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separately for each DNSP as previously – this mainly affects AusNet Transmission and Transgrid.

#### Issues raised in TNSP submissions

Most TNSPs urged caution in the application and interpretation of TNSP benchmarking in their submissions. In the current context the AER is required to publish an annual TNSP benchmarking report as set out by the AEMC (2012, p.vii):

‘The AER will be required to publish annual benchmarking reports, setting out the relative efficiencies of NSPs based on the information available to it.’

In Economic Insights (2014, p.2) we made the following observation:

‘While economic benchmarking of distribution network service providers (DNSPs) is relatively mature and has a long history, there have been very few economic benchmarking studies undertaken of TNSPs. Economic benchmarking of transmission activities is in its relative infancy compared to distribution. As a result, in this report we do not apply the above techniques to assess the base year efficiency of TNSPs. We present an illustrative set of MTFP results using an output specification analogous to our preferred specification for DNSPs but caution against drawing strong inferences about TNSP efficiency levels from these results.’

We also note that economic benchmarking of TNSPs will be advanced by the publication and discussion of results using the best measures available at the time. This process promotes further discussion and refinement of comprehensive performance measures for TNSPs. Waiting for the perfect measure is a formula for indefinite inaction.

In its submission TransGrid requested more explanation of the output and input specification used in the MTFP analysis. The output and input specifications were developed following extensive consultation with stakeholders during 2013 and 2014. Background and details on the development of the specifications and their rationale can be found in Economic Insights (2013a,b,c,d,e and 2014).

Powerlink’s submission raised the question of how network density differences are allowed for in the MTFP analysis. By including the main numerator and denominator components of network density ratios as outputs (energy transmitted, connections, maximum demand and line length) we are indirectly allowing for differences in the ratios. For example, a TNSP with a low energy density (energy per kilometre) will receive credit for having relatively more line kilometres than an otherwise equivalent TNSP with higher energy density. A more formal illustration of this can be seen (in a DNSP context) in Frontier Economics (2015, p.39).

Powerlink also noted that TNSPs had reported connection point numbers and voltages in different ways. Some TNSPs that had two DNSPs taking power from the same substation counted this as two connections instead of one. This has now been corrected. And ElectraNet had reported the higher transmission voltage for exit points rather than the lower voltage reported in the AEMO Marginal Loss Factor (MLF) reports. The MLF definition has now been consistently applied. We note that TNSPs have debated the best way of forming a measure of the connections output and this will be subject to future review and refinement.

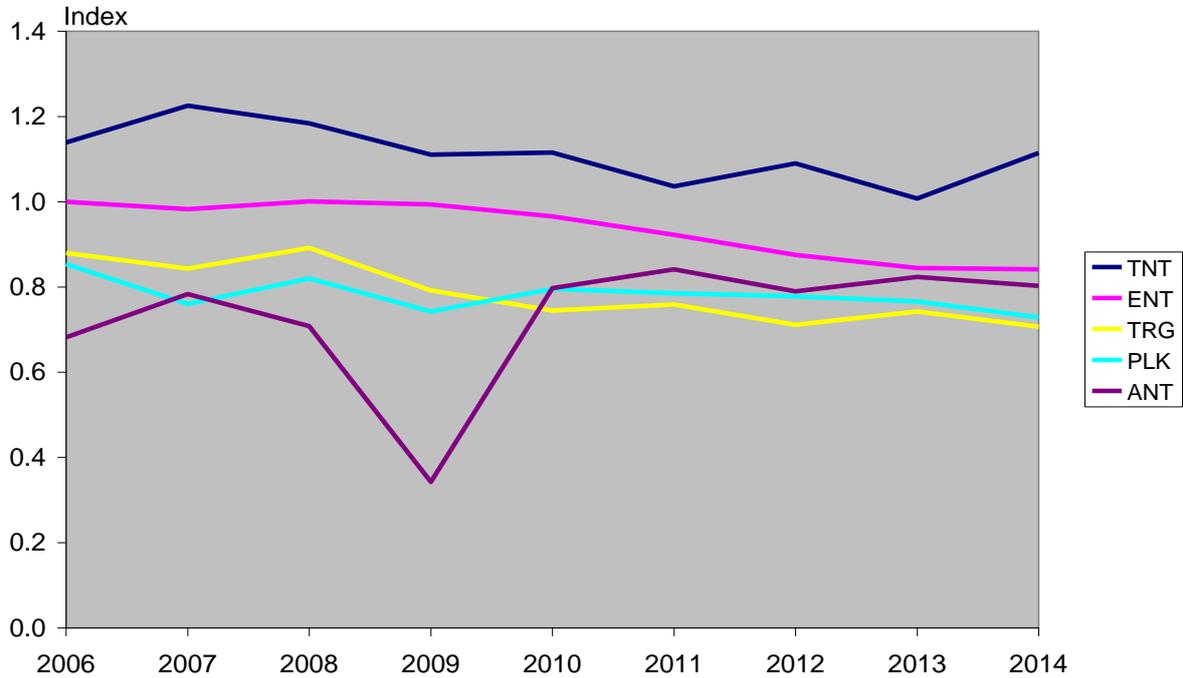
AusNet Transmission noted that revenue from AEMO had been double counted in forming the Victorian TNSP revenue for 2014. This has now been corrected.

TasNetworks noted that TNSPs that have to connect more intermittent renewable generation to service demand will be at a relative cost disadvantage. We note this will offset in the MTFP analysis to some extent by those TNSPs having a higher connection output.

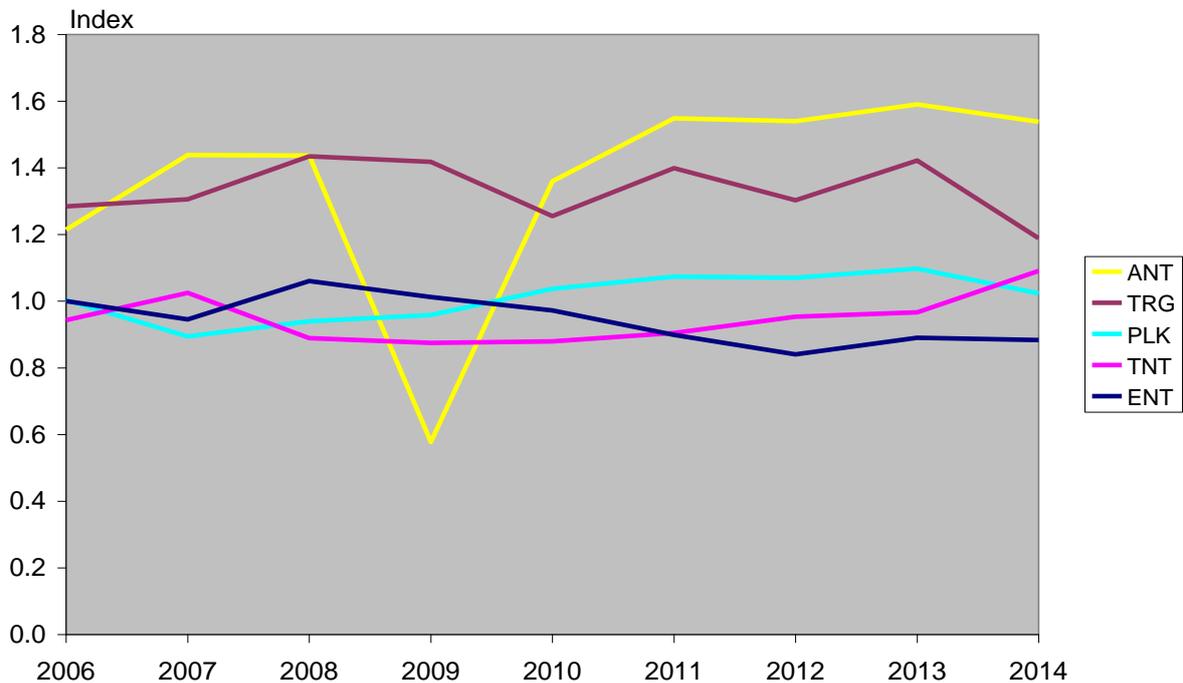
**MTFP and MPFP results**

TNSP MTFP and MPFP results are presented in the following figures.

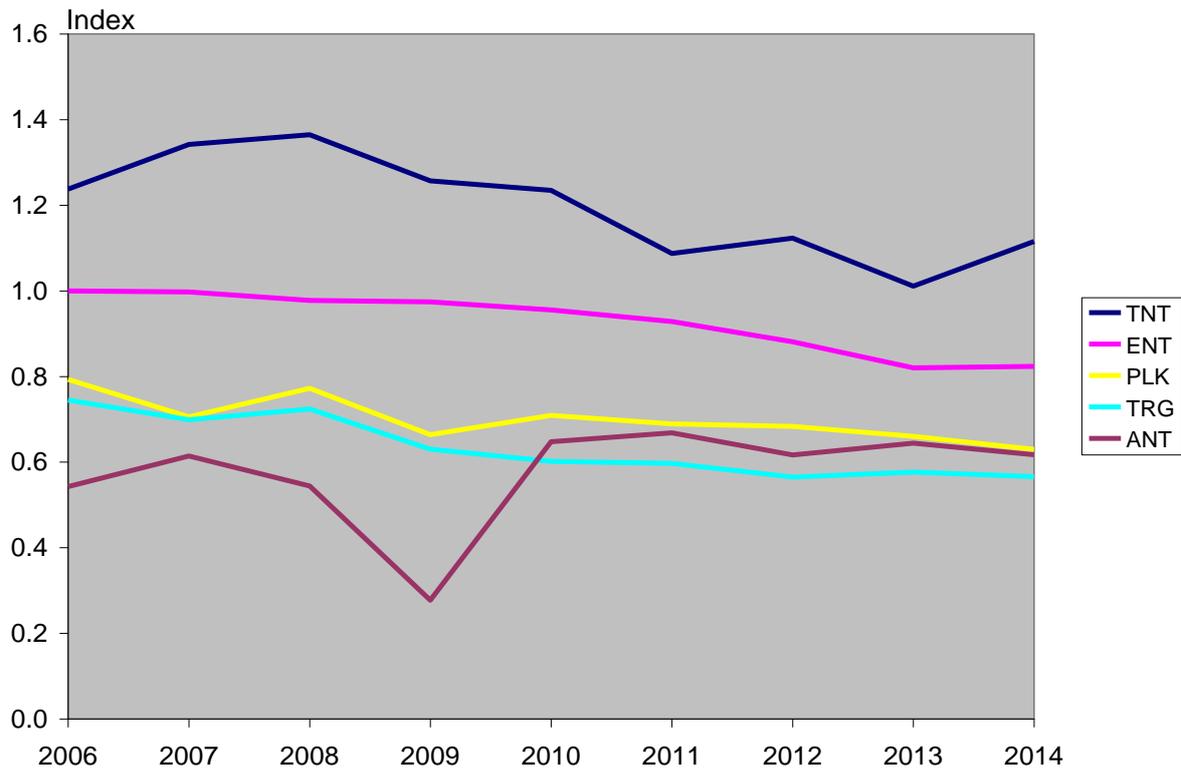
**Figure 1 TNSP multilateral total factor productivity indexes, 2006–2014**



**Figure 2 TNSP multilateral opex partial factor productivity indexes, 2006–2014**

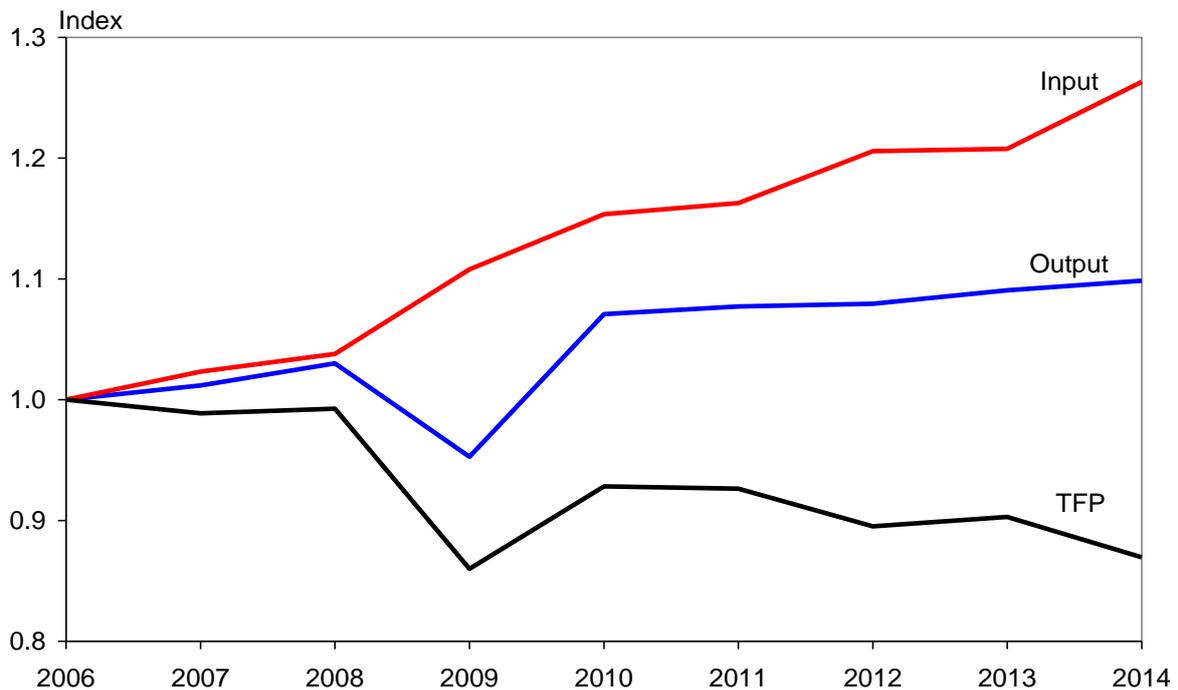


**Figure 3 TNSP multilateral capital partial factor productivity indexes, 2006–2014**



Transmission industry level output, input and TFP indexes are presented in the following figure.

**Figure 4 Industry-level transmission output, input and total factor productivity indexes, 2006–2014**



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## References

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- Australian Energy Regulator (AER) (2014), *Electricity transmission network service providers – Annual benchmarking report*, Melbourne, November.
- Economic Insights (2013a), *Outputs and Operating Environment Factors to be Used in the Economic Benchmarking of Electricity Transmission Network Service Providers*, Briefing notes by Denis Lawrence and John Kain prepared for Australian Energy Regulator, Eden NSW, 21 February.
- Economic Insights (2013b), *Inputs to be Used in the Economic Benchmarking of Electricity Network Service Providers*, Briefing notes by Denis Lawrence and John Kain prepared for Australian Energy Regulator, Eden NSW, 27 February.
- Economic Insights (2013c), *Measurement of Outputs and Operating Environment Factors for Economic Benchmarking of Electricity Transmission Network Service Providers*, Briefing notes by Denis Lawrence and John Kain prepared for Australian Energy Regulator, Eden NSW, 16 April.
- Economic Insights (2013d), *Measurement of Inputs for Economic Benchmarking of Electricity Network Service Providers*, Briefing notes by Denis Lawrence and John Kain prepared for Australian Energy Regulator, Eden NSW, 22 April.
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- Frontier Economics (FE) (2015), *Taking Account of Heterogeneity between Networks When Conducting Economic Benchmarking Analysis*, Report prepared for Ergon Energy, February.