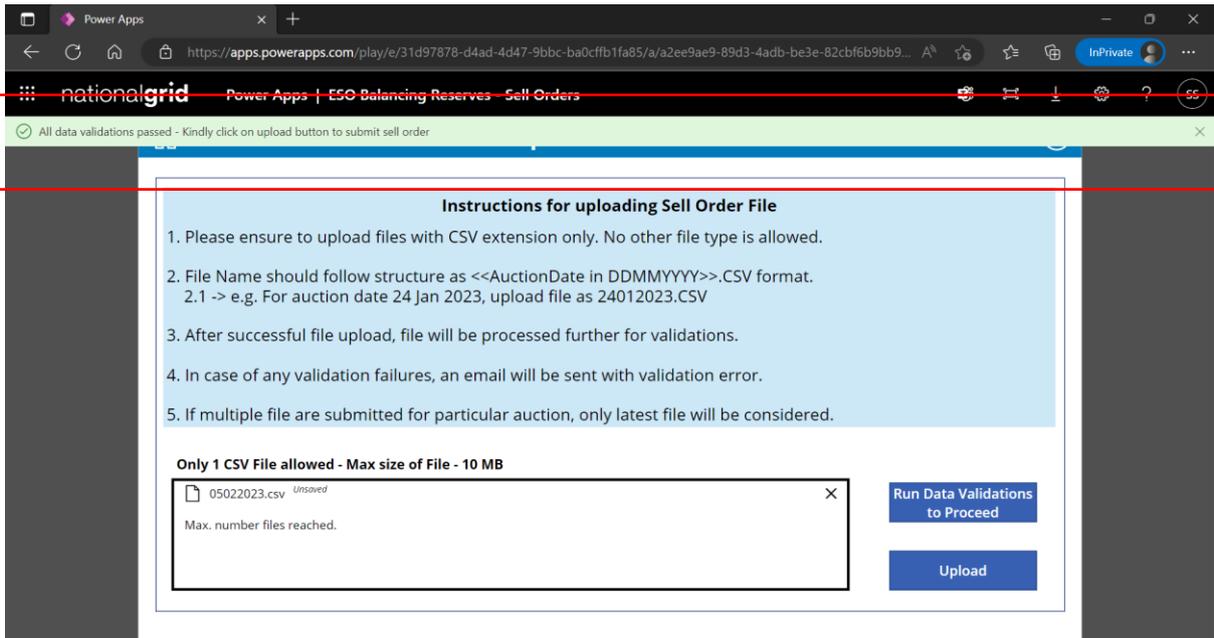
Click on Attach file and select the Sell Order file you want to submit



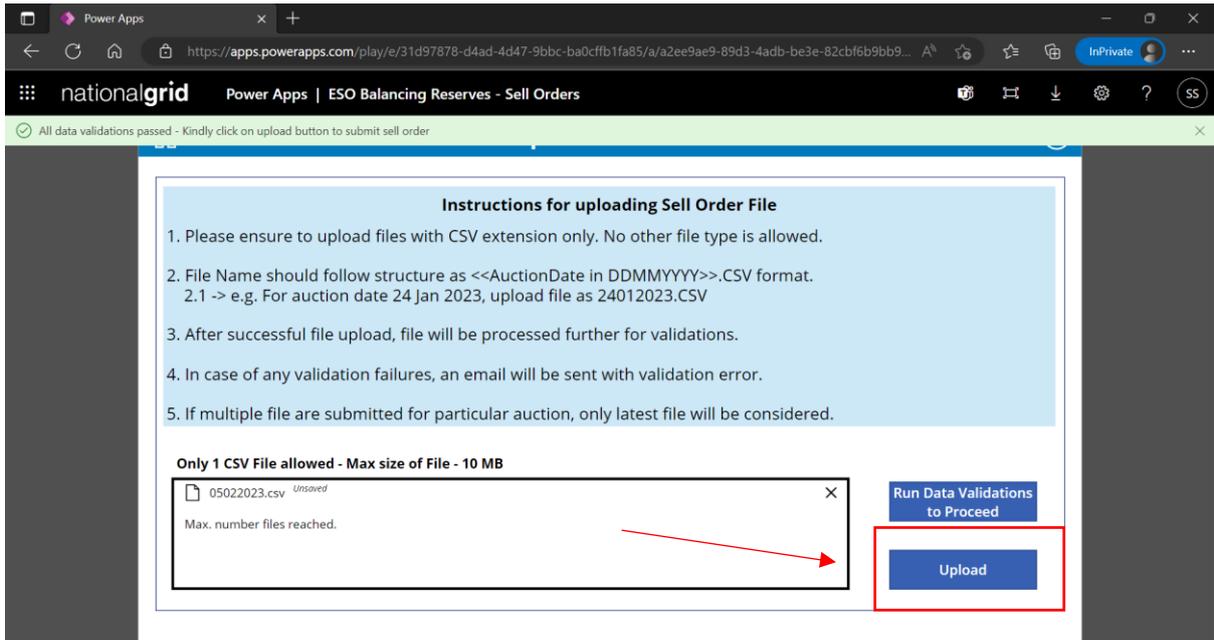
Once the file is attached, click on the Run Data Validations to Proceed button



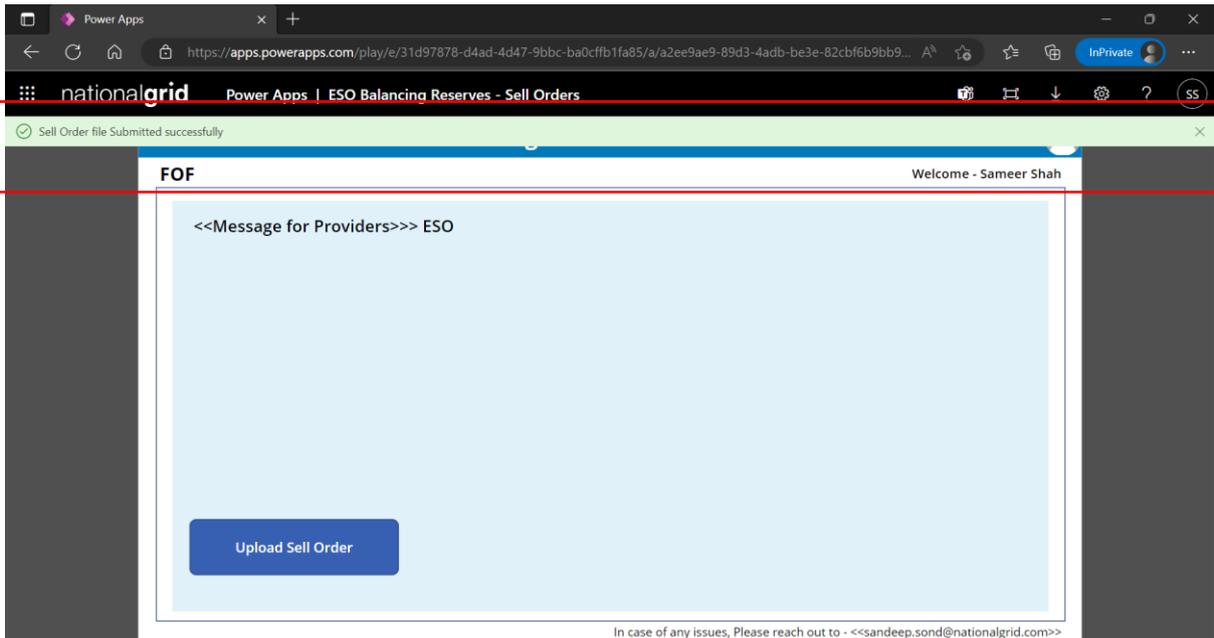
If the Data Validations are successful, you will see a successful message saying All data validations passed



Now click on the Upload button

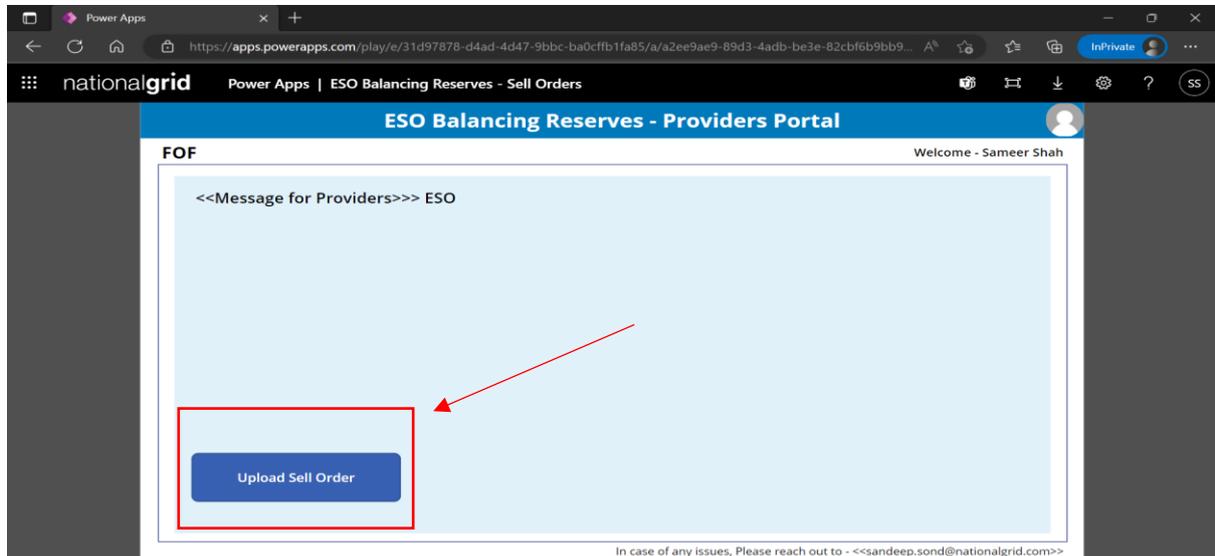


You will get the message Sell Order file Submitted successfully. You have now submitted the Sell Order file successfully

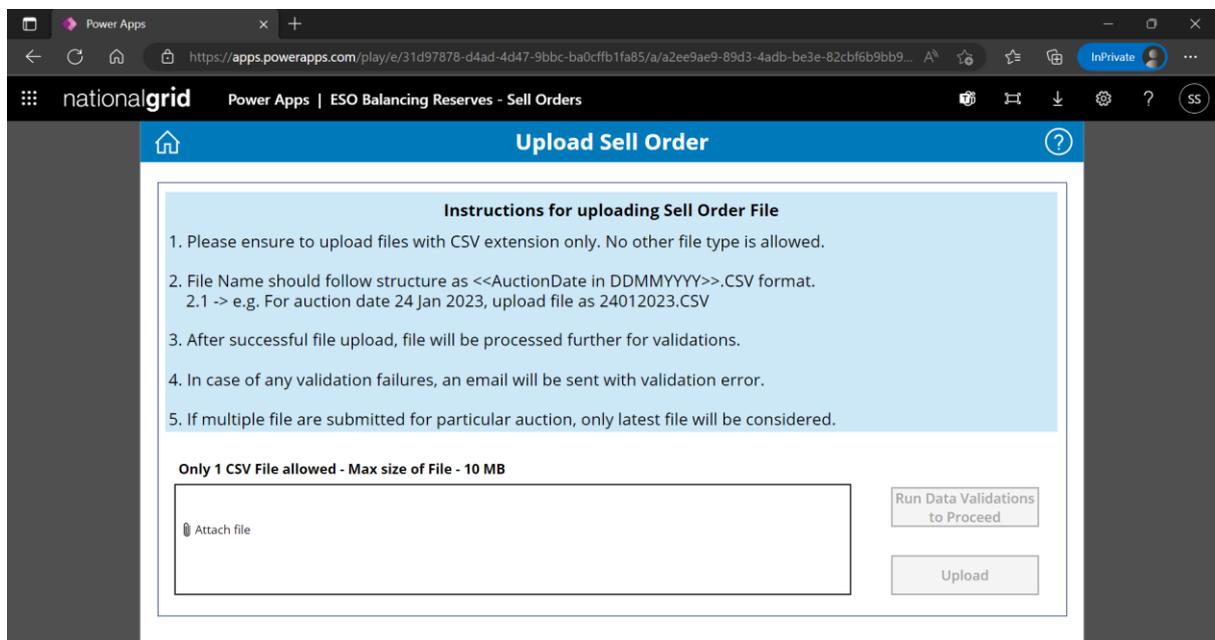


What actions / steps the Participants should take if the Data Validation fails

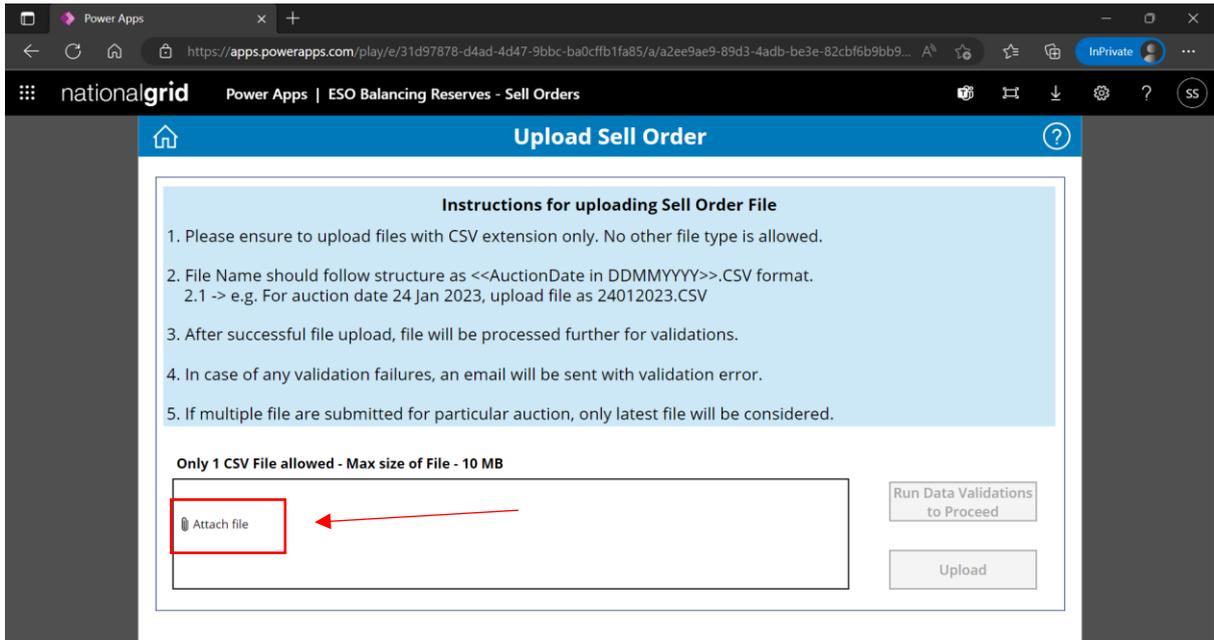
Click on Upload Sell Order button to upload your Sell Order



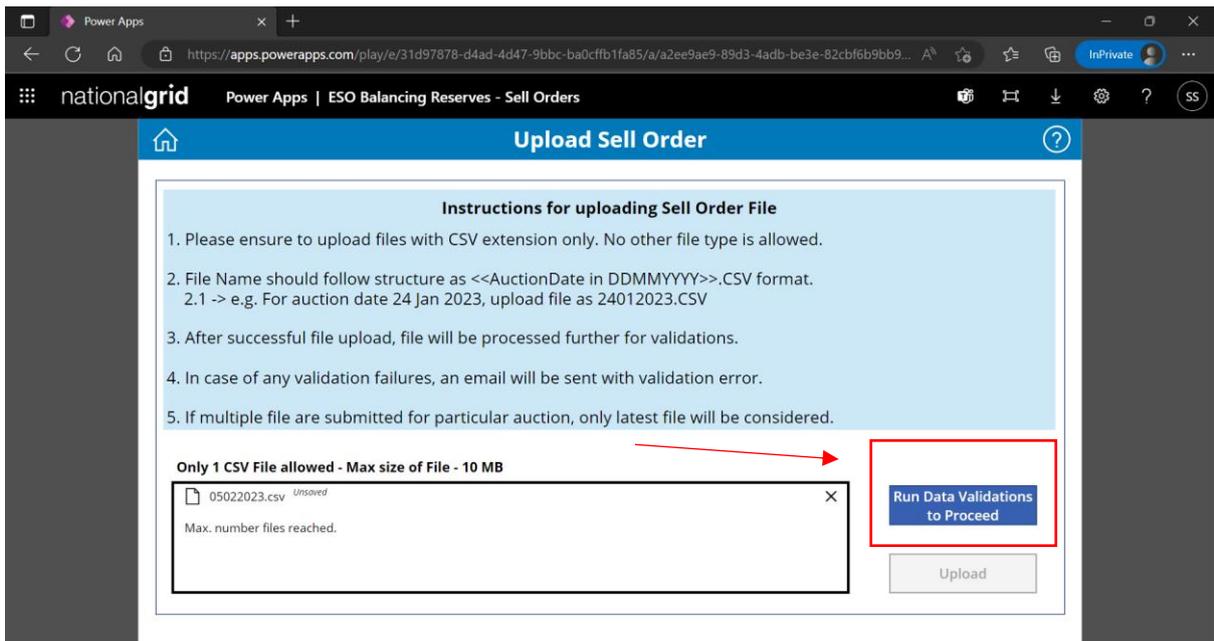
It will take you to the Upload Sell Order page where you can find some of the useful instructions you should consider before uploading a file



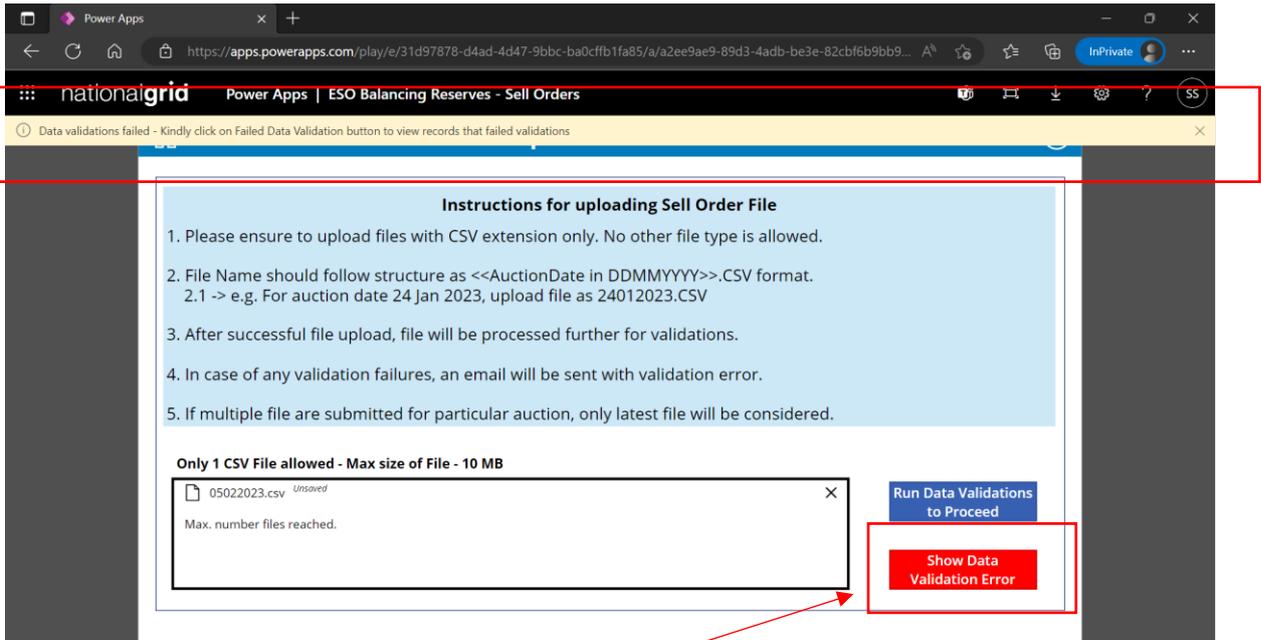
Click on Attach file and select the Sell Order file you want to submit



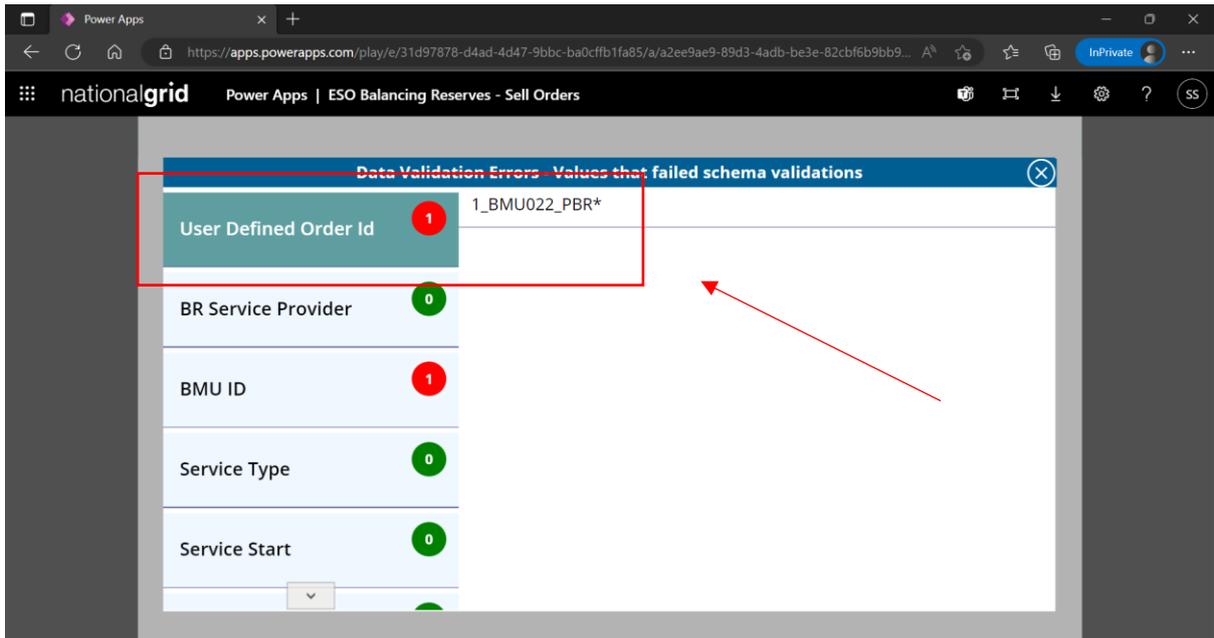
Once the file is attached, click on the Run Data Validations to Proceed button

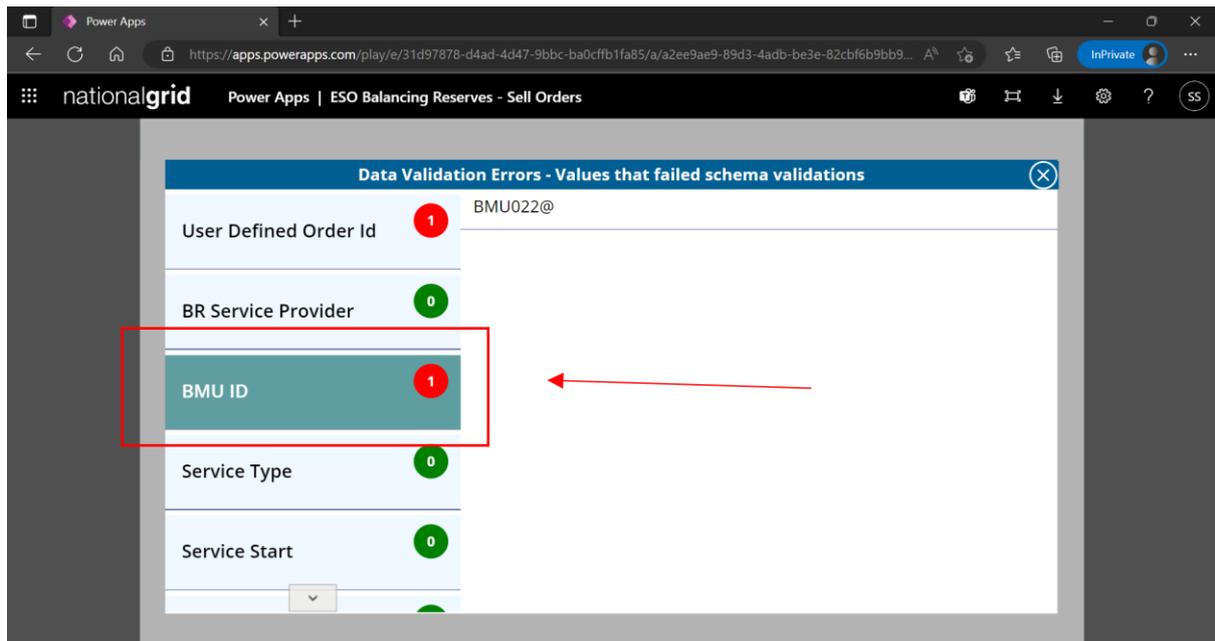


If Data Validations fail, you should see a message saying Data validation failed. Kindly click on Failed Data Validation button to view records that failed validations. Click on Show Data Validation Error button



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





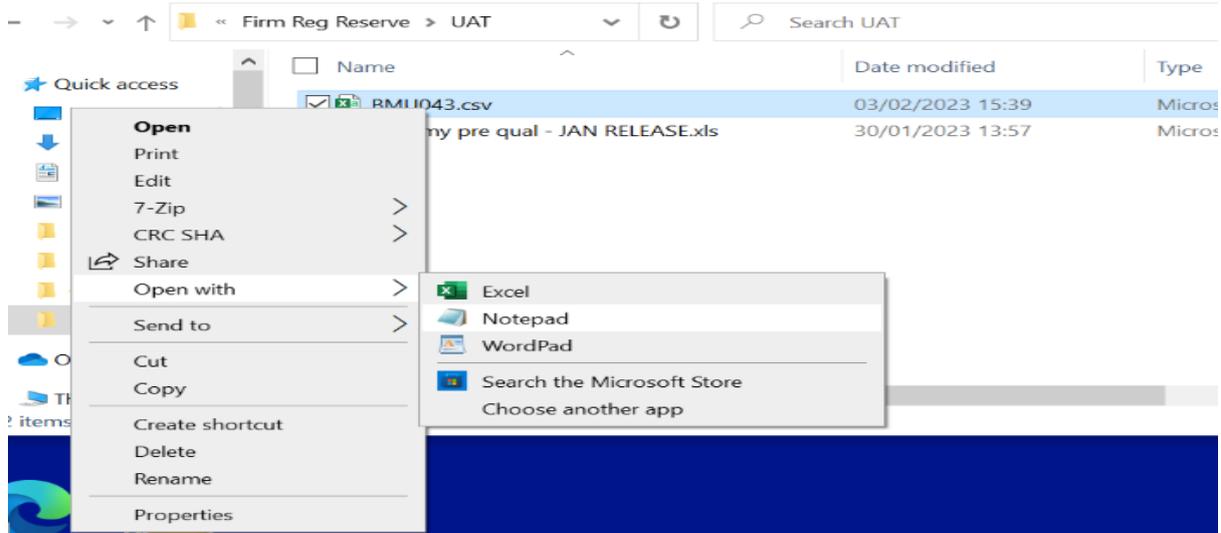
Make the necessary changes to the Sell Order file and upload the Sell Order file from the Home Page

Steps to ensure correct .csv encoding for Sell Orders

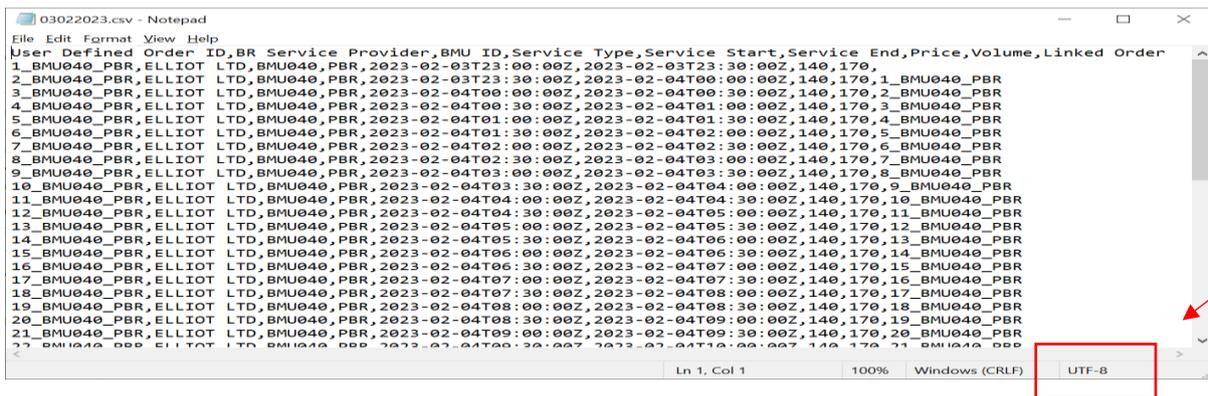
The National Grid API and National Grid Provider Portal / UI uses UTF-8 encoding to validate the .csv files submitted by the Market Participants. It is therefore essential that the Market Participants verify the encoding on the .csv files they are submitting and making sure the .csv files are with correct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

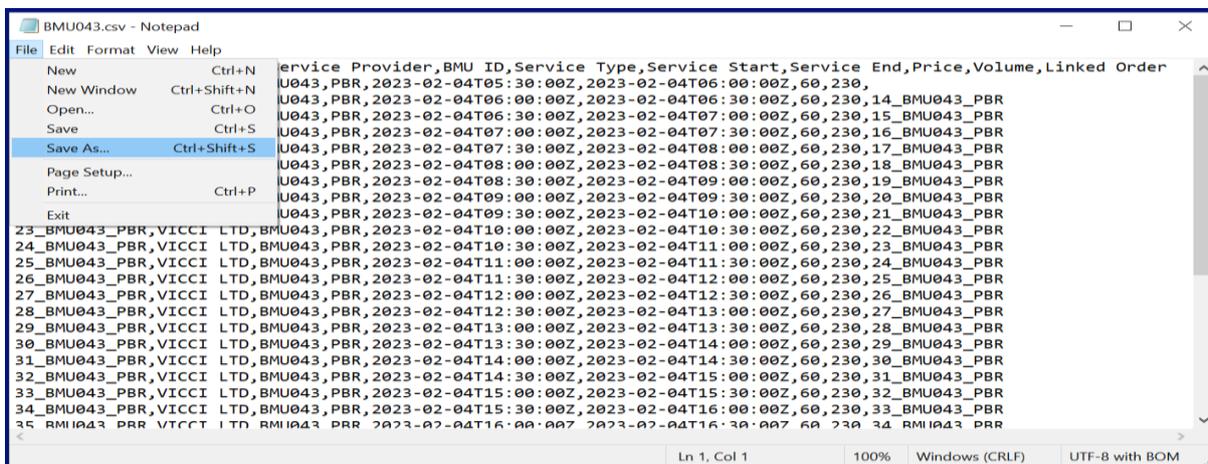
Once the sell order has been created and saved on your internal system, right click on the .csv file you want submit and then click 'Open With' and then select Notepad from the available options



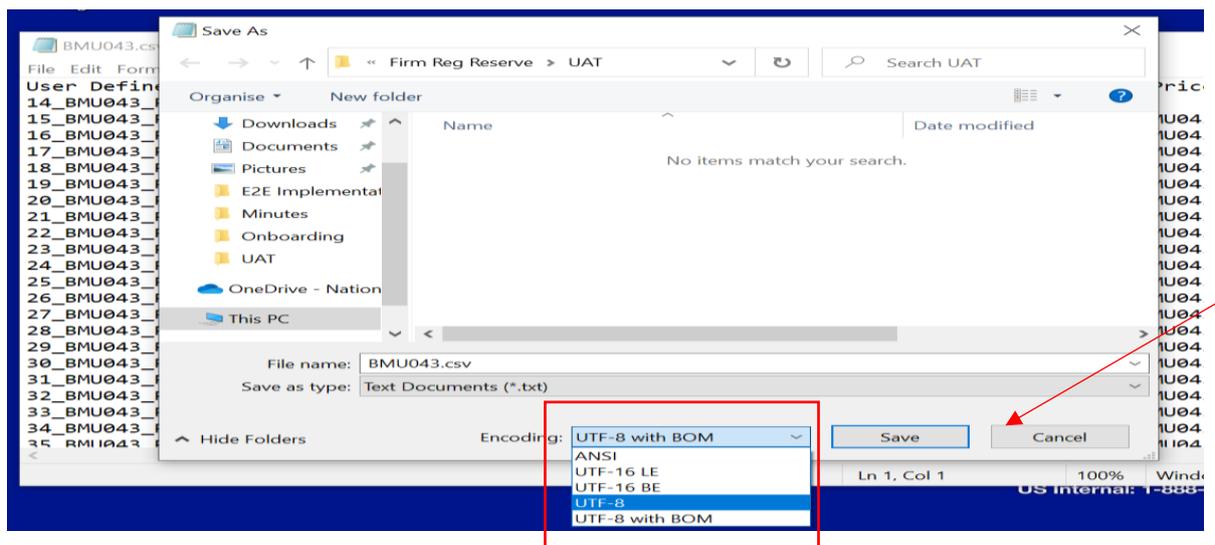
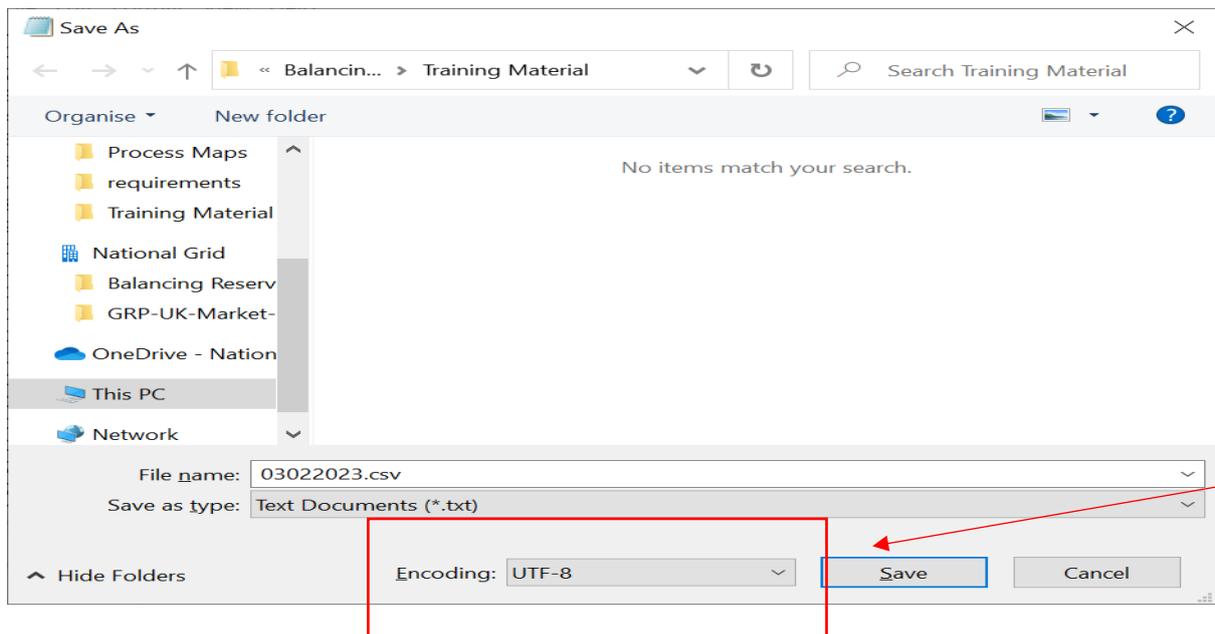
This will open the .csv file in notepad. On the bottom right corner, please verify if its UTF-8.



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



While saving the file, you will find an option to select encoding of the file. Please select UTF-8 and save the file.



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

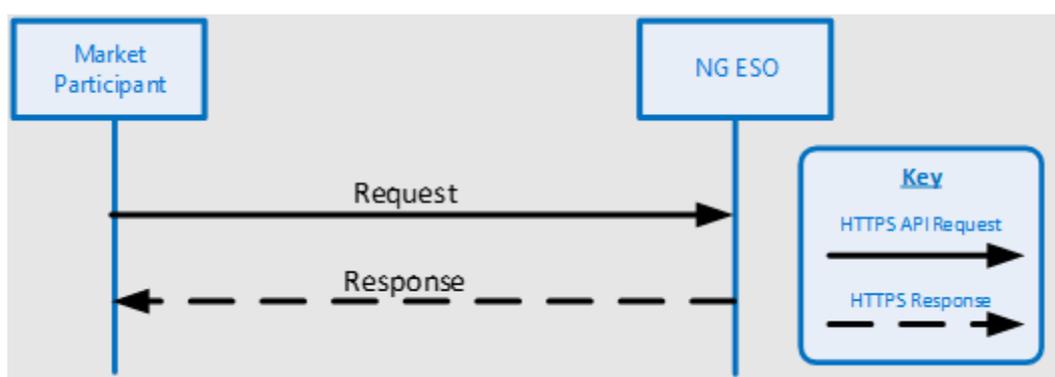
More information about Balancing Reserve, including the Balancing Reserve API, is available on the [Balancing Reserve](#) page of the NG ESO website.

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

Page Break

Overview

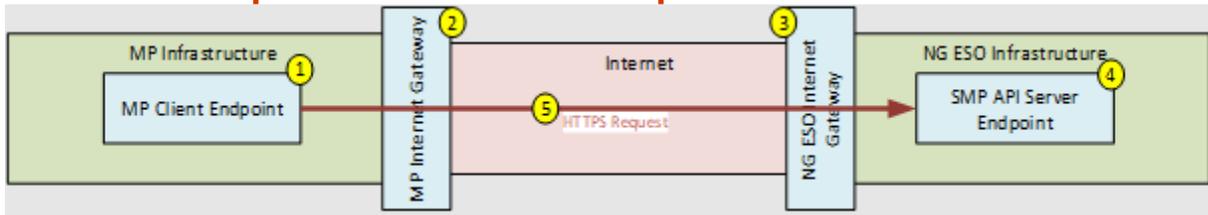
All Transactions with the Balancing Reserve API are synchronous, with a web service request from the Market Participant resulting in a response payload from NG ESO.



Available Balancing Reserve API Calls

Transaction	Type	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

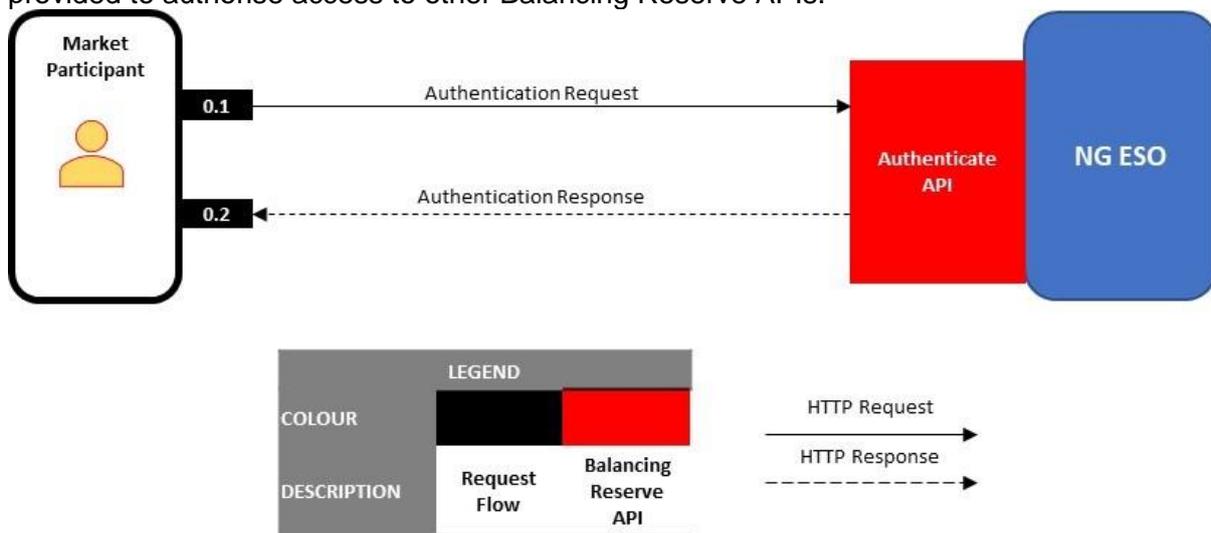


#	Item	Type	Description
1	MP Client Endpoint	Component	This is the Client Endpoint that will initiate a connection to the Balancing Reserve API.
2	MP Internet Gateway	Component	This is the Internet Gateway that provides connectivity between the Market Participant's Client Endpoint and the internet. It should implement appropriate security measures. 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
3	NG ESO Internet Gateway	Component	This is the Internet Gateway that provides connectivity between the Balancing Reserve API and the Internet. It implements security points and checks, including validating incoming flows are coming from known sources.
4	Balancing Reserve API Server Endpoint	Component	This is the HTTPS endpoint that the Market Participant will connect to when initiating a call to the Balancing Reserve API. It will enforce that the client is using TLS1.2 or later.
5	HTTPS API Request	Flow	This is an instance of a connection from Market Participant to Balancing Reserve API, for example to perform an 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: <ul style="list-style-type: none"> • Authentication Error • Authentication Token

Specification

Submission

The submission to the Authenticate API is a POST request made up of the following parameters:

PARAMETER	DESCRIPTION
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

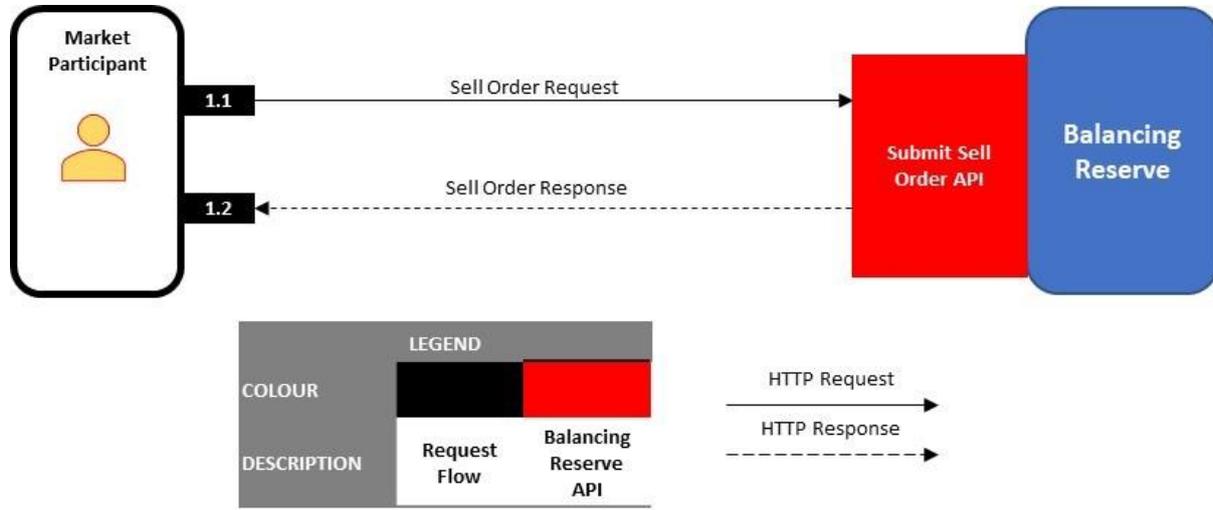
Rather than post a sample URL, we have included a sample CURL Request as that shows the required information clearly:

```
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

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: <ul style="list-style-type: none"> 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
M	User Defined Order ID	Text(16)	2_ABC001_PBR	Unique Order Reference for that Sell Order Line
M	BR Service Provider	Text(100)	ABC Power Ltd	Your Company Name as Registered with NG ESO
M	BMU ID	Text(10)	BMU ID	"Asset", "Unit"
M	Service Type	Text((3)	PBR	"PBR", "NBR"
M	Service Start	Date Time	2023-02-24T09:30:00Z	Start Date Time of Settlement Period being bid for
M	Service End	Date Time	2023-02-24T10:00:00Z	End Date Time of Settlement Period being bid for
M	Price	Number	41.89	
M	Volume	Integer	70	
O	Linked Order	Text(16)	1_ABC001_PBR	Only include if this Line is Linked to a previous order line

Appendix A: General Errors

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.

HTTPS Error Code	Issue	Details
401 Unauthorized	Invalid token	The token has failed validation. This may be for one of the following reasons: <ul style="list-style-type: none">• Token was not generated by National Grid ESO• Token has been modified so the signature fails validation• Token has expired• Token is incomplete
400 Bad Request	Invalid Grant	The token provided does not have a valid grant for this application. This may be because you haven't been granted access privileges for this API. Or Username or password Incorrect
400 Bad Request	Bad Request	If there is issue with the Payload, e.g. Mandatory fields are missing or wrong, e.g. <ul style="list-style-type: none">• Invalid datatype• Parameter has invalid length/format
404 Not Found	Not Found	Wrong URL used
500 Internal Server Error	Internal Server Error	An unknown error has occurred within the API Endpoint. If this recurs, please contact support

Page Break

Appendix B: Version History

Version	Date	Scope of Change
1.00	9 th Feb 2023	First External Release