



Invitation for Expressions of Interest: Services for Winter 2018 and Summer 2019

V2.0

May 2018

Table of Contents

Table of Contents.....	1
Glossary.....	3
Introduction	4
What is Flexible Power?.....	5
Purpose of this document.....	5
Service principles	6
Three Services	6
Secure service	6
Dynamic service	7
Restore service.....	7
Metering and Dispatch	8
API.....	8
Outstation	8
Payment and Billing	8
Pricing	8
Payment methodology	8
Baseline.....	10
Billing.....	11
Procurement process.....	12
Minimum requirements.....	12
Sign Up process.....	13
Timeline	14
Assessments.....	14
Registering Interest.....	14
Details of each Constraint.....	15
Constraints Vs Zones.....	15
Exeter City Transformer Constraint	16
South Hams & Plymouth.....	18
Rugeley	20
Northampton Circuits	22
Beaumont Leys.....	24
How to respond	25

Glossary

Abbreviation	Definition
API	Application Programming Interface
CMZ	Constraint Managed Zone
DNO	Distribution Network Operator
DSO	Distribution System Operator
DSR	Demand Side Response
Eol	Expression of Interest
FP	Flexible Power
HH	Half Hour
STOR	Short Term Operating Reserve
WPD	Western Power Distribution

Introduction

Western Power Distribution (WPD) is extending the procurement of customer flexibility beyond the Midlands trial (Project Entire) to 18 new businesses as usual zones that cover 5 constraints.

Flexible Power is procuring three Demand Side Response (DSR) services to address different operational requirements on the Distribution Network. The services are called **Secure**, **Dynamic** and **Restore** and will be available between October 2018 and October 2019. The zones covered by the constraints are highlighted below alongside the existing Midlands trial area.

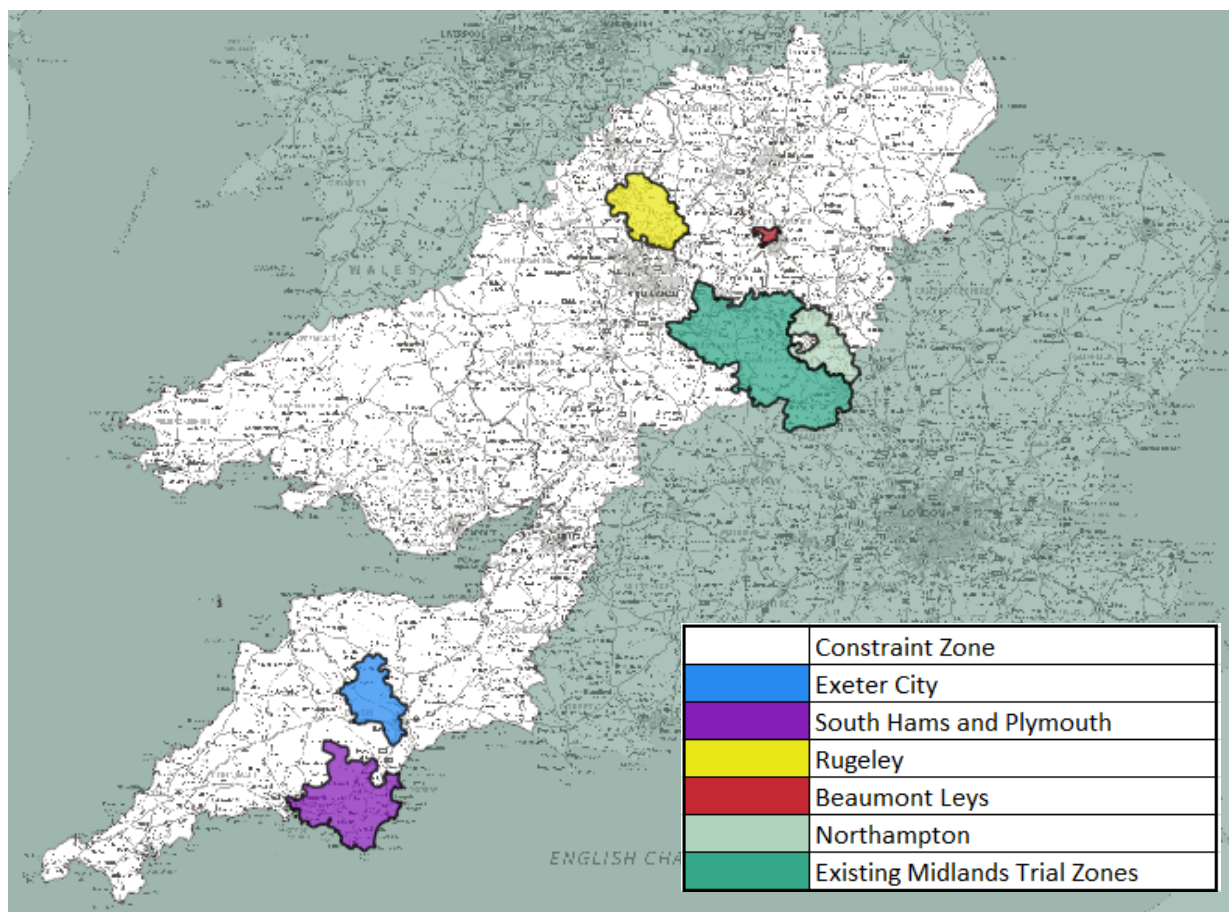


Figure 1: Overview Map of flexibility zones

The **Secure** and **Dynamic** products are the main response services and operate to reduce predictable stresses on the distribution network. All constraints (except Northampton) will operate *either* a Secure *or* a Dynamic service. Both services are used to manage known conditions of increased risk on the network. The advance notice is intended to assist participants in assessing their ability to declare capacity whilst minimising conflicts with any other DSR programmes.

The **Restore** service is an additional service and would only be activated in the event of rare faults occurring on the network. The service would help manage an incident and expedite the process of reinstating normal operations. Restore will be available across all the zones and is optional.

The CMZ services are available to half hourly metered customers in the target area who can increase generation output or reduce demand within 15 minutes of being called and can hold the response for at least 2 hours.

Please register your interest in the CMZ products by completing the [Eol Form](#) on the website by **17.00** on **11/07/2018**.

For full details on the services to be procured please visit www.flexiblepower.co.uk.

What is Flexible Power?

Flexible Power is a customer facing brand created by Western Power Distribution to deliver the procurement of flexibility services. The distinction has been made to clearly segregate these new procurement activities from the existing connections and network operation responsibilities of the core WPD business.

Western Power Distribution is the largest DNO by geography in the country and is responsible for keeping the lights on for 7.8 million customers across the Midlands, South West and South Wales. As part of our responsibility to run an efficient, co-ordinated and economical network we are continually looking to innovative new ways to maximise the use of the network. The use of DSR is a core area of this innovation and forms a key part of our [innovation strategy](#) and our [DSO strategy](#).

This procurement is a key step in the transition of DSR to business as usual for WPD.

Purpose of this document

This invitation for Expressions of Interest (Eol) is the first stage of the procurement of flexibility services by Flexible Power for the services commencing in winter 2018 and summer 2019. This builds on the processes and learning generated from the trials in the Midlands. In order to understand the potential markets in the target area, Flexible Power is looking for initial Expressions of Interest from potential participants. This will allow us to assess which zones to take forward to procurement. The Eol is purely informational and does not commit either party to service provision.

This document should provide participants with sufficient information to determine whether participation is of interest. To do so it is split into the following sections:

- Service description
- Procurement Process
- Detailed locations and requirements
- How to respond

More details on the processes can be found on the Flexible Power website:

www.flexiblepower.co.uk.

Service Description

The services to be delivered follow on from those developed as part of the Entire trial.

Service principles

Flexible Power have designed a weekly process for the CMZ services to interact with existing DSR services and establish any requirements ahead of the declaration deadlines for National Grid frequency and flexible STOR services.

Each contracted participant will have access to a web-based portal (www.flexiblepowerwpd.co.uk) where they can update the available capacity that they can offer for each site/group for in each zone. Please see the latest [Availability declaration guide](#) from the Entire project for more details on what the process should look like. Different capacities can be declared for each of the three CMZ service types (Secure / Dynamic / Restore). These can be a static, one off, declaration or can be altered when required. At the declaration cut off time (midnight on Wednesday) the declaration will be locked down. WPD then carry out analysis of the following weeks requirements during the following twelve hours and notify Flexible Power of any Secure or Dynamic service requirements. The portal is then updated with the DSR requirements which are then issued to participants as declarations by midday on Thursday. If Flexible Power doesn't declare any requirements, then participants can make their assets available to other DSR schemes. All Restore availability will be automatically accepted by Flexible Power.

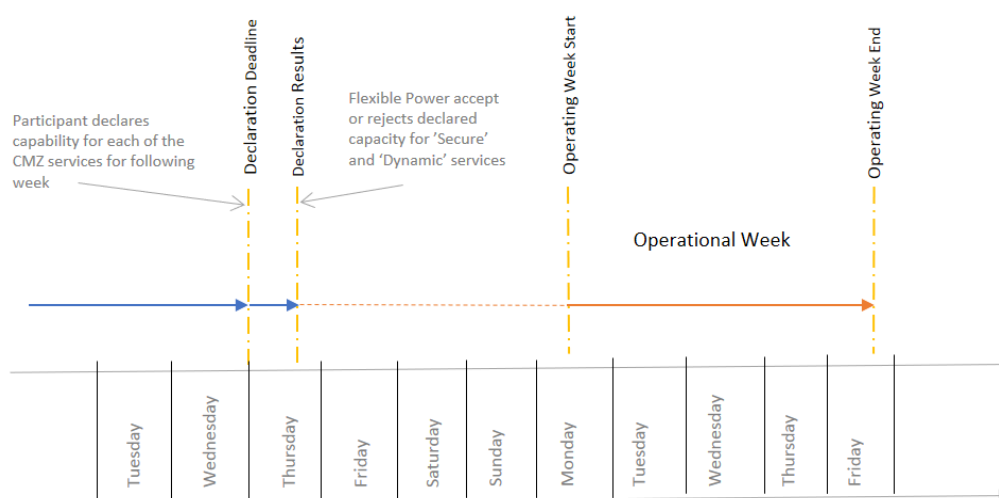


Figure 2: Weekly timeline

Three Services

Flexible Power is offering three services which serve different requirements.

Secure service

The **Secure** service is used to manage peak demand loading on the network and pre-emptively reduce network loading. This service is expected to be required on weekday evenings and may occur throughout the year due to the seasonal ratings of assets. (Specific requirements are defined later in the document).

As these requirements are predictable, **Secure** requirements are declared each Thursday for the following week (commencing Monday). Payments consist of an Arming fee which is credited when the service is scheduled and a further utilisation payment awarded on delivery.

The week-ahead declarations are scheduled to allow customers to participate in alternative services when not required for the **Secure** service.

Dynamic service

The **Dynamic** service has been developed to support the network in the event of specific fault conditions, often during summer maintenance work. (Specific requirements are defined later in the document).

As the service is required following a network fault, it consists of an Availability and Utilisation fee. By accepting an Availability fee, participants are expected to be ready to respond to Utilisation calls within 15 minutes. **Dynamic** availability windows are declared each Thursday for the following week (commencing Monday).

The week-ahead declarations are scheduled to allow customers to participate in alternative services when not required for the **Dynamic** service.

Restore service

The **Restore** service is intended to help with restoration following rare fault conditions. Such events are rare and offer no warning as they depend on failure of equipment. Under such circumstances, response can be used to reduce the stress on the network. This is the purpose of **Restore**.

As the requirement is inherently unpredictable, **Restore** is based on a premium 'utilisation only' service. This will reward response that aids network restoration, but will pay no arming or availability fees. Participants declared available for the **Restore** service will be expected to respond to any utilisation calls within 15 minutes and will receive an associated utilisation fee.

Table 1: Service Overview

	Secure	Dynamic	Restore
Advance Payment	Arming	Availability	None
Utilisation	Medium	High	Premium
Customer declaration	Week Ahead	Week Ahead	Week Ahead
FP Accept / Reject	Week Ahead	Week Ahead	Automatic Accept
Dispatch Notice	Week Ahead *	15 minutes	15 Minutes
Seasonal Requirement	All	Summer	All
Site Type	Half Hourly Metered	Half Hourly Metered	Half Hourly Metered
Generation	✓	✓	✓
Load Reduction	✓	✓	✓

* A 15 minute signal will also be provided

Metering and Dispatch

The technical interface for metering and dispatch can be provided in one of two ways: API or outstation. For either solution the participant is expected to provide minute by minute metering data.

API

The API has both Incoming and Outgoing signals, covering start, stop, metering and emergency stop, for each service in each zone. The provisional definition can be found at <https://flexiblepowerwpd.co.uk/> including the required security and authentication. This is also covered in our latest [API guide](#)

Outstation

The Outstation is a DIN-rail mounted, hardware device that is independently powered and facilitates communication with the Flexible Power Central Control Facility. This is a highly adaptable processing station allowing for connections across a range of connection types and protocols. The core unit can also be supplemented to allow for more advanced I/O options or a metering unit.

Due to the wide range of connection options available and the diversity of on-site requirements, site specific discussions will be needed with Flexible Power to detail the most effective connection option. This is covered in more detail in our [Outstation guide](#).

Payment and Billing

Pricing

To simplify the process and provide clear information to the market, Flexible Power will maintain the fixed pricing from the Entire Project for this procurement round.

These are summarised in the table below:

Table 2: Payment rates summary

	Arming	Availability	Utilisation
Secure	£75/MW/h or £118/MW/h	N/A	£150/MWh
Dynamic	N/A	£5/MW/h	£300/MWh
Restore	N/A	N/A	£600/MWh

Please see the detailed location information to see the exact pricing available in each zone.

Payment methodology

The expected payment methodology can be found in the latest [contract notes](#). This is briefly summarised below.

Customer payments are generally split into 2 categories.

- Availability/Arming payments, earned at the acceptance phase, securing the participant for WPD operations
- Utilisation payments, earned on delivery of the service, incentivising delivery.

These payments have strong performance metrics within their calculations, aimed at ensuring delivery and are calculated from a baseline (see section below). The aim of the methodology is to encourage accurate declarations of capacity and reliable delivery.

For example for the Secure and Dynamic utilisation payments, there is a 5% delivery grace factor followed by a 3% reduction in utilisation payments for each 1% of under delivery. This is administered on a minute by minute basis. This means that if a participant delivers 95% of their expected delivery they get full payment, however below 63% they get nothing.

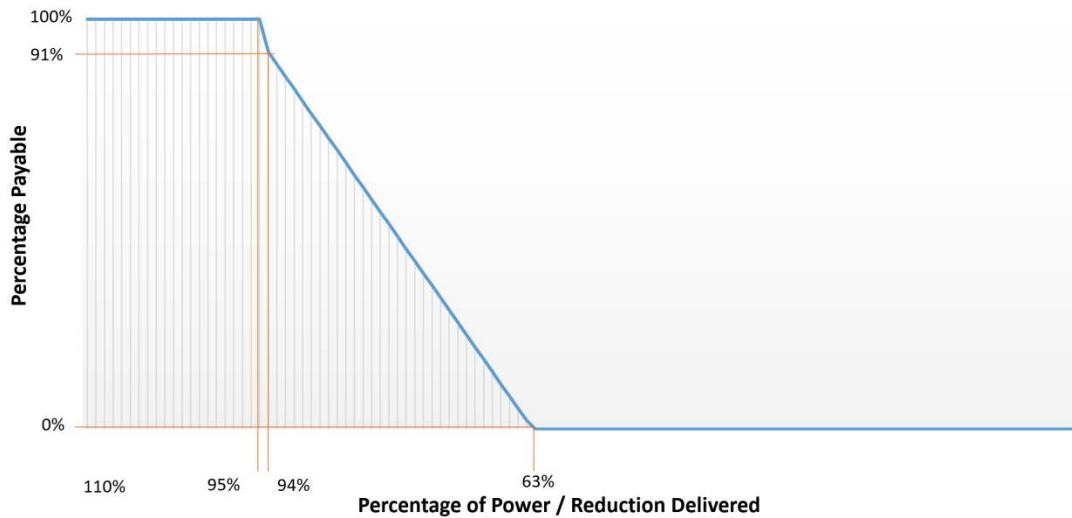


Figure 3: Secure and Dynamic Utilisation payments

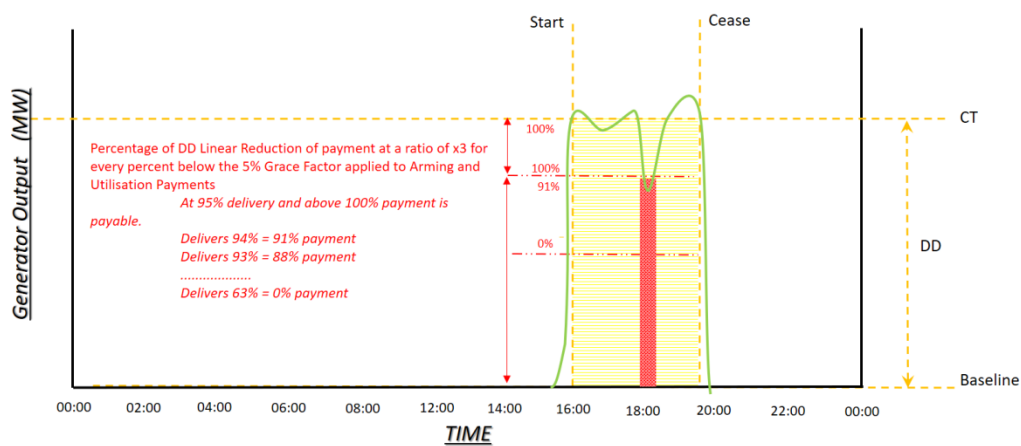


Figure 4: Secure Utilisation example

In addition to the utilisation reduction there is also a monthly reconciliation to claw back availability/arming payments for under delivery. This looks at the average proportion of energy delivered (per event, capped at 100%) and is used as a multiplier for total availability and arming payments.

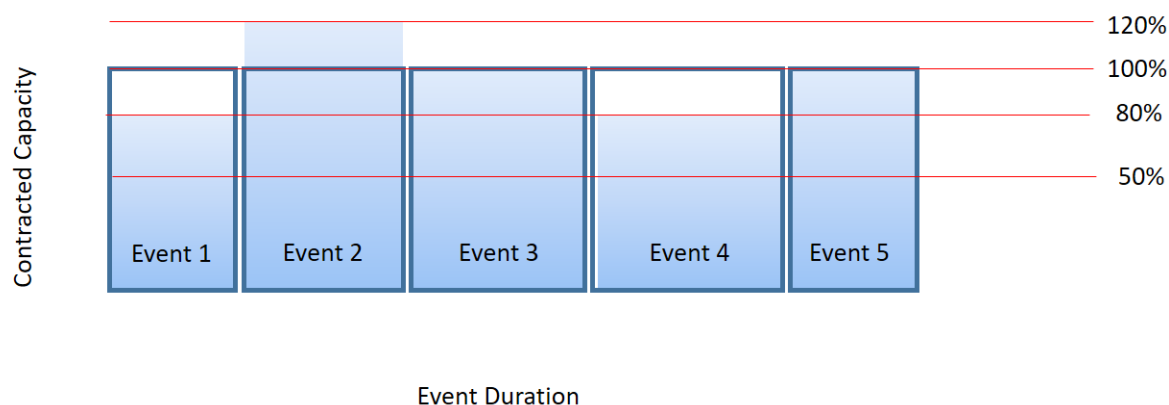


Figure 5: Monthly reconciliation example

Based on the five example events above, the site achieved a total monthly volume equivalent to 92% based on the event average performance.

$$\frac{80\% + 100\% + 100\% + 80\% + 100\%}{5} = 92\%$$

The Restore service also has a performance metric on utilisation with a 20% grace factor and a 2% ratchet. There is no availability or arming fee and so there is no monthly reconciliation.

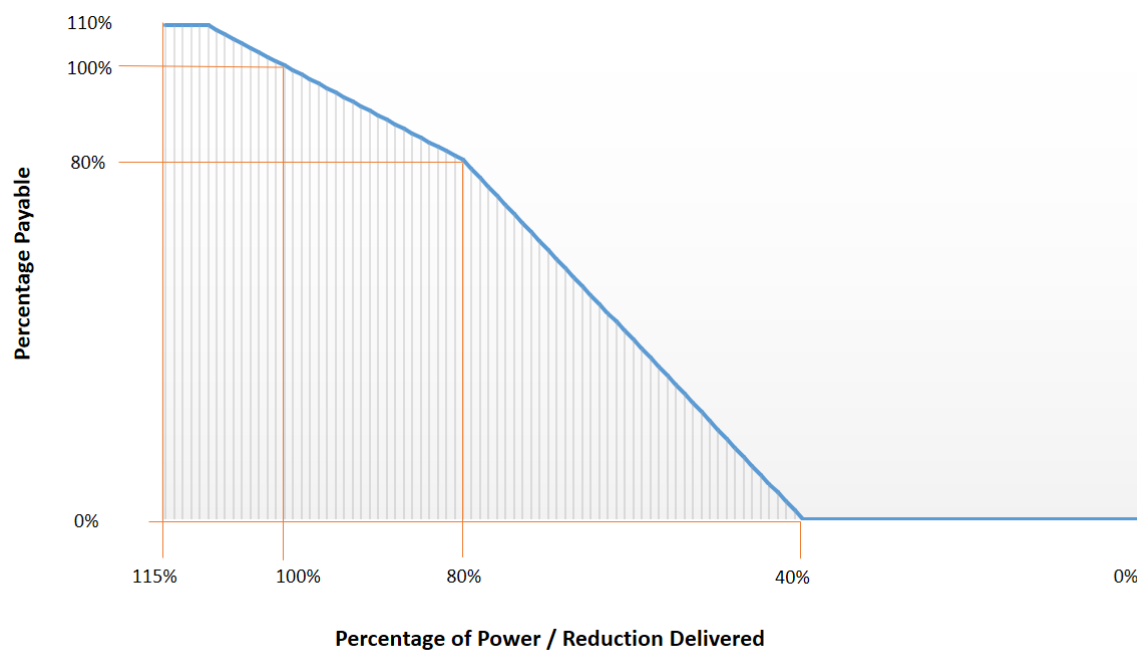


Figure 6: Restore Utilisation payments

Baseline

The baseline is calculated as the average value of the group metering between 3PM and 8PM of the first three weeks of the previous month (working days). This will be communicated to customers at the week-ahead declarations stage. Full details are available in our [contract notes](#).

Billing

The service and payment cycles are based on a calendar month and therefore we operate a total of 12 billing cycles within a year. After the end of each event a performance report is created and provided to the participant via the web portal, and this allows the participant to review their results. At the end of the month these event reports are then compiled along with the availability / arming payments and reconciliations for any shortfall of delivery. Participants should allow up to 14 days from the last day of the month to allow for the processing of the data to produce a full earnings statement. Once the statement has been created and provided to the participant there is then a further 14 days during which they can raise a query against any aspect if there is any dispute over performance or subsequent earnings calculations. If a query is raised, then the earnings statement is placed on hold until any concerns have been resolved. We would endeavour to try and complete this within the 14 day 'approval' window so as to avoid deviating from the standard payment timeline. If however this can't be achieved we will defer the payment to the following months billing cycle.

There will be a 'check box' with each monthly statement so that the participant can proactively 'approve' and confirm that they are happy with the calculations. If however no query is raised within the 14 day window it is then assumed to be correct and will generate a 'self-billing' invoice which can be downloaded for financial records and a duplicate sent to WPD accounts payable for processing. This should then be paid directly into the bank account provided within a 30 days.

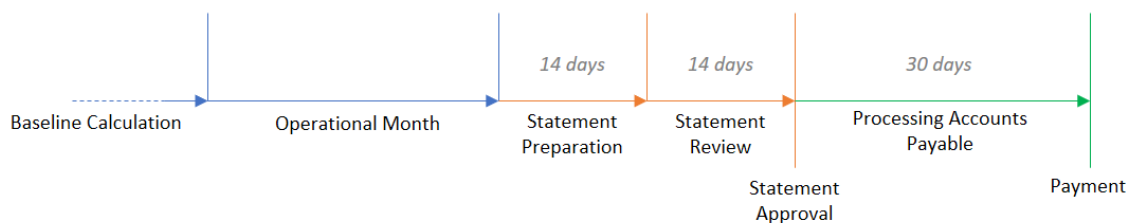


Figure 7: Billing timeline

For more detail please view our [billing guide](#).

Procurement process

Minimum requirements

The services procured are for a decrease in import or an increase in export.

The following requirements are required for participation:

- Each site must be in one of the zones detailed below
- Each site must be HH metered
- Each site must have minute by minute metering
- Each site must be able respond within 15 minutes of receipt of a dispatch signal and hold the response for at least 2 hours
- Each site must be built or have a connection agreement with final milestone before the end of the procurement
- Provision of the service must not put the participant in breach of other agreements (e.g. connection agreements...)

Sign Up process

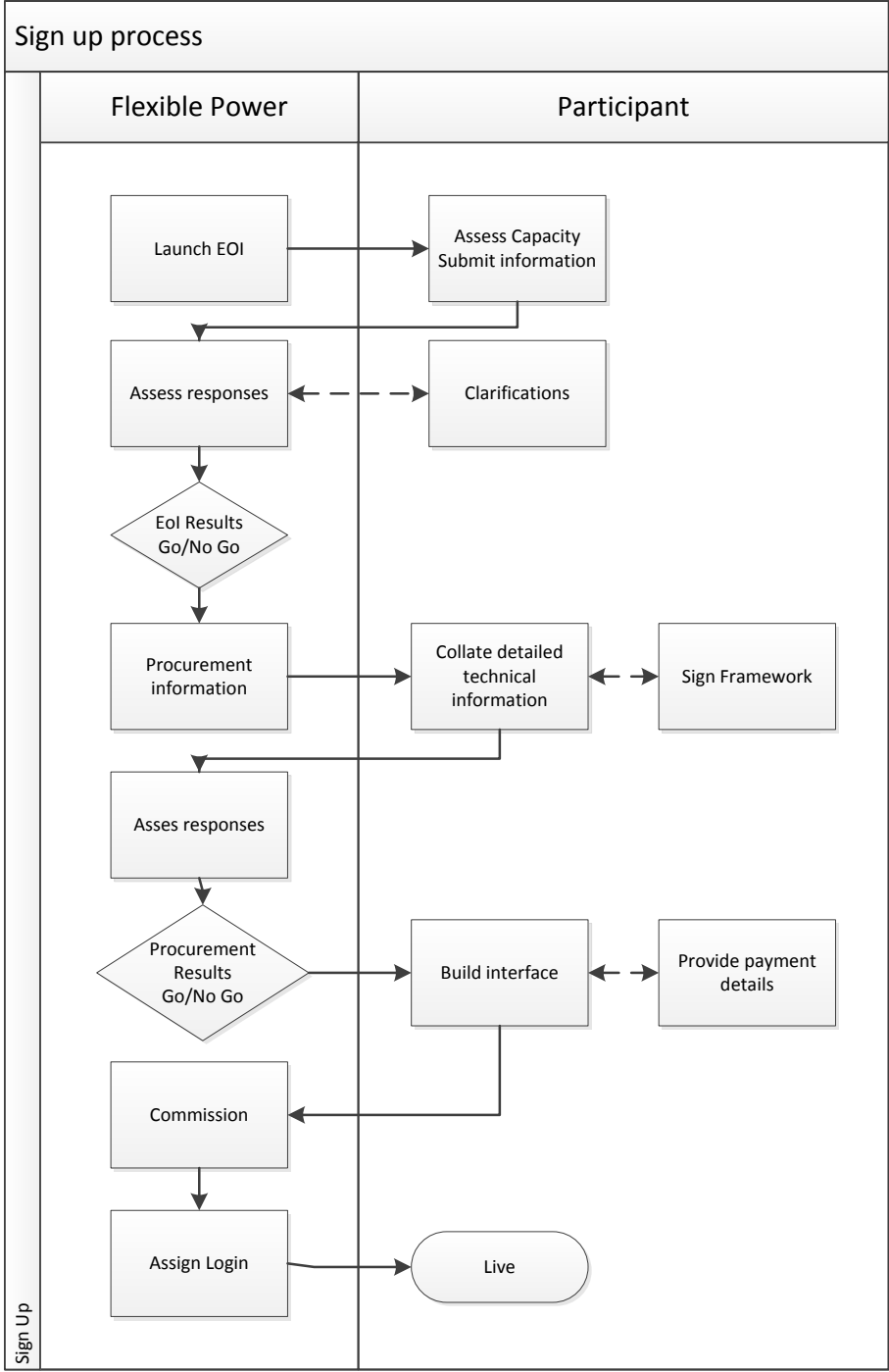


Figure 8: Sign Up Process

Timeline

Table 3: Procurement Timeline

Stage	Expected Timescale
Winter Eol opens	18/06/2018
Winter Eol closes	11/07/2018
Winter Eol results	25/07/2018
Winter procurement opens	25/07/2018
Winter procurement results	19/09/2018
Winter Go Live	31/10/18

Assessments

Where more capacity is available at the week-ahead process than is required by WPD, the following principles will be used to determine which participants to call:

- Lowest total cost: whilst the unit prices are fixed, different groups will have different costs due to parameters such as minimum run times, or the MW provided. WPD will prioritise customers with lower capacities and shorter run times.
- Most redundancy: WPD will prioritise multiple smaller sites to reduce any over procurement required
- Most reliable: WPD will prioritise the most reliable sites

The detailed methodology will be published at a later date.

Registering Interest

To register your interest please complete the [Eol Form](#) and return it to wpdflexiblepower@westernpower.co.uk by **17.00** on **11/07/2018**.

As part of the Expression of Interest phase we are also collecting information on the potential to expand the services to run over weekends. Please provide this information in Section 3 to help inform this decision.

Details of each Constraint

Each zone is detailed below. To check whether your site is in each zone please use our [online postcode checker](#).

Constraints Vs Zones

For this Expression of Interest, Flexible Power is differentiating between zones and constraints. This has been implemented to allow for apt descriptions of more complex requirements into the future.

A **constraint** is defined as the limitation on WPD's network. This could be an overloaded transformer or cable. This is the reason behind service procurement. Each constraint will have a set of requirements and a set of associated zones.

A **zone** is a geographic area defined by the connection to specific electrical assets. This allows WPD to understand the geographical and electrical impact of participants.

Sites are inherently tied to a specific zone based on their geography. However the constraints associated with the zones may vary over time as loading patterns change.

Splitting these 2 concepts allows us to be clear on the geographic boundaries of the requirements whilst allow flexibility over the changing nature of constraints. This also allows us to communicate any hierarchies between zones.

In future it may well be possible for participants in a single zone to help with multiple constraints.

Exeter City Transformer Constraint

Exeter City BSP is fed by 2 transformers. The total loading on the network is nearing the firm limit of Exeter City BSP. This means that should there be a fault on one of the transformers, at times of peak loading; the other is approaching its long-term ratings. Due to the emergency ratings of the transformers, the service can operate post-fault. In this case WPD will look to use DSR to increase operability of the network and reduce the level of network reconfiguration required.

The Exeter City Constraint covers only one Zone

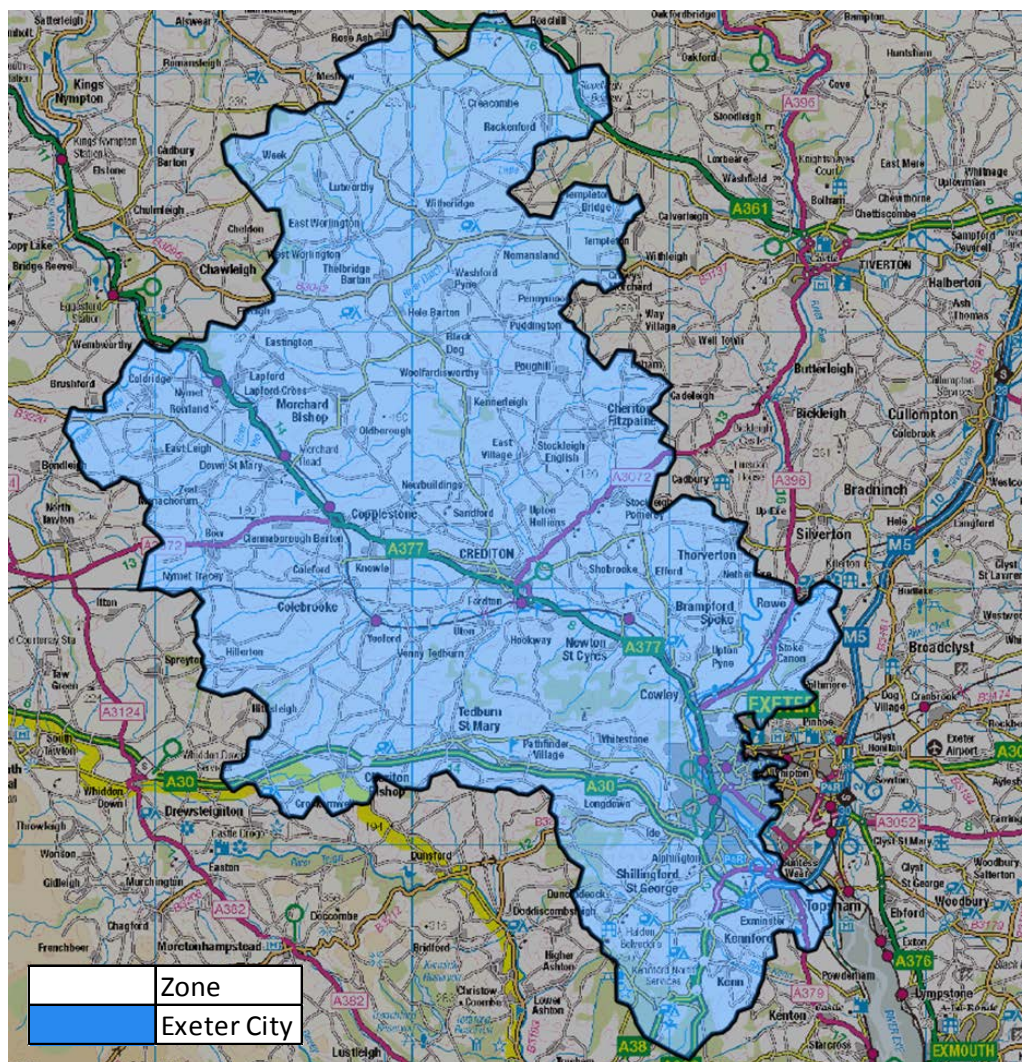


Figure 9: Exeter City Transformer Zones Map

Flexible Power will procure a **Dynamic** service to deliver services over winter (except for Sundays). A **Restore** service will also be procured.

The following table visually demonstrates WPD's expectations of availability and volume requirements. These are based on forecasts and could vary from actual usage. Please remember that this shows the potential availability, utilisation would be triggered following a fault.

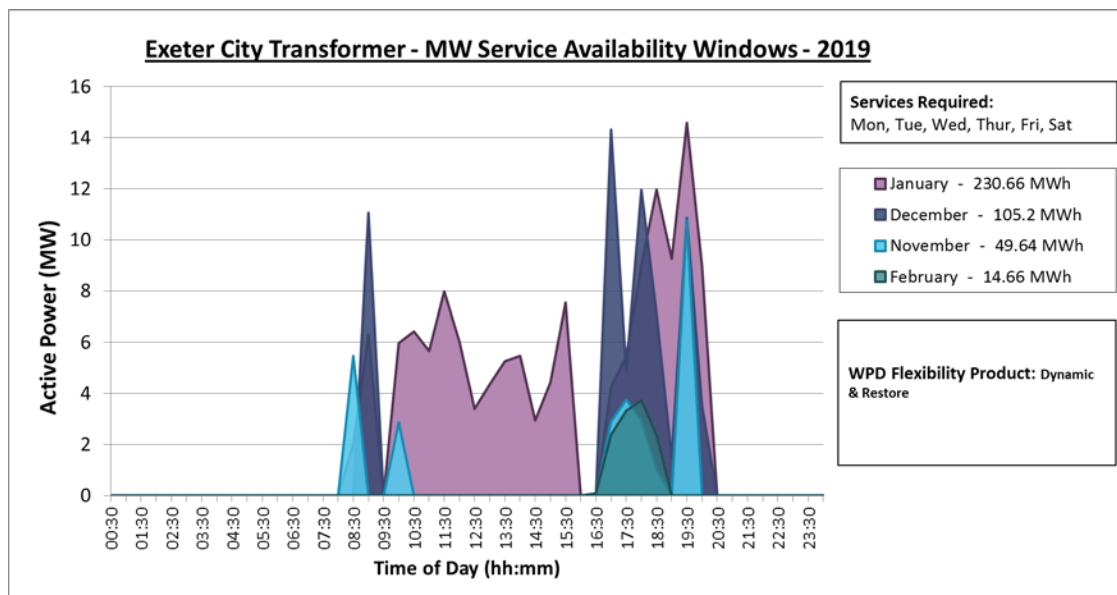


Figure 10: Exeter City Transformer Service availability windows 2019

Payment Rates

Please see the payment rates for the services.

Table 4: Payment Rates for Exeter City Transformer

	Arming	Availability	Utilisation
Dynamic	N/A	£5/MW/h	£300/MWh
Restore	N/A	N/A	£600/MWh

South Hams & Plymouth

The cable from Ernsettle to Milehouse is an integral part of the South Coast interconnected network. Future load growth in the area will trigger major reinforcement across the wider area. As such WPD is looking to procure services in the area to reduce loading on the cable.

South Hams & Plymouth covers 6 zones. The Plympton, Plymouth and Milehouse zones have a stronger response to the constraint. The Totnes, Torquay and Paignton zones have a lesser response. The latter zones have a sensitivity factor of 50% with respect to first 3. As such availability in Plympton, Plymouth and Milehouse will generally be called ahead of Totnes, Torquay and Paignton.

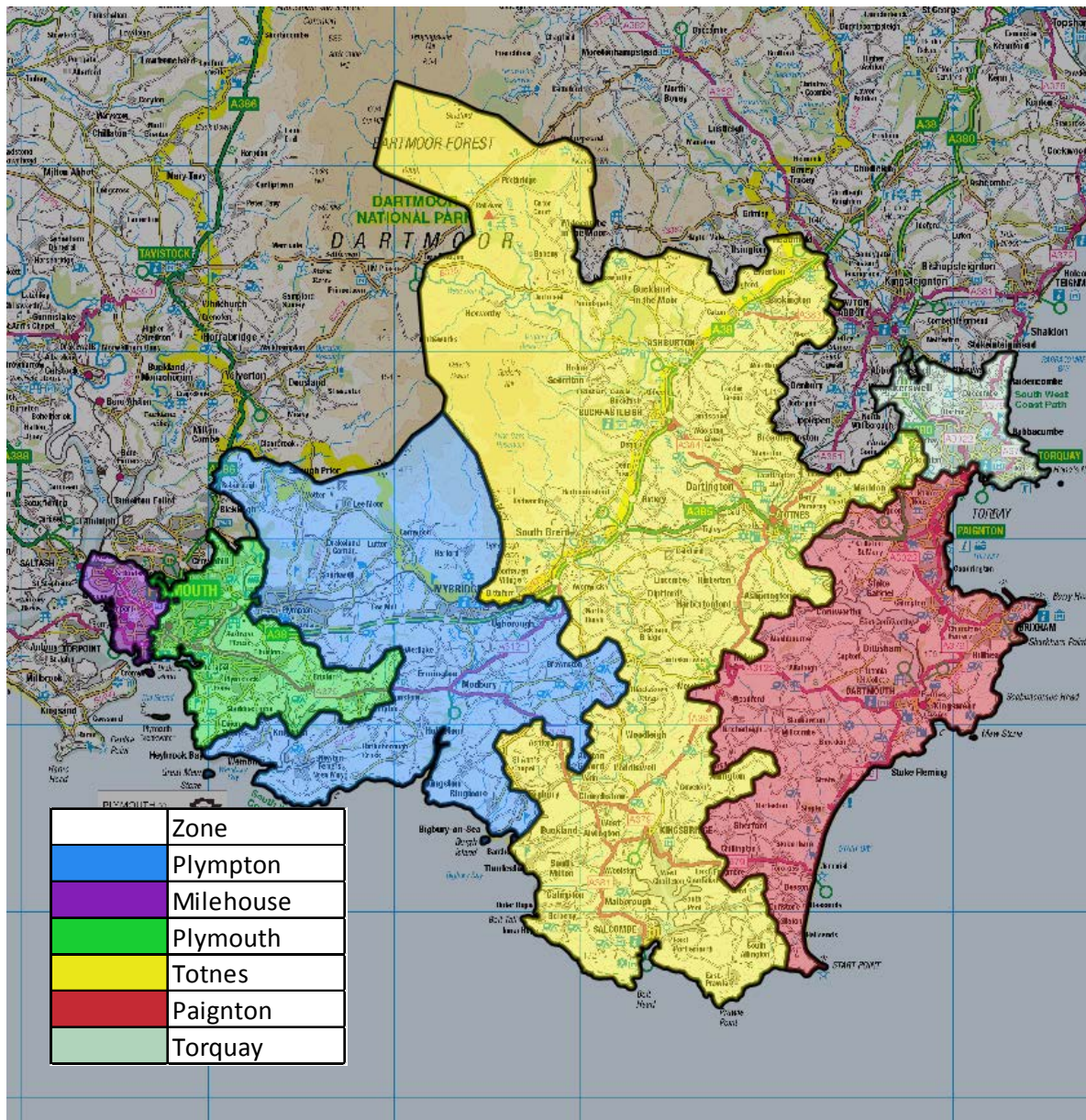


Figure 11: South Hams & Plymouth zones map

WPD will look to operate a pre-fault service, however due to the complexity of flows in the network a **Secure** service is not appropriate. As such a **Dynamic** service will procure summer availability at the week ahead stage with utilisation determined closer to real time. This will only be required during planned outages on the WPD or National Grid's network. A **Restore** service will also be procured.

Due to the interconnected nature of the network the constraint has been split into 2 constraints to reflect the relative effects of response on the network.

The following table visually demonstrates WPD's expectations of availability and volume requirements. These are based on forecasts and could vary from actual usage. Please note that this network is heavily impacted by the running arrangements of certain key customers, these values consider the worst-case scenarios. Also please remember that this shows the potential availability, utilisation would be triggered following a fault.

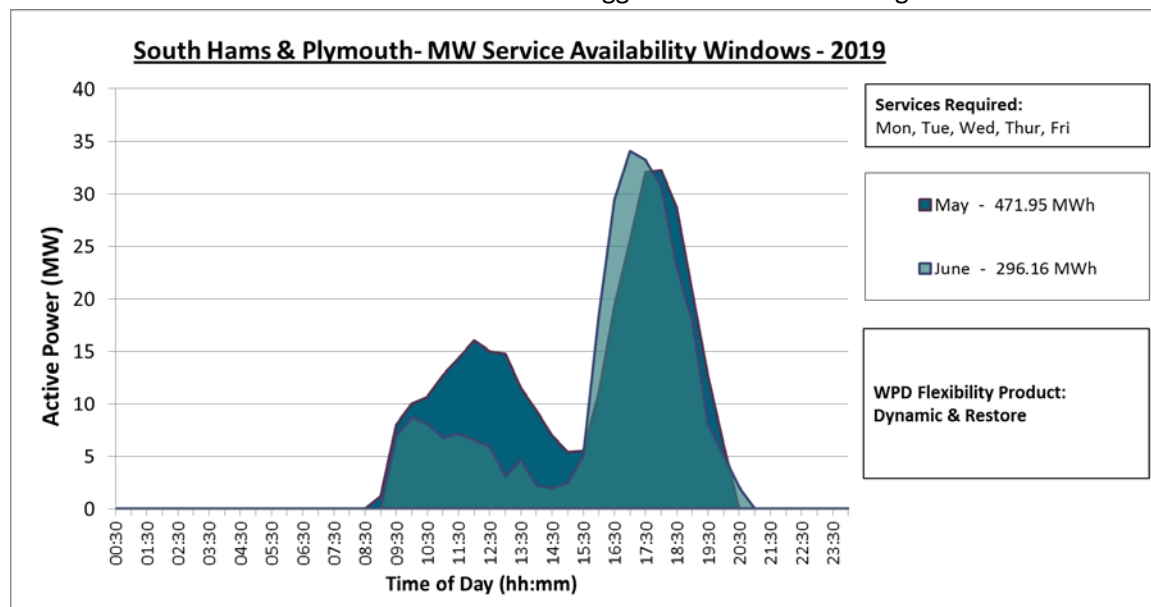


Figure 13: South Hams & Plymouth availability windows 2019

Payment Rates

Please see the payment rates for the services.

Figure 14: Payment Rates for South Hams & Plymouth

	Arming	Availability	Utilisation
Dynamic	N/A	£5/MW/h	£300/MWh
Restore	N/A	N/A	£600/MWh

Rugeley

Rugeley is fed by 2 Supergrid Transformers. The total loading on the network is nearing the firm limits of the site. This means that should there be a fault on one of the transformers, at times of peak loading; the other is approaching its limits. WPD is looking to procure services in the area to reduce the switching required to maintain a compliant network and increase operability.

Rugeley covers 6 zones, responses in each zone is equally valuable to WPD.

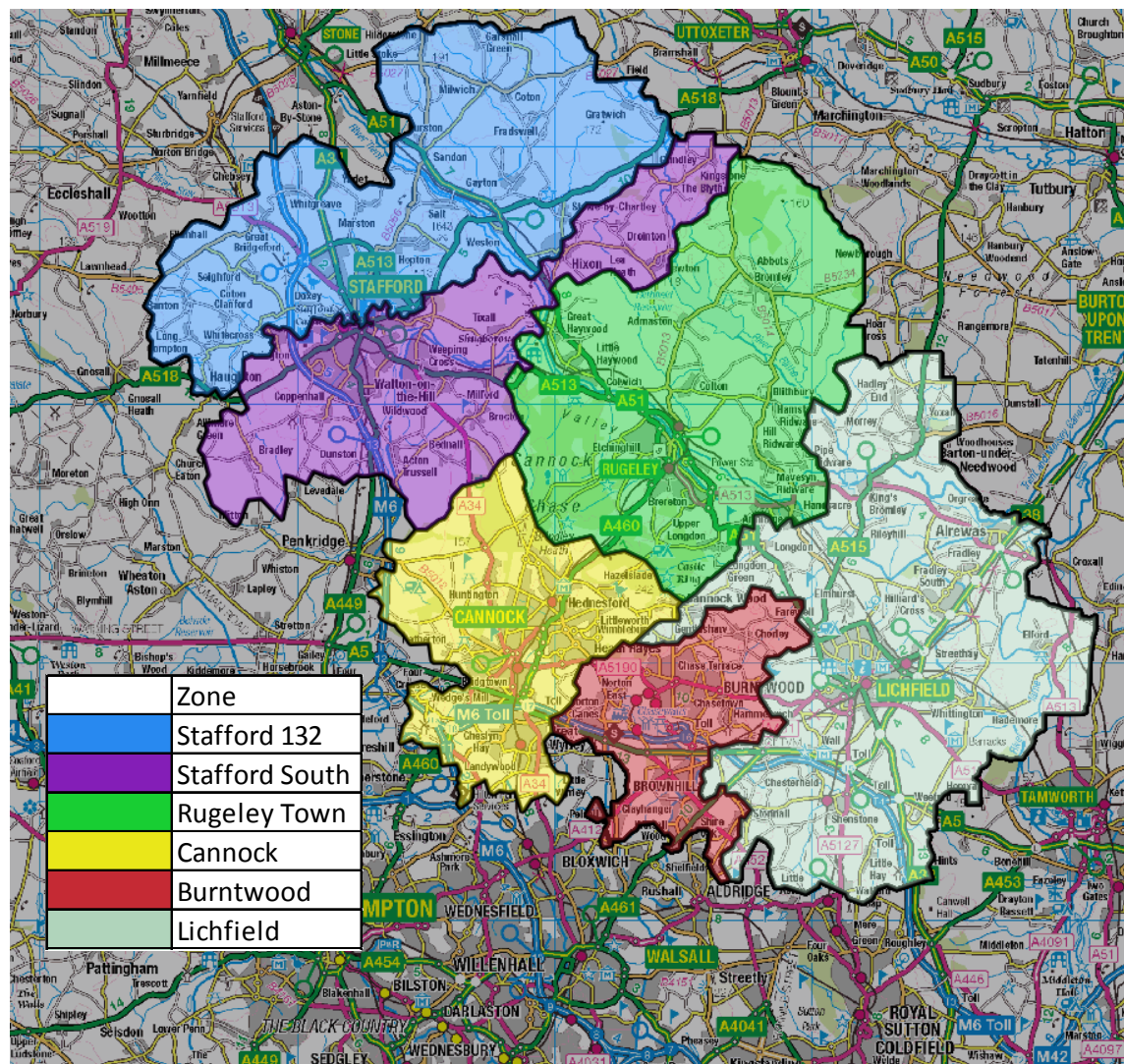
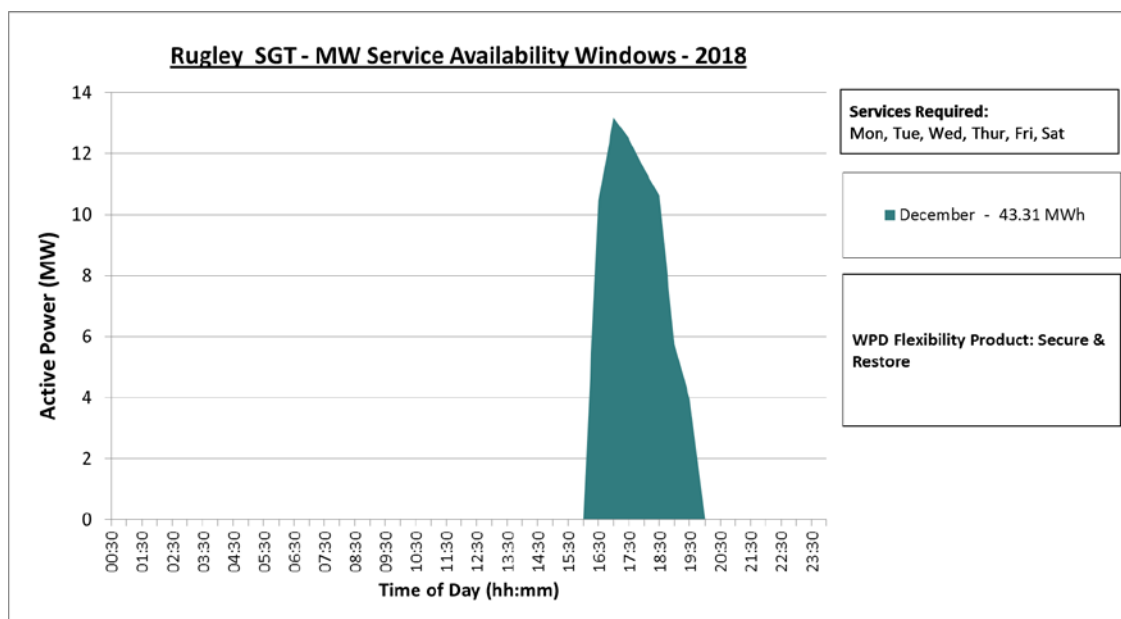


Figure 15: Rugeley zones map

Flexible Power will procure a **Secure** service to deliver services over winter. A **Restore** service will also be procured.

The following table visually demonstrates WPD's expectations of availability and volume requirements. These are based on forecasts and could vary from actual usage.



Payment Rates

Figure 16: Rugeley service availability windows 2018

Table 5: Payment Rates for Rugeley

	Arming	Availability	Utilisation
Secure	£75/MW/h	N/A	£150/MWh
Restore	N/A	N/A	£600/MWh

Northampton Circuits

The wider Northampton Group is fed by two 132kV circuits from Grendon GSP. If a fault were to occur on one circuit following a planned outage of the other, or a double fault were to occur, WPD would not be able to recover the whole group. Whilst the group is compliant to design standards, flexibility will allow more load to be recovered more quickly.

The Northampton Circuits constraint covers 3 zones, these will be called as the group is restored.

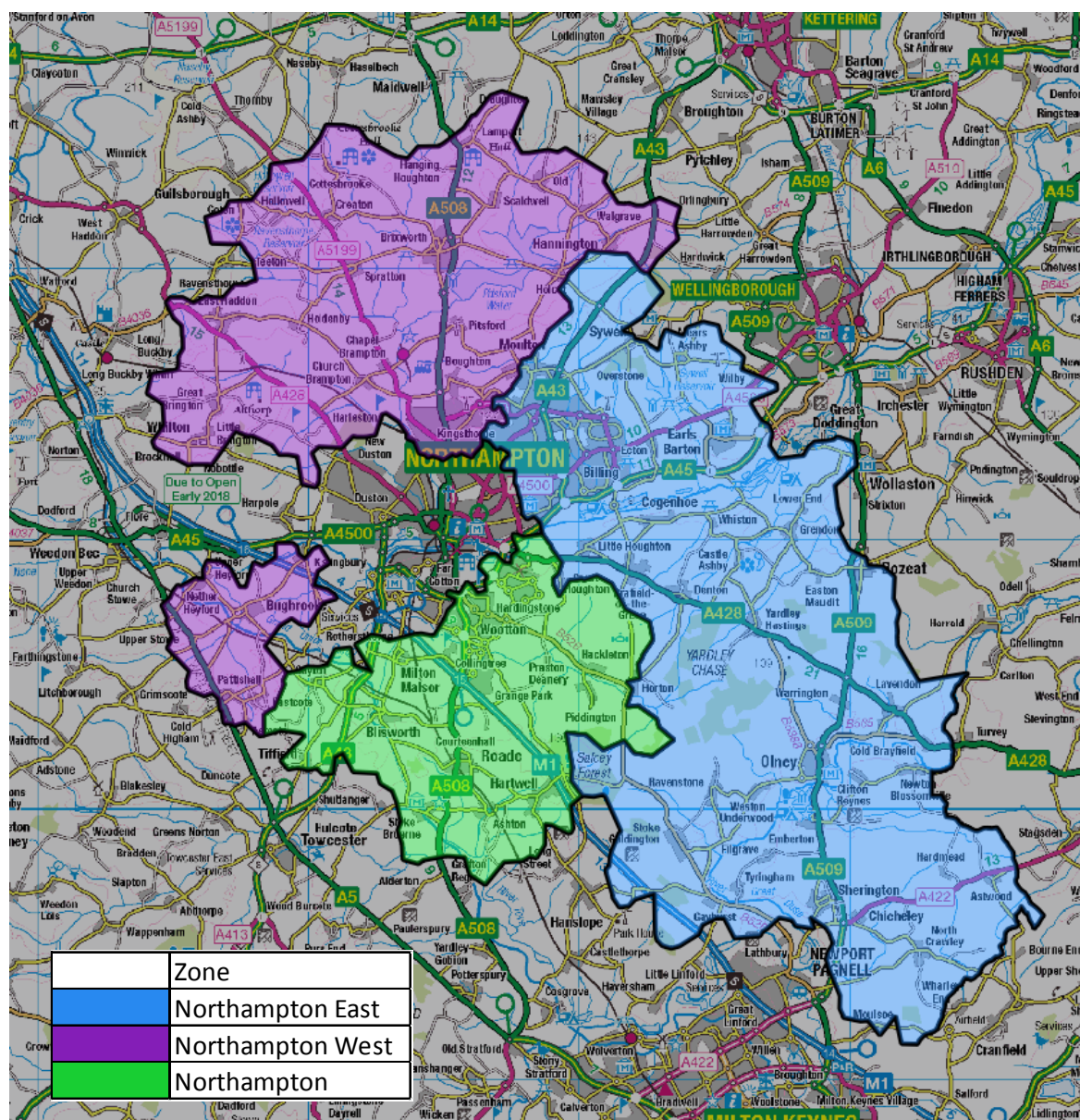


Figure 17: Northampton Circuits zones map

WPD will look to only procure a **Restore** service in the area. This is of particular interest during planned outages on the circuits, however could be required anytime in the year.

The Northampton Constraint covers 3 zones.

There are no firm MW of MWh requirements for this zone.

Payment Rates

Please see the payment rates for the services.

Table 6: Payment Rates for Northampton

	Arming	Availability	Utilisation
Restore	N/A	N/A	£600/MWh

Beaumont Leys

Beaumont Leys is a primary substation in the Leicester area Which has reached its firm capacity. Plans are in place to reinforce the network by the end of 2019. By procuring a secure service, WPD will increase the operability of the network by reducing the network reconfiguration required to manage the network until the reinforcement work has been carried out.

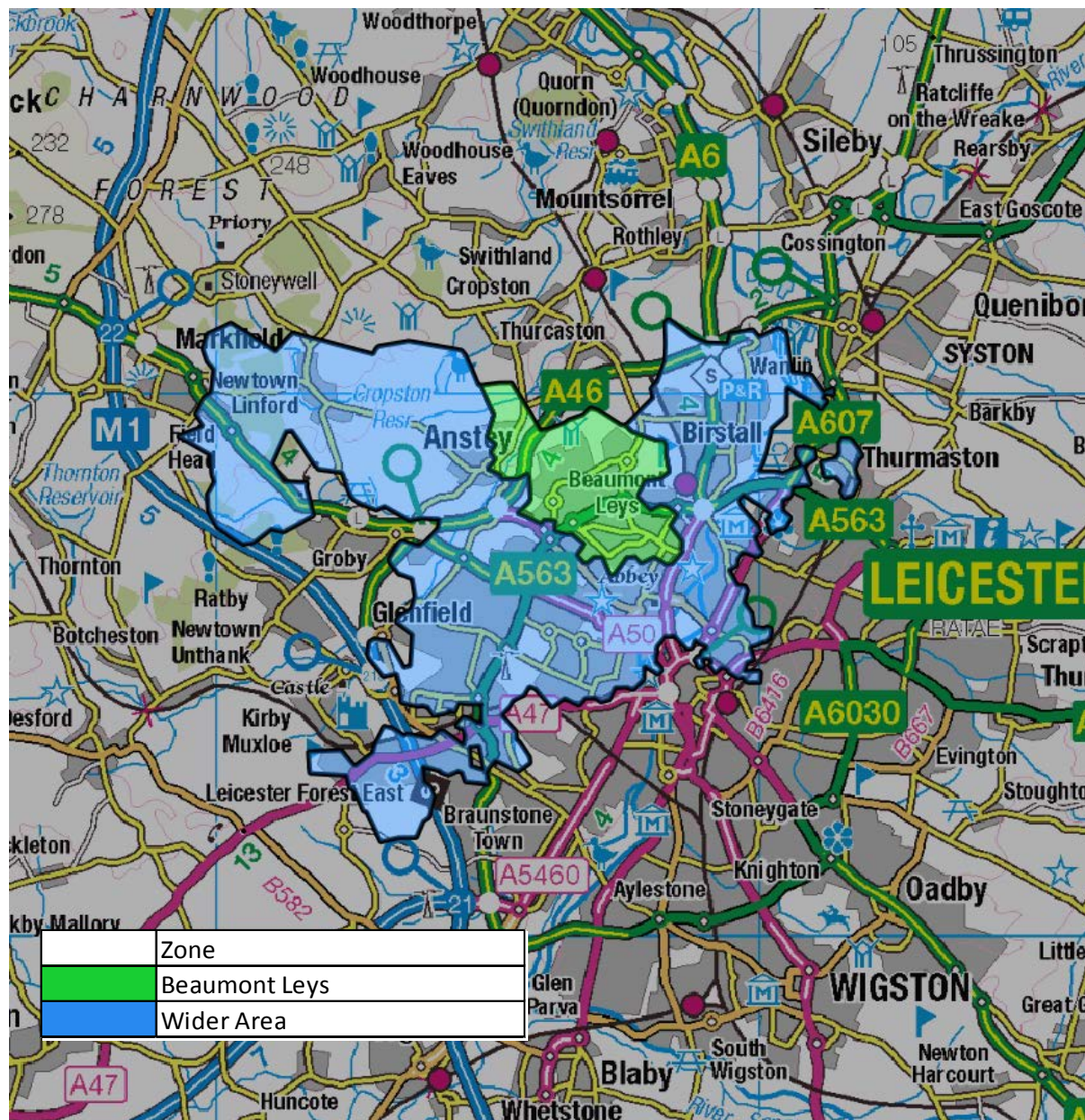


Figure 18: Beaumont Leys zones map

WPD is looking to procure a **Secure** service for use over the winter period. The Beaumont Leys constraint covers 2 zones. Response in the core Beaumont Leys zone will be prioritised over response in the wider area zone. Respondents in the wider area will need to be assessed on a case by case basis to assess the potential effect of their response on the constraint. A **Restore** service will also be procured.

The following table visually demonstrates WPD's expectations of availability and volume requirements. These are based on forecasts and could vary from actual

usage.

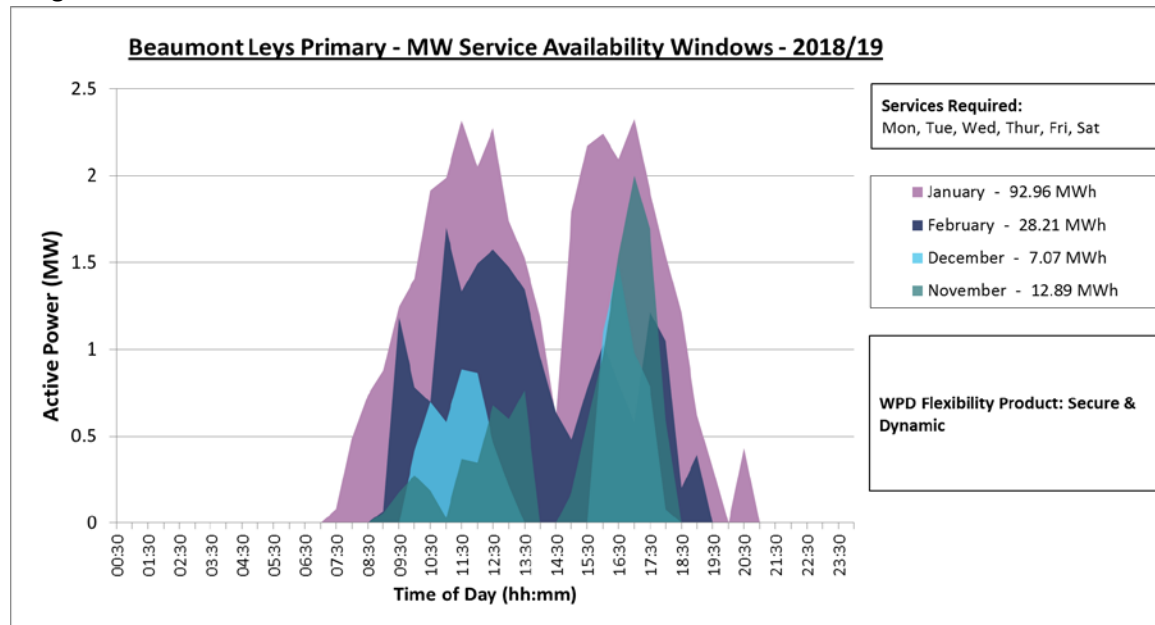


Figure 19: Beaumont Leys service availability windows 2018-2019

Payment Rates

Please see the payment rates for the services.

Table 7: Payment rates for Beaumont Leys

	Arming	Availability	Utilisation
Secure	£118/MW/h	N/A	£150/MWh
Restore	N/A	N/A	£600/MWh

How to respond

Please register your interest in the CMZ products by completing the [Eol Form](#) on the website by **17.00 on 11/07/2018**.

Flexible Power will use these responses to determine the viability of the zones and select the zones to take to full procurement. The Eol is purely informational and does not commit either party to service provision.

We are also collecting information on the potential to expand the existing services to run over weekends. Please provide this information in Section 3 to help inform this decision.

For more information please contact the Flexible Power team: WPDFlexiblePower@westernpower.co.uk.