WPD INNOVATION
Transforming the electricity network

# IntraFlex

## Phase 1- Learning Dissemination Webinar

westernpower.co.uk/innovation

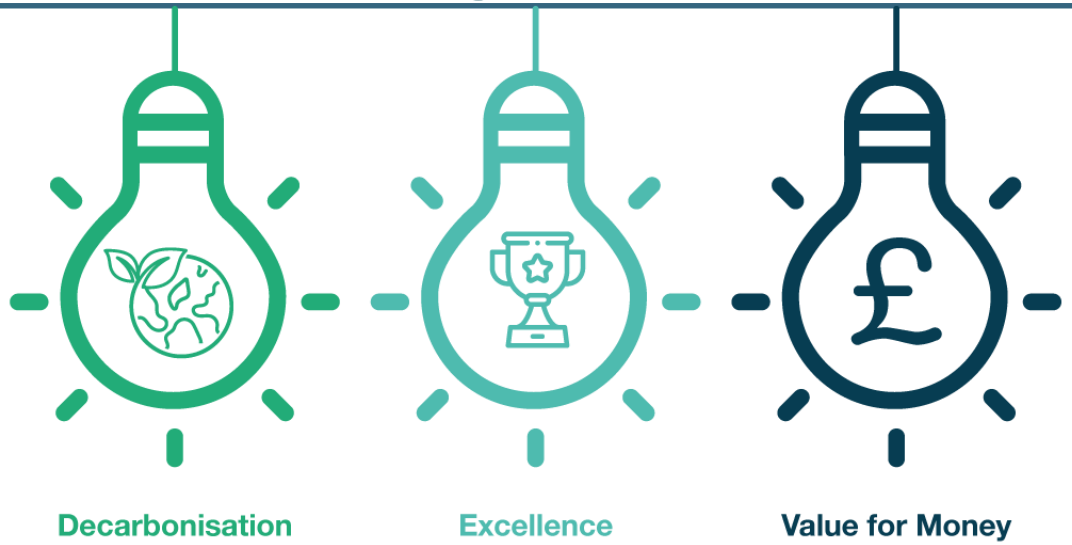
WESTERN POWER DISTRIBUTION
*Serving the Midlands, South West and Wales*

# Outline

- WPD Innovation Introduction
- Project overview
- Progress to date
- Key learning
- Next steps

# Our Innovation Strategy & Values

We are a team of engineers dedicated to implementing our Innovation Strategy




We identify problems, find solutions and trial them through our projects

**We aim to be a main contributor to decarbonisation**

**We are passionate about using our innovation funding the best way possible and providing value for money**

**We want to be working with the best people to achieve excellence together**

# Our Commitments

- ✓ We are committed to overcoming the barriers to the energy transition.
  - ✓ We will continue to focus on finding novel ways of efficiently and effectively transforming our network.
    - ✓ We will continue to develop new technologies, commercial solutions and standards to make the most out of our existing network.
      - ✓ We will work with our communities to understand how best we can support our vulnerable customers and ensure that no one is disadvantaged.

# Our Priority Areas

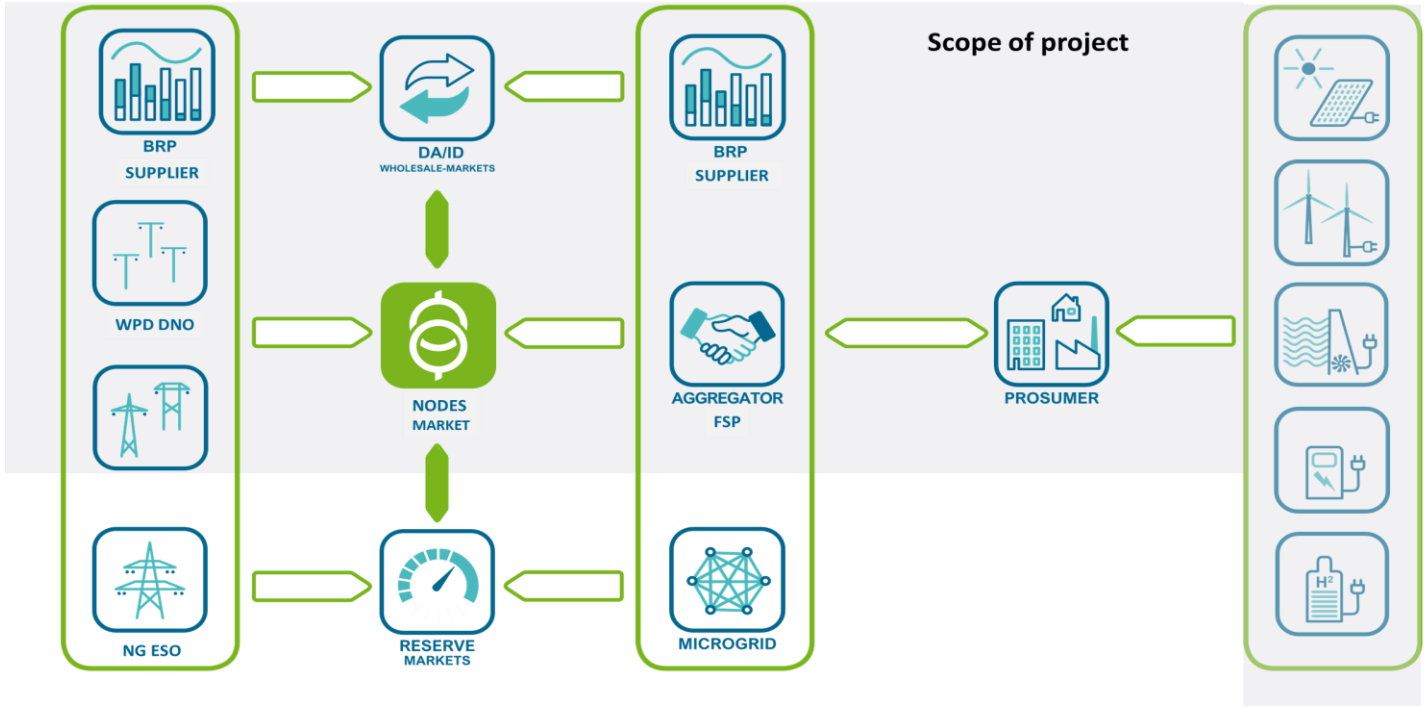
- Decarbonisation and Net Zero
- Heat
- Transport
- Communities and Consumer Vulnerability
- Data

# Our Innovation Programme

DC Share
SHEDD
Harmonic Mitigation
ALARM
Net Zero South Wales
OpenLV
Presumed Open Data
PNPQA
MADE
PCB Sniffer
Virtual Monitoring Data
Wildlife Protection
OHL Power Pointer
Electric Nation - PoweredUp
EDGE-FCLi
Take Charge
EFFS
LTE| Connecting Futures
Virtual Statcom
Future Flex
IntraFlex
Coordination of ANM & Markets
ARC Aid

# Project Overview

- The project builds on WPD's existing procurement of flexibility services through Flexible Power.
- IntraFlex aims to understand how to deliver a link between DNO procurement activity and Balance Responsible Party (BRP) imbalance positions.
- It will test **a short-term market** for DNO flexibility which actively **accounts for the imbalance it creates** in the electricity market.
- It is a £1.2m project (£0.89m NIA funded) and runs from October 19 to November 21. The project partners are NODES and SGC.



# Project Overview

- The IntraFlex project is looking to:

  - ✓ Expand the Flexibility Services portfolio used by DNOs to include complimentary alternatives to Flexible Power
  - ✓ Test a market-based service that offers closer to real time opportunity to sell flexibility
  - ✓ Assess the impact of flex trading on wider energy markets including wholesale
  - ✓ Obtain participant and stakeholder feedback on proposed services
  - ✓ Refine services based upon findings of the trials

- The Phase 1 trial was aiming to have a first pass at this, to gather learning and experience to feed into Phase 2 early next year.

# Progress to date

## Market Design

Nov 19 – Apr 20

Extensive Stakeholder engagement to deliver a viable and valuable market

## Recruitment

Apr 20 - July 20

EoI with over 700MW of response across 68 sites

5 participants signed contracts for the Phase 1 trial

## System Build

Apr 20 - July 20

Adaption of NODES Marketplace

Development of IntraFlex Metering Solution

## Phase 1 trial

Aug-Sep 20

241 trades on the platform

50.15 MW procured

# Market Design Learnings

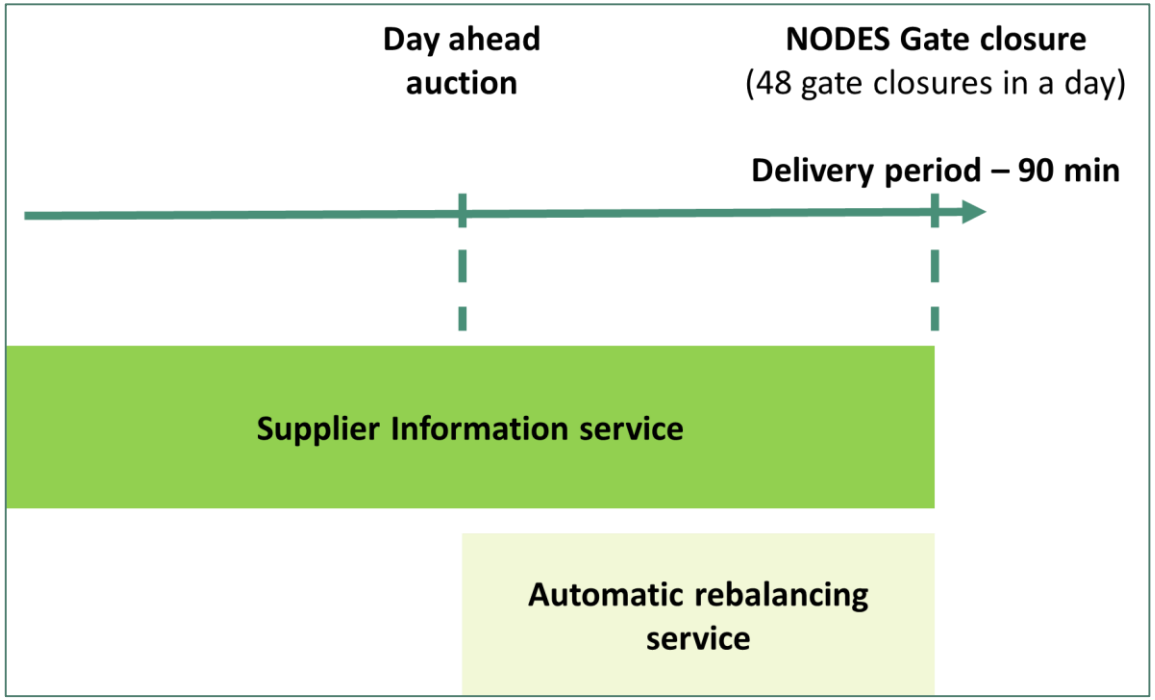
The NODES market is a continuous market that can be accessed from a few days ahead to close to the delivery period.

WPD would use the NODES market after the current Flexible Power week ahead acceptance timeline;

2 key services were originally proposed:

- Information service to BRPs. Provides information on relevant trades. **Kept**
- Automatic rebalancing service in the intraday timeframe. **Removed**

The option of resolving the issues via changes to ABSVD were added and investigated.



# Recruitment and Onboarding

**4 step process with dedicated support via NODES**

1. Submit Member registration form
2. Sign Membership agreement
3. Complete web-based tutorial
4. Complete relevant technical build

Submit all documents & raise any queries by email on:

member.services@nodesmarket.com

# Relevant Systems

**Participants interact with 2 systems**

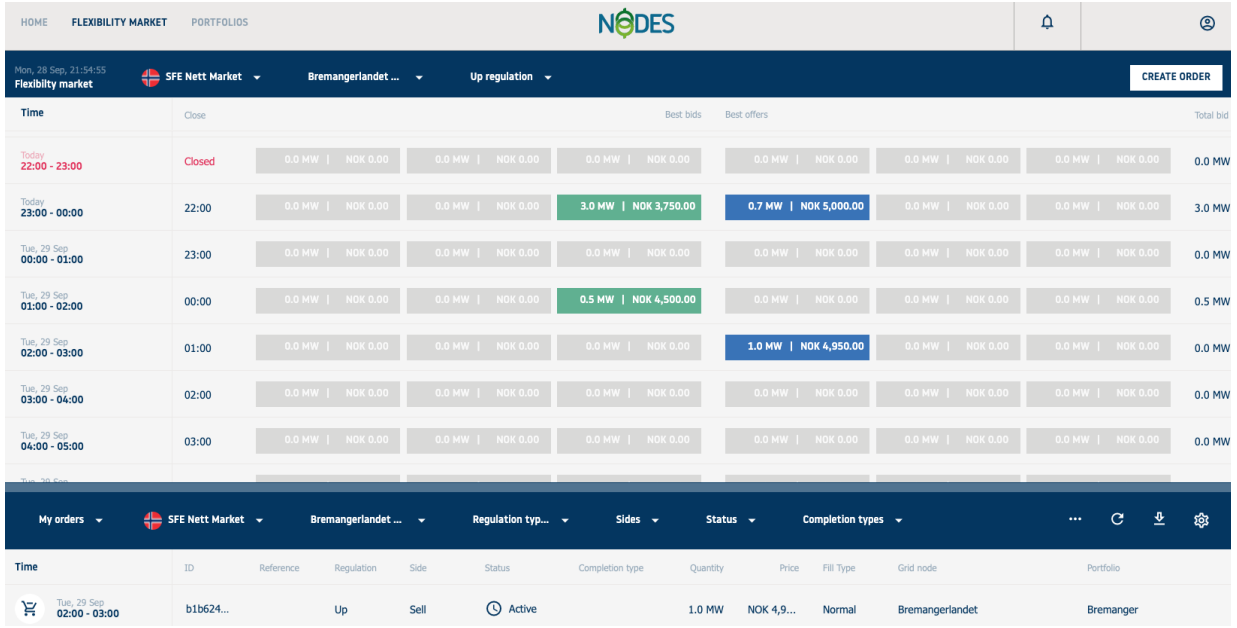
| Metering system | NODES marketplace |
| --- | --- |
| • Collects meter values from participants<br>• Uses these to provide the NODES system with (i) default baseline values and (ii) meter values for the validation of service delivery | • Commercial system that provides order matching and settlement services<br>+<br>• Dispatch signal |
| **Access via API** | **Access routes:**<br>• **API for acting on NODES + Dispatch API**<br>• **API for acting on NODES + Manual dispatch**<br>• **Web interface + Dispatch API*** |

** Both NODES API & Dispatch are optional – but we suggest that participants who act on NODES via the web interface implement the Dispatch API rather than manual dispatch*

# NODES - Platform

Creating a market, where **different types of flexibility** can **compete** on a **level playing field**, where the **right type** of flexibility can be procured at the **right price**, in the **right location** at the right time.

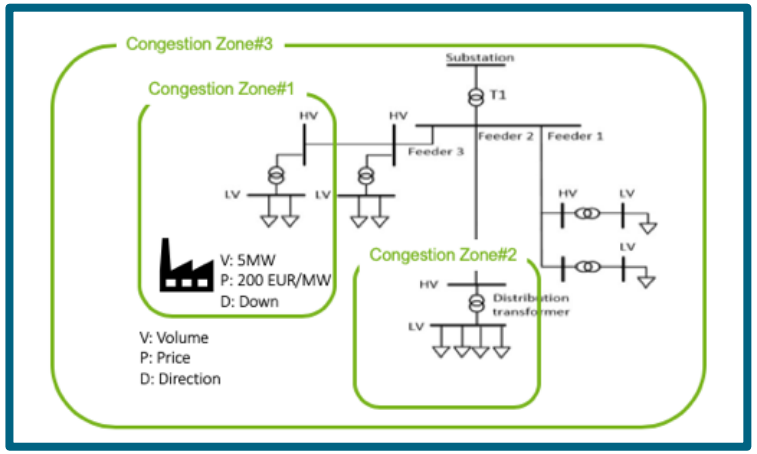
Operated by NODES



# NODES ShortFlex Market

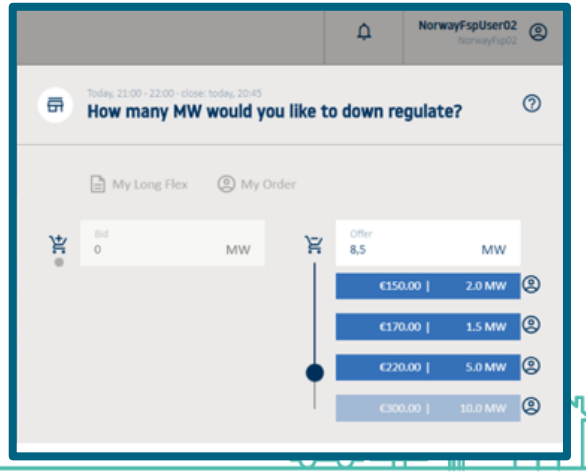
- DSOs determine where congestions sits within their network and define congestion zones on NODES.
- Each congestion zone on NODES has an order book.
- ShortFlex is a continuous market.
- Traded volumes are activated volumes.
- For IntraFlex market opening was set at 5 days before delivery / closing at 90 min before delivery.

## Congestion zones



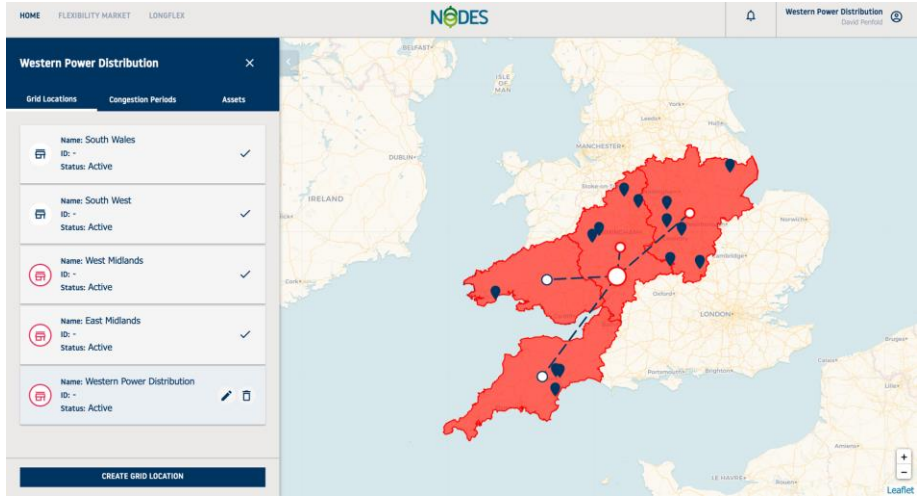

## Grid locations


## Order books



# System Build - NODES

- The primary system is owned and operated by NODES and focuses on the commercial relationship between the participants
- This built on their existing market platform and was supplemented with project specific development.
- Several options for participant dispatch information were also provided. This included the options for FSPs to receive dispatch notification via SMS, email or through a URL call-back.
- The Trading interface allowed FSPs to enter their offers to requirements placed onto the market by the DNO. FSPs can also place offers onto the screen proactively, in advance of WPD placing a bid.




NODES marketplace home screen


Trading Interface

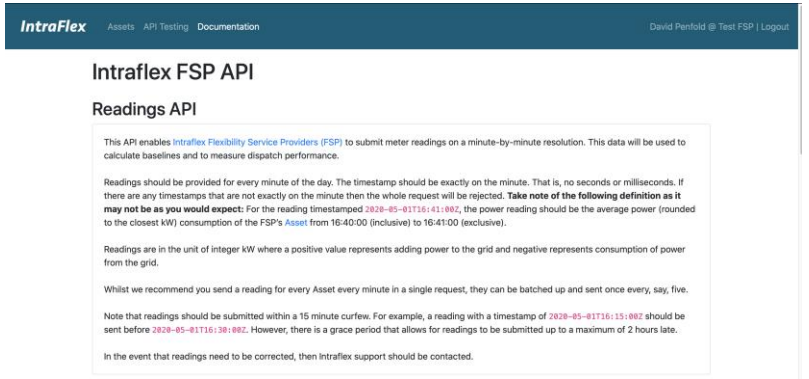
# System Build – IntraFlex Metering Portal

Alongside the NODES system, we developed the IntraFlex metering portal. This was built around a stripped back version of the Flexible Power portal.

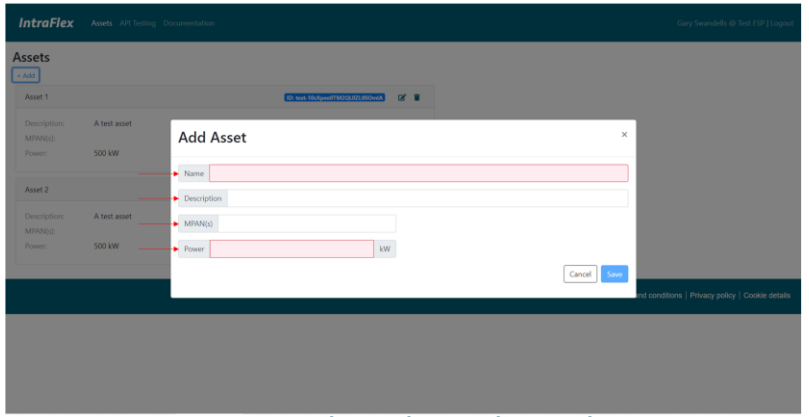
The IntraFlex metering portal (https://intraflexmetering.co.uk), was used to facilitate verification and metering of sites and assets. This portal provided each of the enrolled assets with a unique identification code that is used to link it with the NODES market platform.

The work included:

- Adapting the metering API
- Developing the Baseline Calculation
- Creating the NODES Baseline API
- Creating the NODES metering API
- Branding and Segregating the Portal
- Creating an export for Asset validation




Metering API overview




Asset creation on the metering portal

# Phase 1 Trial

The Phase 1 trial was aiming to have a first pass at the platform, to gather learning and experience to feed into Phase 2 early next year.

The Phase 1 trial was broken down into individual tests as follows;

**Test 0** - Technical Proving

**Test 1** - Basic Function and FSP Interaction

**Test 2** - Speed of response to order requirements

**Test 3** – Increased Base price (Optional pending outcome of Test 2)

**Test 4** - Profiled Capacity linked to pricing.

# Test Zero (T0)

(T0) The purpose of the first test was to verify that commissioning has been completed and to provide the opportunity to each FSP to complete a full end to end test.  Ideally this test with all participants would have been completed ahead of the official start date.

- This ran for 2 weeks with some API & metering issues identified by FSP's

**Our view**

- ✓ By allocating more time, and setting firm test 0 dates, and expectations earlier, this process could have been smoother.
- ✓ Ideally, we would have had longer between the final details of the technical build going out and T0.

# Phase 1 Trial Plan

| | Thr | Fri | Sat | Sun | Mon | Tue | Wed |
|---|---|---|---|---|---|---|---|
| Week 1 | **Test 1 Commences** | Publish bids for week 1, and minded to position for Thr & Fri, week 2 | | | Publish bids for week 2 Thr & Fri and minded to position for Mon – Wed. | | |
| Week 2 | | Publish bids for week 1, and minded to position for Thr & Fri, week 2 | | | Publish bids for week 2 Thr & Fri and minded to position for Mon – Wed. | | |
| Week 3 | | Test 1 concludes Test 2 commences | | | | | |

# Test One (T1)

(T1) was intended establish that the interactions between FSP & DNO work correctly within the competitive framework.

- Ran for 2 weeks we published 7.3MW of ½ hourly flexibility requirements.
- We successfully traded 4.9MW of ½ hourly flexibility.
- We saw 2.4MW of ½ hourly flexibility not taken up.

**Our view**

- ✓ A number of offers were made to our bids, from a number of participants with bids over a certain size clearing quickly.

# Test Two (T2)

(T2) was intended establish that the interactions between FSP & DNO work correctly within the competitive framework, with a focus on speed of response and bid expiry.

- Ran for 2 weeks and we adjusted the way in which pricing was defined.
- We published 23.15MW  of ½ hourly flexibility requirements trading 17.6MW of ½ hourly flexibility.
- We saw 5.5MW of ½ hourly flexibility not taken up.

**Our view**

- ✓ Bids over a certain size cleared quickly but we equally saw some of the smaller bids clear.

# Test Four (T4)

(T4) Tested the ability to prioritise offers where needs are greatest.

- Variable pricing, with times of more volume attracting higher prices.
- Higher volumes were uploaded at more variable times to understand the flexibility of assets.
- We published 112.88MW of ½ hourly flexibility requirements trading 22.49MW of ½ hourly flexibility with 90.41MW of ½ hourly flexibility not taken up.

**Our view**

✓ Participants tended towards higher pricing (more higher priced bids were accepted than lower priced ones), other factors such as volume and timing seemed to be important.

# What we saw

- ✓ There was a limited number of participants so results are anecdotal and shouldn't be seen as representative of a fully fledged market.
- ✓ We completed 241 trades procuring 50.15MW (½ hourly).
- ✓ We saw offers from 3MW down to 10kW and traded at prices £180 down to £120/MW/HH. Some bids matched within 10 minutes of submission; others matched within 2 hours of real time.
- ✓ Participant behaviour varied over the trial with different levels of engagement. Some of this was to do with the limited nature of the trial.
- ✓ We also believe that annual leave during the tests had an impact on the ability for participants to place offers.

# Trial Learnings Summary

We operated 4 sub trials.

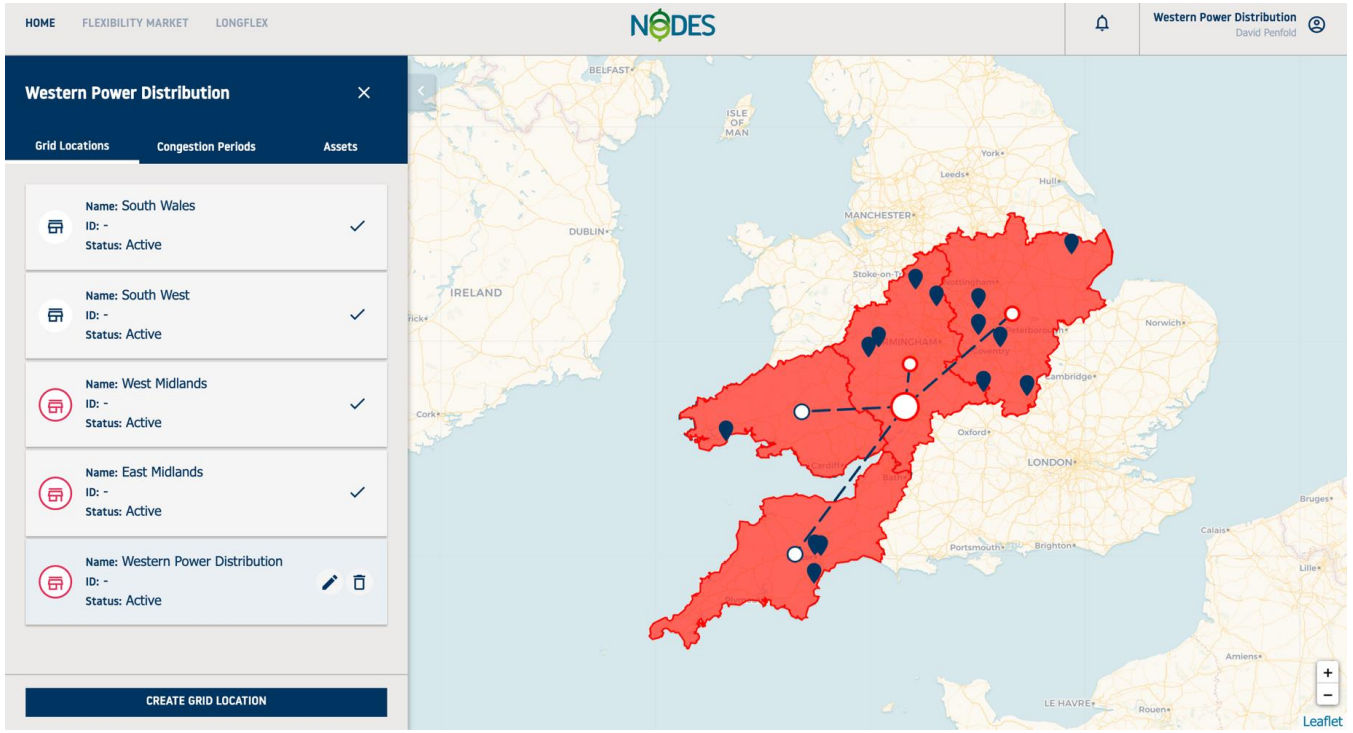
Bids put up proactively on Mondays and Fridays.

We learnt:

- Level of response was variable
- Speed of response was variable
- Bids driven by timings and volumes rather than price.

A lot of this driven by the early nature of the trial.

We hope to build on this going forward.



# Next Steps

**The focus is now on ramping up to the larger Phase 2 in Spring 2021.**

This will focus on:

- Driving closer to a BaU behaviours
- Longer duration trial with more value on the platform
- Increased liquidity and hence competition.
- Active bids from providers to create competition on price rather than just speed.
- Platform and process improvements to make things simpler and easier to scale.

# Next Steps

- ✓ We will be hosting a follow up webinar on the 2nd to gather detailed feedback on our phase 2 plans.
- ✓ If you are interested in joining the webinar or participating in Phase 2 please contact: sofia.eng@NODESmarket.com
- ✓ We can take you through the on-boarding process.
- ✓ The zones for phase 2 are being finalised.

# Questions

WPD INNOVATION

Transforming the electricity network

# THANK YOU FOR YOUR PARTICIPATION

westernpower.co.uk/innovation

WESTERN POWER DISTRIBUTION

*Serving the Midlands, South West and Wales*