Central Networks

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Central Networks West - Proposals Concerning Use of System Charging Methodology

Excess Reactive Power Charging

March 2006

INTRODUCTION

Central Networks has developed a methodology for the basis of charging for excess reactive units. This submission is made in respect of Central Networks West. A separate but similar submission is also being made in respect of Central Networks East.

It is our aim (subject to approval) to implement the proposal detailed in this document as soon as possible. Assuming that the Authority does not notify us of an intention to consult on this proposal then this would result in implementation on 1 June 2006.

The remainder of this document is arranged in the following way:

1.1 Detailed description of our proposal;
1.2 Explanation of how the proposal better meets licence objectives;
1.3 Consultations carried out;
1.4 Illustrative charges;
1.5 Proposed wording of Methodology Statement; and
1.6 Our future plans.

1.1 Detailed description of the proposal

Poor power factors impose costs on the distribution network. Central Network's believe that this additional cost should be apportioned onto those giving rise to it and that a clear and cost reflective signal to those users with poor power factors will result in lower network costs in the long run.

At present, however, we only provide power factor cost signals in the somewhat opaque form of kVA capacity charges (i.e. a poor average power factor may lead to a higher kVA demand at the customer's peak and therefore a higher capacity charge). We believe that this is not fully cost reflective since our network costs are actually recovered through both capacity AND kWh charges and therefore at present those consumers with a poor power factor are only receiving the capacity charge element of the appropriate cost signal (assuming that suppliers are passing this cost message on).

Central Networks seeks to remedy this by introducing cost reflective charges for excess reactive power to work alongside our kVA capacity charges to provide a more appropriate and explicit cost signal to users with a poor power factor.

This is in line with Ofgem's view[1], that:

"It is important that DNOs' charging arrangements reflect the costs that low power factors impose on the networks. Competition in supply would then mean that it would be in suppliers' interest to give the appropriate signals to their customers. Ofgem would therefore expect DNOs to include charges for low power factors for large customers as part of a revised charging methodology……."

Our standard pricing model which was recently implemented (and associated methodology modification approved by Ofgem) to prepare the DUoS tariffs for 2006/07 begins with an assumption that demand customers' power factors will not be worse than 0.95 (the minimum

[1] Quote taken from Ofgem's Structure of Charges Initial Conclusions Document

power factor required in our connection agreements with large customers). The basic principle of the model is to share the asset costs of the network between customers by reference to their contribution to the demand that necessitates the assets. The outputs from the model are tariff 'yardsticks', representing the relative amounts of cost attributable to each customer group.

In recognition of the additional costs prompted by customers with poor power factors the model also calculates excess reactive power charges for large customers with demand at average power factors below the level assumed in our pricing model.

We propose to introduce charges for excess reactive power, where total kVArh exceeds 33% of total kWh in a particular charging period (this boundary being equivalent to the minimum average power factor of 0.95). The charges will be derived by 'flexing' the pricing model between power factors of 0.95 and a value equivalent to the weighted average power factor for the sub set of customers who's power factor is worse than 0.95. This has the effect of increasing the size of the model network used to set prices and thus the cost of that network. This increased cost causes an increase in the relevant yardsticks for the half-hourly tariffs at each voltage level. Our methodology uses the yardstick increment that would not be recovered by a consumer's standard capacity charge (since it could be argued that the consumer with poor power factor is already paying for the increased capacity through their standard kVA capacity charge) and converts this into equivalent prices in pence per kVArh that will recover the incremental cost, given forecast levels of reactive power.

We believe that reactive power charges will form an important cost reflective element of the longer term charging arrangements, and that introduction of these charges paves the way for transition to the longer term arrangements.

1.2 Explanation of how the proposal better meets licence objectives

We believe that the proposal better meets licence objectives by providing explicit cost reflective charges for excess reactive power which complement the assumptions made in our new pricing model, and that are expected to modify customers' behaviour in a way that will reduce long run network costs.

1.3 Consultations carried out

In June 2005 we wrote to all suppliers with an update on the work we were doing to develop our use of system methodology, and an invitation to comment. Below are the relevant sections of that letter which applied to the introduction of charges for poor power factor (we have removed the sections which did not relate to power factor in order to remain focused on the subject at hand. The full letter has been provided in a previous modification proposal from Central Networks or can be supplied upon request).

Dear Supplier

I am writing to you to tell you about work that we are currently doing to develop our use of system methodology, and to invite your comments…

…In addition to addressing Ofgem's specific conditions, we are considering further improving the methodology for demand tariffs in a number of other ways:…

- *…By introducing special charges for demand at average power factors below an acceptable limit, possibly by way of kVArh charges where kVArh exceeds a set proportion of kWh in a particular charging period…*

…I hope that this letter provides a helpful insight into the work that we are currently undertaking. If you would like to make any comments it would be helpful to receive these by mid July. I would also be happy to

discuss any comments with you on a one-to-one basis, please contact me if you would like to do this.

Yours sincerely

Andrew Neves
Tariff and Income Manager

c.c. Mark Cox, Ofgem

We did not receive any response to this letter, and this was taken as an indication that the proposals it outlined were broadly acceptable to suppliers. We also listened to what suppliers were saying in forums such as the Implementation Steering Group (ISG). Again these views did not appear to conflict with anything that we were proposing to do.

Furthermore, on 1 December 2005 Ofgem published a consultation letter which invited comments in relation to an earlier proposal by Central Networks (and United Utilities) for the introduction of reactive power charges. There were 13 responses to that consultation and on 22 February 2006 Ofgem wrote to Central Networks with their decision letter regarding that consultation. The responses to the consultation and in particular Ofgem's decision have had a strong influence on this proposal.

The primary issue with our previous proposal was that it made no distinction between the additional kVA capacity and kWh costs associated with poor power factor and some respondents argued that since Central Networks charge for capacity in kVA this could lead to an element of double charging (i.e. a customer with a poor power factor would pay for the extra kVA that this power factor is causing through their kVA capacity charge PLUS pay for the excess reactive units causing the increased kVA through the reactive power charge). Ofgem agreed with this view and having considered the issue again Central Networks are also now sympathetic to this view. It is for this reason that we are putting forward this revised proposal which explicitly excludes the kVA

capacity cost recovery element of the additional cost that poor power factors cause.

We have not carried out formal consultations on our final proposals.

1.4 Illustrative charges

The illustrative excess reactive power charges for large non-domestic (half-hourly) customers detailed in the table below have been calculated in the way described in section 1.5 below using latest available data. These are the proposed 2006/07 prices.

Name	Charge	Units	Old Price	New Price
LND LV	Excess reactive power charge	p/kVArh	N/A	0.19
LND HV	Excess reactive power charge	p/kVArh	N/A	0.10
LND EHV	Excess reactive power charge	p/kVArh	N/A	0.07

1.5 Proposed wording of methodology statement

The methodology statement will be amended by inserting the following paragraphs between the existing paragraphs 'Setting Unit Charges' and 'Setting Standing Charges' (i.e. between existing paragraphs 43 & 44).

Setting excess reactive power charges

Excess reactive power charges apply to half-hourly demand where total kVArh exceeds 33% of total kWh in a particular charging period (this boundary being equivalent to the average power factor of 0.95 assumed in the pricing model). The charges are derived by 'flexing' the pricing model between power factors of 0.95 and a value equivalent to the weighted average power factor for the sub set of customers who's power factor is worse than 0.95 and those assumed to be 0.95. This has the effect of increasing the size of the model network used to set prices and thus the cost of that network. This increased cost causes an increase in the relevant yardsticks for the half-hourly tariff at each voltage level. Our methodology uses the yardstick increment that would not be recovered by a consumer's standard capacity charge (since it could be

argued that a consumer may already be paying for a proportion of the increased capacity costs through the standard kVA capacity charge) and converts this into equivalent prices in pence per kVArh, given forecast levels of reactive power.

The methodology is set out in more detail below:

For each voltage level (LV, HV and EHV):

- The average power factor of those customers with power factors less than 0.95 is calculated.

- This is then combined with the assumed power factors (0.95) of those customers who do not use excess reactive power to produce a weighted average power factor for the voltage specific class of customers as a whole.

- This new weighted average power factor is then fed into the charging model which calculates the increased network costs that this extra capacity requires.

- These increased network costs translate into increased yardsticks that are applicable to customer's with poor power factors.

- The standard capacity charge will recover an element of the increased yardstick costs.

- The unit charge will not capture any of the increased yardstick costs.

- The element of the increased yardstick costs which are not recovered through standard capacity charges or unit charges will be recovered by excess reactive power charges.

- The excess reactive power charge is calculated by dividing the element of the additional yardstick costs from the half-hourly

customers that is not recovered from the standard capacity charge or unit charge by the forecast volume of kVArh that is causing that increase, expressed in p/kVArh.

1.6 Our future plans

We plan to use the proposed methodology (if approved) to implement the charges set out in this document as soon as possible.

We are also actively collaborating with other DNOs through the Energy Networks Association (ENA) to develop proposals for the longer term arrangements.