

RIIO-ED2 Safety, Resilience, and Reliability Working Group (SRRWG) – 31st March 2020

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| From: Ofgem | Date: 31 st March 2020 | |
| People invited: Relevant stakeholders | Time: 10am to 2:30pm | Location: Teleconference |

1. Introductions, overview and Actions review

- 1.1. Matthew Jones, Catherine Dow – SPEN
- 1.2. Andrzej Michalowski – WPD
- 1.3. Jonathan Booth, David Darley – ENWL
- 1.4. Landel Johnston, John Campbell – SSEN
- 1.5. Paul Measday, Bill D’Albertanson – UKPN
- 1.6. Greg Farrell - NPg
- 1.7. Chris Watts – S&C Electric Company
- 1.8. Gregory Edwards – Centrica
- 1.9. Robbie Urwin – Fraser Nash Consultancy
- 1.10. Thomas Roberts, Mark Hogan, Jack Ambler – Ofgem

2. Value of Lost Load (VoLL)

- 2.1. ENWL provided some background to their work on VoLL – they had initiated and run a detailed project on VoLL as part of their Network Innovation Allowance programme in 2018 and 2019. This involved undertaking quantitative research on customer attitudes to lost load and the different vectors involved in the approach to valuing lost load.

2.1.1. Most of the discussion around VoLL in the RIIO-ED2 working groups has come back to the SRRWG.

2.2. Fraser Nash (FN) were asked to look at all the previous work that has been done in this space and assess it to identify the key and/or material vectors that affect customers' valuation of lost load. They then looked at how these vectors could be used and deployed when making investment decisions.

2.2.1. It is important to note that this project did not involve conducting customer research; instead it was taking the existing research and trying to turn it into something useable within the context of RIIO-ED2.

2.3. FN provided an overview of the work that they have done to the group. They set out that VoLL has traditionally only included domestic and SME customers. The value that is currently used in RIIO-ED1 is a GB-wide value that was derived from a study conducted by London Economics in 2013; the work that FN have done is, effectively, to replicate the methodology used by London Economics to produce an updated value. This shows that VoLL has significantly increased, and varies by customer segments.

2.4. VoLL is currently applied in three places within RIIO-ED1: in the Interruptions Incentive Scheme (IIS) incentive rate(s); in calibrating the Cost-Benefit Analysis (CBA) model; and in tailoring the network performance factor in the Common Network Asset Indices Methodology (CNAIM).

2.4.1. ENWL pointed out that the CBA model and CNAIM make reference to the Customer Interruptions (CI) and Customer Minutes Lost (CML) rates that are set through the IIS. So there is a piece of work at the end of this to consider how a single value of lost load is translated into the interruption (CI) and duration (CML) vectors. A series of assumptions are required to make that translation, and this will need to be stepped through for RIIO-ED2.

Action: ENWL agreed to circulate a spreadsheet that was used to translate a single VoLL figure into the CI and CML incentives for RIIO-ED1.

2.5. Part of the work on VoLL was a survey carried out by Impact Research, which replicated the London Economics study methodology. In this survey, demographic data

from the respondents was also recorded, which meant that further analysis can be done on this dataset beyond the original analysis of the study.

2.6. The result of that further analysis is that the current VoLL is significantly higher than the £16,000/MWh currently used in RIIO-ED1. There are multiple ways in which the data that is used to calculate a VoLL figure can be split (by domestic/SME customers, and Rural/Urban), but the values can be aggregated in a load-weighted manner to give an aggregated figure for VoLL of around £25,000/MWh.

2.6.1. It is worth noting that fuel poor customers are significantly under-represented by this figure for VoLL, and the impact of customers with Low Carbon Technologies (LCTs) is not reflected accurately.

2.6.2. Despite this, the results highlight that it is possible and important to have a more dynamic VoLL that more accurately represents the views from different customer types. However, this methodology does not allow the combination of indicators/vectors in a meaningful way (i.e. you couldn't get a view of VoLL from a rural LCT owner). This, therefore was the point at which FN were able to take their study further.

2.6.3. UKPN questioned whether the current VoLL and the 'updated' VoLL figures presented are done so on a consistent price basis, or whether the current VoLL needs to be uplifted to account for inflation. Given that this is the case (i.e. the £16k/MWh and the £25k/MWh values are not on the same price base), part of the difference is accounted for by inflation.

2.7. In developing a disaggregated VoLL model, FN used the customer survey data that included a catalogue of a variety of characteristics. To use this data, their first step was to determine which were the most significant VoLL indicators (customer type, rurality, income, fuel poverty, socio-economic status, and electricity consumption).

2.8. Using these characteristics, it is possible to estimate a VoLL for different customer groups, as long as the sample contains more than 200 customers (though it is worth noting that these are not 'real' sample populations). FN used samples of the population that were more reflective of actual populations to generate a large number of sample populations from the overall database.

- 2.9. Using these sample populations they were able to train the model to then be able to predict the VoLL for any sample population where the characteristics are known. Inputting these characteristics provides an estimated VoLL for that sample population.
- 2.9.1. In order to estimate a VoLL for a given population, you need to be able to estimate a population's VoLL indicators. The Lower Super Output Area (LSOA) is the smallest population group that the Office for National Statistics could use, which covers around 1,500 people (meaning there are more than 40,000 LSOAs in GB). For some characteristics it was necessary to use proxies or estimates, such as using chargepoint data to estimate Electric Vehicle (EV) adoption in different places.
- 2.10. To assess the accuracy of the model, a well known method was used where some part of the data set was withheld from the model that was being trained, before running that data through the model and comparing the estimate that was given from the model with the VoLL indicated by the dataset.
- 2.10.1. The results of these tests highlight that it is difficult to estimate VoLL, and that human values are different in different circumstances. There will, therefore, be a limit on how accurate a model can be.
- 2.10.2. However, when taking the Root Mean Square Error for each of the VoLL figures produced by the disaggregated VoLL model, the Rurality Disaggregated VoLL Model, the ENWL uniform VoLL and Ofgem's uniform VoLL, it shows that the disaggregated VoLL model is the most accurate of the four.
- 2.11. All models depend on the accuracy of the data they are using. The disaggregated VoLL model only looks at domestic VoLL, and there is not enough data from the survey to build a fully disaggregated model for SME. Producing a combined value depends on the ratio of domestic customers to SMEs – the value used by London Economics in 2013 has now been shown to be more heavily weighted towards domestic customers (up to 83:17 from 74:26).
- 2.11.1. A further consideration is the granularity of the data that is available for different areas. One example is the data available for Scotland is, in many cases, on a different basis than the data that is available for England and Wales. This may change over time, but it needs to be a consideration.

- 2.12. S&C Electric asked whether the regional variations are meaningful given the levels of accuracy that were highlighted, and if there is a danger that the values become swamped by inaccuracies and/or error levels. FN noted that there is significant room for error in these estimations, but that there is still more value (i.e. it is still more accurate) in disaggregating VoLL than retaining a single, uniform VoLL. The question then becomes about the level of disaggregation to go to.
- 2.13. FN's recommendations were that the most effective action would be to update the single uniform VoLL figure. Using the updated domestic:SME ratio would produce a value of around £23,500/MWh.
- 2.13.1. When looking at a histogram of VoLL figures by LSOA, ENWL reinforced a previous point made about the distribution of these values as well as just the average, i.e. there is a need for something to drive a focus at the 'tail' of the histogram.
- 2.14. Using a 'simple' disaggregated VoLL model (based on urban/rural and domestic/SME splits) with the current methodology and aggregated to a local level would give a further level of accuracy on the updated single uniform VoLL. A complex disaggregated approach would give an even further level of accuracy, but the additional complexity and data requirements associated with that, as well as model maintenance and transparency, may not be outweighed by the benefits it brings. FN suggested further research would be needed to improve the approach.
- 2.15. There is also the consideration of granularity, both in terms of the data that is entered into the model and the way in which VoLL is displayed. Different options may be appropriate for different applications. It was suggested that the uniform figure for VoLL could be updated for use in the IIS, and further investigation could be done into the application of disaggregated VoLL in CNAIM and CBA models.
- 2.16. ENWL highlighted that the IIS is a macro-level initiative, so disaggregating VoLL may not be appropriate. For longer-term investment decision making, it may be more appropriate to disaggregate VoLL.
- 2.16.1. This raises two questions: one, about whether disaggregated VoLL may have a role in developing programmes for vulnerable customers; and two, about the process by which the IIS incentive rates are updated. For the second question,

it is worth remembering that inflating the RIIO-ED1 value in line with RPI may still understate VoLL, given that by the end of the price control the value will be around seven years old.

2.16.2. WPD made a further point about whether VoLL/incentive rates should not be static through the price control, but instead vary over time, though it was agreed that this may be overly complex to develop and administer.

2.17. ENWL noted that the discussion of VoLL in the SRRWG should not preclude other groups and parts of the framework from considering whether a disaggregated VoLL would be appropriate there, though it was pointed out that this group would likely work to determine the value that is used as a reference in other parts of the ED2 price control.

3. IIS target setting - Alternative CML methodologies

3.1. One of the priorities identified through the SRRWG was around IIS target setting and, in particular, the approach that should be taken to benchmarking CMLs. Following the initial discussion, ENWL have looked at how the incentive scheme as a whole needs to weight the costs and benefits.

3.1.1. CML targets are not set on a benchmarking of CMLs themselves, but instead are based on a secondary function that takes the CI target and applies a separately calculated value.

3.2. As network companies look to put more automation onto the network, the effect of that automation is to shift the minutes of supply lost when the equipment is working out of the calculation of CMLs. The overall view of CMLs therefore starts to rise overall, even though CML performance generally has improved.

3.2.1. This potentially introduces the risk of a solution bias, and that the benchmarking approach does not look at the outcome that customers actually experience.

3.3. To address this, ENWL have considered three potential options for benchmarking CMLs differently:

- 3.3.1. Option 1 is to maintain the existing approach, but instead benchmark CMLs directly within the existing model. This looks to make micro adjustments that account for network factors.
- 3.3.2. Option 2 is to benchmark CMLs by voltage only, removing the existing disaggregation by HV circuit function. This would retain macro adjustments that account for network factors, but would be effectively treating HV in the same way as LV (since HV is no longer as significant a component of performance as it once was).
- 3.3.3. Option 3 is to benchmark CMLs in total across all companies that creates a medium term convergence towards a single target. This makes no adjustment for network factors, and reflects the question that often comes up through customer research regarding varying performance levels across and within DNO regions and/or GB.
- 3.4. WPD raised a question about why there are targets for CIs and CMLs, given that the CML target is an element of the number of customers that are interrupted (and how long they are interrupted for). CMLs measure a combination of customers interrupted and the duration of that interruption.
 - 3.4.1. UKPN noted that moving towards only having targets for CMLs would potentially mean a reduction in the ability to track industry performance over time, and that there would need to be an adjustment to the incentive rates to reflect the fact that DNOs carry out work to reduce the number of CIs as well as the number of CMLs.
 - 3.4.2. WPD highlighted that in ENWL's Option 3 there is a convergence of targets towards a single value, and whether the Sector Specific Methodology Consultation for ED2 will ask a question around this. Ofgem noted that it is likely there will be something in this space, though it is unlikely to be specific to CML targets.

4. Short interruptions reporting

- 4.1. UKPN and SSE had shared a proposed change to the Occurrences Not Incentivised RIGs pack, with changes to enable more consistent and detailed reporting of short interruptions.

- 4.2. It was noted that some of the proposals could be brought in line with other requirements on the DNOs. For example, the types of short interruptions could be aligned with Engineering Recommendation G43/3 to avoid the need to create new codes.

Action: WPD to share the list of codes from G43/3 for incorporation into the new template.

- 4.3. It was also agreed that any information that is collected needs to be done so consistently to ensure comparisons are undertaken on a like-for-like basis. SPEN noted that the frequency of short interruptions may be more inconvenient to customers than the duration of them, and that we could consider something like a multiple short interruptions measure in this space. UKPN suggested that they could include an additional tab.

- 4.4. WPD and SPEN raised the point that system changes may be needed for some of this reporting. There was a discussion on whether DNOs could report a consistent duration for manual short interruptions.

Action: UKPN to ask, via Ofgem, a number of questions that DNOs should answer. These will also cover multiple short interruptions.

Action: UKPN to form a view of how to establish an 'average' duration for manual short interruptions.

Action: Ofgem to organise a further call on SRR topics, mainly focused on WSC.