



Demand Diversification Services

**Dynamic Congestion Response
Detailed Design**



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1. Background and Dynamic Congestion Response

Load Managed Areas (LMAs) were introduced under the Distribution Connection and Use of System Agreement regulations to provide Distribution Network Operators (DNOs) with a means to diversify demand to avoid, reduce or defer the need for network reinforcement as electric storage heating demand increased significantly during the 1980s. Every postcode in the Scottish Hydro-Electric Power Distribution (SHEPD) area in the north of Scotland is categorised as an LMA.

The use of storage heating has reduced substantially but the significant increase in the number of domestic Low Carbon Technology (LCT) devices (primarily heat pumps, electric vehicle chargers and domestic batteries) as GB decarbonises domestic heat and electricity creates the same demand diversification issue. If unmanaged, LCTs could be switched on at the same time and if that occurred at peak times, it could affect the level of demand diversification on DNO assets (Assets) and risk overloading them. The innovative aspect of this project is to consider new services that will deliver enduring and reliable demand diversification on the distribution network.

SSEN, in consultation with stakeholders, identified two potential services that incentivise flexible loads to be scheduled to reduce peak demand on the network. These are referred to as Demand Diversification Services, or DDS for short. This paper defines one DDS, Dynamic Congestion Response (DCR) which incentivises a Flexibility Services Provider (FSP) to respond to real-time network demand signals using the demand from consumers with flexible loads (Schedulable Demand). There is an incentive to encourage increasing demand during Settlement Periods (SPs) with a low demand and reduce demand during SPs with a high demand. However, this may not be the only solution. Others, such as Vehicle to Grid, could also be used to reduce the peak demand of a portfolio. DCR should, with the correct incentives, provide a level of demand diversification that reduces the risk to Assets by keeping aggregate demand within network capacity.

1.1. Document purpose

The purpose of this document is to:

- Define DCR for the Commercial Trials.
- Provide guidance on potential changes to the SSEN Service Terms aligned to Flexibility Services Agreement (FSA) to create a bespoke Trial FSA for the Commercial Trials and guidance for a Business as Usual (BaU) service. *[Internal version only]*
- Define DCR for BaU and potential iterations to existing Flexibility Procurement and Dispatch processes. *[Internal version only]*

1.2. Table of defined DDS terms

Term	Definition
AC	Allocated Capacity, one of two enduring DDS'.
AC Price	The price paid in each SP for the Outturn FSP Demand using the AC Price Table.
Advanced AC	The advanced version of the AC service, where there is an incentive for an FSP to improve the Initial Diversification Factor towards the Maximum Diversification Factor.
Advanced AC Price Table	A table detailing the AC Price for the Advanced AC service, comprising a variable payment for improving the Diversification Factor.

Term	Definition
Asset Capacity	The nameplate rating of an Asset, expressed in kW and assuming unity power factor.
Asset Demand Forecast	The sum of all FSP Demand Forecasts and other demand for an Asset.
Asset Maximum Demand	The maximum SP demand on an Asset in the Historic Asset Demand or during a trial period.
Assets	Primary substations (33kV / 11kV) and secondary substations (11kV / 400V) including associated feeders (overhead lines or underground cables). For the purposes of the Commercial Trials, this could be a physical asset, a Synthetic Asset, or a Virtual Asset.
Base Demand	Consumer demand that is non-schedulable, i.e. loads that cannot be controlled and exist in every home, such as electric ovens, kettles, and other domestic devices. All homes have one or more of these loads.
Basic AC	The basic version of the AC service where each FSP is allocated an FSP AC based on the maximum demand in the Historic FSP Demand.
Basic AC Price Table	<p>A table detailing the AC Price under two circumstances:</p> <ul style="list-style-type: none"> • a flat payment for each SP when demand is at or below AC. • a reduction of a proportion of the payment for each SP when demand exceeds the AC.
BaU	Business as Usual.
Call Off	A subcontracted Call Off from the contract awarded under the Trial FSA with specific terms for the delivery of the AC or DCR service that includes details of the (non-geographic) location, duration, and Asset Capacity. The Call Off process includes a Call Off bid issued by SSEN and a signed Call Off.
Charge Statement	<p>An FSP-specific summary covering each SP in the previous trial period (as defined in the Trial Design document).</p> <p>For Allocated Capacity, the Charge Statement details the Outturn FSP Demand, relevant price for the Basic AC service and (if applicable) the Advanced AC service, and the calculated sum payable to the FSP.</p> <p>For Dynamic Congestion Response the Charge Statement details the Outturn FSP Demand, SP Capacity Factor (or, if applicable, the FSP-Specific SP Capacity Factor), relevant DCR Price, and the calculated sum payable to the FSP.</p>
Commercial Trials	A series of tests undertaken during Field Trials or Virtual Networks Trials over several trial periods to achieve the Project Objectives.
Consumer	A domestic or small to medium business user of electricity.
Customer	A Consumer that receives a contracted service from an FSP.
DCR	Dynamic Congestion Response, one of two enduring DDS'.
DCR Price	Price payable per kWh using the DCR Price Table and based on the SP Capacity Factor.
DCR Price Table	A table detailing the DCR Price that applies to each SP based on the SP Capacity Factor calculated using the Outturn Asset Demand (or, if applicable, the FSP Specific SP Capacity Factor).

Term	Definition
DDS	Demand Diversification Service, a new category of enduring flexibility services.
Demand Forecast	A forecast of the FSP demand at an Asset for a defined Period.
Diversification Factor	<p>A measure of the diversity of the demand supplied by an FSP over a given Period. It is calculated as</p> $\frac{\text{total FSP demand on an Asset in Period}}{\text{maximum demand in any SP in Period} \times \text{number of SPs in Period}} \times 100\%$ <p>There are three Diversification Factors used in the Advanced AC service:</p> <ul style="list-style-type: none"> • Maximum Diversification Factor, 80%, the maximum useful diversity for an Asset. • Initial Diversification Factor where the FSP portfolio demand is determined using Historic FSP Demand. This provides a benchmark for Diversification Factor improvement. • Period Diversification Factor where the FSP portfolio demand is determined using Outturn FSP Demand. This is used to determine any Diversification Factor improvement.
DNO	Distribution Network Operator, responsible for delivering electricity to Consumers and businesses.
ENA	Energy Networks Association.
ESCLL	Energy System Catapult Living Lab, a partner in the project with volunteers who have a combination of one or more of Schedulable Demand, flexible demand, and Base Demand that may participate in the Commercial Trials or act as reference demand.
Field Trials	A series of tests that utilise FSP Customer Schedulable Demand to address the Project Objectives over several trial periods to determine the viability of the DDS'.
Flexibility Markets Team	An internal SSEN team, responsible for the procurement of flexibility services on the distribution network.
Flexibility Solutions Team	An internal SSEN team, responsible for the operation of procured flexibility services to meet the needs of the network.
FSA	Flexibility Services Agreement, an ENA developed contract for the provision of flexibility services.
FSP	Flexibility Services Provider, an aggregator, supplier, or other organisation that controls Schedulable Demand for a portfolio of Customers comprising Schedulable Demand and potentially non-schedulable Base Demand.
FSP AC	The level of AC allocated to an FSP.
FSP Maximum Demand	The FSP portfolio demand for the same SP when the Asset Maximum Demand occurs.
Historic Asset Demand	Historic demand for an Asset that includes Schedulable Demand and Base Demand (if the FSP is a supplier) and enables FSPs to maximise the use of Schedulable Demand.
Historic FSP Demand	Historic data provided by the FSP for all Customers for the same period as the Commercial Trials for the previous year or other period, as agreed.

Term	Definition
LCT	Low Carbon Technology devices or loads, primarily heat pumps, electric vehicle chargers and domestic batteries.
Live Asset Demand	A real-time data feed of the demand on an Asset. For the purposes of the Commercial trials, this is a demand profile that represents the live demand profile for, or a revision to, that profile for an Asset over a Period.
LMA	Load Managed Area, an area established under the Distribution Connection and Use of System Agreement regulations to provide DNOs with a means to diversify demand in a network area.
LMA Team	The SSEN project team (including Baringa partners) responsible for the future of LMAs, including Asset analysis, and the trialling of innovative solutions to resolve constrained Assets.
Outturn Asset Demand	The aggregate of all Outturn FSP Demand and other demand at an Asset for each SP in the previous Period.
Outturn FSP Demand	The aggregate FSP demand of the participating Customers at an Asset for each SP in the previous Period (as defined in the Trial Design document). The project assumption is that Consumer meter will measure the net demand which, if there is one or more generating source at the premises, e.g. battery, EV, or rooftop solar, the meter will measure negative demand.
Period	The duration of the delivery of the DDS service.
PNDC	Power Network Development Centre, a project partner who will create rural, semi-rural and urban network configurations, conduct power system analysis for Commercial Trials, and support project reporting.
Project Objectives	The project objectives to be considered during Trial Design and project delivery.
Project Team	The Project Team comprises staff from the LMA Team, Flexibility Markets Team, Flexibility Solutions Team, ESCLL and PNDC.
Reserve Asset Capacity	The portion of Asset Capacity that provides for growth during SP demand peaks.
Schedulable Demand	LCTs, storage heating or other electrical devices that are controlled directly or indirectly by an FSP (in the case of the Field Trials) or by the Project Team (in the case of the Virtual Networks Trials).
SHEPD	Scottish Hydro-Electric Power Distribution, SSEN's northern licence area and the distribution area in which all LMAs are located.
SP	Settlement Period, the thirty minutes that starts at the spot time occurring at the beginning of the half hour and ends at the spot time occurring exactly thirty minutes later. The first Settlement Period of a day begins at the spot time 00:00 of the day and ends at the spot time of 00:30 of the same day.
SP Capacity Factor	<p>The SP Capacity Factor is a measure of the mean utilisation of an Asset over a single SP. It is calculated using the following formula with the result expressed as a percentage:</p> $\frac{\text{Net measured demand on an Asset in a SP} \times 2}{\text{Asset Capacity}} \times 100\%$

Term	Definition
	<p>The SP Capacity Factor can also be calculated as an average for the year, for the peak SP demand in the year, and for FSPs. These are calculated as follows:</p> <p>Average SP Capacity Factor</p> $\frac{\text{Net measured annual demand on an Asset SP}}{\text{Asset Capacity} \times 8760 \text{ hours}} \times 100\%$ <p>Maximum SP Capacity Factor</p> $\frac{\text{Maximum net measured demand on an Asset in an SP} \times 2}{\text{Asset Capacity}} \times 100\%$ <p>FSP-Specific SP Capacity Factor</p> <p>Calculated using the process outlined in section 1.3.6, in the sub-section entitled “Individual FSP Risk”.</p>
SSEN	Scottish and Southern Electricity Networks, the trading name of SHEPD and other organisations.
SSEN Active Power Services	Flexibility services procured by SSEN using a call off agreement that provide the ability to manage the load of an Asset at certain times.
Synthetic Asset	An Asset created for modelling Outturn FSP Demand collected during the Field Trials to understand how the delivery of AC affected the Asset.
Trial Design	The design of the Commercial Trials to ensure it delivers the Project Objectives and is consistent with this document.
Trial FSA	The overarching Flexibility Services Agreement that governs the contractual terms for the delivery of DDS and used for the Commercial Trials. It is based on the Standard Agreement for Flexibility Service v3 and SSEN Service Terms aligned to FSA (Flexible Power) v4 (dated July 2024), with the liabilities set to zero for the Commercial Trials
Virtual Asset	An Asset created for modelling Outturn FSP Demand data collected from ESCLL volunteers during the Virtual Networks Trials to understand how the delivery of the AC service could affect a simulated electricity network under a variety of conditions.
Virtual Networks Trials	A series of tests that aggregates data from ESCLL volunteers on virtual networks designed by PNDC to address the Project Objectives over several trial periods to determine the viability of the AC service.

1.3. DCR Service Description

SSEN has Assets where peak demand is reaching a level of concern and, if demand increases further, they may have to reinforce the Asset. Under the Dynamic Congestion Response (DCR) Demand Diversification Service, SSEN will incentivise FSPs to reschedule the demand within their portfolio from peak hours to non-peak hours.

SSEN expects the DCR service to provide two benefits:

- reduce the maximum demand on an Asset, deferring the need to reinforce, and

- improve the utilisation of an Asset, enabling more connections without the need to reinforce.

Both benefits can be achieved from loads with Schedulable Demand, such as electric vehicles, storage heaters, heat pumps, and electric batteries, which can be rescheduled to improve the diversification of demand on an Asset.

The premise of DCR is that FSPs will optimise the scheduling of their portfolio against a DCR Price Table that incentivises the scheduling of demand away from peak demand times and towards times of low utilisation. The DCR Price sets the FSP compensation and will be based on the aggregate (of all FSPs and non-FSPs) Outturn Asset Demand for each settlement period (SP). To enable FSPs to forecast and optimise, SSEN will provide Historic Asset Demand data for forecasting and access to real-time measured demand data to re-optimize in times when demand on the Asset is not within historical norms.

The following sections describe the key concepts behind the DCR Service.

1.3.1. SP Capacity Factor

The utilisation of an Asset within a half-hour settlement period will be referred to as the SP Capacity Factor, and is calculated as follows:

$$\frac{\text{Net measured demand on an Asset in a SP (in kWh per SP)} * 2 \times 100\%}{\text{Asset Capacity (in kW)}}$$

As there is no other way of collecting aggregate demand, it will be necessary to calculate the SP Capacity Factors from measured data captured by monitoring equipment.

Over a day, a high variance in the SP Capacity Factors indicates that demand diversification on the asset could be improved, see Figure 1(a). However, low variance and a consistently high SP Capacity Factor, see Figure 1(b), is also an issue as it signifies that there is little headroom for growth or to cope with unexpected spikes in peak demand.

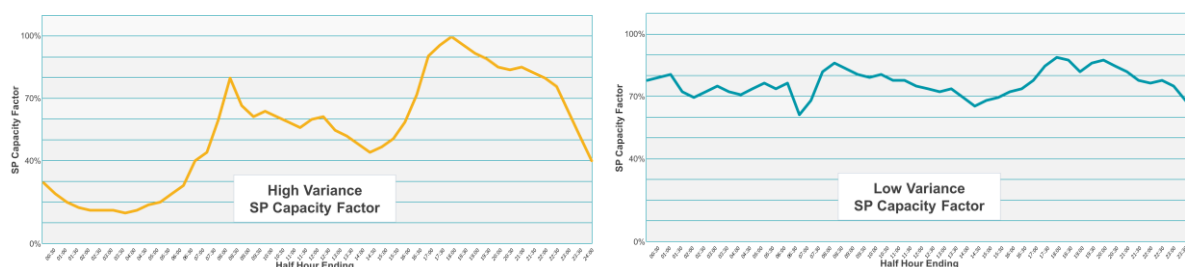


Figure 1 (a) High Variance SP Capacity Factor and (b) Low Variance SP Capacity Factor

It is difficult to be prescriptive about a target SP Capacity Factor, as each Asset supports a variety of loads. However, there is an Ideal Demand Zone (see Figure 2) for an Asset, where there is sufficient headroom for peak demand growth from new connections but no long times of the day when the asset is underutilised.

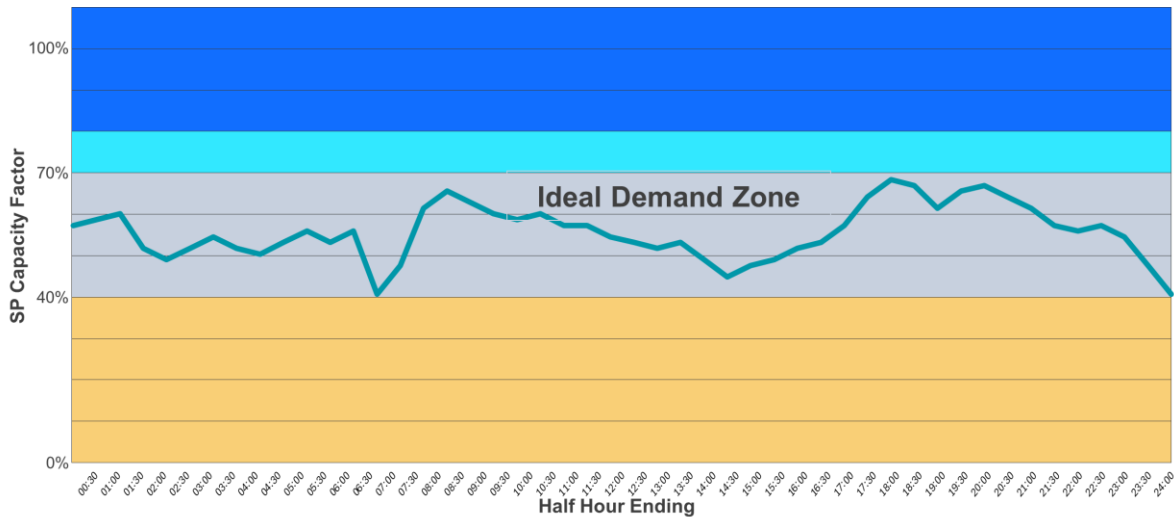


Figure 2 Ideal Demand Zone

1.3.2. The DCR Price Table

The DCR Price Table details the various levels of payments that will be made for different ranges of SP Capacity Factors. The intention is to have the same DCR Price Table apply to all Assets where DCR is being introduced as, until the Commercial Trials prove otherwise, it is assumed the administrative burden of calculating and maintaining individual DCR Price Tables will be too high.

An indicative DCR Price Table is provided in **Error! Reference source not found.** (the colour bands correspond to those in Figure 2**Error! Reference source not found.**., there could be a different number of DCR Price bands once the service is introduced into BaU).

Table 1: Indicative DCR Price Table

SP Capacity Factor		Indicative DCR Price
Zone	Range	
1	more than 110.1%	-£0.50 / kWh
	100.1-110%	-£0.05 / kWh
	90.1-100%	-£0.01 / kWh
2	80.1-90%	£0.00 / kWh
3	70.1-80%	£0.01 / kWh
	50.1-70%	£0.02 / kWh
	40.1-50%	£0.01 / kWh
4	less than 40.1%	£0.00 / kWh

The DCR service is designed to deliver constantly during the term of the service. If the SP Capacity Factor is 100% or below, the increase or reduction of the payment in each SP is relatively small, resulting in many small payments, and is expected to be significantly lower than the wholesale electricity price paid by supplier FSPs. However, there is likely to be a good correlation between SP Capacity Factor and wholesale electricity prices (lower overnight and higher at peak times).

The very high DCR Price when the SP Capacity Factor is over [110]% acts as a disincentive to placing demand in an SP with a high SP Capacity Factor and should result in the intended outcomes. Further, for suppliers it could represent more than the margin per kWh of electricity supplied. However, the desire for FSPs to reduce wholesale energy costs means SPs with a low wholesale price would attract a high level of Schedulable Demand and result in a high SP Capacity Factor which could result in a significant reduction in DCR payments.

1.3.3. Determining the FSP Payment

The steps to determine the price to be paid for the DCR service in each SP are outlined below.

Illustrative examples are shown in Figure 3 and Figure 4, and the resulting indicative Charge Statements are shown in Table 2 and Table 3. Each of these has **Error! Reference source not found**.three zones:

- **Zone 1 applies when the SP Capacity Factor is more than 90.1% of the Asset Capacity** (mid blue area); an FSP's accumulated incentive payment is reduced for each SP when the SP Capacity Factor is in this zone and there is a greater reduction for an SP Capacity Factor above 100% due to the potential for Asset damage or loss of supply.
- **Zone 2 applies when the SP Capacity Factor is between 80.1% and 90% of the Asset Capacity** (light blue area); an FSP's accumulated incentive payment is unchanged for each SP when the SP Capacity Factor is in this zone.
- **Zone 3 applies when the SP Capacity Factor is between 40.1% and 80% of the Asset Capacity** (light grey area); an FSP's accumulated incentive payments are increased for each SP when the SP Capacity Factor is this zone.
- **Zone 4 applies when the SP Capacity Factor is less than 40.1% of the Asset Capacity** (light mustard area); an FSP's accumulated incentive payments is unchanged for each SP when the SP Capacity Factor is this zone.

Example 1 - A High Variation Day

In this example, the demand profile demonstrates the variability of an Asset that has a mix of loads from domestic and small and medium enterprise consumers. There is a defined overnight trough, a morning peak, an afternoon trough, and a tea-time peak that slowly reduces as the evening progresses.

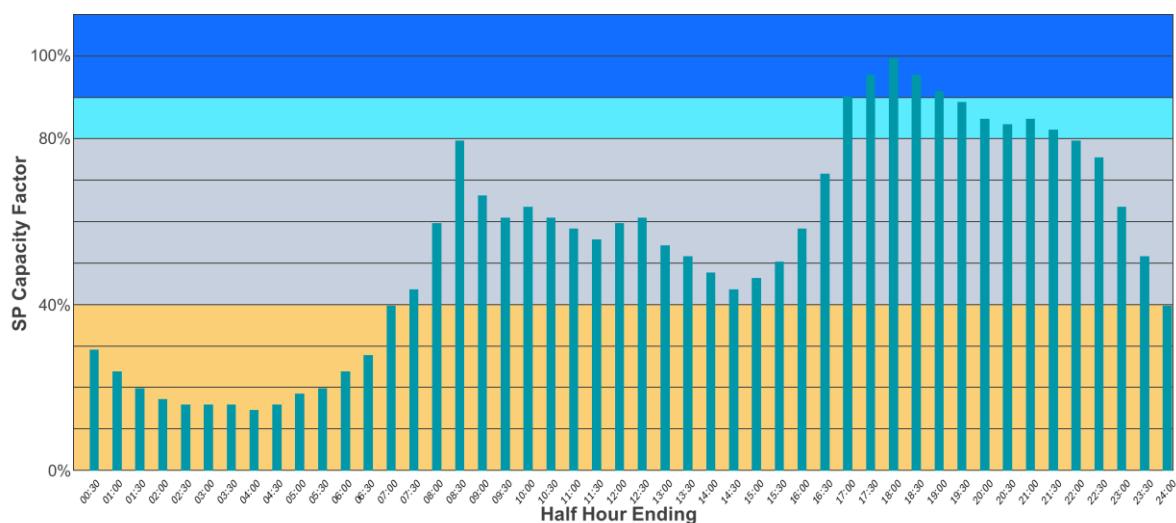


Figure 3: illustrative SP Capacity Factor for a high variation day

Table 2: Indicative Payment for Figure 3

SP Capacity Factor		Indicative DCR Price	No. of SPs	Total Price Paid
Zone	Range			
1	more than 110.1%	-£0.50 / SP	0	-£0.00
	100.1-110%	-£0.05 / SP	0	-£0.00
	90.1-100%	-£0.01 / SP	4	-£0.04
2	80.1-90%	£0.00 / SP	6	£0.00
3	70.1-80%	£0.01 / SP	4	£0.04
	50.1-70%	£0.02 / SP	14	£0.28
	40.1-50%	£0.01 / SP	5	£0.05
4	less than 40.1%	£0.00 / SP	15	£0.00
		Totals	48	£0.33

Example 2 - A Low Variation Day

In this example, the demand profile demonstrates the effective use of Schedulable Demand to dramatically change the demand variability of an Asset. The overnight demand has increased and, whilst there is still a defined morning peak, an afternoon trough and a tea-time peak that slowly reduces as the evening progresses, the demand is substantially reduced.

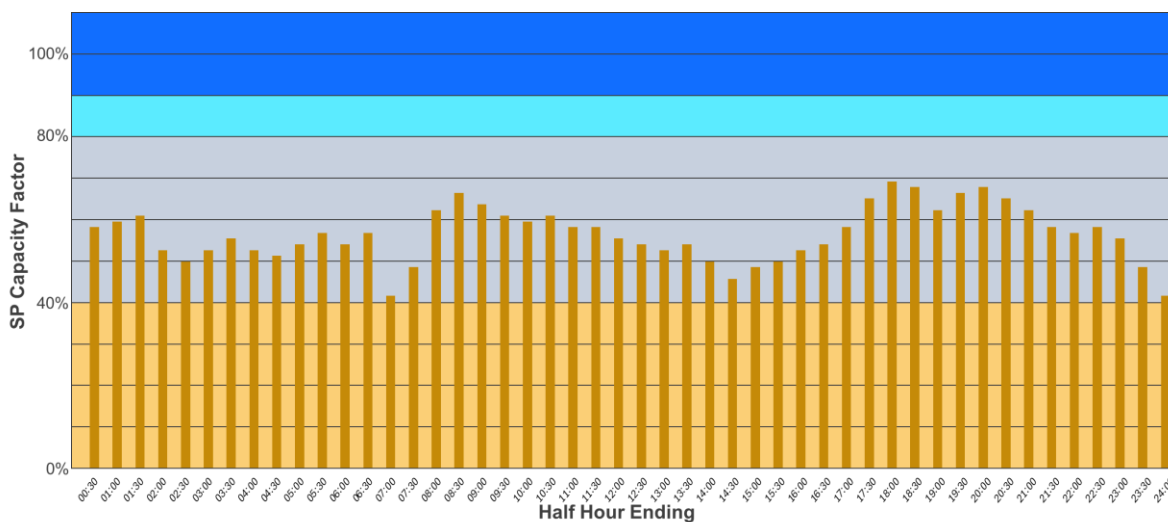


Figure 4 Illustrative SP Capacity Factor for a low variation day

Table 3: Indicative Payment for Figure 4

SP Capacity Factor		Indicative DCR Price	No. of SPs	Total Price Paid
Zone	Range			
1	more than 110.1%	-£0.50 / SP	0	-£0.00
	100.1-110%	-£0.05 / SP	0	-£0.00

SP Capacity Factor		Indicative DCR Price	No. of SPs	Total Price Paid
	90.1-100%	-£0.01 / SP	0	-£0.00
2	80.1-90%	£0.00 / SP	0	£0.00
3	70.1-80%	£0.01 / SP	14	£0.14
	50.1-70%	£0.02 / SP	25	£0.50
	40.1-50%	£0.01 / SP	9	£0.09
4	less than 40.1%	£0.00 / SP	0	£0.00
		Totals	48	£0.73

1.3.4. How the DCR service works?

The DCR service operates in three phases: Forecasting, Real-time response, and Outturn. This is illustrated in Figure 5 and a summary of the expected Business-as-Usual (BaU) steps in each phase are provided below it. The variations for the Commercial Trials are in section 2.2.

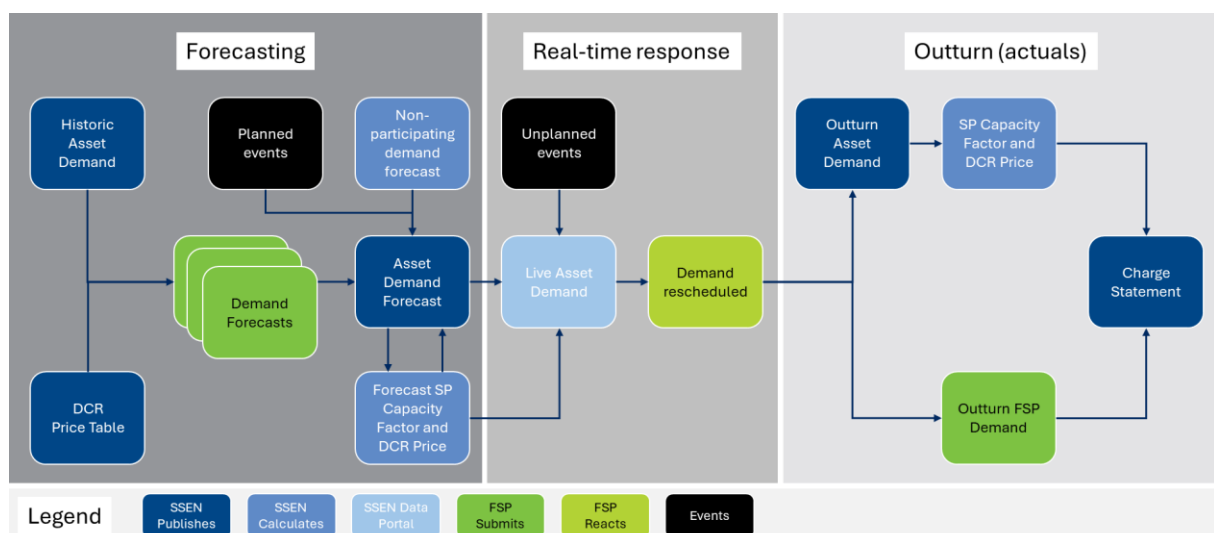


Figure 5: Three phases of DCR

Forecasting Phase

The purpose of this phase is to provide the different forecasting building blocks to enable the FSPs to calculate an indicative view of the achievable DCR income. The activities within this phase apply to the next Period (day or week ahead).

- SSEN will determine the Historic Asset Demand profile by aggregating available data for the last [12] months from a variety of SSEN sources (most likely real-time monitoring equipment). This allows FSPs to understand the historic demand profile for the Asset.
- SSEN will calculate the DCR Price Table (including the SP Capacity Factor bands and the DCR Price for each) and issue this to all participating FSPs, allowing them to understand the DCR Price that will apply to the Outturn Asset Demand (see below).

- Based on the Historic Asset Demand and DCR Price Table, FSPs will optimise the scheduling of their portfolios in the form of a Demand Forecast that will be submitted to SSEN.
- SSEN create an Asset Demand Forecast which is published ahead of the start of a Period. This will aggregate:
 - the non-binding **Demand Forecasts** from each FSP:
 - for an FSP that is an electricity supplier, their expected aggregate demand (net of any Schedulable Demand used to deliver the DCR service) for Customers.
 - for an FSP that is not an electricity supplier, their expected aggregate use of Schedulable Demand used to deliver the DCR service.This allows SSEN to determine the total FSP forecast demand for the Asset.
 - the **non-participating demand forecast** that accounts for demand not included in the Demand Forecasts, e.g. Base Demand for all Customers where the FSP is only providing metering for Schedulable Demand, Base Demand, or other demand on the Asset. This allows SSEN to calculate the Asset Demand Forecast.
 - the effect of **planned events** which could increase or reduce the total Asset demand. In a worst case, it may result in a suspension of the DCR service during the planned event. This allows the effect of network maintenance to be included in the Asset Demand Forecast.
- The Asset Demand Forecast will include the **forecast SP Capacity Factors** and associated **DCR Price** for each SP. The publication of this allows FSPs to understand the DCR Price if the Outturn Asset Demand is the same as the forecast.

Real-time response Phase

The purpose of this phase is to understand how the Asset demand varies in real-time and provide FSPs with the opportunity to move Schedulable Demand to improve the DCR payment. Activities within this phase occur within day and within SPs during the Period.

- The SSEN data portal provides access to real-time data [directly or downloadable via an API]:
 - **Live Asset Demand** from substation LV monitoring equipment that provides data on demand, voltage and current for the Asset up to [1] minute ago. This allows FSP and SSEN to understand the likely SP Capacity Factor and associated DCR Price for previous SPs and an indication for the current SP.
 - Visualisation of any **unplanned events** that affect part or all of the demand of the Asset. This allows SSEN to determine if the severity of the event means the DCR service is suspended for part or all of the unplanned event.
- An FSP that can change their Schedulable Demand within day could **reschedule demand** to influence the SP Capacity Factor and DCR Price for near-future SPs. If the control was in real time, the FSP would have an increased influence of the SP Capacity Factor and DCR Price for the current or next SP but the effect on future SPs is less certain as it depends on the actions of other FSPs.

Outturn (actuals) Phase

The purpose of this phase is to collect sufficient data to enable SSEN to issue a settlement statement to the FSPs for delivering the DCR service during the previous month for agreement prior to payment.

- FSPs provide **Outturn FSP Demand** - the FSP demand on the Asset for each SP during the previous month which comprises:

- for an FSP that is an electricity supplier, the aggregate metered demand (net of Schedulable Demand used to deliver the DCR service) for Customers.
- for an FSP that is not an electricity supplier, the aggregate metered demand for Schedulable Demand used to deliver the DCR service.
- SSEN collects data from the LV monitoring equipment to determine the **Outturn Asset Demand**, the total demand on the Asset for each SP during the previous month. This also provides SSEN with new, more recent, Historic Asset Demand data and an understanding of the non-FSP demand on the Asset.
- SSEN uses the Outturn Asset Demand to calculate the **SP Capacity Factor** for each SP and use this with the DCR Price Table to determine the **DCR Price** for each SP of the previous month.
- SSEN creates the **Charge Statement** for each FSP, a spreadsheet providing the accumulated incentive payment for delivery of the DCR service for each SP of the previous month which aids speedy approval or resolution of any queries. It will include:
 - the Outturn Asset Demand per SP.
 - the SP Capacity Factor per SP.
 - the relevant DCR Price for each SP, which could result in an increase or decrease in the accumulated incentive payment.
 - the submitted Outturn FSP Demand per SP.
 - the calculated incentive payment per SP (Outturn FSP Demand multiplied by the DCR Price)
 - the final DCR payment for the period.
- The incentive payment will be paid to the FSP periodically, expected to be every [3-6] months, and, regardless of FSP performance, there will never be any payment from the FSP to SSEN even if the final DCR payment is negative.

1.3.5. How will the service be introduced?

SSEN will run a mini competition for the DCR service based on a fixed offer price (DCR Price Table) and FSPs have a choice to participate at the price provided. The price will be informed by the outcome of Commercial Trials.

1.3.6. De-risking the BaU Service

The DCR service is based on the Outturn Asset Demand which presents a collective risk to FSPs. There are three ways to de-risk the operation of the DCR service (summarised below) and others may be developed as the Commercial Trials progress.

- The **downside financial risk is capped** with no payment from the FSP to SSEN.
- Provide **FSPs with access to real-time data on Live Asset Demand** which enables them to reschedule the use of Schedulable Demand.
- Replace the collective risk over which an FSP has little control with an individual risk that an FSP can control; this is discussed below.

Individual FSP Risk

The DCR Price is calculated from the aggregate SP demand and those FSPs able to control Schedulable Demand in real-time can respond to Live Asset Demand. However, the DCR Price is not determined until the Outturn Asset Demand is known after the end of the month in which the SP occurs. This may change the FSP payment from an expected increase to a significant reduction, highlighting an unmanageable risk.

An alternative approach, to reduce the DCR Price uncertainty and that is directly related to the actions taken by the FSP is being considered. Discussions are on-going at the time of publishing this version of the

document. The biggest hurdle is designing a solution that is easy to administer my SSEN and the FSPs. Any potential solutions will be incorporated into this document and the Trial Designs.

- **Future Work**
 - Review the forecasting process to determine if there is a process improvement that helps FSPs optimise their individual and collective demand profiles.
 - Consider if an relative performance factor is effective at reducing collective risk and if it is achievable with an acceptable administrative burden.

2. Process steps for Commercial Trials

A mapping of the BaU process to the DDS DCR process is summarised in section 2.1 with a summary of the data flows in section 2.2, and specific issues are discussed in detail in section **Error! Reference source not found..**

2.1. Summary of DCR process steps for Commercial Trials

Process Step	High-Level Activities undertaken
Requirements Identification	The Project Team will engage with FSPs to conduct analysis based for two separate non-geographic trials: Field Trials and Virtual Networks Trials. Analysis will be conducted to determine the impact and viability of DCR on different network configurations.
Pre-Qualification	The Flexibility Markets Team will follow the BaU process of assessing potential DDS providers.
Mini-Competition	<p>The Flexibility Markets Team and LMA Team are jointly responsible for:</p> <ul style="list-style-type: none"> • Defining the DCR service terms. • Determining the indicative DCR Price Table for the service. • Advertising the mini competition to all relevant FSPs, finalise negotiations, and arrange signature of the Trial FSA with relevant FSPs. • Engaging with FSPs who do not accept the Trial FSA to understand why. • Refining DCR service terms (if required). • Refining the indicative DCR Price Table (if required). <p>Only the commercial terms require to be accepted for FSPs to pass this stage.</p>
Service Definition	<p>The Flexibility Markets Team and LMA Team are jointly responsible for:</p> <ul style="list-style-type: none"> • Defining the Call Off. • Advertising the Call Off, finalise negotiations and sign the Call Off. • Refine the Call Off (if required). • Finalising the DCR Price Table for the Call Off.
FSP Setup	<p>The Flexibility Markets Team and LMA Team are jointly responsible for:</p> <ul style="list-style-type: none"> • Registering each FSP on the relevant SSEN systems. • Making provisions to obtain, verify, and aggregate data.

Process Step	High-Level Activities undertaken
	<ul style="list-style-type: none"> • Make provisions for settlement and paying FSPs. • Creating Historic Asset Demand. <p>The FSPs are responsible for:</p> <ul style="list-style-type: none"> • Recruiting Customers to take part in the Field Trials. • Providing a test forecast Outturn FSP Demand for the Assets. <p>ESCLL is responsible for:</p> <ul style="list-style-type: none"> • Recruiting volunteers to take part in the Virtual Networks Trials.
Service Coordination	<p>The Flexibility Solutions Team is responsible for considering how the use of DDS during the Commercial Trials could impact other internal teams, conflict management and Asset demand.</p>
Monitoring and Management	<p>The LMA Team is responsible for</p> <ul style="list-style-type: none"> • Receiving the forecast Outturn FSP Demand and publishing an indicative Asset Demand Forecast. • Creating Live Asset Demand data as a proxy for real-time Asset demand data. • Publishing Outturn Asset Demand for use during Commercial Trials. • Analysing the level of DCR delivery against forecasts. • Determining the effect of DCR on the SP Capacity Factor and the Maximum Capacity Factor. <p>The FSPs are responsible for:</p> <ul style="list-style-type: none"> • Providing Demand Forecasts for the Assets for the agreed trial period. • Reviewing Live Asset Demand data and reacting as they see fit.
Settlement	<p>The Project Team is responsible for:</p> <ul style="list-style-type: none"> • Conducting settlement validation. • Determining and approving FSP service payment. • Determining FSP performance against Commercial Trial objectives and forecasts
Adjustments during the Commercial Trial	<p>The Flexibility Markets Team and LMA Team are jointly responsible for:</p> <ul style="list-style-type: none"> • Operating the Commercial Trial in accordance with the outcome of the Trial Design and making changes to ensure the Commercial Trial objectives are being met. • Iterating the service design to reduce the burden on stakeholders.

2.2. Summary of Data Flows

Data flows are summarised in Figure 6.

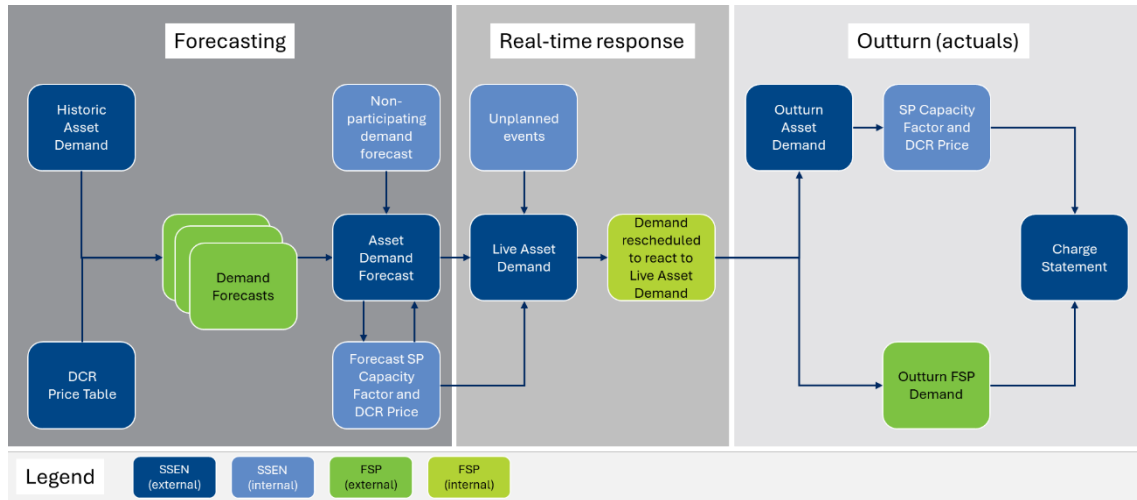


Figure 6 - Summary of DCR Data Flows