



Flexible Power

Guide to API Setup & UAT Testing
Version 2 Dec 2020

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1 Definitions

DER	Distributed Energy Resource
CFP	Contracted Flexibility Provider
User	CFP appointed person with access to The Portal
DNO	Distribution Network Operator
The Portal	The Flexible Power Portal
API	Application Programming Interface
CMZ	Constraint Management Zone. A geographical zone defined by the DNO within which the CFP has been awarded a contract to deliver flexibility services.
UAT Environment	The version of the portal where User Acceptance Testing is conducted
Live Environment	The version of the portal where live flexibility operations are conducted
MU	Meterable Unit
DG	Dispatch Group
DSR	Demand Side Response

2 Introduction

This guide has been produced to assist contracted flexibility providers (CFP) in their set-up within the Flexible Power Portal ('The Portal').

The Portal is the operational platform through which flexibility providers are able to declare their Distributed Energy Resource (DER) availability and submit associated meter readings. The Distribution Network Operator (DNO) uses the portal to accept availability declarations and instruct utilisation events/

The Portal is equipped with functionality that calculates;

- the DER baseline
- Event performance
- Event earnings
- Monthly invoices

3 Applicability

The Portal is used by the following UK DNOs to administer their flexibility operations;

1. Scottish & Southern Electricity Networks; flexible.services@sse.com
2. Scottish Power Energy Networks; flexibility@spenergynetworks.co.uk
3. Northern Powergrid; flexibility@northernpowergrid.com
4. Western Power Distribution; wpdflexiblepower@westernpower.co.uk

CFPs appointed users will be provided with a UAT account once they have been awarded a contract by any of the above DNOs.

4 API Set-up

4.1 An Introduction to APIs

An Application Programming Interface (API) is a software intermediary that allows two applications to talk to each other.

In the context of Flexible Power's services, the API replaces the requirement for dedicated hardware to be connected at a DER site in order to collect the metering data and send instructions from a DNOs central control desk.

There are a large variety of DER control arrangements, ranging from a single asset such as a standalone generator through to a complex estate with multiple assets or even part of a portfolio under management by a commercial aggregator. Therefore, CFPs are required to develop their own interface for the API to their DER control.

DNOs are available to assist in discussions to advise options that may be appropriate for specific DER control arrangements. For further advice, email your DNO as detailed in section [0](#).

4.2 Testing Environment

All API set-up and testing must be performed in the User Acceptance Testing (UAT) environment which offers new users as a safe environment in which test establish and test the technical aspects of the Flexible Power service.

UAT replicates the live environment that is used for operating all Flexible Power services. CFPs can use this to establish the API interface as well as familiarise with the diary system used for capacity declaration.

- The UAT Environment (for testing only) is found at: <https://uat.flexiblepowerportal.co.uk/>
- UAT includes a self-testing environment where users can set up and test API and declaration procedures.
- A supervised test will be required before a user is given access to the Live Environment

4.3 Live Environment

The live 'Production' environment is found at: <https://flexiblepowerportal.co.uk>. We recommend using a Chrome browser to access the platform.

4.4 Signal and Control Requirements

The API requires continual provision of minute-by-minute data throughout the operational season, ideally three weeks before a CMZs operational season begins. This provides the portal with both data for the baselining and so delivery can be verified in real time/close to real time.

The Portal will tolerate a 15-minute delay of data. Any data missing beyond 15 minutes will need to be submitted to the CMZs DNO via email to upload manually. After manual upload the event performance and earnings reports are automatically refreshed.

The following data needs to be provided via the API;

- Current power usage in kW, with timestamp, per MU and per CMZ
- Emergency stop signal, per MU, per DSR programme and per CMZ

In addition, the following control signals will need to be received;

- Dispatch start instruction, per DSR programme, per MU and per CMZ
- Dispatch stop instruction, per DSR programme, per MU and per CMZ

5 Accessing the Portal for the first time

New CFPs requiring an account for the Flexible Power Portal should do so by providing the following information to their DNO;

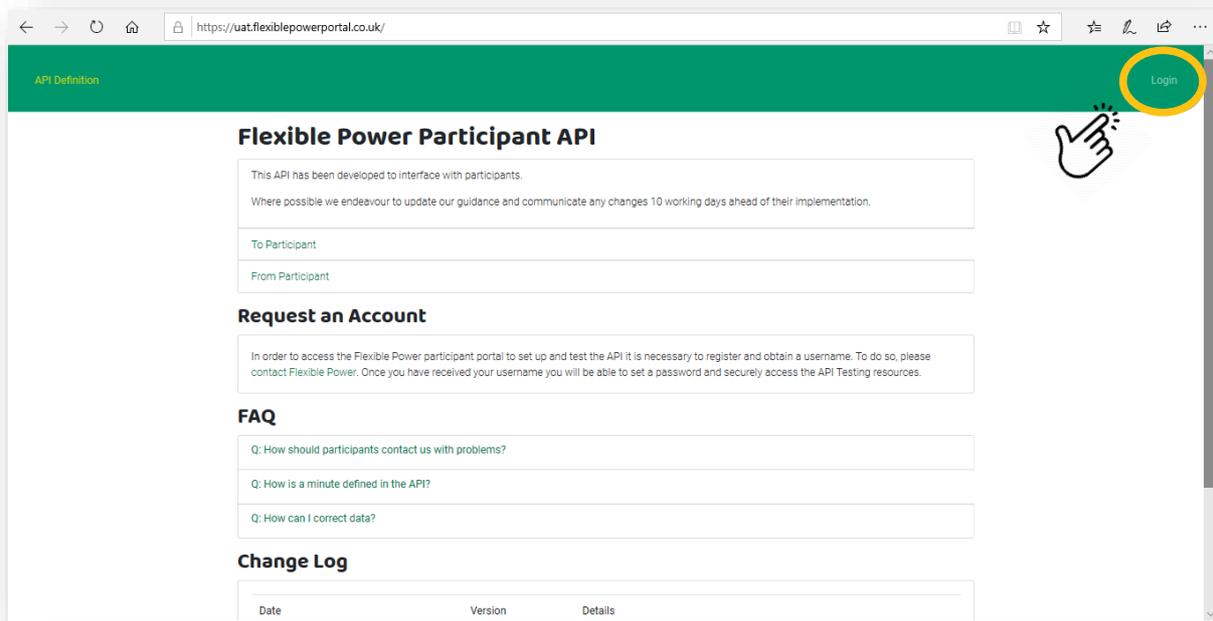
- Organisation / Company name
- CMZs in which they have been awarded contracts and wish to declare capacity
- Full name and email address for initial user account

An account will then be created within three working days for the UAT environment. The DNO will send a notification to the user when this has been completed.

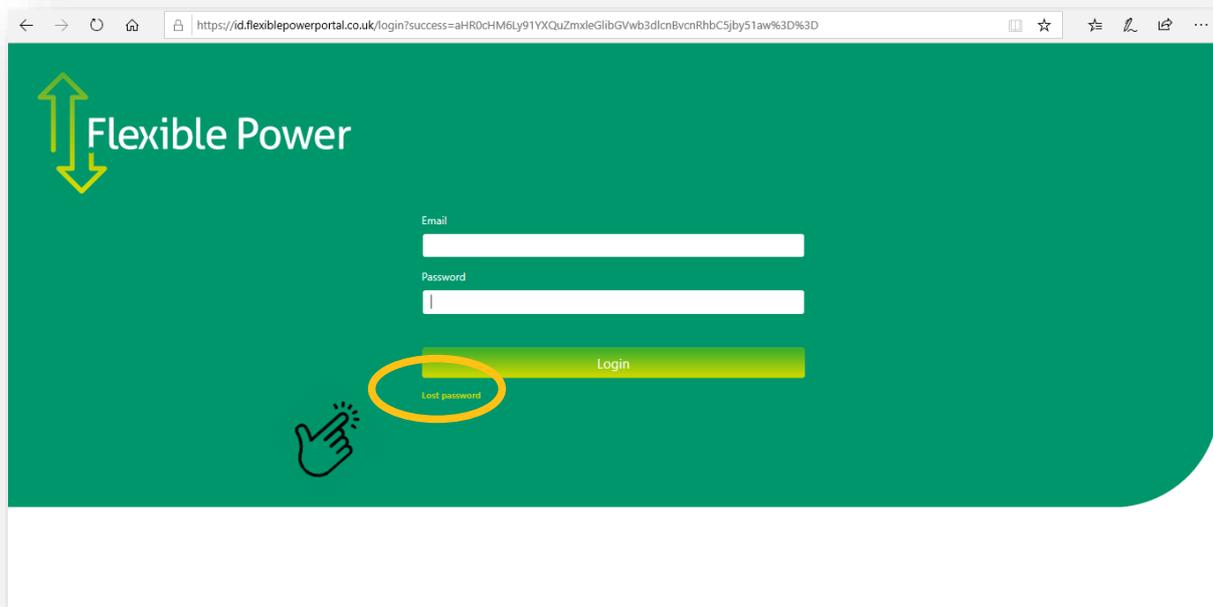
The user should then visit; <https://uat.flexiblepowerportal.co.uk/>

Step 1. Follow the '**Login**' link at the top right corner of the page.

Step 2. On the first time visiting this page the user should use the '**lost password**' link and input the email address previously provided to set up the users account.



Step 3. Check the email account for an email from Flexible Power with a reset link to create the user's password (please note only one user account per organisation is typically provided in the UAT environment, but multiple are permitted when set up in Production)



6 Setting up Meterable Units and Dispatch Groups

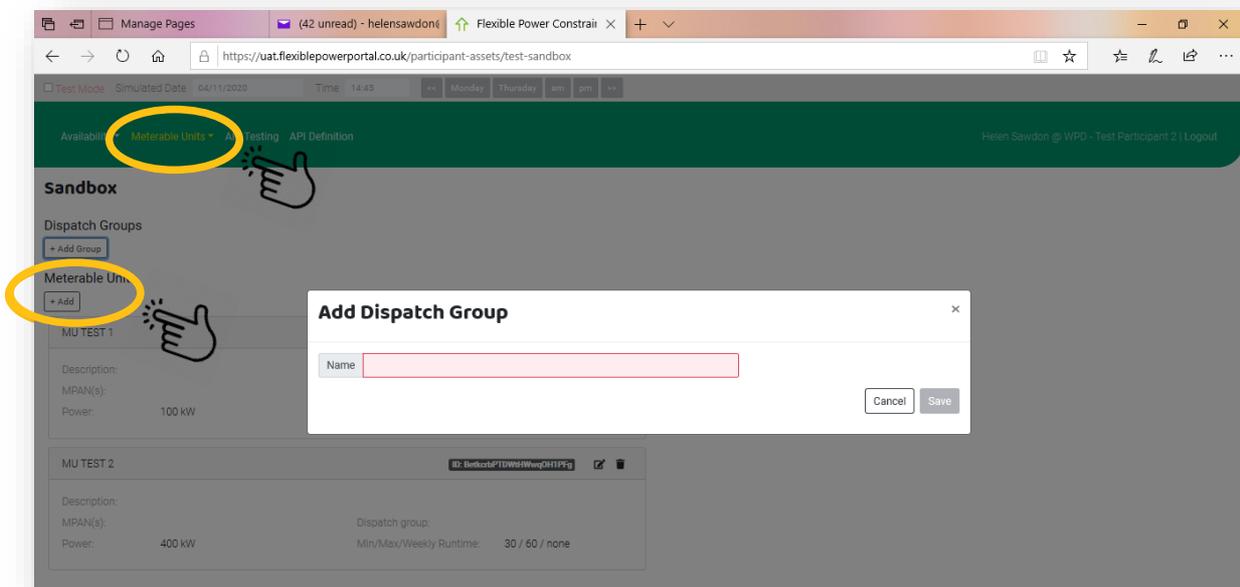
A Meterable Unit (MU) is one or more flexibility assets. The criteria for how many is based on the granularity you are able to send meter readings. If, for example, you have two assets behind a single meter, then those two assets would be a single Meterable Unit with a single set of meter readings.

A Dispatch Group (DG) is a collection of Meterable Units within a single zone. The purpose of this is to group together assets that you wish to be dispatched together. When you make availability declarations, they will be for a given Dispatch Group rather than the whole zone.

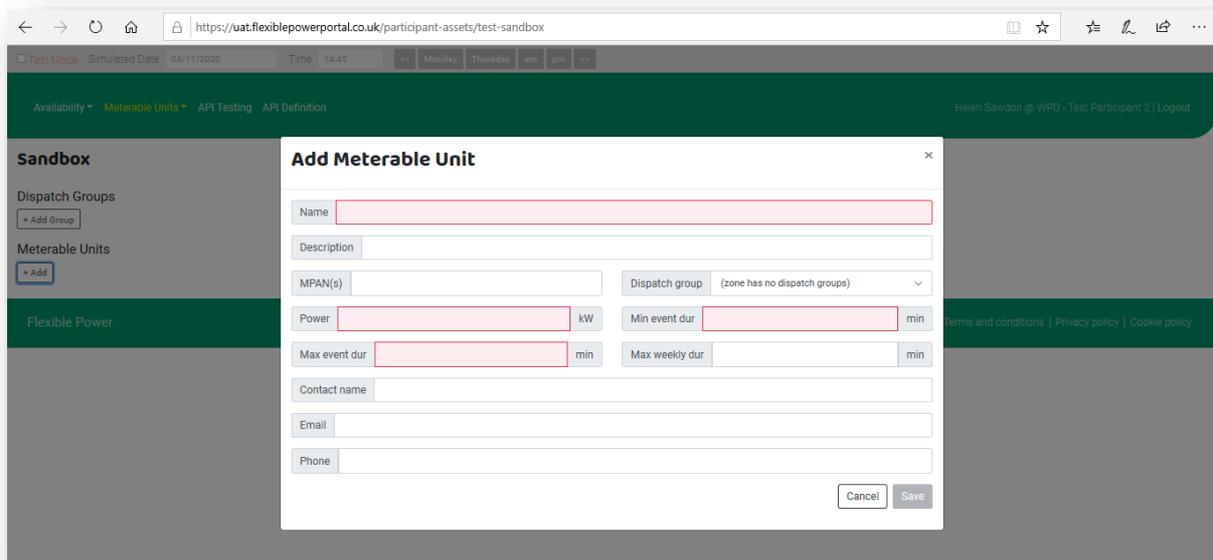
If there is a Meterable Unit you wish to dispatch by itself then you must create a Dispatch Group containing that one Meterable Unit. You can rearrange Meterable Units into different Dispatch Groups at any time but these changes will apply from the declarable weekonwards.

In order to test the start/stop API Meterable Units (MUs) will need to be created. These can be created to reflect your real assets, but for the purpose of testing any value can be used to create the Meterable Units.

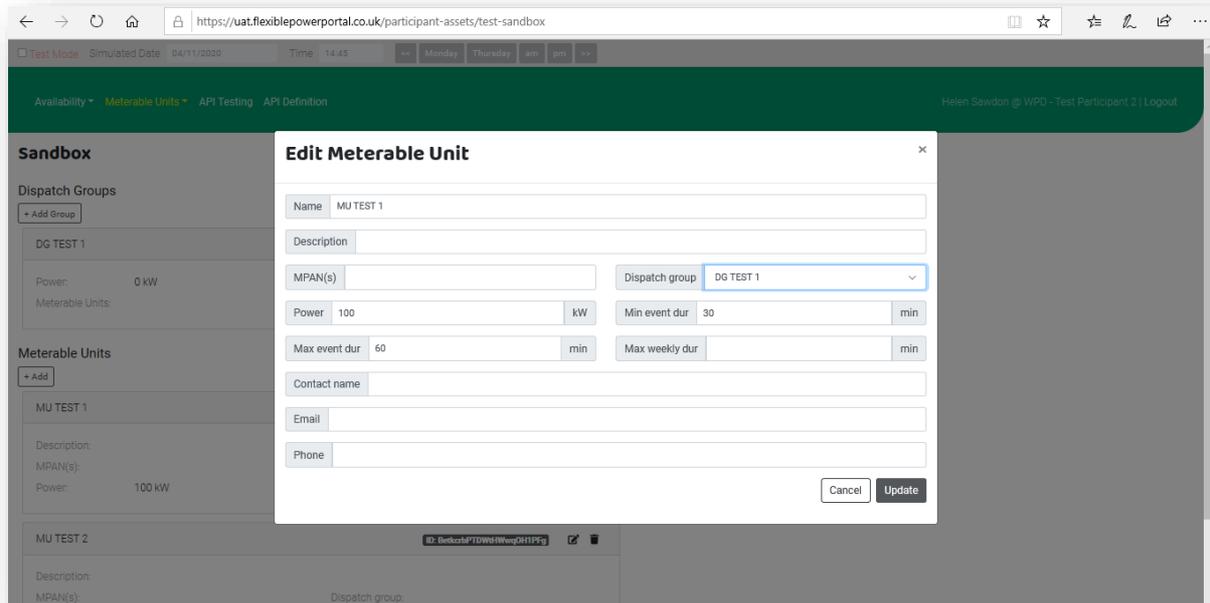
Step 1. go to the "Meterable Units" page, select 'sandbox' and define at least one Dispatch Group.



Step 2. go to the "Meterable Units" page, select 'sandbox' and define at least one Meterable Unit.

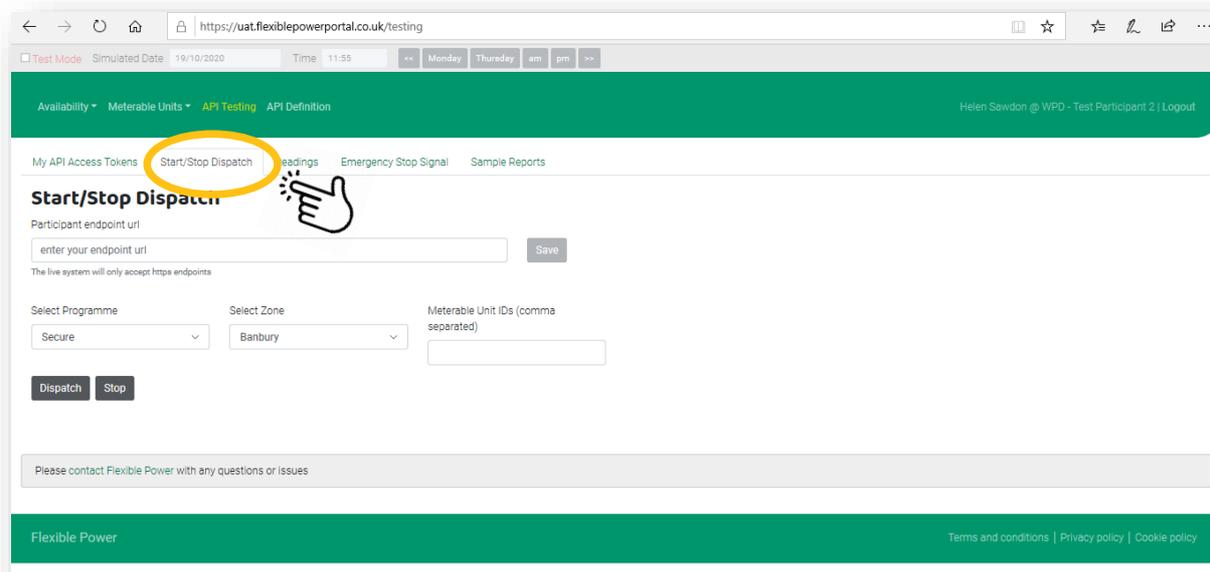


Step 3. Assign the Meterable Unit to your Dispatch Group



7 Receiving start and stop signals

Step 1. Go to 'Start / Stop Dispatch' tab via the link circled below



Step 2. Under send a test dispatch, add your 'url endpoint', this is where the Portal will send the dispatch instructions to. It will typically be a webserver that can receive the metering data but doesn't have to physically be located where the asset is. Aggregators for example will in most cases have their own systems connected to customer sites to collect data back to their own central facilities which in turn may be located in 'the cloud' rather than at a specific premises.

Step 3. While developing and self-testing the user should choose any programme from the drop down menu (Secure, Dynamic / Restore) and select the 'Sandbox' subzone.

Step 4 . Enter one or more MU ID, these can be found on the Meterable Units page.

Step 5. When ready click on ‘Dispatch’.

This will send a dispatch order via the dispatch API for the ‘Sandbox’ sub-zone/program, only to the MU that was added under "participant endpoint url".

Step 6. check the endpoint to confirm;

- the dispatch order is received
- the dispatch order is for the chosen programme and ‘sandbox’ sub-zone

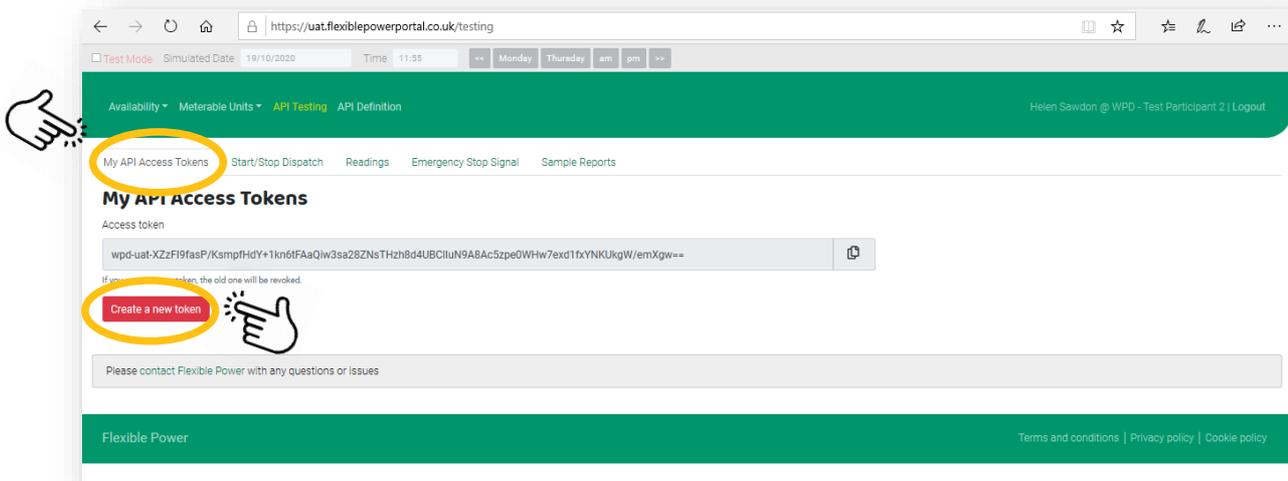
Step 7. Repeat the same process to confirm that the ‘STOP’ signal can also be received to the endpoint.

8 API Access token

A unique API access token is generated for you by default and we recommend this is retained, however we understand there may be circumstance where users need to create a new API access token. This can be done using the ‘Create a new token’ button.

Note: this will break any existing API integrations and will automatically update the curl commands shown on the ‘readings’ and ‘emergency stop’ pages. Whenever a new token is created it will be necessary to update the API software script for communications to continue.

Step 1. Under ‘My API access tokens’, create an access token that you can use for authorisation purpose when using the APIs (please refer to the API definition [here](#)).



The screenshot shows a web browser window at <https://uat.flexiblepowerportal.co.uk/testing>. The page has a green header with navigation links: Availability, Meterable Units, API Testing, and API Definition. The user is logged in as Helen Sawdon. The main content area is titled 'My API Access Tokens' and shows a table with one access token. The token value is `wpd-uat-XZzF19fasP/KsmpfHdY+1kn6IFaaQlw3sa26ZNsTHzh8d4UBCIuN9A8Ac5zpe0WHw7exd1fxYnkUkgW/emXgw==`. A red button labeled 'Create a new token' is highlighted with a red circle and a hand icon. Below the table is a text input field for contact information.

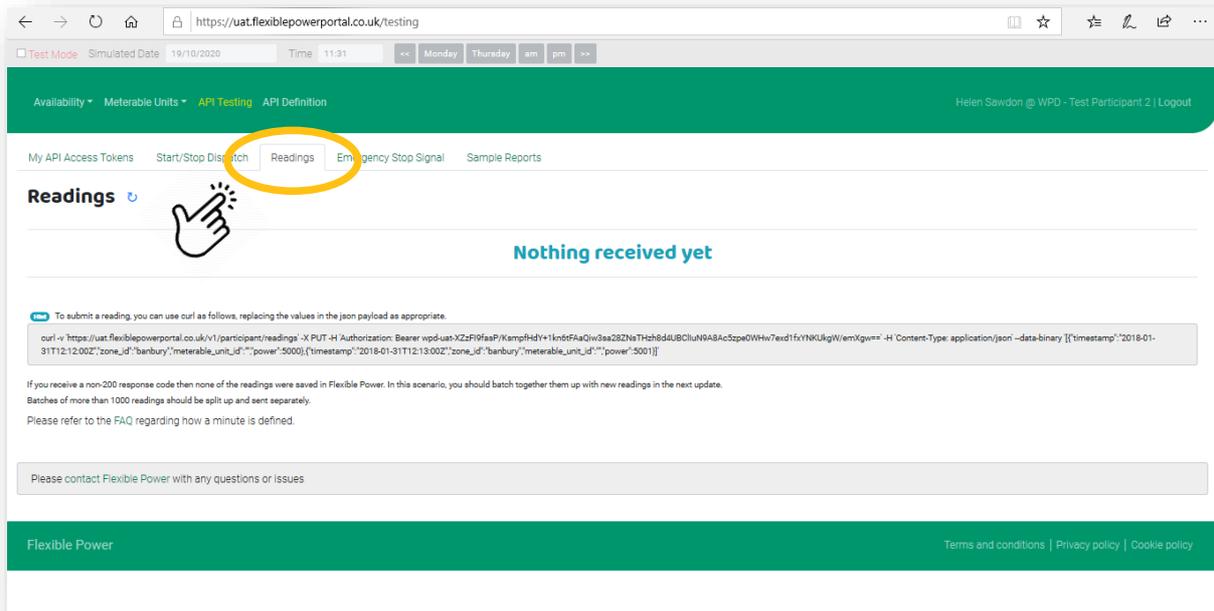
9 Submitting Meter Readings

Readings for each Meter-able Unit within a CMZ can be submitted via the API. All the information needed to develop this API can be found here; https://uat.flexiblepowerportal.co.uk/docs/api_from_participant_v1_0.html

A ‘self-test facility’ is available within the UAT portal, this provides an environment in which users can develop and test their API interface. To access this;

Step 1. Login to the UAT Portal and go to ‘API Testing’ via the link at the top of the page.

Make sure that all the timestamps are in ISO 8601 UTC



Step 2. Go to 'Readings' via the link at the top of the page.

Step 3. Under 'Readings', the user can see the most recent data points they have sent to the portal, compare these data points to the original data points to make sure the data and times are correct.

An example 'curl' command to send reading the platform can be found in the grey box at the bottom.

Flexible Power uses a 'REST API' the advantage of this is that you can use almost any programming language to call the endpoint. The endpoint is simply a resource located on a web server at a specific path. Each programming language has a different way of making web calls. Rather than providing different methods to make web calls in a multitude of different languages such as Java, Python, C++, JavaScript, Ruby, and so on, we are able to show the call using curl.

Curl provides a generic, language agnostic way to demonstrate HTTP requests and responses. Users can see the format of the request, including any headers and other parameters. This allows users the ability to translate this into the specific format for the language they're using.

10 Live Production Environment

If the user is happy that they are ready one of the Flexible Power developers will confirm receipt of metering and UAT signals. The user will then be granted access to the live environment but without access to the constraint zones. A final test will be carried out in conjunction with a member of Flexible Power technical support using the 'sandbox' facility. This provides limited access where users can experiment safely to interact with the live API connection.

This simply repeats what has already been proven in UAT but the API key and endpoint requires to be created so as to connect to the live system. Once proven, the user will have all the zones in which they have been awarded capacity to participate within added to their CMZ drop down menu.

IMPORTANT NOTE;

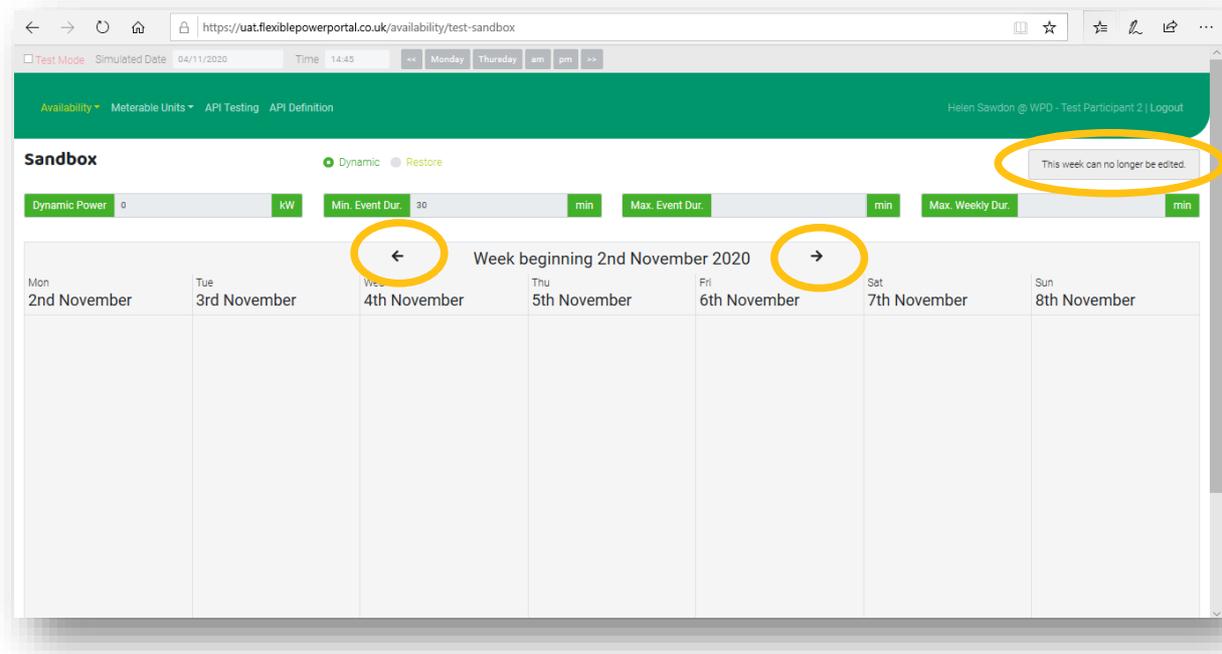
Once a user has completed the initial set up and testing within the UAT environment they will be provided with a log in to the full production environment. This will require the user to modify the API to reflect the 'end point' so that they are able to receive the signals to their chosen device and send metering signals / emergency stop to Flexible Power's live environment.

11 Creating Declarations

In addition to the API functions, the portal includes access to the declarations diary to enable users to familiarise themselves with the screens within the live environment. This can be used to practice making declarations of capacity. This guide can also be used to assist with declaration making in the live environment.

Step 1. Click on the 'Availability' menu and four zones should be shown in the drop down.

Step 2. Select 'Sandbox' from the drop down menu of Zones. Please note that the zone is designated as a 'Dynamic' service zone but the principals are the same for all services. (In the live environment this will list the zones in which the CFP has capacity.)



Step 3. There is an information dialogue in the top right that tells you whether the current viewed week is available for editing. Navigate the weeks using the arrows next to the date to find the editable week.

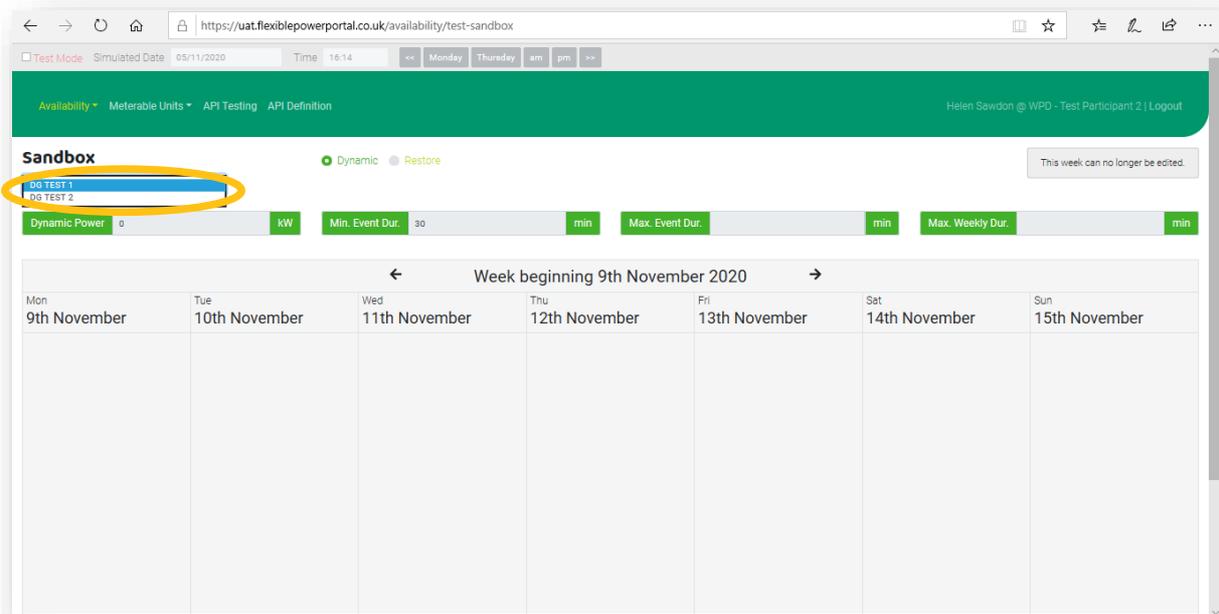


Alternatively, to make any week editable, you can use the "test Mode". Turn on the test mode in the top left and reduce the date until the week becomes editable. This function is only available in UAT and is present to simplify testing.



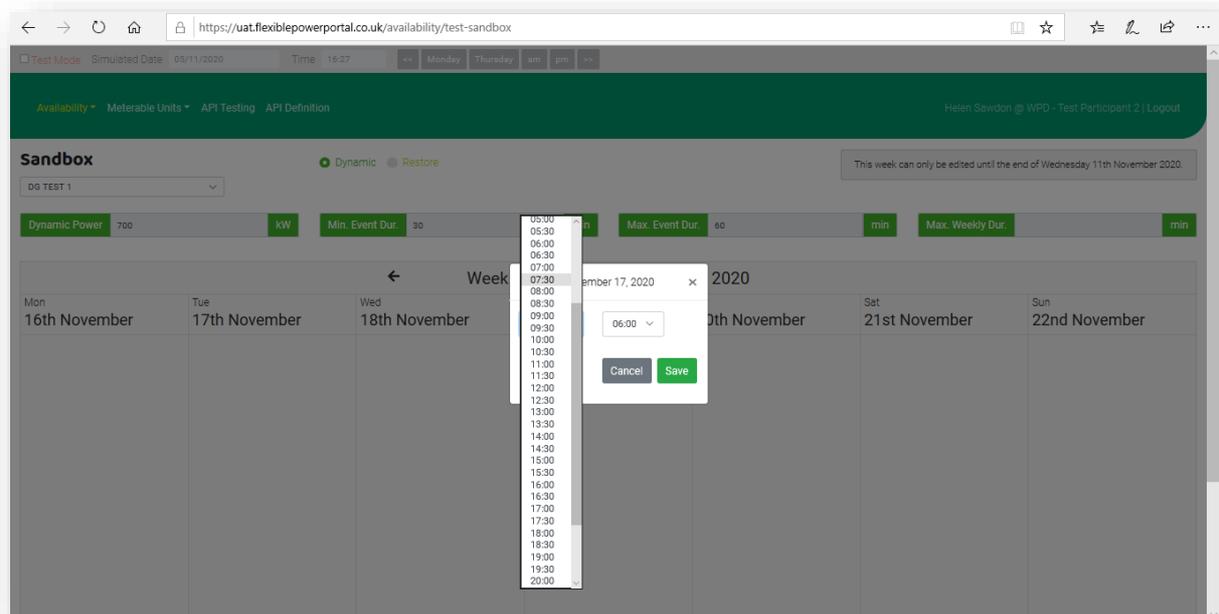
Step 3. Select a programme in the top left (restore/dynamic/secure). Each zone will only have a maximum of two programmes to choose from. 'Restore' is available in all zones, and then either 'Dynamic' or 'Secure' as they are mutually exclusive.

Step 4. Select one of the DGs you have created to make declarations for.

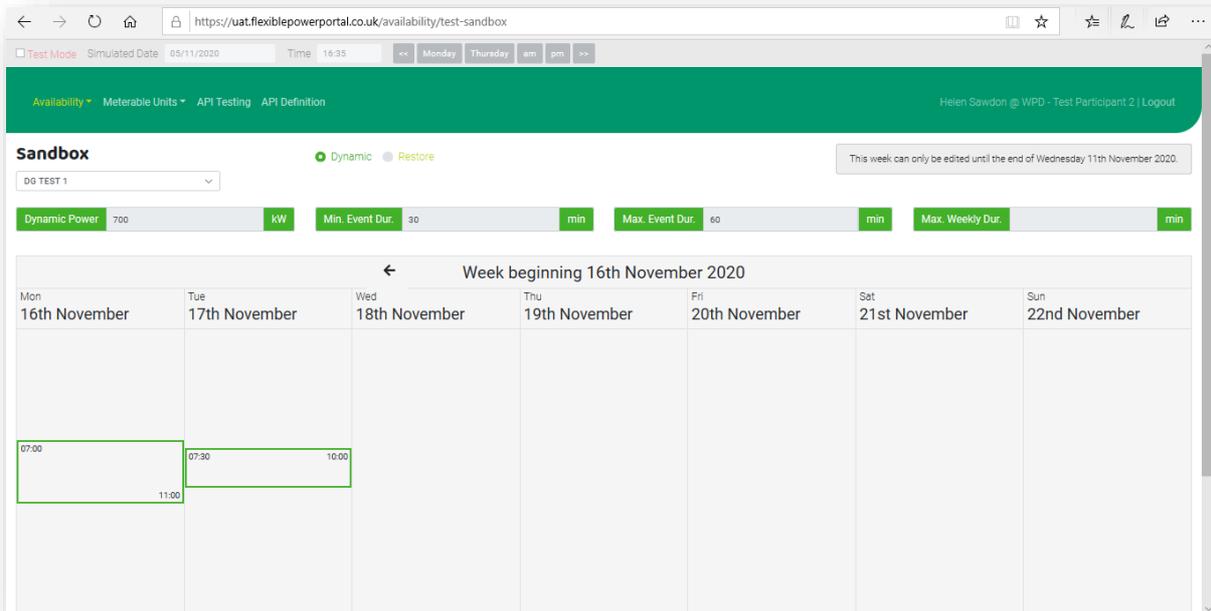


Note: Weekly values will automatically be populated based on the combined values of the MUs within your DG.

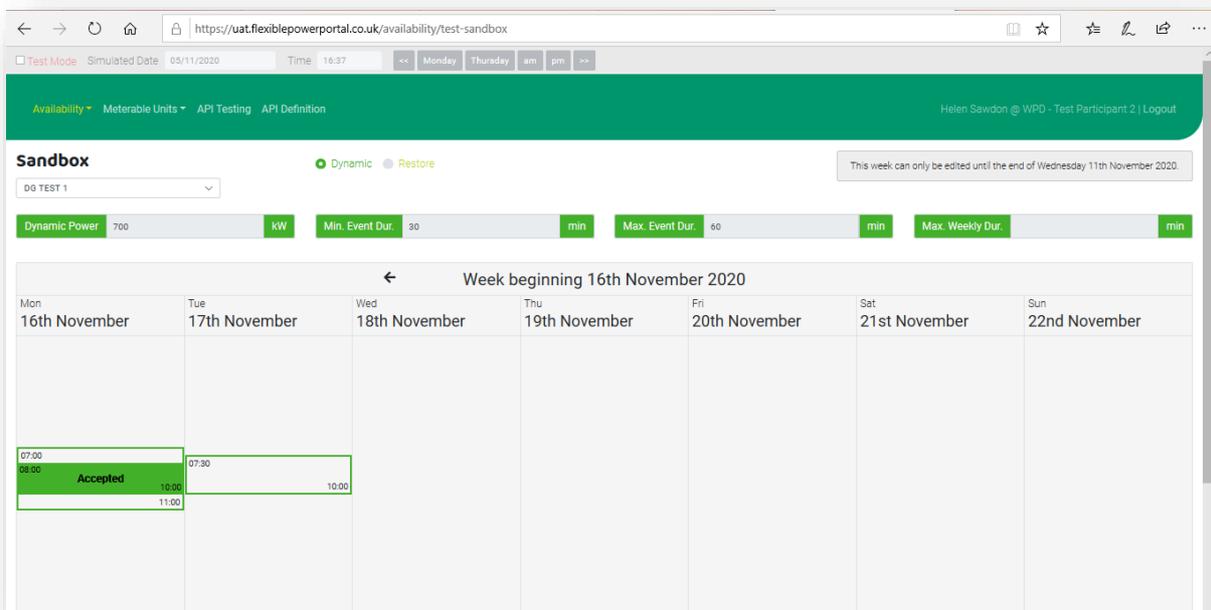
Step 5. Click on a day in the calendar to create a declaration for that day. Complete the form with your availability declaration, then press save.



Step 6. Continue adding windows within your selected DG. If you have multiple DGs you can select another and repeat. The declaration will then display as an empty block. Declared windows can be edited or deleted by clicking on them again.



This is the limit of what a user can achieve with 'self-testing' as they are unable to carry out the weekly acceptance that will be done by Flexible Power and WPD's Control Operators on a Thursday morning. We have however shown a sample screen below of what accepted windows appear like to help familiarise users with the formatting.



12 Baselines

After testing has been completed and users are set up in the full Production environment they will have access to all the CMZs in which they have been awarded capacity. For each MU within a CMZ a baseline will be used to measure the delivery during DSR events.

When first setting up a zone it is necessary for users to state their own estimated baseline which will be used for the first month of operation. During the first month, Flexible Power will collect the metering data provided for that zone in order to automatically calculate and update the monthly baseline thereafter.

13 Emergency Stop by Users

An optional signal is provided for users that is not mandatory in order to provide Flexible Power with DSR capacity. It is provided as a facility to users who would appreciate the capability to ensure sites can rapidly 'opt out' in the event of an emergency. This is not intended to be used as a regularly accessed facility to decide whether or not to deliver DSR based on commercial outcomes or convenience. It has been provided so that in the event of unexpected events occurring during an accepted availability window or armed period there is a single point control where a user can cease an event or prevent a dispatch which could otherwise have a negative impact on their core activities.

Users can issue an emergency stop using the template curl command in <https://uat.flexiblepowerwpd.co.uk/testing> 'Emergency Stop Signal' tab for the programme secure and the zone that the secure declaration was made in.

As this signal is sent via the API it is entirely up to a user as to what form of trigger will initiate the signal and from what type of device. When the signal is received, Flexible Power will record that time as the end of expected delivery for that day is during a DSR event and withdraw availability for the issue of any events in that zone. This will be automatically reset for the following day, so if the issues at site can't be resolved they would be expected to contact Flexible Power to request a longer period of 'opt-out'. It does however provide time to prioritise resources and to address and assess any issues without the pressure of having to try and contact Flexible Power.

14 Reports

Event performance and earnings reports are only created within the live environment shortly after the close of each dispatch event. Examples of these reports can be viewed on the 'Reports' page by clicking on the appropriate tab in the navigation bar.

15 Help & reporting an issue

If you need help or have any problems with the portal you can report them via email to your DNO as detailed in section [0](#). Responses from these mailboxes can take up to 3 working days, if you have an urgent query please call your DNO appointed contact as detailed in your contract.

The following help and support is available to Flexibility Providers for the API development:

- Documentation available on the website: <https://www.flexiblepower.co.uk>
- Technical support for Flexibility Providers and help with API development. For further information, contact your DNO as detailed in section [0](#).