Introduction of Losses Index mechanism supported by system modelling

1. Introduction

1.1. *Overview of the proposed approach to incentivising/measuring/encouraging the reduction of losses. Include brief rationale for why this approach is sensible/appropriate.*

1.2. In order to incentivise DNOs to reduce network losses the mechanism must be based on rewarding/penalising activities which DNOs can directly influence. The proposal is to introduce a Losses Index similar to the existing output measures covering Asset health and system loading. This would categorise discreet asset groups (Primary substation group for example) based on the losses they introduce onto the system. DNOs would put forward improvements to this Losses Index as part of their well-justified business plan. These can then be evaluated post investment to ensure that the agreed improvements have been carried out. This may require some flexibility due to changing network conditions. DNOs are already measured against both Health Index and Load Index which use this format.

2. Details of proposed approach

Approach

2.1. *Describe the overall objectives, functions or tasks that will be features of this approach.*

2.2. The overall objectives of this mechanism are as follows:-

- Introduce a losses mechanism which DNOs have control over

- Ensure that all DNOs are measured against improvements that they can influence whilst not discriminating against DNOs based on the losses profile of historic networks that they have largely inherited from privatisation.

- Ensure that the modelled losses of assets are consistent across DNOs

   The following key tasks will be required in order to implement this mechanism:-

- Agree a proportionate level to measure losses and losses improvements. (System data will likely only support 132kV,33kV and possibly 11kV improvements)

- Agree before and after losses modelling across DNOs to ensure consistency (Although the term modelling is used, this uses live system data)

- Agree scales for a losses index i.e. Loss Index 1 = 0%-5% to Loss Index 5=30-40%. This will likely have to be adjusted by voltage level/asset due to the variance of asset characteristics.

- Provide a suitable incentive mechanism that drives DNOs to complete their agreed improvements but to also introduce further cost effective losses improvement schemes. This could be implemented as:

   o   Incentive on modelled changes in GWh of losses valued at a rate which appropriately includes energy cost and the shadow price of carbon

2.3. Describe how this approach will achieve the key aims of incentivising reductions in distribution losses i.e. to encourage efficient network operation, to help reduce cost for consumers and to reduce carbon emissions.

2.4. This approach will drive DNOs to reduce distribution losses by incentivising them to deliver agreed improvements in technical losses. If the incentive rate is correctly calibrated it will also drive further incentive to reduce losses, where cost effective. Due to this mechanism measuring technical losses DNOs will be able to directly influence the efficiency of their plant. However the overall carbon emission reduction targets must be considered since there may be technologies, such as energy storage, which increase losses but overall reduce the emission of carbon.

2.5. Outline whether this would be a stand-alone approach or would need to be aligned with any other existing or proposed measures.

2.6. This approach is designed to work as a stand-alone measure to reduce technical losses and associated carbon emissions. Nevertheless, in principle, it could be used in conjunction with one or two other measures that cover improvements to non-technical losses such as theft or data improvement. However, the incentive rate for non-technical losses should exclude the shadow price of carbon, as carbon emissions are not directly reduced by improving data quality or discovering theft.

2.7. **Duration of any measure e.g. would it be applied for part of the price control period, the full price control period, or is it intended as an interim measure until a specific event such as full smart metering roll out***.*

2.8. It is proposed that this mechanism would run for the duration of RIIO ED-1. Although the smart meter rollout may provide an alternative by 2019 it is expected that there will be a 'settling in period' in terms of data quality, data roll out and availability of customer data. This would allow the tail end of ED-1 and ED2 negotiations to be used to flesh out an alternative Smart Meter driven losses mechanism.

2.9. Describe when this mechanism should be reviewed / monitored e.g. would any re-openers be necessary?

2.10. The Health Index and Load Index output measure are reported annually however there may be a slightly higher burden on DNOs to analyse the improvements and system characteristics to report a losses index.

2.11. In terms of a re-opener the main driver would be an option to re-baseline losses improvements based on any significant roll out of Low carbon technologies, such as energy storage or electric vehicle charging, negatively impacting system losses. However, any measure of losses would need to take into account such developments.

Outputs

2.12. Set out how this achieves the RIIO principles of an outputs measure; describe the methodological approach proposed.

2.13. This methodology would categorise losses improvements in a measure identical to how asset modernisation and reinforcement investment is already measure by Ofgem

2.14. Clearly detail the expected outputs.

2.15. The expected output would be 3 views of system losses.

- Current view of each DNOs Losses Index profile

- A view of this future losses profile forecast without Intervention

- A view of the future losses profile with Intervention

Targets

*2.16. **Set out whether there will be preset targets and how these might best be determined**.*

2.17. Targets will be set based on the variance between the forecast future view with intervention and the future view without intervention. There will need to be some reconciliation process as due to changing system characteristics the forecast improvements may not deliver the expected benefits. E.g. the planned replacement of a system transformer is expected to result in a 2% reduction in losses. When this is installed the loading and/or load type of that substation has changed resulting in a variance to the planned improvement.

Measurement

2.18. Provide detail on how performance will be measured / assessed.

2.19. The losses index will be reported annually as part of the network outputs section of the Regulatory Reporting Pack.

2.20. Ofgem's annual distribution report would include the losses index as part of the network outputs section.

Rewards / Penalties

2.21. Set out any proposed incentives associated with this approach. Set out when / how any proposed reward / penalty would be applied (e.g. annually / equally across the price control period / ex-post true-up).

2.22. In principle, an annual adjustment could be made, resulting from the reported improvement valued at the incentive rate. This would need a year by year profile of planned improvements. However, this would contribute to additional fluctuation in network charges, which Ofgem are seeking to mitigate.

2.23. An alternative approach would be to incorporate the losses index into network output measures which would be evaluated at the end of the price control period. This would avoids the need for more detailed year by year profiling of improvements.

2.24. Would this approach require any uncertainty mechanism/s?

2.25. It would seem desirable to include the losses indexes in the mid-period review of network outputs.

2.26. Potentially, this mechanism may interact with the treatment of real price effects, as higher real unit costs would discourage investment in lower loss plant and equipment.

3. Risks / Benefits

3.1. Set out the key risks and benefits of the approach. This should include any concerns / constraints which you're aware of that could affect implementation.

3.2. Risks

3.3. Higher real unit costs, for example, resulting from increases in metal prices, would discourage investment in lower loss equipment. Nevertheless, this would apply to other measures aimed at reducing technical losses.

3.4. Changes in energy flows, for example, resulting from electric vehicle charging, electric heating etc may increase technical losses. Again, this would apply to other measures aimed at reducing technical losses.

3.5. Developments in low carbon technologies, for example, energy storage, may increase technical losses on the network but still reduce carbon emissions overall. Again, this would apply to other measures aimed at reducing technical losses.

3.6. Benefits

3.7. Focuses on an issue which is under DNO control.

3.8. Lower loss plant and equipment reduce carbon emissions over the life of the asset.

3.9. Avoids use of volatile and inaccurate settlement data.

3.10. Where possibly, provide an indication of any likely financial impact on key stakeholders – DNOs, suppliers and end-use customers.

3.11. DNOs would be able to justify investment in lower loss equipment.

3.12. Suppliers and customers would avoid extreme movements in revenue adjustments and the loss adjustment factors used in settlements.

3.13. Suppliers would have to purchase less energy, as technical losses reduced, which in a competitive market would be passed on to customers through lower prices.

3.14. Society would benefit from reduced carbon emissions.

4. Some evaluation criteria

4.1. Consider how this approach might be evaluated according to each of the principles set out below.

- **Proportionality**

4.2. The shadow price of carbon would only be applied to technical losses which are the component of units unaccounted for which cause additional carbon emissions.

4.3. Technical losses change slowly, as only a very small percentage of the network is changed each year. Consequently, there would not be sharp movements in revenue adjustments from year to year.

- **Transparency**

4.4. The RIGs would be expanded to provide instructions and guidance on reporting data to calculate the losses index.

4.5. The data and calculation of the losses index would be reported annually, as part of the regulatory reporting pack.

4.6. Ofgem could include a section on the losses in the annual distribution performance report.

- **Consistency**

4.7. DNOs would be expected to report on a consistent basis from one year to the next, in accordance with the RIGs. If necessary, provision could be made for detailed reporting of data cleansing, where historical records may be found to be inadequate.

4.8. The ability of all DNOs to report on an identical basis would need to be confirmed.

- **Credibility**

4.9. Movements in technical losses would be relatively small and directly linked to changes in carbon emmisisons.

4.10. Data assurance measures could be applied to the reporting of the losses index.

- **Clarity and Controllability**

4.11. Technical losses are more directly under the control of the DNO. Nevertheless, there will be some variation due to changing patterns of demand and flows on the network from load shift.

4.12. Technical losses would be expressed as a percentage of units entering the system (as these are more accurately measured than units exiting) and could also be shown as GWh of energy. These GWh could then be converted to the corresponding equivalent amount of carbon dioxide emissions and/or the monetary amount derived from the cost of energy and the shadow price of carbon.

- **Adaptability and Commitment**

4.13. DNOs would propose an appropriate projected change in the losses index as part of their well-justified business plan.

4.14. If necessary, this could then be reviewed as part of the mid-term review of network outputs.

4.15. Where possible identify any additional evaluation criteria which could be applied to this approach.

4.16. Sustainability – Encourages a reduction in carbon emissions

4.17. Predictability – Facilitates predictability of revenue adjustments

5. Any additional information

5.1. Include any additional pertinent information which is not already covered.