Flaws in Ofgem’s Proposals to Reform GB Electricity Transmission Charging

By Sean Gammons and Richard Druce

Summary

This paper examines Ofgem’s “minded to” decision to implement a new transmission charging methodology in Great Britain. We conclude that the proposed methodology:

• Reflects the costs that different generators impose on the system less closely than the existing methodology;

• Reduces the efficiency with which the transmission system is used and developed, and increases transmission system costs by £1.7bn over the period to 2030, and

• Together with other increases in costs resulting from the change in methodology, increases consumer bills by around £3.4 billion in NPV terms over the period to 2030 (or around £9 per customer per year).1

Transmission Charging in Great Britain

Transmission Charges Collected from Generators

Under the British Electricity Trading and Transmission Arrangements (BETTA), generators pay charges to access the transmission system, known as Transmission Network Use of System (TNUoS) charges, which vary depending on their location on the grid. TNUoS charges are structured to signal to generators the investment costs their presence imposes on the transmission system. Hence, TNUoS charges are intended to give generators incentives to account for both their own costs and transmission investment costs when deciding where to develop new capacity, and whether it is economic to retire existing units.
The current charges vary depending on plants’ location as shown in Figure 1. Generators in the north tend to pay more, reflecting the costs of providing transmission capacity to transport power to southern load centres, whereas southern generators pay lower, or even negative, TNUoS charges. Negative TNUoS charges reflect the benefit that southern generators deliver to the system, by reducing the need for transmission capacity to bring power from northern generators.

Figure 1. **Generation TNUoS Charges by Zone in 2013/14 (€/kW/yr)**

![Generation TNUoS Charges by Zone in 2013/14](source: Data from National Grid)

The Existing Transmission Charging Methodology

Currently, generation TNUoS charges are structured around the principle of “Investment Cost Related Pricing” (ICRP). The ICRP methodology aims to set charges that proxy the investment costs that the transmission companies incur to accommodate a “marginal” MW of generation capacity. Historically, the transmission system was planned and built to provide the capacity required in peak demand (i.e. cold, winter) conditions. Hence, the ICRP methodology reflects the investment costs that the TOs incur to meet this capacity requirement.
However, the need to accommodate peak demand conditions is no longer the sole driver of transmission capacity requirements. Increasingly, investments to expand the transmission system are required to integrate renewable generators into the transmission system, particularly wind farms. Wind generators typically produce very little in cold, winter conditions when demand is highest. Instead, their production is highest on windy days when overall electricity demand is typically lower than peak levels. Hence, there are now two main drivers of transmission investment:

- the need to provide the transmission capacity required for peak demand (cold winter) conditions; and

- the need to transport the output from low carbon, especially wind, generators located in remote parts of the country, which tends to be highest in off-peak conditions.

These dual drivers of transmission investment are now reflected in the Security and Quality of Supply Standards (SQSS) document, which specifies the criteria that transmission owners must apply when deciding how much transmission capacity to provide.

**Ofgem’s Project TransmiT Process**

Ofgem’s “Project TransmiT” has considered reforms to the existing ICRP charging model to bring it into line with the new SQSS and hence reflect the dual drivers of transmission investment.³

In May 2012, Ofgem instructed an industry working group (chaired by National Grid) to develop alternative TNUoS methodologies as part of a “Significant Code Review” (SCR) process. Following a year-long process, the SCR concluded in May 2013, when the CUSC Modifications Panel voted (by majority) in favour of 8 out of 27 possible options for reforming the TNUoS methodology.⁴ The result of this majority vote formed the Panel’s recommendation to Ofgem.

Subsequently, Ofgem produced an Impact Assessment that considered the eight alternatives, and announced that it was “minded to” implement the model referred to as “WACM 2” from April 2014/15.⁵ However, Ofgem has now decided to defer implementation until April 2015/16 at the earliest due to the emergence of new evidence, and is currently working towards a decision in March 2014 on whether to implement “WACM 2”.⁶

**Problems with Ofgem’s Impact Assessment**

NERA and Imperial College London prepared a review of Ofgem’s Impact Assessment, which RWE submitted to Ofgem in October 2013 as part of its consultation response. We identified a number of flaws with the Impact Assessment that undermine the claim that the proposed WACM 2 methodology is more “cost reflective” than the status quo (i.e. the existing ICRP methodology), and that its implementation would be in consumers’ interests.
• Making the case for reforming the transmission charging methodology requires that the new methodology is more cost reflective than the status quo. However, our review found that the analysis considered by Ofgem to check the cost reflectivity of the WACM 2 charging model was flawed and incomplete.

• Our own analysis indicated that the WACM 2 charging model reflects the costs that different generators impose on the transmission system less closely than the status quo methodology, suggesting there is no case for reform:
  
  – On the face of it, the WACM 2 methodology seems to reflect the dual drivers of transmission investment, whereas the status quo methodology only reflects the peak demand driver of investment. However, in practice, the detailed calculations prescribed by WACM 2 produce charges that are further from the “true” incremental cost that generators impose on the transmission system than the status quo.

  – In particular, we found that both the WACM 2 and status quo methodologies offered wind generators in Scotland discounts compared to the incremental transmission costs that their presence imposes on the system. WACM 2 offers wind generators in Scotland even lower tariffs than status quo, so is less cost reflective for this type of generator. This distortion would tend to cause too much investment in wind generation in Scotland compared to the level that is economically efficient, and thus drive up transmission system costs. We see this result because there are a large number of sites in GB where wind generators can be developed, and they face a trade-off between locational TNUoS and regional load factor variation.

  – We also found that WACM 2 and status quo charge tariffs to peaking plants in Scotland in excess of the incremental transmission costs that their presence imposes on the system. Because WACM 2 tariffs are lower for Scottish peaking plants, this suggests that WACM 2 is more cost reflective for this category of generation. However, under both WACM 2 and status quo methodologies, TNUoS charges are lower for peaking plants in England and Wales than in Scotland. Hence, setting TNUoS for peaking plants in Scotland that are above the efficient level is unlikely to change locational decisions, and thus has no impact on transmission system costs.

• Ofgem’s “minded to” decision relied, in part, on quantitative modelling to estimate the welfare effects of implementing WACM 2, which suggested the reform would reduce power sector costs and reduce consumer bills. We identified serious flaws in this analysis, some of which bias the impact assessment against the status quo methodology, in favour of WACM 2 and the other alternatives.

• Ofgem did not analyse the distributional affects that the proposed change in transmission charging methodology would create between industry participants. Regulatory decisions that increase the costs of some industry participants, especially those implemented without sound justification, will increase perceived regulatory risk in the British energy sector, and raise the costs of financing the significant investments required in the coming years to modernise and decarbonise the electricity sector. Ofgem’s Impact Assessment ignored this potentially significant cost of reforming transmission charging arrangements.
Estimated Welfare Effects of Ofgem’s Proposals

Given the shortcomings of the quantitative welfare modelling relied on by Ofgem’s Impact Assessment, RWE commissioned NERA and Imperial College London to perform independent modelling of the welfare effects associated with the WACM 2 charging methodology, the results of which are shown in Table 1 below.8

Our analysis suggests that introducing WACM 2 would increase transmission system costs (losses, constraints and investment) by £1.7 billion over the period to 2030 and increase other power sector costs (e.g. the costs of developing and operating generation assets) by around £4 billion. Hence, we estimate that WACM 2 would cause a net increase in power sector costs of £5.7 billion. This increase in power sector costs proxies the reduction in overall social welfare caused by WACM 2.

We also estimate that the introduction of WACM 2 would materially increase consumers’ bills by around £3.4 billion in NPV terms over the period to 2030. Around £1.5 billion of this impact is due to increases in the demand TNUoS charges levied on electricity consumers, as well as constraint costs and losses. Another £1.7 billion of the effect is down to the increase in power prices resulting from a higher long-run marginal cost of new entry into the wholesale power market. Low carbon subsidy payments also increase by £0.3 billion.9

Table 1. Effects of Introducing the WACM 2 Charging Model

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<thead>
<tr>
<th>NPV, 2014-2030</th>
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<tbody>
<tr>
<td>Impact of Consumers</td>
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<tr>
<td>Power Purchase Costs</td>
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<tr>
<td>Low Carbon Subsidies</td>
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<td>D-TNUoS</td>
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<tr>
<td>Constraints</td>
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<tr>
<td>Losses</td>
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<td>Total</td>
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<td>Power Sector Costs</td>
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<td>Generation Costs</td>
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<td>Constraints</td>
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<td>Losses</td>
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<td>Total</td>
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Note, a positive number indicates an increasing cost following the introduction of WACM 2. NPVs calculated between 2014 and 2030, using a real discount rate of 3.5%. Source: NERA/Imperial.10
Conclusions

The role of locational TNUoS charges is to promote the efficient use of the transmission system, by signalling transmission investment costs to users. Our analysis has found that:

- The proposed WACM 2 charging methodology reflects the costs that different generators impose on the transmission system less closely than the status quo methodology; and

- Our quantitative welfare modelling suggests that the WACM 2 charging model would reduce social welfare compared to the status quo and increase consumer bills. If changes to the transmission charging regime improve the efficiency of network usage, we would expect total power sector costs to fall as a result, and thus increase social welfare. Hence, this modelling corroborates our finding that WACM 2 is less cost reflective than status quo.

Additionally, regulatory decisions that redistribute value amongst industry participants, especially without any resulting and demonstrable improvement in efficiency, will add to investors’ perception of regulatory risk and increase the costs of financing for the British energy industry, thus further increasing consumer bills.

Overall, therefore, the evidence prepared to date by NERA and Imperial College London does not support the introduction of the WACM 2 charging model.
The impact per customer was calculated by annualising the £3.4 billion impact evenly over the period from 2014 to 2030, and dividing by the approximately 30 million electricity customers in Great Britain. Source of customer numbers figure: Electricity Industry Review 16, Electrica Services Limited.

At the start of the process, Ofgem also considered the introduction of a “socialised” charging models in its “Options for Change” document. In this paper, Ofgem ruled out the socialised charging model on the grounds that removing the economic signals conveyed to users through locational transmission charges would cause a “disproportionate” increase in power sector costs and customer bills. At the same time, it suggested that an “improved ICRP” charging model “is the right direction for transmission charging arrangements”. Source: Project TransmiT: Electricity transmission charging: assessment of options for change, Ofgem (188/11), 20 December 2011, para 6.16.

Panel Members voted according to whether they considered that each of the possible alternatives better facilitates the “Applicable CUSC Objectives”.

WACM 2 stands for “Workgroup Alternative CUSC Modification 2”. Source: Project TransmiT : Impact Assessment of industry’s proposals (CMP213) to change the electricity transmission charging methodology, Ofgem (137/13), 1 August 2013, page 5.

As the table shows, power sector costs increase by £5.7 billion, whilst customer bills increase by £3.4 billion. The difference between these figures implies that some of the increase in costs is being absorbed by generators, and reducing their margins.

Note, the original estimates of the welfare impacts resulting from WACM 2 published in our October 2013 report differ from those shown in this table. Since publishing our October 2013 report, we have engaged in a process of Q&A with Ofgem regarding our assumptions and approach. Following this process we have amended slightly our approach to calculating welfare effects, and the revised results reflecting this change of approach are presented in this table.
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