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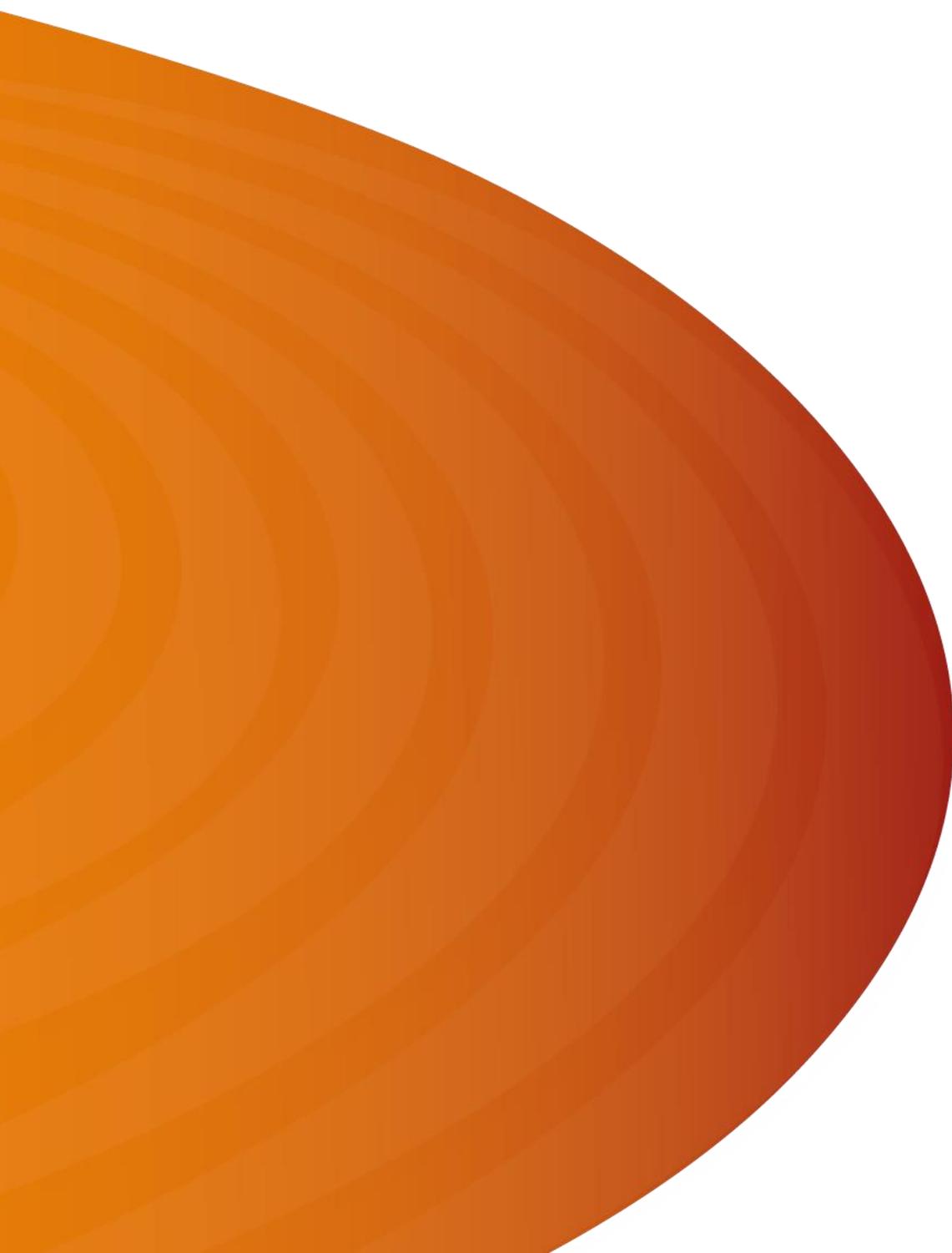
Company:
UK Power Networks
(Operations) Limited



Registered in England and Wales No: 3870728

Call for Information

Enabling connections in constrained networks



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Summary

We seek to continuously expand our flexibility services. Hence, in this document we aim to explore some high-level options to improve flexible connection arrangements and their ability to provide services. This includes clarifying how curtailment assessments are interpreted, providing forward notice of curtailment, and overlaying a market-based arrangement to curtailment. This allows the DER to better understand and manage their risks and to trade their non-curtailed volumes into distribution-level markets as well as other markets.

Flexible connections offer new generation customers a quicker and cheaper grid connection in export constrained areas compared to standard connections. Flexible connections would still be of value in connecting customers quickly even after Ofgem’s proposed changes to connection charges and access arrangements from April 2023.

We are seeking feedback from customers and stakeholders on the contents of this document to help inform the development of our flexibility product roadmap. Please submit your responses by **25/02/2022** by emailing the Flexibility Team at flexibility@ukpowernetworks.co.uk.

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1. About UK Power Networks

UK Power Networks owns, operates and manages three electricity distribution networks in Great Britain, delivering power to 8.4 million homes and businesses across London, the east and south east of England. We have a critical role at the heart of the future energy landscape, enabling the transition to the net zero carbon economy and enabling all our stakeholders to benefit from better safety, reliability and cost efficiencies as we innovate and invest to deliver a sustainable energy future for all.

2. Background to Flexibility

Flexible distributed energy resources (DER) are generators, consumers, or energy storage capable of changing their output or consumption in response to a signal. If utilised to reduce peaks on the distribution network, flexibility can defer the need to install additional network infrastructure and minimise costs for customers and end consumers.

UK Power Networks identified flexibility as a strategic priority back in 2017¹ and detailed how it would be rolled out in the Flexibility Roadmap² a year later. Much progress has been made since then through regular tender rounds for flexibility services, as well as making flexible connections available to customers across our network.

Flexibility services is a commercial arrangement between UK Power Networks and the DER to reduce load in areas where demand exceeds network capacity. In the last tender round in 2021, 350MW of flexible capacity was contracted across 137 network locations.

Flexible connections differ in that it is a non-firm connection agreement with generators or energy storage, which enable the DER to connect quickly and cheaply in areas where exports exceeds network capacity. In return, the DER could be curtailed when the constraint occurs. To date flexible connections has enabled 24 renewable generators or 140 MW of low carbon generation capacity to connect, saving customers over £145m in connection costs.

3. Enabling new DER connections in constrained networks

Customers that want to connect a new DER into constrained areas of network either to provide distribution-level flexibility services or to participate in other markets could come up against the following challenges.

- **Expensive connection offer** – standard connection offers may require the connecting customer to contribute to costly wider reinforcements
- **Lead time to connect** – under the standard connection, the customer is unable to connect until reinforcement is complete which could delay the project

1 FutureSmart Strategy - <https://smartgrid.ukpowernetworks.co.uk/wp-content/uploads/2019/11/FutureSmart-Consultation-Report.pdf>

2 Flexibility Roadmap - <https://smartgrid.ukpowernetworks.co.uk/wp-content/uploads/2019/11/futuresmart-flexibility-roadmap.pdf>

- **Flexible connection is not “bankable”** – the unpredictability of curtailment under a flexible connection could preclude participation in other services, normally a key part of revenues for flexible DER business models

Ofgem’s proposed changes to connection charging and network access³ from April 2023 could significantly reduce the connection cost for most DER. Flexible connections is expected to still be of value, allowing customers to connect quickly compared to a standard connection. In addition, curtailment limits will also be introduced for flexible connections which will give customers greater certainty that curtailment will not exceed an agreed level.

In this call for information, we do not explore further the implications of Ofgem’s proposed changes such as new applications for flexibility, since Ofgem is still consulting on their proposals. Instead, we focus on how we can enhance our flexible connection offering to make it more acceptable to customers, particularly flexible DER that wants to participate in distribution-level flexibility services or other markets.

4. Options to improve flexible connection arrangements

The following are high-level options that we have identified as potential improvements to current flexible connection arrangements which is also summarised in Table 1.

- Improved static curtailment estimates** – when providing flexible connection offers we undertake a curtailment assessment which assumes the DER may be operating at its maximum capacity. This could give a simplistic view of the impact of curtailment since it does not take into account how the customer intends to operate the DER. Incorrect interpretation of the results could negatively affect the customer’s business case. Instead, we could provide the time series forecast data of constraints so that the customer can overlay their planned operations to derive a more accurate curtailment impact. This could then be the basis for ongoing curtailment information. This could be included in the implementation of improvements as already identified through the Open Networks project⁴.
- Dynamic curtailment estimates** – currently customers cannot predict curtailment ahead of time since curtailment instructions are issued in real time which means there is a risk to participating or delivering other services. This can be resolved by updating curtailment estimates closer to real-time based on forecasts and nominations from local DER. This could be at week-ahead, day-ahead and potentially within-day before gate-closure.
- Market-based curtailment** – the Distribution System Operator (DSO) will coordinate the exchange of curtailment between DER through a local market, for example a battery can be compensated to charge when there is a local generation constraint. Subsequently, real-time operation will be based on the market outcome based on forecasts. The benefits of this arrangement is four-fold:
 - curtailment actions are more economic

³ Ofgem Access and Forward Looking Charges SCR - <https://www.ofgem.gov.uk/publications/access-and-forward-looking-charges-significant-code-review-updates-our-minded-positions>

⁴ Open Networks WS1A Product 9 – Curtailment Information Implementation Plan - [https://www.energynetworks.org/industry-hub/resource-library/on21-ws1a-p9-anm-curtailment-information-sharing-implementation-plan-\(22-dec-2021\).pdf](https://www.energynetworks.org/industry-hub/resource-library/on21-ws1a-p9-anm-curtailment-information-sharing-implementation-plan-(22-dec-2021).pdf)

- it gives other DER new revenue opportunities
 - it allows DER to trade non-curtailed volumes into other markets; and
 - it introduces market pricing signals to determine when network reinforcement may be required.
- This is the premise of our Energy Exchange project.

Table 1: Summary of the options' benefits and dependencies

Option	Benefits	Dependencies
A. Improved static curtailment estimates	<ul style="list-style-type: none"> • Avoids misinterpretation of curtailment impact in developing business case 	<ul style="list-style-type: none"> • Information already available • Consistent with improvements already identified through the Open Networks project
B. Dynamic curtailment estimates	<ul style="list-style-type: none"> • DER can trade volumes not subject to curtailment in other markets 	<ul style="list-style-type: none"> • Forecasting capability • System changes
C. Market-based curtailment	<ul style="list-style-type: none"> • More economic curtailment actions • New revenue opportunity for DER • DER can trade volumes not subject to curtailment in other markets • Pricing signals available to DSO 	<ul style="list-style-type: none"> • Forecasting capability • Market timeframes compatible with other markets • Complexity of implementation

5. Next steps

We are seeking feedback from customers and stakeholders on the contents of this document to help inform the development of our flexibility product roadmap. Please submit your responses by **25/02/2022** by emailing the Flexibility Team at flexibility@ukpowernetworks.co.uk.

In your response it would be helpful to consider the following questions

1. Please provide your views on each option we have described in this document. In providing your view please comment on which is of most interest and why?
2. Will these options make flexible connections a more attractive proposition?
3. Do you think flexible connections would still be attractive after Ofgem's proposed changes to connection charges and access?
4. Please describe any other options we should consider but have not set out in this document.
5. For option C, market-based curtailment, where DER can trade their obligations what is your preferred:
 - a. payment structure, for example availability/utilisation payments;
 - b. and granularity of windows, for example EFA blocks to align with other services?