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Mr Evan Lutton
Assistant Director - Networks Branch
Australian Energy Regulator
GPO Box 520
Melbourne VIC 3001

Sent via e-mail

Dear Mr Lutton,

AER Review of Economic Benchmarking of TNSPs

TransGrid welcomes the opportunity to respond to the Australian Energy Regulator's Review of Economic Benchmarking of TNSPs. This letter is TransGrid's response to the Issues Paper 'Review of Economic Benchmarking of Transmission Network Service Providers' published on 18th April 2017.

TransGrid is the operator and manager of the high voltage transmission network connecting electricity generators, distributors and major end users in New South Wales and the Australian Capital Territory. TransGrid's network is also interconnected to Queensland and Victoria and is central to a secure electricity system that allows for interstate energy trading.

TransGrid welcomes the AER's continuing efforts to improve TNSP benchmarking in response to previous feedback. Issues raised previously by TransGrid include that:

- The sample size is very limited
- Material environmental factors are not well accounted for
- The model appears to become unstable when the latest data is used
- There appears to be a bias against larger TNSPs.

These concerns are not exclusive to TransGrid and each has been raised by other businesses. In its recent Revenue Proposal to the AER TransGrid provided evidence which supports the need for a wider review. This is covered in more detail below.

While the Issues Paper foreshadows a wider review of TNSP benchmarking, the scope of this review is limited to output specifications. As a result, this process will not cover all of TransGrid's concerns. While it would be preferable to consider the limitations of TNSP benchmarking holistically, there may be value in improving the output specification in the interim.

Overview response

Appropriate benchmarking can be a useful tool for both businesses and economic regulators and TransGrid supports the AER's efforts to improve TNSP benchmarking.

Evidence supports a wider review

Analysis provided by TransGrid in its recent Revenue Proposal supports an argument for a more holistic review of TNSP benchmarking[1].

One of the examples raised was that analysis by Frontier Economics found that the preferred benchmarking model (used for the 2016 TNSP benchmarking report) became unstable when updated with the latest two years of data. The analysis showed that the inclusion of this data caused significant movements in output share coefficients. This included that the 'connections' variable coefficient became negative, suggesting that an *increase* in TNSP connections would result in a *decrease* in its cost. Given this, the weightings developed previously and used in the benchmarking report may not be valid. Frontier Economics concluded that the instability of the preferred benchmarking model may be due to a high correlation between input variables and the small sample size. The report submitted with TransGrid's Revenue Proposal includes other examples which suggest that a more holistic review is needed.

Clarity on the review process is required

A clear process for this consultation has not been presented. TransGrid notes that some care is required in using TNSPs' responses to the eighteen questions in the Issues Paper. There is some dependency between the issues addressed. It would be inappropriate to go forward based only on the answers provided, particularly as many questions are set out as binary choices between two alternatives.

TransGrid has responded to most of the questions raised in the Issues Paper. However, responses are provided on the understanding that any changes to output measures and weightings should only be made following appropriate consultation and a full consideration of the impacts.

Summary comments on outputs

Notwithstanding wider concerns about TNSP benchmarking, TransGrid considers that incremental improvements can be made to the current output specifications.

In particular, the existing voltage weighted 'connections' output does not reflect the quantum of transmission provided nor the cost of providing it. It is also an arbitrary source of difference in TNSP's 'apparent' outputs, where these differences are the result of historic local design requirements (such as the prevalent distribution voltages).

TransGrid also considers that larger TNSPs are disadvantaged by the current approach, as outputs do not properly control for a network with high MVA capacity lines.

Detailed response to Issues Paper

Connection points output variable versus end–user numbers

TransGrid agrees with the Issues Paper that the existing connection point output variable has limitations and welcomes the opportunity to explore improvements.

The existing voltage-weighted connections output variable does not provide an accurate measure of transmission services provided. It introduces arbitrary differences between TNSP

[1] TransGrid Revenue Proposal 2018/19 – 2022/23, Appendix F, Frontier Economics: Review of the AER's 2016 Benchmarking Results

outputs which reflect historic design choices based on local requirements. It does not reflect service efficiency and does not provide a strong reflection of network complexity.

1. Would the use of downstream customer numbers be a better output measure than the current voltage weighted connections output variable?

TransGrid is open to exploring customer numbers as an output measure. It provides a better reflection of how many end-use customers rely upon the transmission service. Inclusion of customer numbers (along with the separate ratcheted maximum demand and throughput outputs) allows the benchmarking to reflect the average maximum demand per customer and energy per customer.

While an end-use customer number is a proxy for the complexity and level of service provided at the transmission and distribution interface it could be more representative than the current measure.

2. Would the use of end–user customer numbers for the state the TNSP operates in be appropriate or would allowance need to be made for interconnectors and special situations such as the Snowy Mountains Scheme on end–user numbers?

This would require adding an estimated adjustment to a robust data point. The rationale, to reflect when a TNSP's network may contribute to serving customers in other areas (and incur associated costs) seems valid at face value. However, it introduces an additional level of estimation and annual variability as inter-regional trade is driven by wholesale market factors.

3. Would there also be a need to include a measure of entry points or would the end–user customer numbers measure be adequate?

Transmission costs are impacted to a degree by the complexity of the supply-side, in terms of generation and interconnectors. For example, a TNSP in a region with no local generation but a highly reliable interconnector would likely have lower costs than a TNSP that receives supply from multiple small generators.

While reflecting supply driven costs in benchmarking could be worth examining, combining entry points and end-user customers is not adding similar items together.

4. Would the simple addition of the number of entry and exit points be a viable output measure?

Any connection point measure would be improved by properly considering the quantum and complexity of the service provided. A simple addition of entry and exit points does not do this.

Construction of the connection points output variable

As noted above, TransGrid does not consider the voltage-weighted connections variable to be reflective of transmission service output.

5. If we retain the voltage weighted connections variable, is there a better approximation to the 'size' of connections than the current multiplicative variable?

A connections variable which reflected the supply *capacity* of connections (e.g. in MVA) would provide a much better approximation of the quantum of output provided. The design and use of such a measure would need to be considered in more detail.

6. Should the voltage weighted connections output variable use the voltage at the customer side or the TNSP side or entry and exit point transformers? Which measure would better reflect the service provided by TNSPs to customers?

The voltage weighting of connections is not an effective reflection of the service provided. Using the customer side voltage makes it even less effective. If the voltage weighted connections output variable is to remain, the TNSP side voltage is more accurate and not subject to legacy design variations.

7. Is there a case for the treatment being consistent with AEMO's Marginal Loss Factor reports, which uses downstream voltage?

The voltage weighting of connections is not an effective reflection of the service provided and the downstream voltage makes it even less so. As a result, there does not seem to be a case for this.

8. In accounting for terminal stations that connection to multiple DNSPs:

> ***(a) Should connections to multiple DNSPs at the one terminal station be counted separately or as one connection?***
>
> ***(b) How would counting the connections separately or as one connection advantage or disadvantage particular TNSPs?***

This suggested change would introduce another arbitrary difference between TNSP outputs. It does not assist in the measurement of efficiency nor does it provide a better indication of the complexity or quantum of service provided.

Reliability output weighting

9. Should the weight placed on the TNSP reliability output be reduced to avoid volatile movements in MTFP?

10. If so, should a cap be placed on the weight itself or on the volume of unserved energy incorporated in the model?

11. The value of the reliability output relative to total TNSP revenue exceeded 5% in only 7 of our current 50 observations. Of these all were less than 8.5% except AusNet in 2009 which equalled 29%. If we were to cap this weight, what should the size of the cap be?

12. Should a cap be made to be consistent with the current TNSP STPIS, which applies a cap on the impact of unplanned outages? If so, how would this be applied to the reliability output measures for benchmarking purposes?

13. Would using a rolling average of unserved energy be an alternative way of handling annual volatility in reliability?

In response to questions 9 to 13 - without further analysis and more detailed consideration TransGrid does not have a position on the most appropriate weighting or whether a cap is required.

However, it seems logical that reliability should be included as a measure of transmission service output in some form. The Issues Paper suggests that the review of this output measure is because it introduces volatility which can mask underlying productivity trends.

While this may be true, the issue also highlights the importance of the appropriate use of benchmarking results which should consider a multi-year trend rather than a single performance point. A single year variation of the magnitude highlighted in the Issues Paper[2] should lead to further interrogation of the underlying data and possible cause. In such a case, it would not be appropriate to conclude that a TNSP was less efficient in that year.

Econometrically–derived weights for outputs other than reliability

TransGrid agrees that any changes to output measures will require a review of output weightings. TransGrid also notes the recent advice from Frontier Economics which suggested instability in the preferred model. TransGrid's view is that changes to outputs and their weightings should be approached carefully, with a view to other potential changes to economic benchmarking as foreshadowed in the Issues Paper.

14. Do the current output cost share weights of 21.4 per cent for energy, 22.1 per cent for ratcheted maximum demand, 27.8 per cent for weighted entry and exit connections and 28.7 per cent for circuit length seem reasonable?

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[2] Figure 1: Multilateral total factor productivity index by TNSP, 2006 to 2015, 'Review of Economic Benchmarking of Transmission Network Service Providers', page 7

TransGrid does not have a view on what the specific weightings should be but notes that the Frontier Economics' analysis suggests that current weightings may be the result of coincidence. On face value, it does not seem intuitive that the voltage-weighted connections output (with its limitations) has a higher weight than that of peak demand.

15. Should the output cost shares be updated to take account of the latest information?

It would seem reasonable to update output cost shares to take account of the latest information, particularly as the update would increase the small sample size. However, TransGrid can only form a definitive view on this after detailed consideration of other possible changes in TNSP benchmarking.

'Additive' versus multiplicative capacity measures

16. Does the current separate inclusion of output capacity variables and the MVAkms based input specification introduce any biases?

The current input and output specifications are biased against networks with a higher proportion of high voltage lines (which the model assumes to have a higher capacity). They do not reflect the non-linear relationship between line capacity and line cost.

For example, fifty kilometres of 500MVA capacity transmission line does not cost five times more than the same length of 100MVA capacity line. Multiplying line length by peak demand on the output side is a way of controlling for this.

The algebraic example presented in the Issues Paper specifically does not address the root of the issue as it assumes that the lines of both TNSPs all have the same capacity on average. The bias in the modelling occurs because this is not the case.

17. Is there an objective basis on which to divide a category of very high voltage lines from other lower voltage transmission lines (noting that productivity indexes require non–zero quantities and values for all input categories for all TNSPs)?

As TNSP know the voltages which all their transmission lines operate at, it should be possible to create a more representative split. The issues of non-zero quantities could be at least partly addressed by the use of voltage ranges which captured most lines.

18. Can TNSP asset values be reliably and accurately split and provided on a similar basis?

Various TNSP datasets include asset values. It is not possible to answer this clearly without more understanding of what is required.

Conclusion

TransGrid support the AER's effort to improve TNSP benchmarking. While there are wider limitations which need to be addressed, this review of output specifications is welcomed. Even with this narrowed scope, this review is expected to raise complex technical matters and TransGrid hopes that the process will allow time for proper consideration.

If you would like to discuss this submission, please contact me on 02 9284 3120. We look forward to engaging with the AER on this matter.

Yours faithfully

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