

From: Ralph Turvey [<mailto:ralph@randb.demon.co.uk>]
Sent: 12 June 2007 13:28
To: COMMERCIAL
Subject: Comment by Ralph Turvey on G3 Distribution charge consultation

Very interesting. I get stuck at para 4.7 where I would have expected the marginal cost charge rate to have been calculated by dividing by 1,057,475, not by 2,425,776, since it is the growth of period 2 demand which will trigger off the expenditure with a present value of £1,207.48. That increase in capacity will leave plenty of spare capacity available over the next ten years in periods 1,3,4,5 so that marginal cost in those other periods will be zero and their charges should therefore be zero (unless the revenue requirement can be met only by imposing some charges in excess of marginal cost).

Ralph Turvey

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From: WRHodgkins@aol.com
Sent: 12 June 2007 16:09
To: ralph@randb.demon.co.uk
Cc: Nigel.Bessant@scottish-southern.co.uk; Andrew, Stuart; McEntee, Tony; Liendo, Maria; Andrew.Neves@central-networks.co.uk; Mo.Sukumaran@scottish-southern.co.uk; Dominique.Tilquin@scottish-southern.co.uk; Blundell, Garth; George.Moran@central-networks.co.uk; max.lalli@scottish-southern.co.uk
Subject: Re: FW: Comment by Ralph Turvey on G3 Distribution charge consultation

From: W. R. Hodgkins
Mathematical & Computer Modelling
15 Cotebrook Drive
Upton, Chester CH2 1RA

Tel: +1244 383038 email: WRHodgkins@aol.com

Ralph,

Mo Sukumaran asked me to reply to your query.

If there was only one time period, then our procedure and your procedure would be identical. However, we are considering how to levy charges when more than one time period is involved. If all time periods had identical loadings, then the charge would be split equally between the time periods. When the loadings are slightly different then we have to cope with the situation that the loadings may not be accurately known, weather corrected data may be used and the maximum demand could easily oscillate between different time periods from year to year. Also in this situation, If the current maximum demand time period was charged substantially more, then this could easily induce the switch between time periods giving oscillating and unhelpful signals.

We have therefore looked for a method where there is a gradual shift between sharing costs equally when all time periods have the same demand to one where a time period bears no charge if the demand is substantially below the maximum demand. There is no unique way to do this and we have considered different alternatives. The present method applies the same rule as is applied to a single time period. If the demand in a time period is such that it will not exceed the capacity within the cost recovery period (10 years) then no charge is levied (this applies to period 5 for the example shown). Otherwise it is proportional to the Present

Value based on its time to reinforcement. Therefore for reinforcement 1 at this particular point in the 10 year cycle, the other 4 time periods all contribute at different rates with Period 2 contributing most. For the first 3 years of the cycle, only Period 2 is charged, then Period 4 kicks in, then Period 1, etc. So the charge rate is determined by dividing by the sum of the contributions for all time periods rather than only the contribution from the time period of maximum demand.

We think the proposed method serves its purpose. It has the advantage that it is based on a single rule rather than introducing additional criteria. An alternative would be to say that no charge would be levied on a time period if its maximum demand was less than some percentage of the maximum demand with say a quadratic function to set charges above this percentage. This introduces another arbitrary parameter which we would need to set.

The problem of the maximum demand oscillating could become very real. We have situations where the maximum demand has shifted away from the winter peak to avoid high prices. We then have a problem when it shifts into the 'Other time' period, since we can hardly send out a message saying avoid other (unspecified) times and encourage load to move back into the normal peak period. Ideas would be appreciated.

Best wishes

Robin Hodgkins

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From: Ralph Turvey [ralph@randb.demon.co.uk]
Sent: 14 June 2007 19:04
To: WRHodgkins@aol.com
Cc: Nigel.Bessant@scottish-southern.co.uk; Andrew, Stuart; McEntee, Tony; Liendo, Maria; Andrew.Neves@central-networks.co.uk; Mo.Sukumaran@scottish-southern.co.uk; Dominique.Tilquin@scottish-southern.co.uk; Blundell, Garth; George.Moran@central-networks.co.uk; max.lalli@scottish-southern.co.uk
Subject: Re: FW: Comment by Ralph Turvey on G3 Distribution charge consultation

Yes, your point that " If the current maximum demand time period was charged substantially more, then this could easily induce the switch between time periods" was recognised as the problem of the shifting peak in the classical 1957 Quarterly Journal of Economics paper "Peak loads and efficient pricing" by Peter Steiner. So in the present case I agree that periods 1 and 2 should be charged the same or almost the same.

My point is that once capacity is increased to meet demand growth in periods 1 and 2 your illustrative data suggest that there will be bags of spare capacity in periods 3, 4 and 5, so that it will be possible to meet increases in demand in these other periods without additional capital expenditure and no charges are justified for them.

Even if cross price elasticities of demand for energy between periods 1 and 2 and the other periods were fairly high, they will be much lower with respect to DUOS charges, as these constitute only a fraction of what is paid for energy. Nevertheless, if, as you say, "We have situations where the

maximum demand has shifted away from the winter peak to avoid high prices." the principle still applies: the relevant peak period is different in those parts of the network where this has happened. Maybe you are thinking of areas without gas, where Economy 7 demand has created night-time peaks.

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From: WRHodgkins@aol.com
Sent: 15 June 2007 11:07
To: ralph@randb.demon.co.uk
Cc: Nigel.Bessant@scottish-southern.co.uk; Andrew, Stuart; McEntee, Tony; Liendo, Maria; Andrew.Neves@central-networks.co.uk; Mo.Sukumaran@scottish-southern.co.uk; Dominique.Tilquin@scottish-southern.co.uk; Blundell, Garth; George.Moran@central-networks.co.uk; max.lalli@scottish-southern.co.uk
Subject: Re: FW: Comment by Ralph Turvey on G3 Distribution charge consultation

Ralph,

The point you raise came up at our consultation on Wednesday. Attached is the power point slide which we used to illustrate how marginal charges would be levied for the ratio of maximum demands used in the example in the consultation document. As you will see, Period 5 incurs no charges. Period 2 with the highest maximum demand, alone incurs charges for the first 3 years, after which Period 4 kicks in, then Period 1 and finally Period 3. I am not sure whether the data was chosen to fit the named time periods in the consultation document. However, it does illustrate the point that maximum demand no longer occurs during Winter Weekday Peak for many (and for some companies, the majority) of network groups.

We certainly need a band to avoid sudden switching between tariffs as the maximum demand varies from one period to another. We can't arbitrarily limit this to the two bands with the greatest demands. In this example the 3rd greatest maximum demand is less than 1% less than the 2nd. So we need a uniform procedure. In terms of growth, maybe the band could be smaller than produced by the present method. However, there are substantial amounts of load that could be shifted from one period to another. Much of this is controlled by suppliers using teleswitching and it greatly exceeds the amount caused by annual growth. The proposed method should deter substantial switching into a time period as the demand in that time period approaches the maximum capacity.

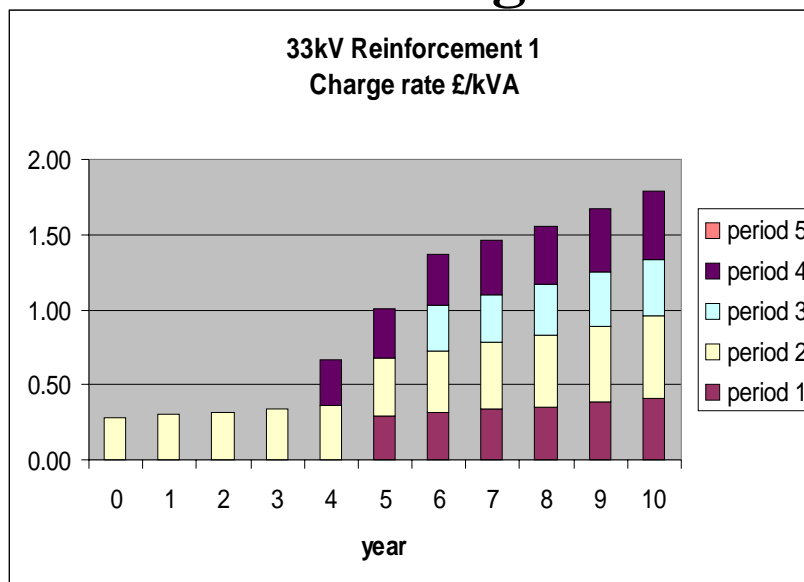
I don't think we have resolved all the issues in this area. I mentioned at our consultation, the confused message that is given when the maximum demand occurs in 'Other Times' (used by SSE) as it is not clear how customers are expected to respond - another reason for damping the output of an on/off charging method.

I hope this helps to clarify our thinking.

Best wishes

Robin Hodgkins

Annual Charge Rates



From: Ralph Turvey [ralph@randb.demon.co.uk]

Sent: 15 June 2007 13:05

To: WRHodgkins@aol.com

Cc: Nigel.Bessant@scottish-southern.co.uk; Andrew, Stuart; McEntee, Tony; Liendo, Maria; Andrew.Neves@central-networks.co.uk; Mo.Sukumaran@scottish-southern.co.uk; Dominique.Tilquin@scottish-southern.co.uk; Blundell, Garth; George.Moran@central-networks.co.uk; max.lalli@scottish-southern.co.uk

Subject: Re:Further comment by Ralph Turvey on G3 Distribution charge consultation

Interesting. We need more information about the likelihood of peak shifting in relation to DUOS charges that differ between periods by amounts which may be a substantial % of those charges but which will be a much smaller % of the total cost per KWh paid by consumers. I thought that, apart from street lighting, teleswitching was limited to staggering the onset of the evening charge and of the daytime boost for storage heating of (Economy 7) consumers with two meter registers. The night-time peak in parts of the SW (and Scotland?) is due to the difference between the restricted and unrestricted rates (mainly reflecting differences in energy costs) not to the precise timing of the restricted supplies. What other consumers are subject

to teleswitching?

I agree that IF, in the later years of the decade, maximum demands were to become much the same in a number of periods, the charge should be much the same in all those periods

Ralph

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From: WRHodgkins@aol.com
Sent: 15 June 2007 13:29
To: ralph@randb.demon.co.uk
Cc: Nigel.Bessant@scottish-southern.co.uk; Andrew, Stuart; McEntee, Tony; Liendo, Maria; Andrew.Neves@central-networks.co.uk; Mo.Sukumaran@scottish-southern.co.uk; Dominique.Tilquin@scottish-southern.co.uk; Blundell, Garth; George.Moran@central-networks.co.uk; max.lalli@scottish-southern.co.uk
Subject: Re: Further comment by Ralph Turvey on G3 Distribution charge consultation

Ralph,

SSE are investigating the causes of the various peaking times in Hydro and seeing whether this can be tied to teleswitching. There is quite a lot of peaking about 20.00 hours. Until we understand it better, we are cautious about giving strong signals between time periods. I haven't seen the Scottish Power data, but Tony McEntee was also concerned about this point. Maybe he can add something to what I know.

Best wishes

Robin

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From: Ralph Turvey [ralph@randb.demon.co.uk]
Sent: 17 June 2007 17:07
To: WRHodgkins@aol.com
Cc: Nigel.Bessant@scottish-southern.co.uk; Andrew, Stuart; McEntee, Tony; Liendo, Maria; Andrew.Neves@central-networks.co.uk; Mo.Sukumaran@scottish-southern.co.uk; Dominique.Tilquin@scottish-southern.co.uk; Blundell, Garth; George.Moran@central-networks.co.uk; max.lalli@scottish-southern.co.uk
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If one of you can get at IEEE publications without paying, which I can't, try <http://ieeexplore.ieee.org/Xplore/login.jsp?url=/iel3/59/14619/00667383.pdf?tp=&isnumber=&arnumber=667383#> so as to access a paper "Variations in area- and time-specific marginal capacity costs of electricity distribution" by Heffner, G. Woo, C.K.

Horii, B. & Lloyd-Zannetti, D. in IEEE Transactions on Power Systems
May 1998, pages 560-567 which claims (1) to propose a method to estimate
marginal distribution capacity costs; (2) to demonstrate the significant
intra- and inter-utility variations in marginal distribution capacity costs
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