DERMS FLEXIBLE CONNECTION

Frequently Asked Questions (FAQ)

November 2025

DSO | UK Power Networks Delivering your electricity

Flexible Connection FAQ

November 2025

V1.0

CONTENTS

1 What is a Flexible Connection?

A **Flexible Connection** is a non-firm access product that enables customers to connect to the network ahead of, or as an alternative to, traditional reinforcement. In return, the customer agrees that their import and/or export may be curtailed during periods of network constraint. Curtailment is managed automatically by the Distributed Energy Resources Management System (DERMS), which issues upper or lower active power setpoint limits to the site in real time.

2 What is the Distributed Energy Resources Management System (DERMS)?

DERMS is a technology employed by UK Power Networks to connect more customers to our networks faster and at a lower cost by avoiding the need for reinforcement. It achieves this by managing participating customers in real-time to keep the network within safe operational limits.

DERMS is fully integrated into UK Power Networks (UKPN) Advanced Distribution Management System (ADMS) which communicates to the Distributed Energy Resources (DER) through our communication network and Remote Terminal Unit (RTU).

Figure 2-1 Communication hierarchy for a Flexible Connection

3 How does DERMS operate?

DERMS continuously monitors constraint locations across the network in real time. When a constraint is detected, DERMS automatically issues setpoint instructions to the Distributed Energy Resources (DERs) contributing to that constraint, ensuring the network remains within safe operational limits.

In the example below, two circuit constraints—identified as Measurement Points (MP1 and MP2)—are being monitored by DERMS. A 10 MW Flexible Distributed Generation (FDG) site and a 20 MW Firm Generator are both contributing to the loading at these points. During a constraint event, DERMS will curtail the output of the 10 MW flexible generator as required to keep loading within safe limits.

For further information, please refer to the ***DERMS in Operation Guide*** available here: Curtailment and DERMS - UKPN DSO

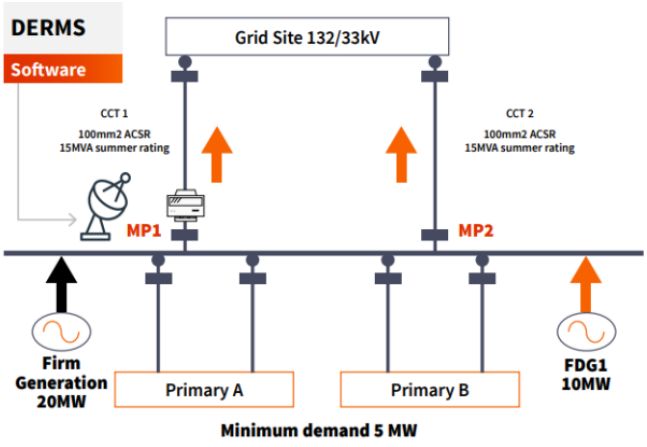

Figure 4-3: System monitoring equipment at constraint location

Figure 3-1 System monitoring equipment at constraint locations

CONTENTS

4 Why would I want to be connected to the DERMS?

Connecting through DERMS can save both time and cost. Traditionally, if your connection contributed to network constraints, you would have been required to fund reinforcement works and wait for their completion before connecting. DERMS provides a smarter alternative, enabling earlier and more cost-effective connections by dynamically managing network capacity. In return, your site may occasionally be subject to curtailment during periods of network constraint.

You can read more about boundary charging here: Ofgem Significant Code Review (SCR) | UK Power Networks

5 How much will it cost to apply for a Flexible Connection?

The process is the same as for an unconstrained connection:

- **Budget Estimate:** Free of charge. A Budget Estimate is not a formal Connection Offer and cannot be accepted.
- **Formal Quote:** Subject to an Assessment & Design (A&D) payment.

You can find out more about Common Connection Charging here: Regulatory information | UK Power Networks

The DERMS equipment requirements will vary depending on what voltage level you are connecting to. Standard requirements that applied to HV and EHV connection include:

- Mainline communications – this may be fibre back to the premises (normally a UKPN Primary Substation) or Very Small Aperture Terminal (VSAT), which can be wall-mounted or pole mounted depending on the material of the new UKPN substation being built for the project.
- Remote Terminal Unit (RTUs). Typically, for an 11kV High Voltage Connection, two Remote Terminal Units (RTU) will be required, DERMS High Voltage (HV) Telecontrol Equipment Cubicle (TEC) Type D and Type E
- Power Quality Meter (PQM)
- DER communication link, single mode fibre between the new UKPN substation being built for the project and the customer substation housing the site controller
- Distributed Network Protocol 3 (DNP3) module, which is the communication protocol for DERMS connections
- Failsafe 4 Circuit Breaker (CB) Trip and CB Readback, typically volt free contact between the G99 Interface Protection Relay and new UKPN substation being built for the project.

6 DERMS Technical requirements

6.1 What technical requirements must my site meet?

Your site must be equipped with communications and control interfaces so DERMS can send signals and monitor compliance. You can find the requirements detailed in our Engineering Design Standards (EDS) found on our Technical Library here: Home - Document Library - UK Power Networks.

- EDS 08-5060 Distributed Energy Resources Management System (DERMS) - DER Connection Requirements
  - EDS 08-5060a Flexible Connection Interface Schedule
- EDS 08-5061 DERMS Flexible Connection Design

6.2 How does DERMS communicate with my site?

DERMS communication is via Distributed Network Protocol 3 (DNP3) over Transmission Control Protocol/Internet Protocol (TCP/IP), providing a secure and reliable channel for real-time exchange of control and monitoring signals.

7 How will I know how much I am estimated to be curtailed?

If you apply for a formal quote, we'll issue a **Curtailment Estimate Assessment** showing the percentage of energy and the times at which we expect curtailment each year. This is based on historical network power flows, typical load and generation profiles and the Last-In First-Out (LIFO) stack position.

CONTENTS

You can find the methodology and assumptions here: Curtailment and DERMS - UKPN DSO along with an example assessment.

How often your connection is curtailed depends primarily on three factors:
1. Your position in the Last-In First-Out (LIFO) priority stack, which is based on your application date.
2. The sensitivity factor values between your site and the constraints, which indicate your contribution to the constraint.
3. The number of constraints triggered by your site and their operational ratings.

7.1 What profiles do you use to model the sites/customers/DERs in the LIFO stack?

We use technology specific profiles to model the sites/customers/DERs in the LIFO stack. These profiles are available in the Open Data Portal: https://ukpowernetworks.opendatasoft.com/pages/home/

- Generation/Export: https://ukpowernetworks.opendatasoft.com/explore/dataset/ukpn-standard-technology-profiles-generation/information/
- Demand/Import: https://ukpowernetworks.opendatasoft.com/explore/dataset/ukpn-standard-profiles-electricity-demand/information/

7.2 What's the difference between Curtailment Estimate and Curtailment Limit?

Curtailment Estimate is the estimated energy reduction (kWh) that a site is expected to be subject to due to distribution and/or transmission constraints and sits outside of the DCUSA Schedule 2D. The assessment shows the percentage of energy we expect to curtail the site for a sample year (not for every single year as this may vary, see question 12.2). This is calculated as the ratio between energy produced by the curtailed profile and the energy produced by the un-curtailed profile.

Curtailment Limit sets a contractual cap on curtailment (% of hours per year) that a site can be subject to, which is a ratio between the hours curtailed and the total hours in the year. If exceeded, UK Power Networks will compensate the exceed curtailment at a published set price. This is a regulatory requirement and is calculated through the Distribution Change Proposal (DCP) 404 spreadsheet issued with the Connection Offer. You can find more information here: Ofgem Significant Code Review (SCR) | UK Power Networks

7.3 How accurate are the Curtailment Estimate Assessments?

Curtailment Estimate Assessments are produced using the best available historical network data and the most up-to-date view of the connection queue. However, actual curtailment may vary depending on fluctuations in demand or generation at the relevant constraint points, any changes in customer operating profiles and network outages.

7.4 Can I run my own Curtailment Estimate Assessment?

Yes! You can use **The Connections Lab**, our publicly available tool, to model curtailment scenarios yourself. The platform includes a detailed user guide and tutorial to help you get started.
Access the tool here: https://lab.ukpowernetworks.co.uk/
Please review the tutorial and user guide to support your registration and use of the tool. If you need any assistance, contact us at **dsocurtailment.selfserve@ukpowernetworks.co.uk**.

7.5 Why are my curtailment results sent by UKPN different to those I get in the Connections Lab?

While the **Connections Lab** uses an automated constraint selection process to estimate curtailment, the assessments issued by **UK Power Networks' Network Planning** team are based on a detailed, site-specific constraint analysis.

A new feature will soon be available: the **Configuration ID**, which will allow you to copy and paste the Config ID from your official curtailment report into the Connections Lab. This will automatically populate all study settings, enabling you to reproduce the same curtailment results issued by Network Planning (unless any parameters have since changed).

7.6 Are the power flow data available on the ODP the same as those in curtailment studies?

No. The data published on the **UKPN Open Data Portal** (ODP) are measured values directly collected from network devices. In contrast, the data used for **curtailment assessments** are *cleansed and modelled* to represent normal operating conditions. For example, if an outage occurred on the network, the curtailment assessment uses adjusted data to reflect what the network would have experienced **had the outage not taken place**, ensuring a consistent and accurate basis for analysis.

7.7 Will I be notified before my connection is curtailed?

DERMS sends an upper kW signal via the Distributed Network Protocol 3 (DNP3) interface in real time, before curtailment begins. Please refer to EDS 08-5060 Distributed Energy Resources Management System (DERMS) - DER Connection Requirements and EDS 08-5060a Flexible Connection Interface Schedule.

7.8 Can I have visibility of predicted future curtailment events?

Yes, curtailment forecasts are now available for connected flexible connection customers. Once your site is connected,

1. please register for a free Open Data Portal account here: Home — UK Power Networks.
2. Next contact dsooperations@ukpowernetworks.co.uk and provide them with your site details and list of people who are registered on the Open Data Portal who require access. The DSO Operations team will assign access and you will be able to see an estimated day ahead forecast for your site here; Real Time Curtailment Data — UK Power Networks.

7.9 Can I opt out of a curtailment event?

No. By accepting a Flexible Connection, your site agrees to follow curtailment instructions issued through DERMS. This ensures the network remains safe and stable for all users. If a site does not comply with curtailment signals, it may be automatically disconnected, in line with the terms of the Connection Agreement.

7.10 How is curtailment enforced?

DERMS automatically sends control signals to your site to limit import or export to the agreed levels. This requires the correct control interface to be installed during commissioning.

If a site does not respond to a curtailment instruction, DERMS applies a series of escalating actions to keep the network safe. For export sites with a dedicated G99 breaker, this can include opening the G99 circuit breaker (CB), allowing the rest of the site to continue operating. If this also fails, the DSO Operations team is alerted and may contact the site or, if needed, open the main incomer CB, which would disconnect the whole site.

Independent Distribution Network Operator (IDNO) Flexible Connection

For IDNO-connected customers, DERMS first issues an open command to the site's G99 breaker, followed by the IDNO/DER substation breaker if the site remains non-compliant. If the network overload persists and cannot be mitigated through further curtailment, UK Power Networks, in coordination with the IDNO control room, may disconnect the IDNO incoming breaker as a last resort to protect network safety.

Additional information can be found in the DER commissioning guide available here: Curtailment and DERMS - UKPN DSO.

Figure 6-1 DER Failsafe 4 Trip options

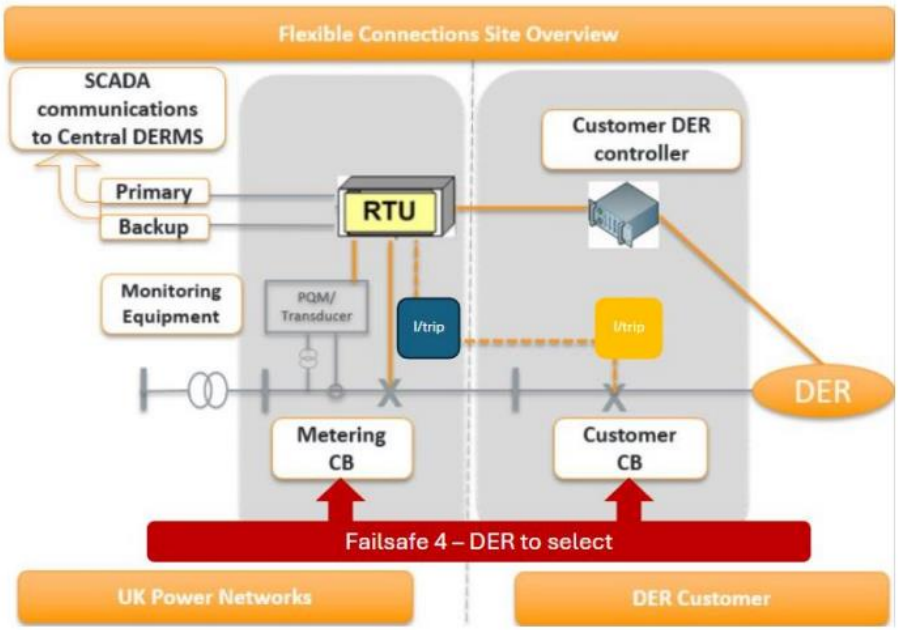

Figure 7-1 DER Failsafe 4 Trip options

7.11 Will my curtailment change over time?

Yes. As described in Question 11, several factors can influence your curtailment over time.

- **Changes in power flows:** Variations at relevant constraint points can increase or decrease curtailment. For example, if a neighbouring site increases its demand, it may relieve loading on the constraint and reduce curtailment at your site. Conversely, an increase in generation from e.g. rooftop solar nearby can increase loading and lead to higher curtailment.
- **Changes in the LIFO stack:** If customers above you LIFO stack cancel their connection offer, your curtailment is likely to decrease, as your site will be moving up in the stack.
- **Changes in network running arrangements:** Different network configurations can alter constraint triggered by your site and sensitivity factors, affecting the overall curtailment.
- **Changes in constraint ratings or new network assets:** When a constraint is uprated or new assets are commissioned, available network capacity increases, which will typically decrease the curtailment.

For further detail, please refer to the Curtailment Assessment Methodology and Assumptions found here: Curtailment and DERMS - UKPN DSO

7.12 Will the curtailment reduce if a section of a circuit is replaced/upgraded as part of the non-contestable works?

If you have been offered a **Flexible Connection as an interim solution ahead of reinforcement**, curtailment will cease once the reinforcement is completed, and your site will operate unconstrained for that part of the network. If your site is subject to **multiple constraints** and only one is reinforced, it will remain flexible for the remaining constraints and be **disassociated** from the one that has been resolved.

Circuits are typically composed of multiple sections, including both underground cables and overhead lines, each with a different set of seasonal ratings (based on the cable/line type). The section with the lowest section rating would be

the one dictating the rating for the circuit. If the non-contestable works replaces the section of the circuit with the lowest rating, it is likely that a reduction in the curtailment takes place after the upgrade.

The Connections Lab displays the seasonal ratings for the section of the circuits with the lowest ratings. This is the same information as displayed in the **LTDS Table 1**. To understand how the upgrade will impact your curtailment, you can update the seasonal rating in the Connections Lab with the rating you expect your upgrade to have and run the curtailment estimate again.

- Link to LTDS Table 1: **Long Term Development Statement (LTDS) Table 1 Circuit data — UK Power Networks [ukpowernetworks.opendatasoft.com]**

8 What principal of access does UK Power Networks use to manage curtailment?

Access to the network is managed based on a Last-In-First-Out LIFO principal of access determined by the site's application date. Under LIFO, each flexible DER is assigned a position within a global priority stack. When a constraint is breached, the DER at the bottom of the priority stack that have a contribution to the constraint will be curtailed first and the DER at the top of the priority stack will be curtailed last.

8.1 Can my LIFO position change?

Yes, below are some of the circumstances:

1. if your offer expires,
2. you withdraw your application,
3. you request significant modifications to your connection,
4. the outcome of Connections Reform review.

Connections Reform

The electricity industry is going through major changes to ensure that we are supporting the government's Clean Power by 2030 initiative. Previously, projects have been able to connect to our network on a 'first come, first served' basis, which has caused a back log with projects not having the necessary plans in place to ensure they are ready to connect.

Ofgem's approval of Connections Reform is supported by two new Connection and Use of System Codes (CUSC) modifications, CMP 434 and 435 and the National Energy System Operator (NESO) methodologies, setting out the how: Customers now needs to demonstrate the readiness of their project which is check by UK Power Networks for projects under 100MW and NESO will confirm that the project is needed i.e. strategically aligned. Customer are required to submit evidence to demonstrate both readiness and strategic alignment.

Customers will then be allocated either a gate position:

- Gate 1 – will not be assigned a confirmed connection date but may progress through further windows if readiness is demonstrated.
- Gate 2 – applies to projects that meet the new requirements for readiness and Strategic alignment. These projects can secure a confirmed connection date, connection point, and queue position.

We will then manage the LIFO queue based on projects receiving a Gate 2 offer. For projects post 2030, stack order will be created based on evidence of readiness submission rater than application date, in line with NESO capacity allocation.

9 Adding Capacity to an existing site

9.1 Can I add flexible import/export to my existing unconstrained connection?

Yes. DERMS will need to be installed at the UK Power Networks incoming breaker to monitor total site flow and curtail only the flexible portion when required.

Example: 40 MVA (unconstrained) + 10 MVA (flexible) → DERMS curtails from 50 MVA to 40 MVA.

CONTENTS

Do I need new metering? No — only DERMS interface equipment is required.

Important: Non-compliance with curtailment instructions can result in the whole site being tripped.

9.2 Can I increase flexible export at an already flexible site?

Not currently, unless:

- You connect the new capacity at a different Point of Connection and obtain a separate Last-In First-Out (LIFO) position **or**
- Move the **entire site** to a lower LIFO position based on the new application date.

9.3 Can I add a Battery Energy Storage Solution without increasing export?

Yes, you can install behind the meter if it does not cause other constraints or impact customers above you in the LIFO stack. No new DERMS or metering is required.

Example: 50 MVA PV (unconstrained) + 50 MVA battery (unconstrained) export stays at 50 MVA → no DERMS needed (provided criteria above are met).

Note: If you require more import capacity for charging and this capacity will need to be managed flexibly, follow the rules for adding flexible import to an existing unconstrained site.

9.4 Can I add Flexible Import to a Flexible Export Site (or vice versa)?

Yes. A single Remote Terminal Unit (RTU)/DNP3 interface will be used, with separate Circuit Breakers (CBs) for import and export recommended.

How is it managed? Import and export have separate LIFO positions. You keep your existing position for the original flexible generation (or demand) connection and get a new position for the new flexible demand (or generation) connection— no need to reapply or change your Point of Connection.

10 Is a Flexible Connection available for IDNO connections?

Yes. Flexible Connections can be offered to customers connecting via an Independent Distribution Network Operator (IDNO) network. In these cases, some DERMS interface equipment will need to be installed within the IDNO substation. For further guidance, please request a copy of EDS 08-5063 DERMS IDNO DER REQUIREMENTS (which is in development) from NetworkAccess@ukpowernetworks.co.uk

11 I am a Storage/Demand customer, can I apply for a Flexible Connection?

Yes. DERMS is capable of managing both import and export constraints. Demand customers can apply for either a fully **Flexible Connection** or a **Profiled Connection**, depending on their operational requirements and the level of flexibility they are able to offer.

12 Can I combine a Flexible Connection with Flexibility Services?

Yes. You can have a Flexible Connection for physical access to the network and also participate in flexibility markets (subject to eligibility) to receive payments for responding to network needs. Please visit: Flexibility - UKPN DSO to find out more.

13 How long does it take to commission a DERMS-managed connection?

Commissioning time depends on your site's complexity and readiness. We will arrange for an Operational Telecoms engineer to visit site post energisation to check all the components are in place. We will check the fibre interface is healthy, complete inputs/outputs signal exchanges and verify the measurements. We typically schedule the DERMS commissioning to occur once UK Power Networks commissioning engineers have witnessed the operation of the protection relays. DERMS commissioning typically happens one to three weeks post energisation.
For timescales required for each step in the commisisoning process, please refer to the DER commissioning guide found here: Curtailment and DERMS - UKPN DSO

13.1 Am I able to Import/Export prior to DERMS commissioning?

Yes, this is permissible for testing purposes only and will need to be planned and managed by the DSO Operations team. Please complete and return the below table to dsooperations@ukpowernetworks.co.uk 28 days prior to first synchronisation. The team will review your proposed plan and let you know if testing can go ahead.

Date	Start time	End time	Capacity (MW)

Once testing is completed, the flexible element will be restricted to zero until the site is commissioned to the DERMS.

13.2 What do I need to submit prior to commissioning?

For a Flexible Connection triggering export constraints, customers are required (as part of Engineering Recommendation G99) to send a detailed schedule of tests and procedures for the tests required not less than 28 days prior to the Generator wishing to synchronise. Details of the commissioning test plan should also be emailed to the DSO Operations team (dsooperations@ukpowernetworks.co.uk). This will allow us to check the network outage planning tool (Network Vision) to see if there is any planned works which would impact the testing from proceeding. The DSO Operations will respond to the request to export, providing maximum export capacities for each given day. This activity ensures the network remains within safe operating limits and prevents existing Flexible Connection customers from being impacted.
For Flexible Connections with an Import constraint, customers should send a copy of their commissioning test plan to DSO Operations (dsooperations@ukpowernetworks.co.uk). DSO Operations will check the Outage Planning tool (Network Vision) to see if there is any planned works which would prevent the customer testing from proceeding.

14 What DERMS products are available?

As of August 2025, DERMS supports a range of connection products designed to manage different types of network constraints and customer segments:

- **Flexible Connection (Thermal)**: offered to demand and generation customers triggering thermal network constraints. These are offered either on an interim or enduring basis, depending on the nature of the constraint.
- **Flexible Connection (Voltage)**: offered to demand and generation triggering over/under voltage-related constraints on the network.
- **Profiled Connection**: available for demand sites that require greater certainty around network access throughout the day, providing a guaranteed minimum level of demand in line with the agreed profiles.

A breakdown of constraint managed, applicability and DERMS control for each of the product type is available in Table 1. We welcome suggestions for new products - please email us at: NetworkAccess@ukpowernetworks.co.uk

Table 1 DERMS Products

Product name (constraint)	Applies to	Constraint triggered	DNO liability	DERMS control
Flexible Connection (thermal)	**Generation**	Distribution (Interim)	post April 23, curtailment is liable.	Reduces Export
		Distribution (Enduring)	post April 23, curtailment is liable.	
		Transmission (Interim)	Non-contractual curtailment	
		Transmission (Enduring)		

Product name	Applies to	Constraint triggered	DNO liability	DERMS control
Flexible Connection (thermal)	**Demand**	Distribution (Interim)	post April 23, curtailment is liable.	Reduces Import
		Distribution (Enduring)	post April 23, curtailment is liable.	
		Transmission (Interim)	Non-contractual curtailment	
		Transmission (Enduring)		

Product name	Applies to	Constraint triggered	DNO liability	DERMS control
Flexible Connection (voltage)	**Generation and Demand**	Distribution (Enduring)	Non-contractual curtailment	Restricts Power Factor range – reactive power

Product name	Applies to	Constraint triggered	DNO liability	DERMS control
Profiled Connection (thermal)	**Demand**	Distribution (Interim)	Non-Contractual curtailment	Reduces Import to a pre-defined value
		Distribution (Enduring)		

15 How do I apply?

To begin your journey towards a Flexible Connection, please visit our dedicated application page here: https://www.ukpowernetworks.co.uk/new-electricity-connections/distributed-energy-resources-der-generation/flexible-connections

16 Who can I contact if I have a question that hasn't been addressed?

We're here to help! If you have any questions or need clarification, please email: NetworkAccess@ukpowernetworks.co.uk

CONTENTS