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DNOs, Suppliers, Distributed Generation and Other Interested Parties

Our Ref: RBA/DPC/SOC/38/1
Direct Dial: 020 7901 7255

15 December 2006

Dear Colleague,

Impact assessment and consultation on Western Power Distribution's Modification Proposal to change their Electricity Distribution Use of System Charging Model – Ref: WPD/WALES/WEST/UOS002A

Background

Electricity Distribution Network Operators (DNOs) have licence obligations[1] to have in place as of 1 April 2005 three charging statements: the statement of use of system charges, the statement of use of system (UoS) charging methodology and the connection charging methodology statement. The statement of the UoS charging methodology outlines the method by which distribution UoS charges are calculated.

The DNOs have a requirement to keep the methodology under review and bring forward proposals to modify the methodology that they consider better achieve the relevant objectives[2].

Before making modifications to their charging methodologies each DNO must give the Gas and Electricity Markets Authority (the 'Authority')[3] a report setting out the terms proposed for modification and how the modification would better achieve the relevant objectives. The licensee then makes the modification unless within 28 days of receiving the report the Authority either directs the licensee not to make the modification or notifies the licensee that it intends to consult and

[1] Standard Licence Conditions (SLC) 4-4B

[2] The relevant objectives for both the connection and use of system charging methodologies, as contained in paragraph 3 of SLC4B and SLC4 of the distribution licence respectively are:

(a) that compliance with the use of system charging methodology facilities the discharge by the licensee of the obligations imposed on it under the Electricity Act 1989 and by this licence;
(b) that compliance with the use of system charging methodology facilitates competition in generation and supply of electricity, and does not restrict, distort, or prevent competition in the transmission or distribution of electricity;
(c) that compliance with the use of system charging methodology results in charges which reflect, as far as is reasonably practicable (taking account of implementation costs), the costs incurred by the licensee in its distribution business; and
(d) that, so far as is consistent with sub-paragraphs (a), (b), and (c), the use of system charging methodology, as far as reasonably practicable, properly takes account of developments in the licensee's distribution business.

[3] Ofgem is the office of the Authority. The terms 'Ofgem' and the 'Authority' are used interchangeably in this letter.

then within a further three months directs the licensee not to make the modification.

The proposed modification received from Western Power Distribution (WPD) on 13 December 2006, covering both their South Wales and South West licensees, sets out to modify their UoS charging methodologies. Having carefully considered the issues raised by the proposal, in particular the fact that this is the first significant change in the development of long term distribution charging arrangements, the Authority deems it appropriate to carry out a consultation and set out an impact assessment to help respondents give their views. We wrote to WPD on 15 December informing them of this.

Suppliers have noted concern that if we were to consult, WPD intend to publish two sets of indicative charges at the end of December. This will provide suppliers with a degree of uncertainty on the prices effective from 1 April 2007 (e.g. domestic unrestricted tariff -3% and -5% difference for South West and South Wales respectively). However, as stated above, the Authority considers that a consultation is appropriate and we will work towards making a decision on the proposal as soon as practicable.

WPD Modification Proposal

It should be noted that WPD submitted one report to cover proposed changes to both their South Wales and South West licensees. WPD's report is available on our website as an attachment to this consultation document and therefore the detail of the proposed changes and revised model is not repeated here. In summary:

WPD's proposed revised charging methodologies include a Long Run Incremental Cost (LRIC) model for calculation of charges at the higher voltage networks[4] with a version of the existing Distribution Reinforcement Model (DRM) applying at lower voltages. The new model is a substantial change to the way they currently charge users at EHV.

The LRIC method calculates the brought forward (or deferred) reinforcement cost as a result of the addition of an increment of demand or generation at each network node. The objective is to link the changes in behaviour of a user to an impact on system costs.

An initial AC load flow is used to determine the time it would take for each asset to reach its capacity assuming underlying utilisation levels and growth rates (assumed at 1%). Given these timings, and the future reinforcement costs, a net present value of the future reinforcement costs for the network is calculated using a discount rate equivalent to the cost of capital assessed by Ofgem as part of the price control (currently 6.9%).

For each node, an increment (0.1MVA) of demand/generation is added and a new load flow generated. The evaluation of the net present value of the future reinforcement is repeated for the network with this increment present. The difference between the initial and incremental study represents the impact on future reinforcement investment per incremental change in demand or generation. This is represented as an annual £/kVA at each node by multiplying the difference by an annuity factor.

The above analysis is undertaken for both winter loading conditions and summer loading conditions using the appropriate ratings for the season. The condition

[4] The LRIC model operates at EHV level

that drives the need for reinforcement is used to determine the prices for demand and generation users.

The proposed change predominantly affects charges for parties using WPD's EHV network. Charges for existing EHV demand customers and distributed generation connections at EHV who are liable for UoS charges using the network will be affected. This change will also have an effect on other users of the network mainly due to the impact on revenue scaling.

WPD have consulted twice during 2006 on their proposals and these documents can be found on their website[5] along with consultation responses. Since the last consultation, WPD have made a number of changes to their approach taking into consideration responses. This letter specifically highlights areas that Ofgem is seeking views and in particular considers areas that have changed since WPD's last consultation. A discussion of the main issues can be found in **Annex 1**.

Impact, costs and benefits

This decision has significant impact on parties and is the first proposal by any of the distributors in their development of long term charging arrangements. Ofgem's assessment of the impact, costs and benefits is detailed in **Annex 2** of this document. In general we support the introduction of revised charging arrangements where these are likely to bring greater benefits to consumers. However, we note that although the proposed modification may bring enduring benefits, the proposal does impact significantly on a small number of individual customers.

Views sought

This proposed modification is a significant change to the basis of deriving distribution UoS charges and covers a range of issues. We seek views on the following questions:

- WPD state that their proposal better meets the relevant objectives with regard to transparency and cost reflectivity. Does the modification proposal better achieve the relevant objectives?

- Have we correctly captured the main issues in Annex 1?

- Have we correctly identified the impacts in Annex 2? In particular we would welcome quantified assessments of impacts.

Responses to this consultation letter

Views are invited on all the issues raised by this charging modification proposal from interested parties, including DNOs, suppliers, distributed generators, customers and their representatives. Views are invited by **Friday 19 January 2007**. Where possible responses should be sent electronically to:

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London, SW1P 3GE
Tel: 020 7901 7458
Email: distributionpolicy@ofgem.gov.uk

[5] www.westernpowerdistribution.co.uk

The process associated with modifications to the charging methodologies is detailed within the distribution licence, standard licence condition (SLC) 4. As the Authority's decision is time bound please ensure that your comments are received by the date indicated so that they can be fully considered – it may not be possible to consider responses that are received after this date.

All responses will be held electronically by Ofgem. They will normally be published on the Ofgem website unless they are clearly marked confidential. Consultees should put confidential material in appendices to their responses where possible. Ofgem prefers to receive responses electronically so that they can easily be placed on the website.

Copies of this document are available on the Ofgem website under Electricity Distribution Charges (Modifications) area of work.

Please contact Mark Cox on 0207 901 7458 if you have any queries in relation to the issues raised in this letter.

Yours faithfully,

Martin Crouch
Director, Distribution

Annex 1 – Discussion of main issues

EHV charges

The revisions to the methodology predominantly affect EHV charges. There are significant changes for some EHV customers (over 100 % increases in 4 cases compared to current 06/07 charges). DUoS charges currently make up a minority percentage of an EHV customer's electricity bill. WPD are not proposing to implement any transition to the new prices and therefore unless vetoed these charges would take effect from 1 April 2007. Views are sought on the impact of these changes.

It is worth noting that if this proposal is vetoed WPD's current methodology indicates that current EHV charges will be exposed to an increase of RPI. However, if WPD's current model were subsequently applied in full, this would also lead to some substantial changes in charges.

Scaling to revenue

The scaling requirements for the WPD model are two-fold. Initially the revenue to be recovered is allocated between the LRIC model and the DRM based on the MEA value of the relevant assets. The second element is to scale the individual outputs from both the DRM and LRIC models to the apportioned revenue requirement.

WPD are proposing to scale outputs from the LRIC charging model to their allowed revenue using a 'fixed adder' (£/kVA) approach which is similar to National Grid Electricity Transmission. This approach minimises the disturbance of the economic signals derived from the model as compared with a percentage scaling approach which is the method used for DRM and that used historically.

In the case of generator charges derived from the LRIC model, WPD intend to use a fixed adder approach so they are better able to adjust the marginal costs to their allowed revenue. Due to the fact that this is a separate revenue stream that at this time is small and growing unpredictably WPD have determined that this is the most appropriate mechanism.

Generation Tariffs

This revised method considers the impact both in terms of the costs and the benefits and, as can be seen in the WPD's modification report pages 24-44, some of these charges are negative. The model considers the benefits that generation will afford to the network based on the network security standard[6]. This means that plant considered more reliable will be given greater credit.

WPD propose to amend their methodology also to restrict existing generators (not currently paying GDUoS) from opting in to the new arrangements. WPD propose to resolve arrangements for existing generators as a package rather than having the prospect of generators on negative charging nodes opting in on an adhoc basis from 1 April 2007.

We note WPD intend to retain the 10% limitation on changes in charges year on year for EHV, HV and LV connected generators but have indicated that this is time limited to 2010 while the new arrangements bed down.

WPD do not intend to amend the basis of charges for HV and LV connected generators as part of this modification proposal.

[6] The network security standard is ER P2/6 and this details contribution factors that different types of plant can be assigned to support the network.

New Connections

WPD intend to base their charging model on the forecast network for the relevant charging year. They intend to include proposed reinforcement to their network but with proposed connections, these will only be included in the model for the relevant charging year if a connection offer has been accepted and all consents have been obtained for the proposed connection. The purpose of this is to minimise the effect on existing users from projects that become delayed.

Sole use assets / contributions

There are a number of cases where assets have been originally installed for a customer but form part of the network. However, the assets have been sized to connect the original customer load and therefore are likely to be fully utilised. Due to the way LRIC works it will identify these assets as high marginal cost as they will be highly utilised. This will impose a high cost on the existing customer. WPD have revised their approach to the treatment of off-site sole-use assets by removing these assets from the LRIC calculation. This treatment may lead to step changes in charges if new customers connect to these assets and they become shared use. By not including them in the model there is also the risk that the charges will not provide an effective signal through UoS charges to new parties however this is balanced due to the shallowish connection charging boundary.

WPD's initial position on treatment of contributions to sole use assets was to assume that no assets had been paid for at all. Their revised proposals now assume that all sole use assets have been fully paid which ensures that there is no double charging and the only cost to be incurred by users for these assets will be the annuitised value of the replacement costs. However, such an approach provides a weak signal, certainly at the higher voltages, in deciding whether to replace assets and this may need further consideration.

Capping negative demand charges to zero

In the event that the LRIC model produces negative demand charges, WPD have decided to set these equal to zero. WPD justify this approach on the grounds that these could provide perverse incentives. They also note that the negative demand charges in the main are being driven by existing large generators which are dominating the local area. These generators are not currently paying generation charges and therefore WPD do not think it consistent to levy a negative charge. It is noted that this is not a significant issue at this time as there are no demand charges that are currently capped to zero.

Reactive power charges

WPD utilises an AC loadflow network model as the basis for the LRIC charging model. This approach considers the cost impacts from both real and reactive elements on future network costs. However, the relationship between the combination of real and reactive increments and network costs is not linear. WPD's approach identifies the marginal cost for the addition of 0.1 MVA at a pre determined power factor but customers may have a different power factor and this may reduce the cost reflectivity of the model. WPD have indicated that this is limited and that by including the reactive element it is likely to be more cost reflective than just having a model based on MW flows.

Growth Rate

WPD's model has an assumed growth rate built into it in order to establish when assets will become overloaded. This is set at 1% across their entire network for each licensed area. In WPD's previous consultations this approach has attracted a lot of comment. In particular a number of parties have noted that this may be inaccurate on the grounds that the growth rate may be different depending on

location within the DNO's area. WPD note that growth rate is a key assumption of the model but that it is based on a long run average and do not believe that it is workable to have different assumed growth rates for different locations. They also do not intend to regular change it based on its long run nature and to avoid unnecessary volatility.

Thermal Model

The model only applies to thermal capacity and does not consider fault levels. WPD indicate that their reinforcement costs are in the main driven by thermal requirements and their current UoS methodology does not take account of costs driven by fault level. We would expect WPD to keep this under review and develop arrangements if this becomes a more significant issue.

Chargeable capacity

WPD's modelling assumptions for capacity of customers connected at EHV is different between demand and generation. For generation connections capacity is taken as the contracted capacity, while for demand customers, capacity is taken as the previous years recorded demand. This difference is on the grounds that demand customers are less responsive to market conditions than generation. This approach may be appropriate but it is important that customers are aware of the charging arrangements as in effect demand customers will be charged for their behaviour post the event.

Annex 2 - Impact Assessment

Objectives

The Authority will make its decision on WPD's modification proposal in the light of the relevant licence objectives set out in the electricity distribution licence (SLC4), the Authority's principal objective and its statutory duties and obligations. The purpose of this consultation is to seek views on the proposed modification and the associated impacts.

Key Issues

WPD's proposal to modify their UoS charging methodology is designed to better facilitate achievement of the relevant objectives detailed in the SLC4 of the licence. WPD state that the modification, as compared with the current method, would better achieve these objectives.

WPD state that their proposal increases transparency of charges by publishing these in addition to making the model available to parties each year. This increased transparency should better facilitate competition in supply and generation.

WPD state that their proposal also improves cost reflectivity by moving from average EHV charges to locational ones. This means that the costs imposed on the network by parties will be better reflected to them so that there is a link between changes in customer behaviour and impact on network costs.

The new charging arrangements seek to better reflect the impact, whether positive or negative, on the future cost of the network due to the party's use. In particular, the proposal introduces locational charges at EHV. This model therefore better reflects the costs and benefits caused by users and will value the contribution that distributed generation (DG) can make to network security. Assuming some level of demand elasticity, negative charges for generation will attract projects to connect in favourable locations.

Options

WPD have proposed a modification to their UoS charging methodology. The Authority is required to decide whether or not to veto the proposal – there is no scope to amend or apply conditions to the proposed change. Therefore the options are:

- Veto the proposal and maintain the existing charging arrangements;
- Not veto the proposal enabling the introduction of the new charging model from 1 April 2007 (or a later date depending on timing of decision).

Competition Assessment

The proposed modification is likely to have an impact on both suppliers and DG. By reflecting the costs and benefits, it is more likely to encourage the more cost effective DG to connect and use the distribution network which will benefit competition. Also more cost reflective charges may encourage suppliers to offer more innovative approaches to their customers.

However, some suppliers and DG parties expressed concern that if charges are volatile this could have a negative impact on competition. We note that a large

component of the charges is a flat £/kVA element which will increase stability. In addition as noted below the model is likely to be more transparent as the nodal prices and model will be published which will allow both suppliers and DG parties to better understand the basis of their charges which should improve competition.

Impacts, Costs and Benefits

The main impacts associated with WPD's modification are detailed in their modification report. In particular pages 24-44 detail changes to charges for all customers on their network.

Environment

It is hard to assess the impact that the proposal will have on the environment but to the extent that economic charges encourage generation to connect to the distribution network it is expected that a large proportion of new DG will be from renewable, low carbon sources.

This model does not consider pricing for locational network losses but by providing economic locational network charges to parties it is likely to encourage both demand and generation users to locate in more favourable locations. This may lead to greater utilisation of the network which should lead to lower fixed losses associated network equipment. The impact on variable losses is likely to be dependent on network location.

Security of Supply

Electricity distribution networks are designed to meet security standard P2/6. The charging model considers the benefit that DG will provide to network security based on allowances described in P2/6. This therefore values DG based on the contribution that can be assumed for network security purposes. This is likely to better promote efficient development of the network but should also contribute to encouraging improved security of supply.

Health and safety issues

It is considered that the effects of this proposal are not significant to health and safety.

Distributional effects

This is a major change to the calculation of electricity distribution charges and the first for many years. The proposed charging model would have a significant impact on EHV charges leading to both positive and negative cost implications for customers connected to WPD's network. In some cases there will be significant reductions for customers while in others there will be a significant increase (over 100% in four cases). These would take effect from 1 April 2007 and will impact on the customers but also potentially on the supplier for the site.

The main impact of the proposal is on EHV charges but there will also be limited effect on other customers at lower voltages mainly due to scaling of the charging models to allowed revenue.

Small businesses

This proposal predominantly affects businesses and customers connected to the EHV networks which in the main are large businesses and customers. The impact

on smaller businesses and customers is not considered significant from this proposed change.

Risk and unintended consequences

The proposal as outlined above is designed to better achieve the relevant objectives. The relevant objectives have been determined to ensure that the licensee is able to develop and maintain their network in an economic manner. By doing so costs passed through to all customers in general will be minimised. In assessing WPD's proposal, the Authority will consider whether it better facilitates achievement of these relevant objectives.

Some of the benefits described further below will be achieved based on an expectation that increasing amounts of DG will connect. If lower levels of DG connect or, more generally, fewer new connections are made to WPD's network then the benefits are likely also to be lower. However, the order of magnitude indicates that this approach will still provide a benefit.

Costs and benefits

Assuming some level of demand elasticity, the revised charging model will encourage improved utilisation of the network and reduced network reinforcement. Although initially there will be no effect on the DNO's revenue and hence no benefit to consumers in general, with time the revised charging model will encourage more economic utilisation reducing the need for network reinforcement which will feed through to less requirement for investment by the DNOs and to lower prices to consumers.

Although the analysis of benefits to be drawn from a revised charging model is subjective, Ofgem has undertaken a study with Bath University[7] to assess these potential benefits. This can be found on our website under Electricity Distribution Charges (Structure of Charges) area of work. This analysis argued that if similar proposals to WPD's modification were implemented across GB by all the DNOs that there were likely to be significant benefits – of the order of £200m cost saving compared with status quo, depending on certain assumptions as set out in the report. This analysis is limited by its assumptions but it does indicate the magnitude of potential saving that might be available.

There will be costs associated with implementing revised charging arrangements for each DNO but these are expected to be low £m[8] across all DNOs. In WPD's case these costs have been sunk. Dependent on models there could also be higher on-going costs. WPD's model, although mainly automated, will be more complicated to run and maintain but again this is expected to be a low incremental cost to the existing resource required to set UoS charges for WPD.

Suppliers are the main parties who will be exposed to the arrangements. WPD do not propose to change the structure of their tariffs and hence there is no impact and knock on cost of billing systems at this time. The model is more detailed to understand than the DRM and current site specific charging arrangements due to the volume of data required for nodal prices and requirement for more in depth modelling. However, it is more transparent by publishing the range of nodal

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[7] Bath University, working with DLT consulting

[8] Where DNOs have specified potential costs, following our request in July 2005, these indicated that implementation costs at EHV level would be relatively small. DNOs have suggested that much larger cost would be incurred should lower voltages be covered by economic charging models due to the potential need to change billing systems.

prices and model which will allow suppliers to model charges and understand the model. This may provide benefits by facilitating competition in supply. Similar arguments apply for DG although currently there are negligible numbers of DG that have applied for connection since 1 April 2005 (3 parties) to WPD's network although increasing amounts are expected.

WPD also note that the revised model would reduce perverse incentives to connect to distribution or transmission due to the use of averaged charges on the distribution network.