Mathematical & Computer Modelling

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Rachel Fletcher
OFGEM

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Dear Rachel,

Consultation on proposals from ENW to modify UoS charges for IDNOs, HV/LV generators and the DRM

Please find attached a response to your consultation document of 22nd.August. In view of the on going work on a common methodology I have not responded to all the questions. However, there are some aspects where the questions and answers in my view hold implication beyond ENW's immediate proposal and impact on any common methodology, in particular in terms of meeting the overall objectives set out by OFGEM.

I would be glad to amplify the response if this would be helpful.

Yours sincerely

Robin Hodgkins

OFGEM consultation (22/8/08) on ENW's proposal to modify UoS charges for HV/LV use (16/7/08) - Response from W. R. Hodgkins, Mathematical & Computer Modelling.

OFGEM Schedule 2

- HV/LV Generation Charging - questions 4 - 6

For a demand dominated network, then for circuit and transformer reinforcement it would seem to be appropriate to treat generation as the reverse of demand, provided due allowance is made for the availability of the generation at periods of high demand. This is provided for by the use of P2/6 factors within the planning process. Here ENW use the load factor as a proxy. Since these are only being used generically rather than in the planning of specific reinforcements, this could be regarded as adequate.

However, fault levels are not symmetric between generation and demand. In general increases in demand result in small increases in fault levels, whilst increases in generation can result in substantial increases in fault levels necessitating switchgear reinforcement. This is often the most restrictive and costly factor, particularly for new generation installed adjacent to the HV supply point.

- DRM Modifications - questions 7 - 9

In determining the allowed revenue OFGEM include a number of specific items which primarily relate to operational expenditure. Some of these are external expenditure such as NGET charges and others such as O&M and Administration may be largely internal. However, a substantial portion of the revenue represents an allowance for historic costs and return on investment. For the first set of items ENW propose basing the forecast expenditure on recorded data. In relation to O&M expenditure where ENW propose a change of method to the use of RRP data, OFGEM comment (1.64) that this is not forward looking. However, within the same paragraph they comment there are risks in adopting methodologies regarding emerging industry trends that are subsequently not realised.

A requirement of any satisfactory methodology is that it can at least predict current behaviour. Such a methodology would only then predict significant changes if information about the future charges was built into the model. Such information could be improvements in methods of maintenance, changes in technology, changes in material costs, etc. However, any such predictions could also be used to modify historical RRP data. It is difficult to see any advantage in introducing possibly complex models which tend to mask the underlying assumptions. It is generally far preferable to make the assumptions explicit and generate modified forecasts directly from RRP data. OFGEM's concerns (1.37) lack clarity (and substance?).

In order to answer the question on scaling (1.39), it is first necessary to ask why is scaling required and what is an appropriate basis for scaling. In general there would appear to be no good reason for scaling operational expenditure provided there is reasonable agreement between actual expenditure and that allowed in the 5 year approved plan. Identifying additional items such as licence fees (1.21) and excluding these from the scaling element is to be welcomed. The major need to scale would appear to arise from mismatch between the reinforcement component of charges and the OFGEM allowance arising from historical investment costs. Since the historical investment costs are split by voltage level, then it is appropriate to split the allowed revenue, after allowing for operational expenditure, in a similar way between voltage levels. Usually the MEAV is used, but here the cost of customer funded assets should be excluded. A basis for the latter could be the ENW 'Percentage network level reduction factor'. G3 proposed ignoring all

LV assets as these were largely customer funded, but more accurate estimates may be available. WPD split the allowed revenue between EHV and HV/LV to derive two Fixed Adders. The use of a single Fixed Adder could lead to major distortion in charge rates between different voltage levels. In the case when a large positive Fixed Adder is required, then 132kV customers would be paying a considerable amount effectively to cover for historical expenditure at other voltage levels. Two Fixed Adders avoids the worst of this effect, in that 132kV now only pay for 132kV and 33kV historical expenditure.

It is not clear whether ENW's description of their Fixed Adder notionally applied at GSP level for the HV/LV charges model implies that the same Fixed Adder would apply to the EHV model. Other sources of information suggest that the DRM model (or other models) are applied separately to EHV and HV/LV to split the allowed revenue, but within the proposal only the HV/LV is being considered, in which case this would correspond to a two Fixed Adder model.

However, the other question 'why is scaling required' is just as important and revealing. ENW require a negative Adder presumably because their reinforcement charges more than recover the OFGEM allowance. ICRP would be expected to give a rough match with a slight over recovery. The DRM approach is similar. Bath LRIC, based on a faulty implementation of the LRIC methodology, gives grossly excessive charge rates at low growth rates. WPD LRIC by using a fixed growth rate of 1% mitigates the worst excesses of Bath LRIC but still over estimates by quite a large factor. Forward looking methods such as LRIC Corrected and FCP aim to recover the rate of actual investment and thus at times of low growth will not cover the OFGEM allowance. Hence, particularly if different methodologies are used for different voltage levels, EHV could, for example, over recover, and HV/LV could under recover. So even when the total apparently requires no overall scaling, in reality scaling could be required.

In regard to the ENW proposal, the cause of the over recovery necessitating a negative Adder is not clear. The proposal to use a single Fixed Adder, in effect attaching the negative cost to 132kV could be acceptable if the cause of the over charging is excessive reinforcement charges at the EHV level. On the other hand the cause could be excessive reinforcement charges at the HV/LV level, in which case it would be completely inappropriate. The recent EDF proposal used heavy scaling of the Bath LRIC to avoid a large negative Adder. WPD state that where negative demand charges arise, then these are set to zero and scaling repeated. In both cases the correction is applied at EHV as this is where excessive charges would otherwise be levied.

The appropriate treatment is therefore to treat each voltage level as a cost centre and apply a different Fixed Adder at each voltage level to match the income to the allowed revenue apportioned as described.

The use of a Multiplier may be acceptable in a model where there are no locational signals, but as described above it is preferable to apportion allowed revenue between voltage levels. Where locational charges are to be set, then the use of a Multiplier can cause unacceptable distortions in some situations in an even more adverse way than the single Fixed Adder. If the charging algorithm only assigns significant reinforcement costs to a few nodes (because there is ample spare capacity over most of the network) then a Multiplier could increase the charge rates by a large ratio to a level which held no justification and could be subject to legal challenge.