

Modification proposal:	<b>Distribution Connection and Use of System Agreement (DCUSA) DCP 222 - Non billing of Excess Reactive Power Charges</b>		
Decision:	The Authority <sup>1</sup> directs this modification <sup>2</sup> be made <sup>3</sup>		
Target audience:	DCUSA Panel, Parties to the DCUSA and other interested parties		
Date of publication:	15 August 2016	Implementation date:	1 April 2018

## Background

Alternating current electrical power comprises 'active' power (measured in watts), and 'reactive' power (measured in volt amperes reactive). The combination of reactive and active power is the apparent power (measured in volt amperes). The ratio of active to apparent power is the power factor. Under the Common Distribution Charging Methodology (CDCM), half hourly (HH) metered generators are charged for 'excess reactive power' if their power factor falls below 0.95. This is intended to incentivise generators to maintain an efficient power factor.

In September 2014, National Grid Electricity Transmission (NGET) identified a rapidly emerging issue around falling variable demand leading to high voltage levels on the National Electricity Transmission System under low load conditions. One solution to this issue is for distribution connected generators to operate at lower power factors. This may result in some generators being requested to operate with a power factor of less than 0.95. These issues were considered by the Reactive Power Exchange Application Capability Transfer (REACT) project<sup>4</sup>. The final REACT report estimated the investment cost of dealing with these issues through investing in shunt reactors to be between £213million and £295million over a five year period, which could potentially be avoided through managing the reactive power absorption of generators. This can reduce connection charges for generators and overall costs for consumers.

## The modification proposal

DCP 222 was proposed by Western Power Distribution (WPD). It proposes that those CDCM HH metered generators that have an agreement to adjust their reactive power when required to do so should be exempt from reactive power charges. For each CDCM HH metered generation tariff an additional generation tariff would be introduced that does not include an excess reactive power charge. The existing and proposed new tariffs are set out in annex 1.

## DCUSA Parties' recommendation

The Change Declaration for DCP 222 indicates that DNO<sup>5</sup>, IDNO/OTSO<sup>6</sup>, and Supplier parties were eligible to vote on DCP 222. Suppliers voted unanimously to approve DCP 222 and the implementation date. A majority of DNOs and all IDNOs voted to reject both the proposal and the implementation date. In accordance with the weighted vote procedure, the recommendation to the Authority is that DCP 222 and the proposed implementation date should be rejected. The outcome of the weighted vote is set out in the table below:

<sup>1</sup> 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.

<sup>2</sup> 'Change' and 'modification' are used interchangeably in this document.

<sup>3</sup> This document is notice of the reasons for this decision as required by section 49A of the Electricity Act 1989.

<sup>4</sup> The final REACT report and other documents relating to the REACT project are available here

<http://www.smarternetworks.org/Project.aspx?ProjectID=1460>

<sup>5</sup> Distribution Network Operator

<sup>6</sup> Independent Distribution Network Operator/Offshore Transmission System Operator

DCP 222	WEIGHTED VOTING (%)							
	DNO		IDNO/OTSO		SUPPLIER		DG <sup>7</sup>	
	Accept	Reject	Accept	Reject	Accept	Reject	Accept	Reject
CHANGE SOLUTION	26%	74%	0%	100%	100%	0%	n/a	n/a
IMPLEMENTATION DATE	46%	54%	0%	100%	100%	0%	n/a	n/a

### Our decision

We have considered the issues raised by the proposal, the Change Declaration dated 12 July 2016 and the Change Report dated 17 June 2016. We have considered and 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 General Objectives and the DCUSA Charging objectives;<sup>8</sup> and
- directing that the modification is approved is consistent with our principal objective and statutory duties.<sup>9</sup>

### Reasons for our decision

We consider this modification proposal will better facilitate DCUSA charging objectives 3.2.2, 3.2.3 and 3.2.4, and has a neutral impact on the other applicable 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.***

We consider that DCP 222 will improve competition in two ways. First, it will help DNOs and the system operator (SO) minimise connection costs for distribution connected generators in areas with high voltage issues. Minimising connection costs should reduce barriers to entry for these generators and improve competition in the generation of electricity. Second, it will prevent individual generators being disadvantaged compared to other generators in the same area that are not requested to operate at a power factor of less than 0.95.

We therefore consider that DCP 222 better facilitates this objective.

***DCUSA Charging Objective 3.2.3 – that compliance by each DNO Party with the Charging Methodologies results in charges which, so far as is reasonably practicable after taking account of implementation costs, reflect the costs incurred, or reasonably expected to be incurred, by the DNO Party in its Distribution Business***

We note some DNOs' view that distribution connected generation operating at a power factor of less than 0.95 will drive distribution costs regardless of whether they are requested to operate with a power factor at this level. They therefore consider that DCP 222 will result in less cost reflective charges as compared to the current baseline.

<sup>7</sup> Distributed Generation

<sup>8</sup> 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.

<sup>9</sup> 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.

While we agree that generators operating at lower power factors at the request of the DNO may drive distribution costs, we do not agree that DCP 222 will result in less cost reflective charges. Generators that produce excess reactive power when not requested to do so, will typically drive costs (as compared to operating at an efficient power factor). This is not necessarily the case for those generators that are requested to operate at a lower power factor. For example, if operating at a low power factor avoids reinforcement of the distribution network, then increased reactive power absorption may reduce distribution costs. Or if generators are asked to increase reactive power absorption at times of low load, which is typically when these high voltage issues arise, then their reactive power absorption is unlikely to contribute to the peak flows which drive investment in network capacity. We also note that, so far as increased reactive power absorption does drive distribution costs, to some extent these costs will be driven by other network users who are not requested to operate at a power factor below 0.95. In this case it would not be cost reflective to charge only the party or parties that are requested to increase their reactive power.

We also note concerns that generators exempted from reactive power charges may operate with inefficient power factors at times other than that they are requested to. In their view, this means the removal of excess reactive power charges for these generators is less cost reflective than the current baseline. Generators who have agreements to adjust reactive power on request will have installed equipment that allows them to control their reactive power. They will also have little or no incentive to operate at a low power factor when not requested to do so by their DNO. We therefore consider the risk of generators operating at a low power factor when not required to do so to be minimal.

We therefore consider that DCP 222 is likely to result in more cost reflective charges and better facilitates this objective.

***DCUSA Charging Objective 3.2.4 – that, so far as is consistent with Clauses 3.2.1 to 3.2.3, the Charging Methodologies, so far as is reasonably practicable, properly take account of developments in each DNO Party's Distribution Business***

High voltages on the transmission system due to low variable demand is a rapidly emerging issue that relates to the DNOs' distribution businesses. Requesting distribution connected generators to operate at lower power factors is one way of addressing these issues. Where a generator is requested to operate at power factor of less than 0.95 we do not consider that it is appropriate for that generator to be subject to excess reactive power charges under the current methodology. These charges were designed on the understanding that generators would not be requested to operate at low power factors. Charging individual generators for reactive power output in these circumstances would penalise them for voltage issues driven at least to some extent by other distribution network users. We therefore consider that by exempting generators requested to operate at a power factor of less 0.95 DCP 222 properly takes account of a developments in the DNOs' businesses – ie that high voltage issues on the transmission system mean that generators may, in future, be requested to operate at lower power factors.

A number of DNOs have concerns that this change is not needed now and that it may be appropriate to develop more sophisticated charging solutions. They note that no generators are currently requested to operate at a power factor of less than 0.95 and they do not envisage this happening in their network areas in the near future. We understand that due to high voltage issues in WPD's distribution areas some connecting CDCM generators may be requested to operate at a power factor of less than 0.95 in the relatively near future. We also note that where DNOs do not request generators to operate with a power factor of less than 0.95 DCP 222 will not affect them. We acknowledge that, in future, it may be appropriate to consider more sophisticated contractual and charging approaches to this issue. However, we also consider that DCP

222 provides a simple, proactive arrangement which can help DNOs to address high voltage issues on the transmission system as they emerge. For clarity, in approving DCP 222 we are not restricting any future changes in this area.

We also note and agree with the workgroup's view that making this change will have minimal financial impact on other consumers. We therefore consider that DCP 222 better facilitates this objective.

### **Other network operator concerns**

Some DNOs raised concerns that DCP 222 may make the transmission system more efficient and the distribution system less efficient, and that it may result in trilateral agreements between the DNO, the SO and distribution connected generators. We wish to make clear that this is a charging modification only. Our decision is in respect of whether CDCM generators should be subject to excess reactive power charges *if* they are requested to operate at a power factor of less than 0.95 by their DNO. It is not a decision on how high voltage issues should be managed, although we encourage the SO and DNOs to work together to develop efficient solutions in terms of whole system costs. Further, we would not expect DNOs to make such a request unless they have agreed with the SO that this is the efficient whole system solution. We also note that the alternatives to a generator operating at a low power factor may be reinforcement of the distribution system which can be part or fully socialised under the distribution connection charging methodology, leading to higher costs for consumers.

Some DNOs remain to be convinced of the conclusions of the REACT report. They note that it looks at a limited number of grid supply points (GSP)<sup>10</sup>. While we acknowledge that the REACT report looks at a limited number of GSPs we do not consider that this is a reason to reject its broad findings. We are satisfied that this change can help to deliver improvements in the management of the transmission system and distribution networks in future. We also consider that the benefits of this proposal will outweigh any additional costs associated with its implementation which the workgroup assessed to be negligible.

### **Implementation**

We note some responses to workgroup consultations raised concerns about the implementation date and in particular whether this gave time for the introduction of new tariffs. With the 15 months' notice of charges resulting from DCP 178, the changes to the CDCM, including the introduction of new tariffs, will need to be made in time for charges for 2018-19 which will be set at the end of 2016. We consider that there is sufficient time to make the changes to the CDCM in time for the setting of charges to take effect from 1 April 2018.

### **Decision notice**

In accordance with standard licence condition 22.14 of the Electricity Distribution Licence, the Authority hereby directs that modification proposal DCP 222 Non billing of Excess Reactive Power Charges be made.

**Andrew Wright**  
**Senior Partner, Energy Systems**

Signed on behalf of the Authority and authorised for that purpose

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## Annex 1 – Proposed new tariffs

The new tariffs for generators exempt from reactive power tariffs, denoted 'no RP', and are highlighted in purple in the table below.

Table 7: Half-hourly metered generation tariffs					
Tariff	Unit rate 1 p/kWh	Unit rate 2 p/kWh	Unit rate 3 p/kWh	Fixed charge p/MPAN/day	Reactive power charge p/kVArh
LV Generation Intermittent	✓			✓	✓
LV Sub Generation Intermittent	✓			✓	✓
HV Generation Intermittent	✓			✓	✓
<u>LV Generation Intermittent no RP charge</u>	<u>✓</u>			<u>✓</u>	
<u>LV Sub Generation Intermittent no RP charge</u>	<u>✓</u>			<u>✓</u>	
<u>HV Generation Intermittent no RP charge</u>	<u>✓</u>			<u>✓</u>	
LV Generation Non-Intermittent	Red	Amber	Green	✓	✓
LV Sub Generation Non-Intermittent	Red	Amber	Green	✓	✓
HV Generation Non-Intermittent	Red	Amber	Green	✓	✓
<u>LV Generation Non-Intermittent no RP charge</u>	<u>Red</u>	<u>Amber</u>	<u>Green</u>	<u>✓</u>	
<u>LV Sub Generation Non-Intermittent no RP charge</u>	<u>Red</u>	<u>Amber</u>	<u>Green</u>	<u>✓</u>	
<u>HV Generation Non-Intermittent no RP charge</u>	<u>Red</u>	<u>Amber</u>	<u>Green</u>	<u>✓</u>	