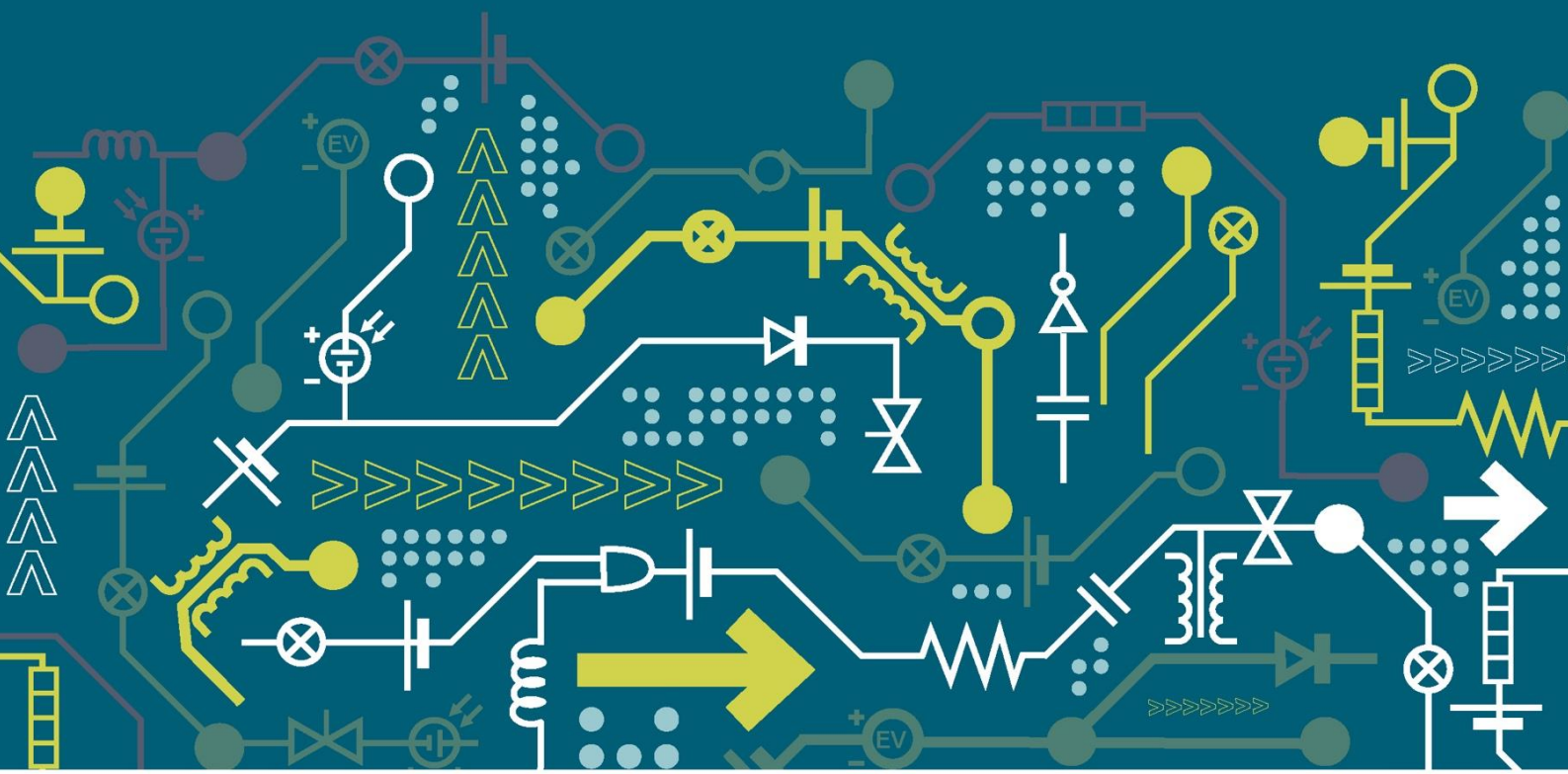
WPD INNOVATION

IntraFlex

WPD_NIA_046

SIX MONTHLY PROGRESS REPORT

REPORTING PERIOD: OCT 2019 – MAR 2020



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Contents

1 Executive Summary

The IntraFlex project is funded through Ofgem's Network Innovation Allowance (NIA). IntraFlex was registered in October 2019 and will be complete by November 2021.

The IntraFlex project 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 Distribution Network Operator (DNO) flexibility which actively accounts for the imbalance it creates in the electricity market. By creating day ahead information services as well as an auto-rebalancing function to the intraday markets, the project is looking to lower supplier exposure to imbalance costs and decrease the costs of providing flexibility in the long run.

Whilst this is primarily a technology and process trial, it is initially focusing on areas where Constraint Management Zone (CMZ) procurement is already underway. This should maximise any network benefit and facilitate any potential roll out to Business as Usual (BaU).

The project will utilise a market platform operated by NODES. This will be extended by NODES as part of the project to add the rebalancing functionality. In addition, Western Power Distribution (WPD) will develop a link between the platform and existing dispatch functionality.

This report details progress of the project, focusing on the last six months, October 2019 to end of March 2020.

1.1 Business Case

The current method of procuring DNO flexibility services does not actively account for the imbalance caused by the action. This simplifies procurement from the perspective of the buyer of flexibility but adds complexity on the seller side.

For many participants this isn't managed directly and is accounted for through loose supply contracts, pushing a poorly quantified risk to the Balance Responsible Party (BRP). Whilst volumes of flexibility have been low this has been seen as a viable method of managing the risk. However, as volumes increase, the associated risk also increases.

There is a risk that the reflectance of true costs increases the costs of flexibility in the short term, as costs that are currently borne by BRPs across whole portfolios are allocated to specific actions. However, this should create a more cost reflective system that reduces overall risk which should in turn reduce costs in the long run.

If the problem were solved, risk associated with the provision of flexibility services would be reduced. In the long run we would expect to see increased liquidity within DNO DSR markets and a corresponding reduction in pricing.

This project will look to provide better tools for managing the imbalance risk, via a direct rebalancing tool (via integration to the intraday markets) as well as information sharing at the day ahead stage. This should minimise the risk (at the intraday timescale) or provide the means for mitigation (at the day-ahead timescale) for the BRP. Reducing this risk should encourage participation from BRPs, as well as make it easier for non-BRPs to work alongside the BRP.

It is anticipated that the value of DNO DSR could reach £12.1m/year by the end of ED1 (£3.38m/year within WPD). If the increased liquidity drove a 10% saving in this value the savings would be £340k/year across WPD or £1.21m/year across the UK.

- Base cost = 12.1m/year
- Method cost = 12.1*0.9= £10.9m/year
- Financial benefits = £1.21m/year

The costs of roll out across the UK would be limited. This would simply require each DNO licencing the required platform which is a commercial product from NODES.

1.2 Project Progress

This is the first progress report. It covers progress from initial registration in October 2019 to the end of March 2019 and during this reporting period has focussed on (this is further detailed in section 2.2);

- The development and validation of the Market Design via 2 stakeholder Webinars and a London Workshop
- The designing of the Technical Requirements
- The opening and of the Expressions of Interest window
- The completion of the key Stage Gate at the end of phase 1.

With this stage now complete and the achievement of the Stage Gate the project will now enter work packages 3, 4 & 5, focussing on the system build and recruitment for the first trial which starts in August 2021.

1.3 Project Delivery Structure

1.3.1 Project Review Group

The IntraFlex Project Review Group meets on a bi-annual basis. The role of the Project Review Group is to:

- Ensure the project is aligned with organisational strategy;
- Ensure the project makes good use of assets;
- Assist with resolving strategic level issues and risks;
- Approve or reject changes to the project with a high impact on timelines and budget;
- Assess project progress and report on project to senior management and higher authorities;
- Provide advice and guidance on business issues facing the project;
- Use influence and authority to assist the project in achieving its outcomes;
- Review and approve final project deliverables; and
- Perform reviews at agreed stage boundaries.

1.3.2 Project Resource

The original project scope was proposed by NODES building on their experience in other European countries. WPD subsequently formed a project team led by NODES to deliver the IntraFlex project, with the assistance of Smart Grid Consultancy (SGC).

The project partners are all experts in their field, as detailed below, and the project will be managed by Smart Grid Consultancy.

Two key subcontractors have been used in this phase of the project, Cornwall Insights and Kiwi Power.

Project Partners	
	**NODES** will develop and deploy the platform. This will be based on their experience of delivering flexibility markets across Europe. The GB intraday integration will be developed as part of their existing R&D program (£360k), and will not be funded under the NIA.
	**Smart Grid Consultancy**: Will manage the project. In addition they will provide detailed technical assistance on service design, building on previous trial learning and participant recruitment support. SGC will also deliver the audit targeting work.
Project Sub Contractors	
	**Kiwi:** Will deliver the system build requirements for baselining, metering and links to the NODES system.
	**Cornwall Insight:** Have been used to deliver a study following some specific stakeholder feedback about Applicable Balancing Service Volume Data (ABSVD) process.

1.4 Procurement

During this reporting period, contracts have been placed with the project partners.

1.5 Project Risks

A proactive role in ensuring effective risk management for IntraFlex is taken. This ensures that processes have been put in place to review whether risks still exist, whether new risks have arisen, whether the likelihood and impact of risks have changed, reporting of significant changes that will affect risk priorities and deliver assurance of the effectiveness of control.

Contained within Section 7 of this report are the current top risks associated with successfully delivering IntraFlex as captured in our Risk Register. Section 0 provides an update on the most prominent risks identified at the project bid phase.

1.6 Project Learning and Dissemination

Project lessons learned and what worked well are captured throughout the project lifecycle. These are captured through a series of on-going reviews with stakeholders and project team members and will be shared in lessons learned workshops at the end of the project. These are reported in Section 5 of this report.

The key dissemination activities held in this reporting period were;

- 2 Stakeholder Webinars,
- 1 Stakeholder London Workshop and
- Industry wide promotion of the Expressions of Interest window, via LinkedIn, email distribution lists, industry newsletters and targeted communications.

2 Project Manager's Report

2.1 Project Background

IntraFlex aims to understand how to deliver a link between DNO procurement activity and Balance Responsible Party (BRP) imbalance positions.

As such the project is looking to trial a short-term marketplace for the procurement of DNO flexibility. This will trial an active rebalancing link to the Nord Pool intraday market as well as an information exchange with day-ahead markets.

The focus of the trial is to understand how to deliver a link between DNO procurement activity and Balance Responsible Party (BRP) imbalance positions.

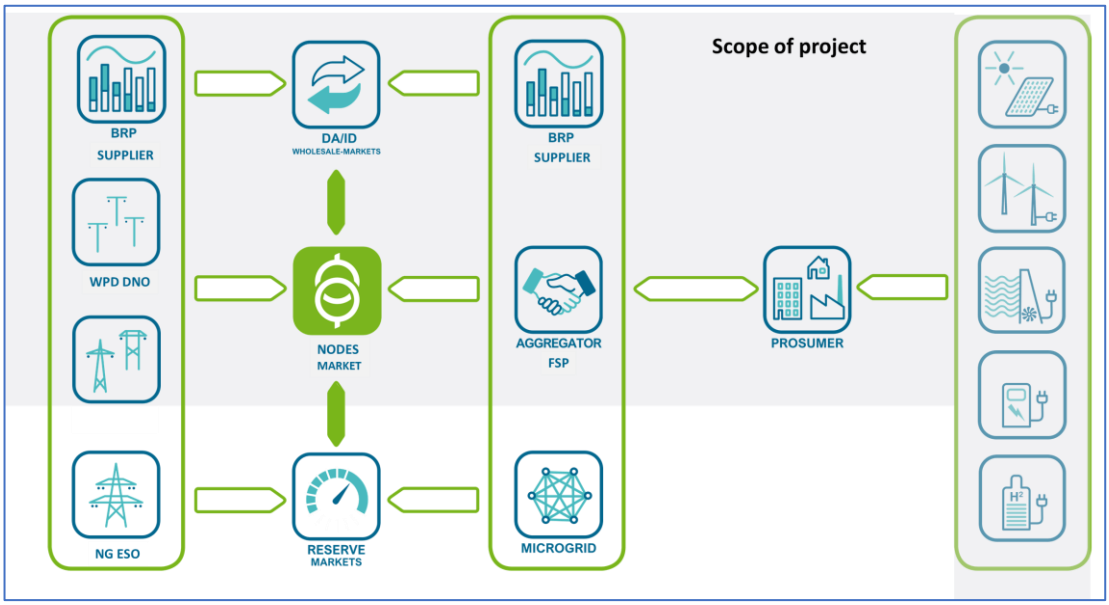

Figure 1: Scope of IntraFlex

The trial will be broken into five work packages based around two trials. These trials will consist of a test of NODES' ShortFlex service for DNO flexibility, followed by a more comprehensive trial with automated rebalancing of imbalance positions through the integration with the GB intraday market.

	Timeline												
Activity	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20
WP1 PM and reporting													
WP2 Detailed Stakeholder Engagement and Market Design													
WP3 NODES Build													
WP4 WPD Build													
WP5 Trial													
	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21
WP1 PM and reporting													
WP2 Detailed Stakeholder Engagement and Market Design													
WP3 NODES Build													
WP4 WPD Build													
WP5 Trial													

Figure 2: Project Timeline

The objective of the project is to develop learning on;

- The operability of short-term flexibility markets
- The value of increased information at the day ahead stage to suppliers
- The value of an integrated link for rebalancing in the intra-day market.

The success criteria of the project are;

- Development of a UK Market design for short term flexibility market that reflects imbalance costs
- WPD access to ShortFlex products that have the potential to benefit the distribution network
- Procurement of ShortFlex via the NODES platform
- Demonstration of ShortFlex products that limit supplier exposure to imbalance costs
- Delivery of the project on time and on budget.

The work packages are:

WP1 Project Management and Reporting

Led by SGC, this work package will cover the management of the project and will include the maintenance of the necessary logs as well as the project reporting. This will run throughout the project. NODES and WPD will feed into this work package.

The Key outputs will include monthly project management reports (including the latest logs), 6 monthly project progress reports, project review groups and the final closedown report.

WP2 Detailed Stakeholder Engagement & Market Design

This joint work package was aimed at specifying and verifying the market design for the project and is primarily aimed at understanding current processes for the handling of imbalance risk as well as the systems in place to mitigate them.

The verification has been via extensive engagement with potential stakeholders to refine the proposed market design and validate assumptions and value flows.

The key outputs of this work package included;

1) An initial market design document,
2) Detailed feedback on this design
3) A final Market design and technical requirement specification documents.
4) Expressions of interest
5) There was a go/no-go stage gate at the end of this work package which will consider the viability and potential value of the market design proposed.

WP3 NODES System & Process Build

This work package led by NODES will build out the technology platform to help deliver the trial. It is split into 3 phases.

WP3a – Implementation of ShortFlex at WPD

This involves preparing and testing the existing, core flexibility market platform within WPD and includes a number of small sub tasks; *Support for 30-minute Imbalance Settlement Period (ISP)* and *Support for Localisation*

Once these features have been built and tested by NODES the platform will be deployed for use by WPD. Basic data will be uploaded, and the platform will be tested by WPD. The output of this phase will be a Site Acceptance Test (SAT) for the platform and its live deployment.

WP3b – Implementation of Wholesale Intraday rebalancing

This phase delivers the core development within the project: the delivery of the intraday balancing service and includes a number of small sub tasks; *Development of the Application Programming Interface (API) Adapter for the Nord Pool Intraday market*, *Market Coupling Gateway and Price Linking in Short Flex.*

As per phase 3a, once the features have been built and tested by NODES, they will be deployed for WPD testing. Following the SAT, the platform will be deployed for live use in the trial.

Work package 3c – ESO integration

This work package does not include software implementation at this stage, but the development of a market design specification aimed at linking the NODES platform and ShortFlex products to National Grid's reserve markets. This will involve both ESO and WPD

WP4 WPD System & Process Build

This work package is led by SGC and aims to ensure that WPD has the required systems and processes to utilise the NODES marketplace effectively. Including the design of new Payment Mechanics, the build of a link between the NODES platform and WPD dispatch processes, a review of procurement law and analysis on the ability to target future audits with existing WPD data.

The outputs of the work package will include a defined contractual relationship with NODES and participants, a live working link which has passed a SAT, a procurement review document highlighting the viability of a short-term marketplace and an audit targeting tool.

WP5 Trial

This work package will be led by SGC and is aimed at delivering a trial of the developed tools. The trial will actually be split into two sub-trials: an initial ShortFlex trial and a more comprehensive intraday trial.

Alongside each trial, significant stakeholder engagement will be required and following each trial, a summary learning report will be produced.

2.2 Project Progress

2.2.1 Work Package 1: Project Management and Reporting

Progress within this Reporting Period

This work package runs for the duration of the project and looks to ensure the project is running smoothly and is progressing adequately. This also looks to track and manage risks to maximise the change of successful delivery. Key elements of this are mentioned in Sections 3-7.

Next steps

This work package will continue for the duration of the project.

2.2.2 Work Package 2: Detailed Stakeholder Engagement & Market Design

Progress within this reporting period

This work package has now completed with the key outputs including; completion of the final Market design document and technical requirement specification document. These documents can be found on the WPD website. Also, the opening of the expressions of interest window for participants to register their flexible assets.

The go/no-go stage gate at the end of this work package has considered the viability and potential value of the market design proposed and progress to the next phase has been signed off.

Market Design Process

The initial Market Design assumptions have been reviewed and further developed via the engagement of a wide group of industry stakeholders. This is to ensure that project teams understanding of the current processes for the handling of imbalance risk as well as the systems in place to mitigate them are correct.
This was accomplishment via the following steps:

1. Internal 2-day workshop with initial thoughts about the market being proposed reviewed by WPD,NODES & SGC with the following outputs:
    - 1st draft Market Design
    - Proposed Customer journey
    - Technical specification
2. A review of the above documents with several market critical parties aimed at understanding current processes for the handling of imbalance risk:
    - OFGEM, BEIS, Elexon & ESO
3. Further review with wider groups of stakeholders via:
    - Webinars – 2 held hosted by NODES and SGC were attended by circa 76 people
    - Workshop – Engagement with a wide group of stakeholders to ensure that market to be developed can produce value.

Following feedback from Elexon, an alternative route for the accounting of DSO services in the supply market was suggested: through the ABSVD process. Cornwall Insight were engaged to review this suggestion. An overview of the ABSVD process can be found in Appendix 1.

The resulting finalised Market Design following the detailed stakeholder feedback can be summarised as follows:

Current DNO procurement of flexibility

The stakeholder engagement has confirmed that the current processes for the procurement of DNO flexibility may cause issues in the wider electricity market as volumes increase resulting in material impact that has the capability to push suppliers out of trading balance. As there isn't always a formal contract between the Aggregator or the DNO and the Flexibility Provider's BRP, the purchase of flexibility can result in an energy imbalance and therefore results in the BRP being charged with an Imbalance cost.

In addition, the BRP loses value from the loss of the energy sale if the requirement is to reduce demand or increase embedded generation The reverse is also true if the DSO was seeking to

increase demand to absorb excess localised generation that could leave the BRP short on their market position.

The project is therefore correct to trial a method of mitigating the associated risks with the introduction of a marketplace that operates closer to real time. This should allow new participants to access day ahead information services as well as a potential auto-rebalancing function. This has the possibility to lower supplier exposure to imbalance costs and decrease the costs of providing flexibility in the long run.

The figure below depicts, in a simplified manner the current process for the procurement of DNO flexibility services.

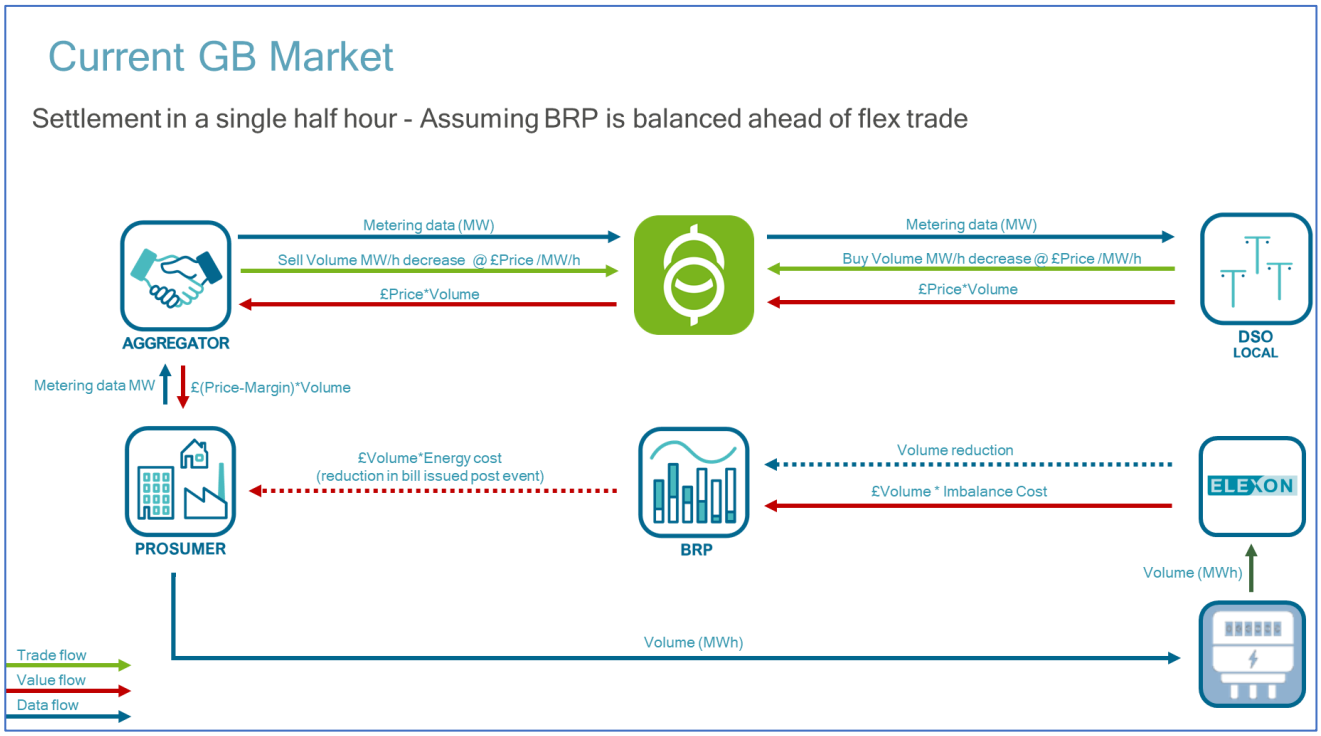

Figure 1: Current GB market

The IntraFlex Project is therefore developing tools to mitigate these associated risks and will be delivered through the operation of the NODES marketplace in closer to real time.

The stakeholder feedback we have received confirms that operating closer to real time should allow new participants to access the markets whilst key features, such as a day ahead information services as well as an auto-rebalancing function to the intra-day market, should help to lower supplier exposure to imbalance costs and decrease the costs of providing flexibility in the long run.

Procurement timelines

Within the project we are developing the new markets as shown in the timeline below:

- The NODES market is a continuous market that can be accessed at any timeframe.
- WPD will use the NODES market after the current Flexible Power week ahead acceptance timeline;
- NODES will provide an information service to BRPs. Originally this run up until intraday timeframe on any activation already committed by the DSO. Following stakeholder feedback, we will consider extending the information service throughout the day of delivery up until gate closure on NODES.

- NODES will provide automatic rebalancing service in the intraday timeframe for trades that are being activated in the daily timeframe.
- Discussions with Elexon have highlighted the opportunity to operate the intraday service up to the Delivery Period. However, following discussions with the ESO, we initially agreed to close all procurement ahead of Gate Closure (1 hour ahead of the Delivery Period). This was to reduce the risk of conflicting with ESO services. We also received feedback from stakeholders that the NODES within day results need to be available at least 30 minutes ahead of Gate Closure to allow results to be integrated into bid strategies for the balancing mechanism. We have therefore resolved to introduce a Gate Closure on NODES 90 minutes ahead of real-time.
- We will also endeavour to avoid making trades over the same time period as the day ahead and intraday auctions. Again this will allow participants to accommodate results from on market into the other.

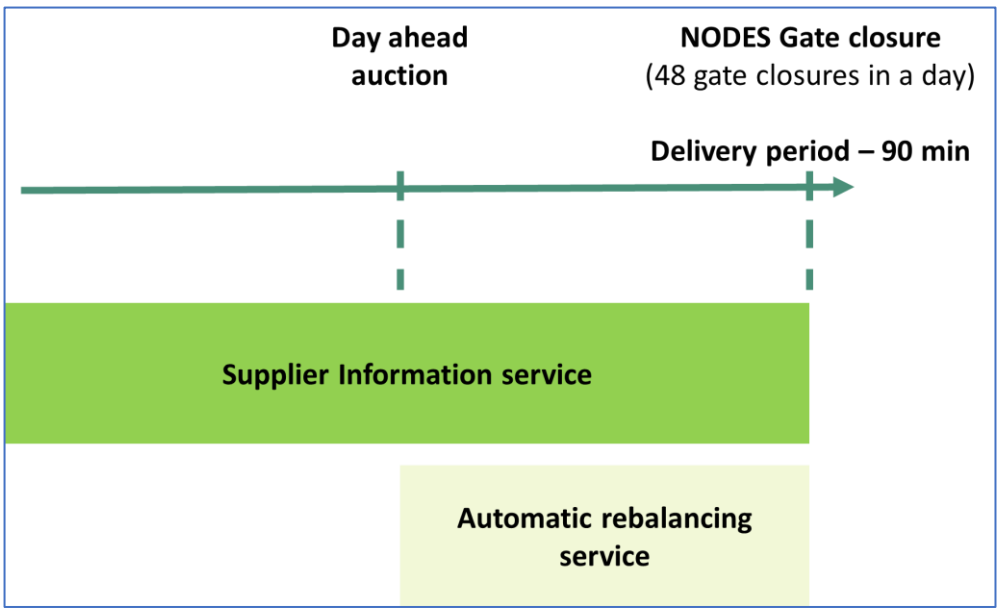

Figure 2: Market Timelines

Depending on the liquidity of the market we are anticipating that beyond the trial, these markets would operate in parallel with existing procurement timelines and other developing markets.

It is worth remembering that we are only looking at Pre-Fault Constraint Management services (equivalent to the Secure service) within this project. This is simply due to the nature of the services and their required dispatch timelines.

Information service for BRPs up to intraday timeframe

During the stakeholder review it became clear that an information service, that will provide suppliers with information on the calls made to date by the DSO, would be very interesting.

Our initial intention was to make this information available until the day ahead energy market gate closure, but we see value in extending the service up until NODES Gate Closure.

This will allow suppliers to correct their position and avoid the associated imbalance costs. This relatively simple process requires minimal intervention from NODES and allows BRPs full control over their portfolio. This process is highlighted in the diagram below.

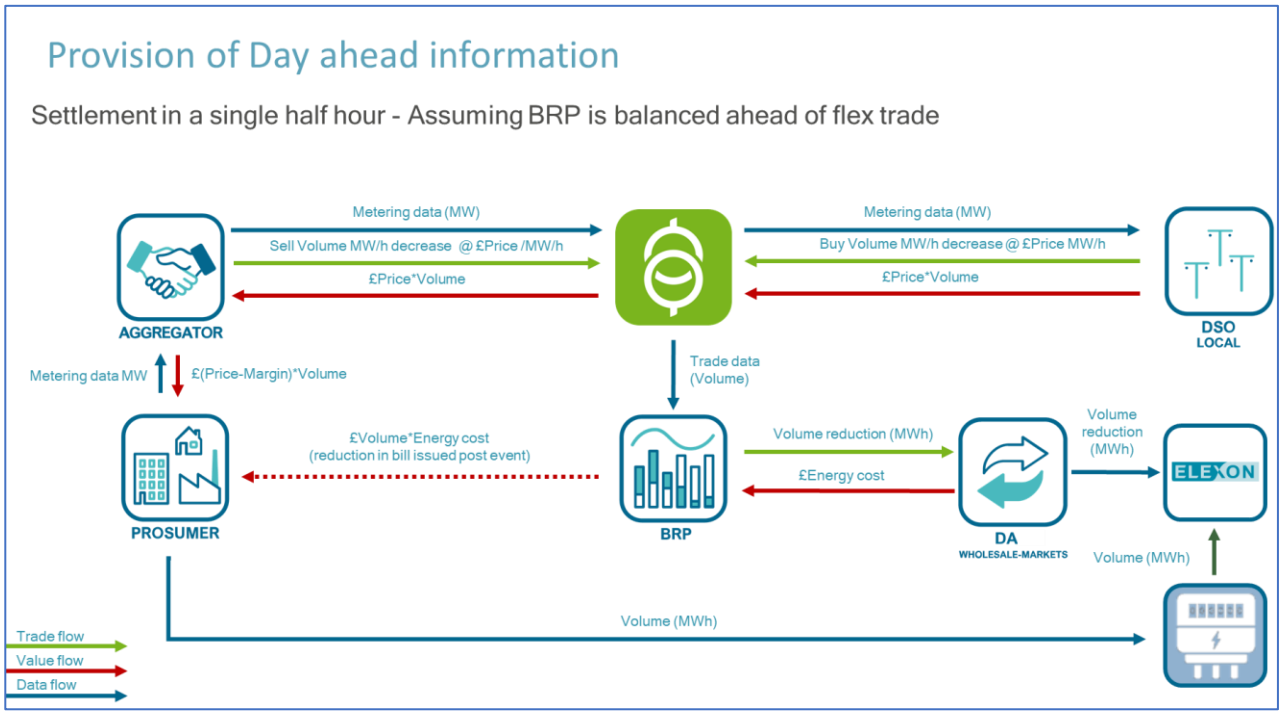

Figure 3: Information Service

Our intention is that this information will be available in the NODES web portal and suppliers will also be able to pull it via an API. This allows the BRPs to time the information to align with their processes. It also simplifies the interfacing of systems.

One of the other key elements we are considering is the flow of potentially commercially sensitive information between parties involved in the market. Attention is being paid to the required level of anonymization and aggregation that will be needed to ensure that all parties involved are comfortable with the information being shared, whilst still allowing value to be created. In the initial instance an opt-out of the service for Aggregators is planned to be provided.

Intraday Auto rebalancing service

A further trial development is to provide an Auto rebalancing service where the BRP can elect to have NODES automatically rebalance its position in the intraday timeframe. This is detailed below and aims to offset any action taken by the DSO with an automatic counteraction in the intraday energy market. In normal operation this should release value back to the BRP. This is explained shown in the figures below.

This service has received an indifferent reception at the moment from stakeholders which may be a function of the reduced amount of BRP's who have engaged with the project so far.

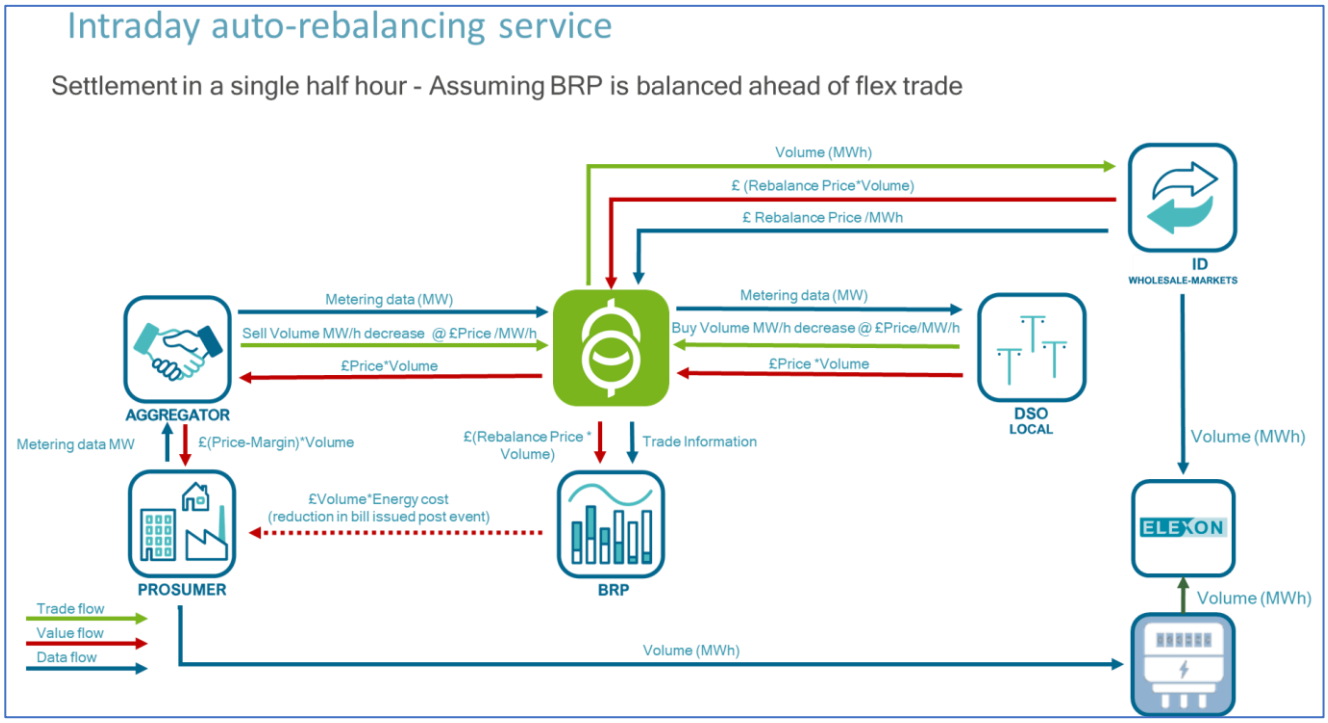

Figure 4: Auto Rebalancing Service

However, in the case of negative pricing in the intraday market the cost of this action will be presented to the DSO at the time of purchase. In this scenario the DSO would pay the sell price which would be passed onto the aggregator and the rebalance price which would be passed into the intraday market.

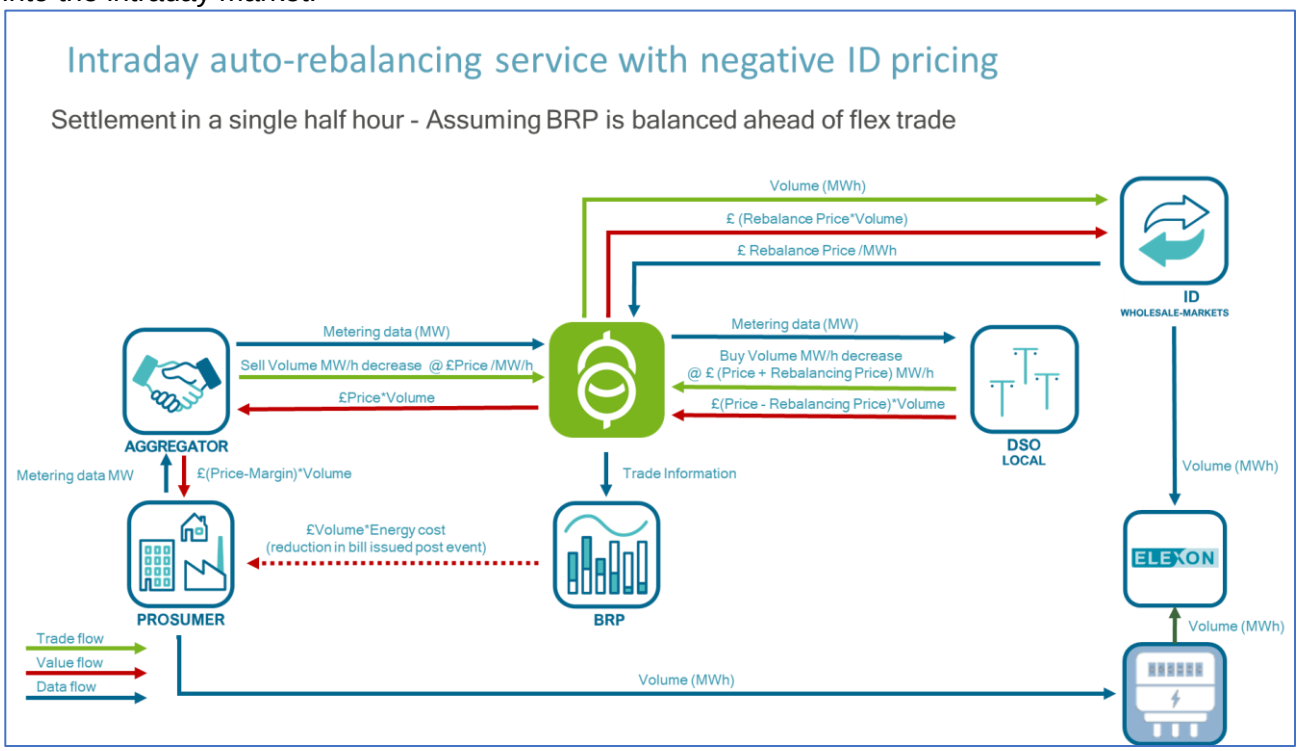

Figure 5: Auto Rebalancing Service with Negative Pricing

Following feedback from the stakeholder engagement the service will include an override/blocking feature to allow the BRP to block the NODES market from taking a counteraction if this would help their energy position (i.e. they are short).

In addition, due to the non-geographic nature of the intraday market, we are aware there is a risk that the counteraction is in the same geographic area as the constraint the DNO is trying to avoid. This is dependent on the scale of DNO constraint zones and it's being investigated further as part of the trial.

Payment Mechanics and Baselines

As the markets being developed within this project are closer to real time, it will be necessary to develop appropriate commercial terms to reflect this. Therefore, it has been identified that new payment mechanics and baselining techniques will need to be developed.

We have attempted to align the payment mechanics with those already in use and therefore the general principals have been adopted as below with some unique to the IntraFlex service proposition.

- Utilisation only (No availability payment)
- 1-minute granularity for measurement of delivery
- Grace factor enabling 100% payment for delivery at 95% or above
- Ratchet reduction of 3% in payment for each percentage under 95%
- No payment for delivery below 63%
- No payment for over delivery
- Delivery capacity can alter for each half hour period in line with the bidding intervals

We will consider changes for phase 2, especially for over delivery

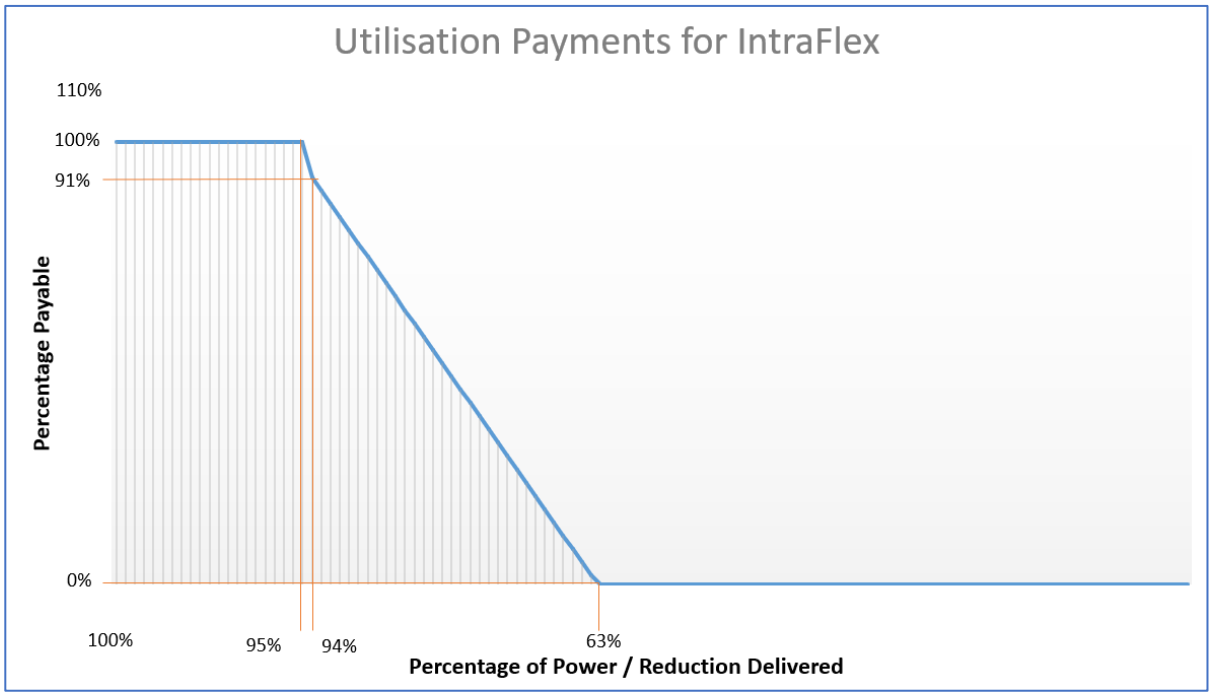

Figure 6 - IntraFlex Payment Mechanics

As previously mentioned, a new baseline methodology has needed to be developed in conjunction with the payment mechanics. The baseline methodology differs quite significantly from that currently used by Flexible Power with the most noticeable feature being that of a daily profile shape.

The Baseline methodology developed specifically for the trials are;

- Automation of suggested baseline values
- Profiled baseline varies across the day
- 48 half hour periods create the profile
- Average value from 5 previous weekday readings for each period
- Non-weekdays eliminated
- Values prepopulated for FSPs within the NODES platform
- FSP can overwrite auto baseline if they have better intelligence to determine the likely 'actual' readings for each HH bid period
- Baseline locked when bid but can be revised if not yet accepted
- FSP will have to adjust delivery at the shoulders of each HH period to maintain consistent delivery ≥95%

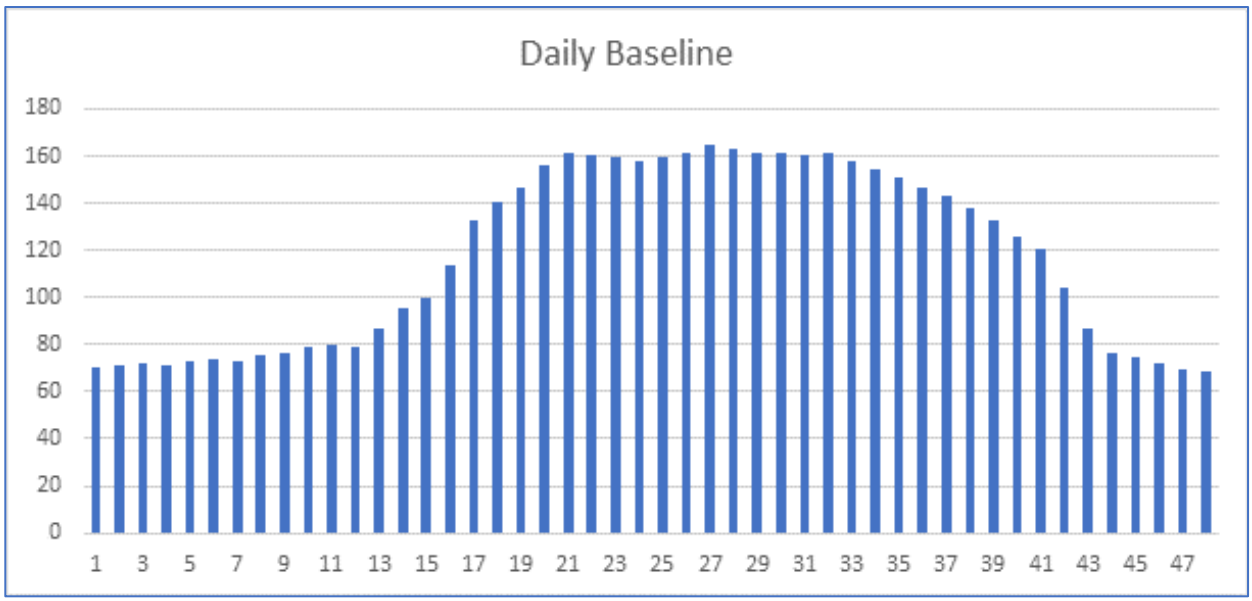

Figure 7 - Example of profiled baseline created with IntraFlex methodology

Technical Systems Overview

To enable the new markets to function, a number of systems and interfaces are required which are intended to balance the requirement for simplicity whilst providing the required level of functionality. This has involved significant coordination between NODES, Kiwi Power and the BaU Flexible Power team.

We have tried to balance the requirements to reduce the trial development risk whilst also looking to BaU. Development has been split to align the two trial phases with more BaU work focussed for Phase 2, once Phase 1 learning can be incorporated.

The primary systems are those owned and operated by NODES and these focus on the commercial relationship with the participant. For the trial the metering systems (for the project metering and baseline calculations) functions will be provided through integration with existing WPD metering capability.

For the trial the metering systems (the project metering and baseline calculations) functions will be provided through integration with existing WPD metering capability. This is to facilitate the timely deployment of the trial as well as the de-risking of the project rather than the mandated long-term solution.

It is expected that beyond the trial, as the market for flexibility services matures, this function may be taken on by an independent operator (NODES or another party). The provision of metering services is a key discussion within Ofgem's Future Insights paper on Flexibility Platforms in electricity markets.

NODES will provide the commercial systems with participants able to interact via a Graphical User Interface (GUI) or Application Programming Interface (API). This will build on their existing market platform and will be supplemented with project specific development.

These systems are highlighted in Figure 16 below.

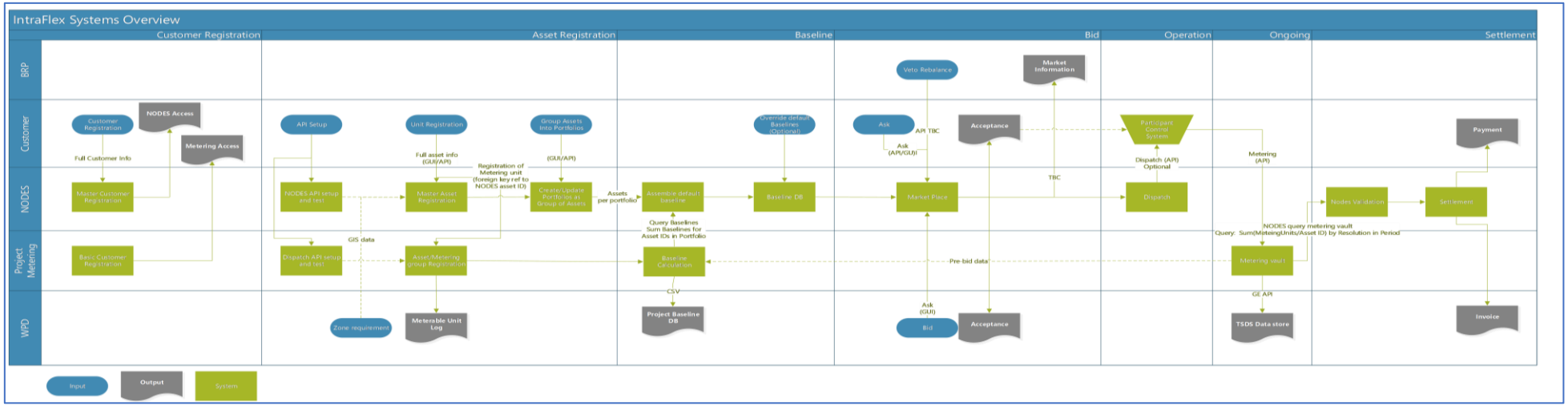

Figure 16: IntraFlex Systems overview

Expressions of Interest

The expressions of interest window opened at beginning of March and was due to close at the end of March. A number of potential participants requested extra time to respond, due to the current COVID-19 situation within the UK, the expressions of interest window was extended to the 8th of April.

The following steps were taken to gather Expressions of Interest (EOI) as follows:

1. Awareness of the project was raised via; WPD LinkedIn & website, NODES LinkedIn & Website, SGC LinkedIn
2. Information that the project is looking for trial partners shared during the webinars and workshop.
3. EOI's invited asked for via;
    - WPD Innovation and Flexible Power Flex email distribution list,
    - WPD news article
    - LinkedIn push
    - Article in the Energyst
    - Targeted emails to attendees of the webinars and workshop
    - Announcements in the EnergyUK and ADE mailing lists
    - All EOI's collated and summarised into a spreadsheet ready for aggregating to WPD CMZ's
4. During the window extension targeted emails were sent out those attendees of the workshops and webinars that didn't respond.

As the EoI was extended into April, final results are not available at the time of writing. However the following interim results are available:

- We have had 19 respondents; 5 are BRP's as shown in the table below.
- There are 62 sites across 18 of the respondents with a total available power 772MW
- The available power is from 50kW to 100MW
- An individual respondent has put forward 683 domestic sites

Stage Gate

The end of work package 2 stage gate for go/no go to work package 3 system build has been reviewed and signed off. A further stage gate has been added after the phase 1 trial to assess the viability of going to the phase 2 trial of automated rebalancing.

Next steps

Following sign off of the Stage Gate in April the project will move onto the System & Process building work packages 3, 4 and 5.

During this work package we will also be taking the opportunity to do some in-depth questioning and research with BRP's to confirm the value of this marketplace to the BRP.

2.2.3 Work Package 3: NODES System & Process Build

Progress within this reporting period

There has been no progress on this work package which is as according to the Project Plan

Next steps

This will be started during April 2020 with completion due May 2021

This work package, led by NODES, will be the buildout of a technology platform which helps deliver the trial with the following key tasks;

- Development of the metering and baseline retrieval process
- Develop the dispatch system
- Develop the information service
- Deploy the platform for the first trial.

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2.2.4 Work Package 4: WPD System & Process Build

Progress within this reporting period

There has been no progress on this work package which is as according to the Project Plan

Next steps

This will be started during May 2020 with completion due January 2021

This work package is led by SGC and aims to ensure that WPD has the required systems and processes to utilise the NODES marketplace effectively. This includes the following key tasks;

- Refining the metering system
- Developing the baseline calculation
- Develop the Audit targeting tool
- Conclude the UCR procurement review.

2.2.5 Work Package 5: Trial

Progress within this reporting period

There has been no progress on this work package which is as according to the Project Plan

Next steps

This will be started during June 2020 with completion due August 2021

This work package will be led by SGC and is aimed at delivering a trial of the developed tools. This includes the following key tasks;

- Recruiting and on-boarding participants for the trial
- Running the trial
- Assessing the calls and baselines
- Reporting on learning.

3 Progress against Budget

Spend Area	Budget (£k)	Expected Spend to Date (£k)	Actual Spend to Date (£k)	Variance to expected (£k)	Variance to expected %
WPD Project Management	£101,435	£31,700	£14,277	£17,423	55%[*1]
Contractors	£573,294	£81,140	£85,503	-£4,363	-5%[*2]
Payments to Users	£100,000	£0	£0	£0	0%
Dissemination	£30,000	£10,000	£1,570	£8,430	84%[*3]
Contingency	£116,473			£0	0%
TOTAL	**£921,202**	**£122,840**	**£101,350**	**£21,490**	**17%**

Comments around variance

[*1] Less WPD PM time was used than expected.

[*2] Includes NODES, SGC, Cornwall Insight and Kiwi. Less expenditure was incurred on travelling than expected by NODES. However this is offset by additional expenditure on Cornwall Insight study into ASBVD.

[*3] Dissemination event held in London sourced at a greatly reduced cost than expected.

4 Progress towards Success Criteria

Objectives	Status
The operability of short-term flexibility markets	**In progress:** This will be tested in the trial in August and September.
The value of increased information at the day ahead stage to suppliers	**In progress:** Initial stakeholder feedback has clearly indicated that this is a valuable service for suppliers. This will be developed further during the trial in August and September and refined for the second trial.
The value of an integrated link for rebalancing in the intra-day market	**In progress:** With the current limited engagement with some of the major suppliers the Initial feedback has been Indifferent to this element. This will be further explored with more targeted interaction with the suppliers. It is expected to be trialled in the second trial.

Success Criteria	Status
Development of a UK Market design for short term flexibility market that reflects imbalance costs	**In progress:** The development has been completed as part of work package 2 and now needs to be validated via the trials.
WPD access to ShortFlex products that have the potential to benefit the distribution network	**In progress:** To be validated via the first trial in August and September.
Procurement of ShortFlex via the NODES platform	**In progress:** To be validated via the first trial in August and September.
Demonstration of ShortFlex products that limit supplier exposure to imbalance costs	**In progress:** To be validated via the trials
Delivery of the project on time and on budget.	**In progress:** During the first six months both timescales and overall budget have been adhered to.

5 Learning Outcomes

Within the project to date we have focused on confirming our market design and developing the technical specifications. Therefore our key learnings are as follows:

- There is widespread acknowledgement of the potential problem this project is looking to resolve, however there has been limited evidence to date on the potential scale.
- There is real participant interest in the availability of short-term DSO markets and there is a very clear desire to understand the potential value of the service.
- The development of the market design highlighted that for demand turn down services, the problem is one of revenue maximisation rather than avoiding penalties in most scenarios. This alters the view of the service.
- There was clear feedback on the value of extending the information service into the intraday timeframe. This would help suppliers who wanted information on the services, but who didn't want to auto rebalance service.
- We have adjusted the project timelines, to account for feedback in terms of interactions with the Day ahead auctions as well as the BM, to be 1 ½ hours ahead of the delivery period.
- Following feedback from stakeholder engagement the service will include an override/blocking feature to allow the BRP to block the NODES market from taking a counteraction if this would help their energy position (i.e. they are short).
- There is significant market activity on Baselines with work being done by Elexon, the ESO, Open networks and individual DNOs. We have developed a simple one that aims to blend the positives of much of this work.
- Participants value in a simple Paymech and baseline for the trial. However, for phase 2 it may have to be more complex as over delivery causes issues for imbalance.
- An alternative solution to reduce the imbalance created by DNO flexibility calls could be to treat them as system actions and resolve them through the ABSVD process. This is being reviewed by the project team.
- Gathering expressions of interest seems to get a better response when utilising targeted personal emailing rather than blanket LinkedIn or emails.

6 Intellectual Property Rights

A complete list of all background IPR from all project partners has been compiled. The IP register is reviewed on a quarterly basis.

IPR	Category	Owner	Progress
NODES Platform	Background	NODES	Developed before the project
NODES Intraday link	Foreground	NODES	Still to be developed
NODES day ahead information	Foreground	NODES	Still to be developed
Flexible Power documentation and Processes	Background	WPD	Developed before the project
Audit Targeting	Relevant Foreground	WPD	Still to be developed
UCR review	Relevant Foreground	WPD	In development
Link to FP dispatch	Relevant Foreground	WPD	Still to be developed
UK Market design	Relevant Foreground	All partners	First version developed and published. To be revised following trials
NODES Market design	Background	NODES	Developed before the project
UK Market design technical adaption white paper.	Relevant Foreground	All partners	Still to be developed

7 Risk Management Current Risks

Our risk management objectives are to:

- Ensure that risk management is clearly and consistently integrated into the project management activities and evidenced through the project documentation;
- Comply with WPDs risk management processes and any governance requirements as specified by Ofgem; and
- Anticipate and respond to changing project requirements.

These objectives will be achieved by:

- ✓ Defining the roles, responsibilities and reporting lines within the Project Delivery Team for risk management;
- ✓ Including risk management issues when writing reports and considering decisions;
- ✓ Maintaining a risk register;
- ✓ Communicating risks and ensuring suitable training and supervision is provided;
- ✓ Preparing mitigation action plans;
- ✓ Preparing contingency action plans; and
- ✓ Monitoring and updating of risks and the risk controls.

7.1 Current Risks

The IntraFlex risk register is a live document and is updated regularly. There are currently 46 live project related risks. Mitigation action plans are identified when raising a risk and the appropriate steps then taken to ensure risks do not become issues wherever possible.

In **Error! Reference source not found.** we give details of our top five current risks by category. For each of these risks, a mitigation action plan has been identified and the progress of these are tracked and reported.

Table 7-1: Top five current risks (by rating)

Details of the Risk	Risk Rating	Mitigation Action Plan	Progress
COVID - 19 Impact	Major	Separate COVID-19 risk register and process put in place with mitigating actions for sickness understood	Managed through separate COVID 19 risk Register which is reviewed daily
WP2 - Recruitment risk - Cannot recruit enough flex providers Scoping Phase	Major	Significant time and resource allocated to this project task. In addition, a project review will assess any uncertainty to determine the impact on the project at the first stage gate.	The EOI has shown good interest in the project. However this risk has increased in proximity.
WP3 - Cost of signing up to NORDPOOL platform could be prohibitive	Major	Discussion to be held with Platform owner over cost to sign up	Discussions underway
WP2 - Limited Evidence of the Market Value and therefore limited value of the project	Major	Extensive engagement and review of feedback with BRP's	Further discussions to be held with BRP's
WP1 - Resource constraints (WPD)	Major	Clear expectation of work required set out in project plan	Reviewed at each Project Meeting

Error! Reference source not found. provides a snapshot of the risk register, detailed graphically, to provide an on-going understanding of the projects' risks.

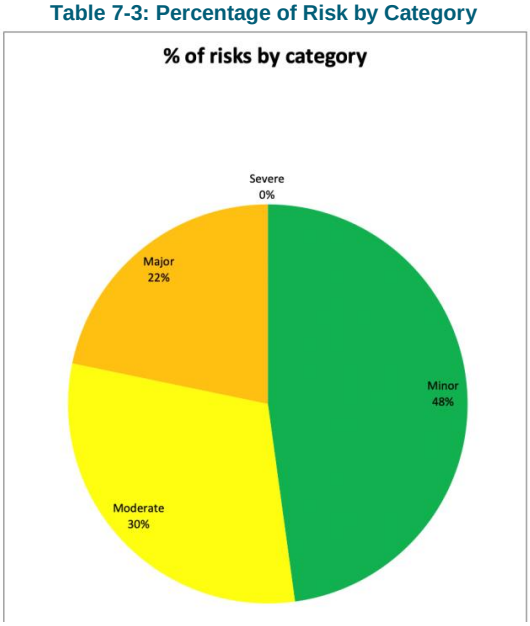
Table 7-2: Graphical view of Risk Register

Likelihood = Probability x Proximity						
	Certain/Imminent (21-25)	0	0	0	0	0
	More likely to occur than not/Likely to be near future (16-20)	0	0	0	0	0
	50/50 chance of occuring/ Mid to short term (11-15)	0	0	1	4	0
	Less likely to occur/Mid to long term (6-10)	0	1	6	5	0
	Very unlikely to occur/Far in the future (1-5)	0	8	13	8	0
		1. Insignificant changes, re-planning may be required	2. Small Delay, small increased cost but absorbable	3. Delay, increased cost in excess of tolerance	4. Substantial Delay, key deliverables not met, significant increase in time/cost	5. Inability to deliver, business case/objective not viable
		Impact				

	Minor	Moderate	Major	Severe	
Legend	22	14	10	0	**No of instances**
Total	46				No of live risks

Error! Reference source not found. provides an overview of the risks by category, minor, moderate, major and severe. This information is used to understand the complete risk level of the project.

Table 7-3: Percentage of Risk by Category



7.2 Update for risks previously identified

Descriptions of the most significant risks, identified at the PEA stage are provided in **Error! Reference source not found.** with updates on their current risk status.

Table 7-4: Risks identified in the Project Outline

Details of the Risk	Previous Risk Rating	Current Risk Rating	Mitigation Action Plan	Progress
WP2 - Unknown ESO relationship impacts timeframes & costs;	New	Moderate	Some time and budget allocated for ESO engagement. Should it become apparent this will increase, a change request will be raises	Initial discussions held with the ESO to clarify relationship.
WP2 - Risk that there is a big gap between our assumptions around Market Design and actual interactions	New	Major	A review of the project at the associated stage. This will review the actual work required compared to the planned work.	Extensive stakeholder engagement has taken place on the market design
WP2 - Recruitment risk - Cannot recruit enough FSP providers Scoping Phase	New	Major	Significant time and resource allocated to this project task. In addition a project review will assess any uncertainty to determine the impact on the project at the first stage gate.	The EOI has shown good interest in the project. However this risk has increased in proximity.
WP3 - NODES tech build risk, Specification not detailed enough	New	Moderate	Detailed technical design specification produced and understood	The technical overview has now been completed. The build phase is about to start.
WP4 - Risk Procurement review provides negative response for market roll out.	New	Moderate	Early and detailed review to be put in place.	Review underway.

8 Consistency with Project Registration Document

The scale, cost and timeframe of the project has remained consistent with the registration document, a copy of which can be found here.

However, there have been a few internal changes within the project. These have been logged within WPD's Change Management process.

During the market design phase Elexon suggested this project aim may be able to be achieved by treating DSO service procurement as part of the ABSVD process. This is a fundamentally different approach to what this project was originally proposing and as such the project team are keen to review the interactions between them and appointed Cornwall Insight to study and produce a report a summarise this option. This additional work has been absorbed within the existing project budget.

In addition, following the limited initial engagement with supplier for the market design we have extended the engagement phase. A new stage gate has been added for the end of June. We have also brought forward the deployment of the information service and added an additional stage gate following the first trial.

9 Accuracy Assurance Statement

This report has been prepared by the SGC IntraFlex Project Manager (David Penfold), reviewed by the WPD Project Manager (Matt Watson) and approved by the Innovation Team Manager (Jon Berry).

All efforts have been made to ensure that the information contained within this report is accurate. WPD confirms that this report has been produced, reviewed and approved following our quality assurance process for external documents and reports.

10 Glossary

Abbreviation	Term
ABSVD	Applicable Balancing Services Volume Data
API	Application Programming Interface
BaU	Business as Usual
BEIS	Department for Business, Energy and Industrial Strategy
BM	Balancing Mechanism
BOA	Bid Offer Acceptance
BRP	Balance Responsible Party
BSC	Balance & Settlement Code
BSP	Balancing Service Provider
CMZ	Constraint Management Zone
COVID-19	2019 Novel Coronavirus
DNO	Distribution Network Operator
DA/ID	Day Ahead/ Intra Day
DSO	Distribution System Operator
DSR	Demand Side Response
EOI	Expressions of Interest
ESO	Electricity System Operator
FSP	Flexibility Service Provider
GB	Great Britain
GUI	Graphical User Interface
IPR	Intellectual Property Rights
ISP	Imbalance Settlement Period
kW	Kilowatts
LongFlex	Long Term Flexibility (before day ahead timeframe)
MW	Megawatt
MWh	Megawatts per hour
NIA	Network Innovation Allowance
OFGEM	Office of Gas and Electricity Markets
PM	Project Management
SAA	Settlement Administration Agent
SAT	Site Acceptance Test
SGC	Smart Grid Consultancy
ShortFlex	Short Term Flexibility (on a day ahead or intra-day timeframe)
STOR	Short Term Operating Reserve
TC	Transmission Company
UCR	Utilities Contracts Regulations

UK	United Kingdom
WP#	Work Package
WPD	Western Power Distribution

11 Appendix 1: ABSVD Overview

This section gives a brief overview of the ABSVD process and is pulled from Cornwall Insights work on the project.

Overview

As the ESO, National Grid procures Balancing Services as part of its responsibility to ensure the network is operated safely and securely, whilst maintaining supply and demand.

When a Balancing Service Provider (BSP) delivers a balancing service for the ESO, these volumes are accounted for in the Energy Accounts of the associated BRPs accordingly, ensuring that the relevant BRPs do not suffer or benefit through imbalance arrangements from actions taken by the associated BSP. This means that an ESO-instructed action to a BSP should never have an impact on a BRP.

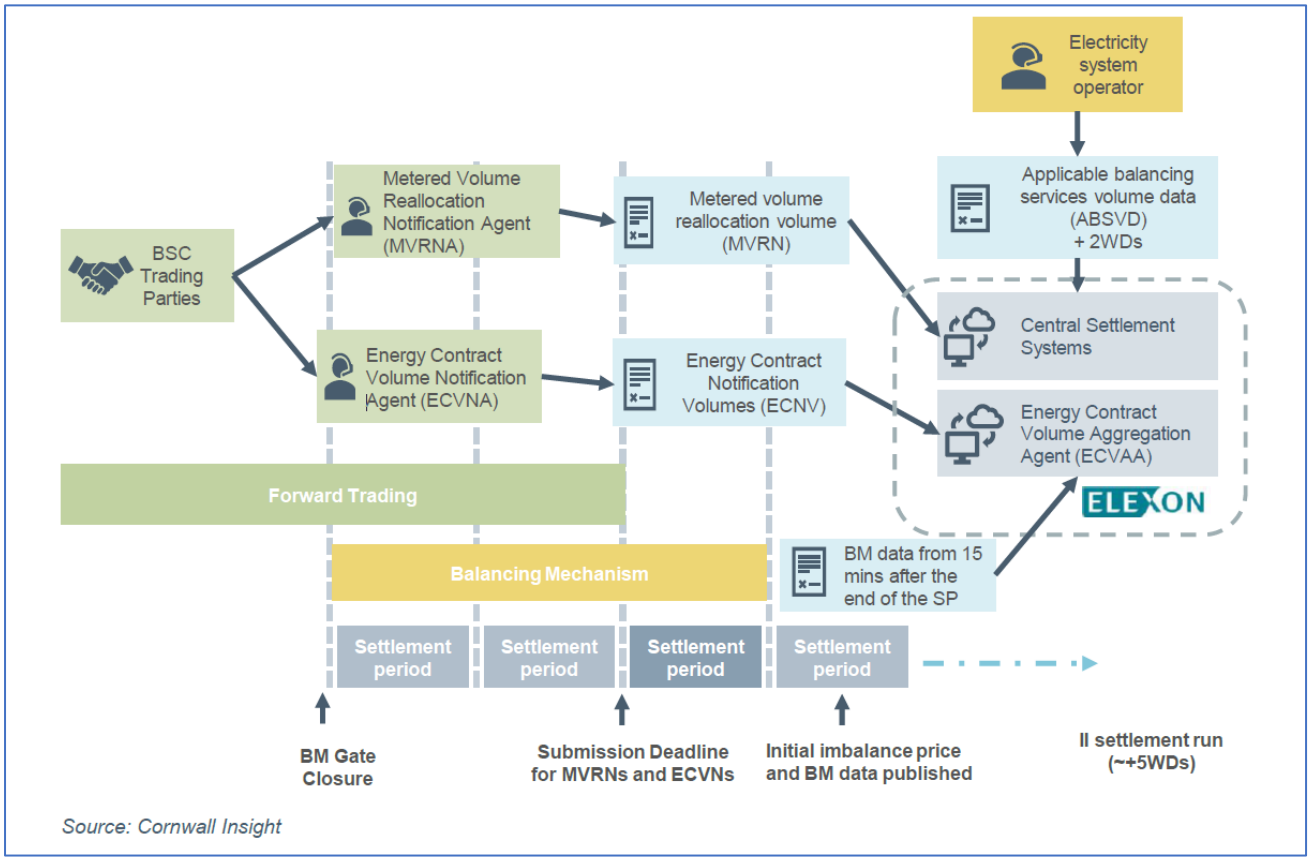


Figure 7: Overview of ABSVD and ECVNA data-flows

Who makes the adjustment?

There are two ways that Balancing Services are accounted for when calculating Balance and Settlement Code (BSC) imbalance positions:

- For Bid Offer Acceptances (BOAs) taken in the BM, these adjustments are made automatically as part of the BM processes; and
- For balancing actions taken outside the BM, these adjustments are made as part of ABSVD.

ABSVD refers to the data related to the Balancing Services volumes taken outside the BM, which are sent to the Settlement Administration Agent (SAA) or Elexon. The SAA then includes the

ABSVD in the Settlement calculation as an adjustment to the imbalance position for the BMU's Lead Party. This ensures that the affected BSC Parties' imbalance positions are calculated correctly.

What is contained in ABSVD?

Balancing Services are defined in the Transmission Licence, and National Grid is required to establish them in accordance with Standard Condition C16 of the Transmission Licence. Standard Condition C16 also required National Grid to maintain the ABSVD statement. The purpose of the ABSVD methodology statement10 is to set out the kinds of Balancing Services National Grid that will be accounted for as part of the ABVSD process.

Applicable Balancing Services are, in general, those services required by the ESO for economic operation of the transmission system, that result in the service provider being exposed to imbalance charges whilst assisting in system balancing. For the avoidance of doubt, a consultation will be carried out prior to any further Balancing Services being included in the calculation of ABSVD.

The following Applicable Balancing Services contracts will be included in the calculation of the ABSVD as of 1 April 2020:

- Short Term Operating Reserve (STOR)
- Mandatory Frequency Response
- Fast Reserve
- Commercial Intertrips
- Fast de-load service (constraint management)
- Maximum generation service
- System to generator operational intertripping

Providers can opt-out from ABSVD when delivering mandatory frequency response.
Currently some of the Balancing Services are treated differently, depending on the mechanism used to dispatch and settle them. For example:

- Where the Balancing Service is dispatched using a BOA, an adjustment will always be made to imbalance, which is separate of ABSVD process.
- Where the Balancing Service is not dispatched using a BOA, and the Transmission Company (TC) is able to allocate the volume to a BMU, an adjustment may be made to imbalance depending upon whether the Lead Party opts out of having ABSVD allocated to their account.
- Where the Balancing Service is not dispatch using a BOA and the TC is not able to allocate the volume to a BMU, no adjustment can currently be made to imbalance.

DSO services are not covered by ABSVD under the Transmission Licence.

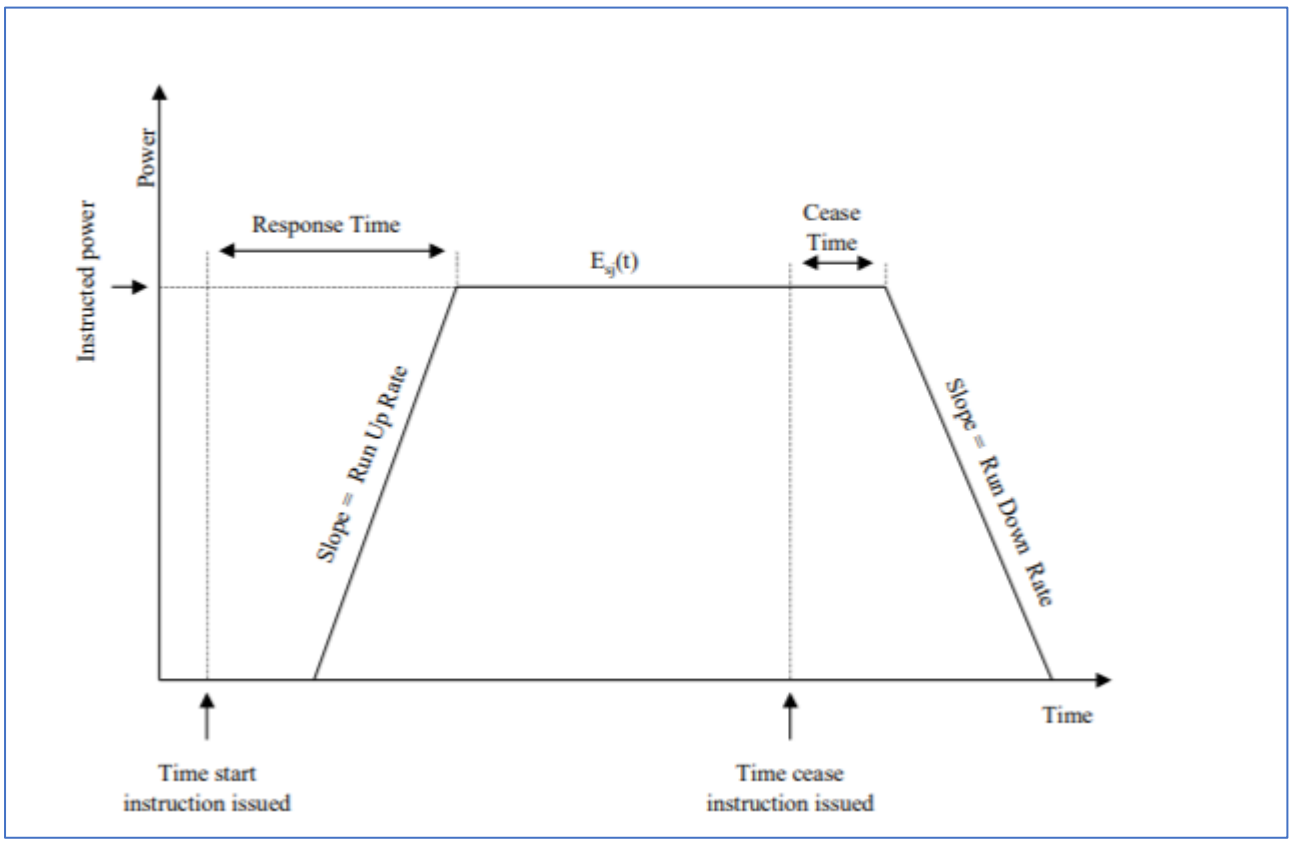
Adjustment

The ABSVD volume adjustment is made to the instructed volumes under the Balancing Service requirement and not to the actual delivered volume. If the BRP fails to meet the requirement or over deliver then they will be in imbalance and subject to system charges.

With regard to ramp up, ramp down and cease times, generally they are not part of the ABSVD calculation as they are specifically excluded from the calculation (ramp up or down) or set to zero response time.

The calculation for ABSVD for STOR and Fast Reserve is shown below. This is used to determine the volumes from individual BSPs to be applied to the accounts of the BRPs they are associated with. To do this, a 'slope' or 'ramp rate' is calculated on the basis of pre-agreed run up rates, run down rates, response time, and the instructions given to the BSP to provide a balancing service.

This volume is then included in the BSC calculation for 'Period BM Unit Balancing Services Volume', which represents all energy associated with balancing services (i.e. BM bids and offers as well as balancing services) used in the determination of imbalance of a BRPs position.



Source: National Grid ABSVD Methodology

Figure 8: ABSVD Methodology for calculating volumes to be adjusted for STOR and fast reserve

When is ABSVD applied?

The ABSVD for action taken in the BM is automatically provided by the TC. For non-BM actions the change under P354 ensured that the TC would provide ABSVD for each applicable Settlement Period to BSC Systems.

As per Section Q 6.4.1 of the BSC, the ABSVD data should be provided no later than the second business day after the settlement day. However, in practice, some data may not be provided until the SF, or the R1 settlement run at the latest

Changes to ABSVD – P354: Use of ABSVD for non-BM Balancing Services at the MPAN level

As of April 2020, there is a limitation where Balancing Services are instructed by National Grid outside of the BM. There is no mechanism in place to enable ABSVD is assigned to the associated BRPs, potentially resulting in an additional payment or cost to the BRP for the imbalance created. In practice, this resulted in the emergence of 'spill' payments to the BRPs of the BSP (which were often passed onto the BSP).

In January 2017, ENGIE submitted a BSC Modification Proposal Form for P354. The purpose of modification was to allow National Grid to provide ABSVD volume at the Meter Point Administration Number (MPAN) level and have the SAA allocate it to the appropriate Supplier BMU. P354 will remove the defect which currently means that BSPs that are not dispatched through the BM gain an additional payment that BM BSPs do not receive. ENGIE believed the current methodology is distorting STOR market competition and potentially increasing the balancing costs faced by consumers.

P354 seeks to address this defect by:

- Identifying and implementing a mechanism to identify the Suppliers responsible for the Metering Systems that contribute to the Applicable Balancing Services; and
- Allocating the appropriate energy volumes to their accounts which will then be included in the Settlement calculation, resulting in the affected BSC Parties' imbalance positions being calculated correctly.

P354 Proposed Modification will be implemented on 1 April 2020 as a standalone BSC Systems Release.

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