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Modification proposal:	**Distribution Connection and Use of System Agreement (DCUSA) DCP172 – Clarification of way in which voltage rise is used in determining the New Network Capacity**		
Decision:	The Authority[1] directs this modification[2] be made[3]		
Target audience:	DCUSA Panel, Parties to the DCUSA and other interested parties		
Date of publication:	21 April 2016	Implementation date:	Next DCUSA release following Authority consent

Background

On 14 June 2013 we issued a Determination[4] on the reasonableness of costs of connection for the provision of three points of connection between a customer and a distributor's electricity distribution system.

The Common Connection Charging Methodology (CCCM) sets out how the Distribution Network Operator (DNO) (or Distribution Service Provider (DSP)) may charge for connecting customers to its electricity distribution system. The calculation of the connections cost apportionment between the DSP and the customer arises as a result of the impact of the new supply on the voltage across the network. The definition of New Network Capacity[5] specifically refers to voltage drop[6] which would result from further demand connections to the network. It does not explicitly address situations of voltage rise which could occur in the case of generation connections to the network. Our Determination considered that the driver for capacity reinforcement could also arise from a need to mitigate the voltage rise caused by additional generation connecting. Our Determination recognised that the current definition of New Network Capacity in the CCCM is not explicit on the treatment of voltage rise.

The modification proposal

DCP172 was raised by Scottish Power Energy Networks on 29 April 2013 to amend the CCCM to clarify the way in which voltage rise is used in determining the New Network Capacity.

The CCCM requires DSPs to provide connecting customers with a connection offer that represents the lowest overall capital cost solely to provide the capacity required by the customer (known as the Minimum Scheme). It also requires that when reinforcement of the network is driven by thermal capacity or voltage, the Security Cost Apportionment Factor ("the Security CAF") is used to apportion costs between the DSP and customers. The Security CAF is calculated using the following formula:

$$\text{Security CAF} = \frac{\text{Required Capacity}}{\text{New Network Capacity}} \times 100\%$$

[1] References to the "Authority", "Ofgem", "we" and "our" are used interchangeably in this document. The Authority refers to GEMA, the Gas and Electricity Markets Authority. The Office of Gas and Electricity Markets (Ofgem) supports GEMA in its day to day work. This decision is made by or on behalf of GEMA.
[2] 'Change' and 'modification' are used interchangeably in this document.
[3] This document is notice of the reasons for this decision as required by section 49A of the Electricity Act 1989.
[4] Determination RBA/TR/A/DET/184 is available here: https://epr.ofgem.gov.uk//document/Download/29383
[5] Paragraph 5.24 of the CCCM contains definitions for terms relating to the Security Cost Apportionment Factor (CAF). This includes the definition for New Network Capacity.
[6] Voltage drop describes how the supplied energy of a voltage source is reduced as electric current moves through the electrical circuit. Voltage drops as further demand is added to the network. Voltage rises when additional electrical energy enters the network.

The CCCM definition for New Network Capacity currently includes the following sentence: *"… The capacity to be used will be based on our assessment of the thermal ratings,* ***voltage drop*** *and upstream restrictions and compliance with our relevant design, planning and security of supply policies. …"* (our emphasis added).

DCP172 proposes changing the term "voltage drop" to "voltage change". This change to the definition would ensure that the DSP can also apply a calculation to apportion costs for the installation of assets required due to voltage rise. A voltage rise calculation will typically be used where the DSP is evaluating the impact of a Distributed Generation (DG) connection to the distribution network.

The DCP172 Working Group (WG) considered that simply amending the wording in the definition to voltage change might not provide for consistent application. New network reinforcement will result in both additional thermal and voltage capacity being provided. Clarity was therefore required as to how the security CAF should be calculated to take into account either the new thermal or voltage capacity created. The WG developed four different options[7] for calculating the Security CAF for a connection where voltage rise (rather than voltage drop) is the main driver for the reinforcement. The four options were:

- **Option 1** - where reinforcement works and costs are sized only to meet the connecting customer's capacity requirements and keep any voltage rise within acceptable limits;
- **Option 2** – where only the additional capacity to meet the thermal requirements of the connecting customer is taken into account;
- **Option 3** – provides an exception to Option 1 in situations where the reinforced network could benefit future connecting customers. It seeks to achieve this by applying a thermal capacity calculation to apportion the cost of the connection when four conditions are met; and
- **Option 4** – which is similar to Option 3 and applies a thermal capacity calculation to apportion the cost of connection when two conditions are met.

The DCP172 WG undertook two consultations. The first consultation received responses from six distributors and only one DG customer. The second consultation was a re-issue of the first consultation and provided some additional clarity on the proposals. It was more widely circulated seeking views specifically from DG customers about the different approaches proposed. No additional responses were received from other DG customers. The WG agreed that Option 1, to always apply the voltage rise method, gave the greatest transparency of application and was simple to apply.

The application of Option 1 results in reinforcement works and costs being sized only to meet the capacity to accommodate the increase in voltage caused by the connecting customer. Where a complete asset such as a transformer has to be replaced then the CAF is likely to be less than 100 percent. Where only part of the circuit is reinforced this option could result in a 100 percent charge of the reinforcement to the connecting customer. Capacity would only be available to other customers if further reinforcement works are carried out.

To support the change to the definition of New Network Capacity, DCP172 also proposes adding three new examples to illustrate how voltage rise would be used in the calculation of the Security CAF when applying the Option 1 approach.

[7] Further details of each of the four approaches developed and considered by the DCP172 Working Group are set out in the DCP172 Change Report available on the DCUSA website: https://www.dcusa.co.uk/Documents/DCP%20172%20Change%20Report%20v1%200.pdf

DCUSA Parties' recommendation

All parties were eligible to vote on DCP172. In the DNO party category, where votes were cast there was unanimous support for the proposal and for its proposed implementation date. No votes were cast in the other categories, including in the DG party category.[8] In accordance with the weighted vote procedure, the recommendation to the Authority is that DCP172 is accepted. The outcome of the weighted vote is set out in the table below:

DCP172	WEIGHTED VOTING (%)							
	DNO[9]		IDNO/OTSO[10]		SUPPLIER		DG[11]	
	Accept	Reject	Accept	Reject	Accept	Reject	Accept	Reject
CHANGE SOLUTION	100	n/a	n/a	n/a	n/a	n/a	n/a	n/a
IMPLEMENTATION DATE	100	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Our decision

We have considered the issues raised by the proposal and the Change Declaration and Change Report submitted to us on 15 March 2016. We have taken into account the vote of the DCUSA Parties on the proposal which is attached to the Change Declaration. We have concluded that:

- implementation of the modification proposal will better facilitate the achievement of the DCUSA Charging Objectives;[12] and

- directing that the modification is approved is consistent with our principal objective and statutory duties.[13]

Reasons for our decision

We consider this modification proposal will better facilitate DCUSA Charging Objectives 3.2.2 and 3.2.1 and has a neutral impact on the other relevant objectives.

DCUSA Charging Objective 3.2.2 – that compliance by each DNO Party with the Charging Methodologies facilitates competition in the generation and supply of electricity and will not restrict, distort, or prevent competition in the transmission or distribution of electricity or in participation in the operation of an Interconnector (as defined in the Distribution Licences)

We consider that providing greater clarity and a consistent approach to how voltage rise will be applied in the determination of the CAF will benefit DG customers, other developers and Independent Connection Providers (ICPs), and thus better facilitate effective competition.

[8] There are currently no gas supplier parties.
[9] Distribution Network Operator
[10] Independent Distribution Network Operator/Offshore Transmission System Operator
[11] Distributed Generation
[12] The DCUSA Charging Objectives (Relevant Objectives) are set out in Standard Licence Condition 22A Part B of the Electricity Distribution Licence and are also set out in Clause 3.2 of the DCUSA. The DCUSA General Objectives (Applicable DCUSA Objectives) are set out in Standard Licence Condition 22.2 of the Electricity Distribution Licence and are also set out in Clause 3.1 of the DCUSA.
[13] The Authority's statutory duties are wider than matters that the Parties must take into consideration and are detailed mainly in the Electricity Act 1989 as amended.

The DCP172 WG considered four different options (described above) for calculating the Security CAF for a connection where voltage rise is the main driver for the reinforcement. While none of the options is without its limitations, Option 1 (to always apply the voltage rise method) has the advantages that it is simple to apply, provides a consistent approach and is transparent. This is the option that was most widely supported by the WG. The other options are more complicated to apply, less transparent and do not always result in a consistent approach.

Option 1 will result in more cost reflective charges than the current approach because the DG will be paying for the capacity it uses. It also sends a price signal to connect where voltage capacity is available. However, it gives no credit for any additional thermal capacity that results and does not recognise the possible benefit of the reinforcement to the wider customer base (eg deferred reinforcement expenditure by the DNO).

Option 2 (using thermal capacity) would be easy to apply, but would not always result in cost reflective charges. For example, in many cases where reinforcement is required for DG there is adequate thermal capacity but reinforcement is required to maintain the voltage. This could result in other customers subsidising some connections by paying the cost of the reinforcement required, and reduce the price signal that could otherwise encourage DG to connect where there is existing voltage capacity.

Options 3 and 4 apply the thermal method but only when certain conditions are met. Option 3 applies the thermal method when four conditions are met. These conditions are where the reinforcement involves a substantial asset; involves a complete asset; provides connection to a demand dominated network; and normally provides connection to a number of customers in excess of a number of customers threshold (a number of these terms would need to be clearly defined). For Option 4 only the first two of these conditions must be met. For both options, if any of the conditions are not met, the voltage method would apply. These are both more complex options than either Options 1 and 2 and would require a degree of subjectivity in application. As a result we are not confident that their application would ensure a consistent approach and an inconsistent approach could impact on competition. They also would not recognise network benefits provided for future DG connections.

We consider that Option 1 provides a clearer and more consistent approach than the current approach. This more effectively facilitates competition as customers are able to make informed decisions based on costs quoted on a consistent basis by the different network companies. An inconsistent or unclear approach would not facilitate a like-for-like comparison. We therefore consider that Option 1 more effectively meets and better facilitates this objective.

DCUSA Charging Objective 3.2.1 – that compliance by each DNO Party with the Charging Methodologies facilitates the discharge by the DNO Party of the obligations imposed on it under the Act and by its Distribution Licence

We agree with consultation respondents who considered that clarifying the way in which the CCCM is applied better facilitates the efficient discharge of the DNO's obligations. It allows a consistent approach to be taken by all DNOs to how voltage rise is treated in determining New Network Capacity for calculating the CAF. We consider that a simple and consistent approach to determining the CAF for both demand and DG customers allows DNOs to more effectively discharge their obligations under Standard Licence Condition 13 of the Distribution Licence (i.e. compliance with the CCCM). This adds further clarity to the CCCM and allows DG customers, developers and ICPs to more accurately estimate the costs to which they will be subject.

We consider that the change proposal will therefore better facilitate this objective than the current approach.

Other issues

We note that one respondent has raised concerns with some of the text included in the examples, which it considers could be confusing. In particular, the respondent highlights that the examples contain the use of "i.e.", implying that this could be derived from previous information, which the respondent considers is not correct. This could in some instances be changed to "e.g." instead for further clarity. We do not consider that this is a reason to reject the modification, and consider that this issue could if necessary be corrected through a DCUSA housekeeping modification in due course.

Decision notice

In accordance with standard licence condition 22.14 of the Electricity Distribution Licence, the Authority hereby directs that modification proposal DCP172 *'Clarification of way in which voltage rise is used in determining the New Network Capacity'* be made.

James Veaney
Head of Connections and Constraint Management
Signed on behalf of the Authority and authorised for that purpose