2023-27
POWERLINK QUEENSLAND REVENUE PROPOSAL

Appendix 4.01 – PUBLIC

HoustonKemp
Efficiency of Powerlink's Base Year Operating Expenditure Report

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Economists

Efficiency of Powerlink's base year operating expenditure

A report for Powerlink

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1. Introduction and key findings

Powerlink is developing its forecast operating expenditure (opex) for its 2023-27 revenue proposal, and is proposing to adopt its outturn opex for 2018/19 as its base year from which the opex forecast will be derived.

Powerlink has asked HoustonKemp to provide advice on:

- the efficiency of Powerlink's revealed opex for 2018/19, drawing on the AER's most recent benchmarking analysis, an understanding of the benchmarking techniques used, the conclusions that are able to be drawn from such an analysis and its role within the regulatory framework;
- an assessment of Powerlink's historical opex over time and compared to its peers, including performance across different opex categories;
- based on the above analysis, our view of whether revealed 2018/19 base year opex is efficient and whether the analysis suggests that an adjustment to revealed outturn opex would be appropriate; and
- an appropriate productivity growth factor to apply over the upcoming regulatory period, considering the AER's previous approach and interactions with the Efficiency Benefit Sharing Scheme (EBSS).

This report is structured as follows:

- section 2 describes the regulatory framework for transmission network service providers (TNSPs) and how the AER has used its benchmarking model within this framework:
  - to inform the assessment of the efficiency of base year opex; and
  - to derive the appropriate productivity growth factor to apply across the regulatory period;
- section 3 presents our review of the efficiency of Powerlink's revealed opex for 2018/19 and our conclusions, drawing on both:
  - the AER's benchmarking analysis, and
  - our assessment of Powerlink's historical opex (both over time and compared to its peers), on a total basis and by major opex category; and
- section 4 presents our analysis of an appropriate productivity factor to apply to Powerlink's opex for the 2023-27 regulatory period, based on the approach previously adopted by the AER.

1.1 Key findings

Our assessment of Powerlink's revealed opex for 2018/19 finds:

- the AER's most recent benchmarking results for Powerlink, both in absolute and trend terms, shows that Powerlink has been responding to the incentives in the regulatory framework and is operating relatively efficiently when compared to its peers.
  - In other words, consistent with the AER's application of the benchmarking framework for TNSPs and its recognition of the limitations of that framework, the benchmarking analysis does not provide any basis to conclude that Powerlink's revealed 2018/19 opex is 'materially inefficient', and to overturn the presumption that the incentive mechanisms in the regulatory framework (in particular the EBSS) should lead to revealed opex being an accurate reflection of efficient expenditure;[1]

[1] See section 2.2 for an explanation of this presumption and the AER's use of the term 'materially inefficient'.

  - Further, Powerlink's relative benchmarking performance in 2018/19 is consistent with its relative performance in 2014/15,[2] where the AER accepted actual opex as representing an efficient base year for the current regulatory period.

- our detailed category analysis of Powerlink's opex over time and against its peers further supports this conclusion, and indicates that Powerlink's opex performance across its major opex categories has been improving over time, and that its relative performance is consistent with the key characteristics of its network relative to other stand alone TNSPs;
- our analysis of the productivity growth factor, based on the AER's previous approach, shows that the most recent benchmarking data provide little evidence to apply a positive opex productivity factor for Powerlink for the 2023-27 regulatory period.
  - Put simply, the benchmarking data suggest that the productivity factor applied for Powerlink for the forthcoming regulatory period, as a stand alone TNSP, should be zero; and
- notwithstanding the application of a productivity growth rate of zero, Powerlink remains incentivised to continue to make efficiency gains in relation to its opex during the 2023-27 regulatory period, as a consequence of the EBSS.

[2] Economic Insights, *Economic benchmarking results for the Australian Energy Regulator's 2019 TNSP annual benchmarking report*, 5 September 2019, p 13.

2. Operation of the regulatory framework

The efficiency of Powerlink's revealed opex for the 2018/19 base year, and the factors used to assess that efficiency, needs to be considered within the context of the regulatory framework that applies to Powerlink.

In this section we set out key features of the regulatory framework for TNSPs, and how the AER has used its benchmarking model within that framework to inform an assessment of the efficiency of base year opex and the appropriate productivity growth factor to apply to a regulatory period.

2.1 Regulatory framework for TNSPs

Opex refers to the maintenance and non-capital costs incurred in the provision of prescribed services, and comprises a separate 'building block' in a TNSP's revenue allowance.

TNSPs are required by the National Electricity Rules (the Rules) to submit a revenue proposal for each regulatory control period. In particular, the TNSP must forecast the total opex for each year during the regulatory period that it considers necessary to achieve each of the opex objectives set out in the Rules, which are:[3]

1. to meet or manage the expected demand for prescribed transmission services over that period;
2. to comply with all applicable regulatory obligations associated with the provision of prescribed transmission services;
3. to the extent that there is no applicable regulatory obligation, maintain to the relevant extent:
    i. the quality, reliability and security of supply of prescribed transmission services; and
    ii. the reliability and security of the network through the supply of prescribed transmission services; and
4. to maintain the safety of the network through the supply of prescribed transmission services.

The AER is required by the Rules to form a view on total forecast opex for the forthcoming regulatory control period (rather than on subcomponents such as individual projects or programs). It must accept a TNSP's total forecast opex if it is satisfied that the forecast reasonably reflects each of the opex criteria in the Rules, which are:[4]

1. the efficient costs of achieving the opex objectives;
2. the costs that a prudent operator would require to achieve the opex objectives; and
3. a realistic expectation of the demand forecast and cost inputs required to achieve the opex objectives.

The Rules provide a list of opex factors that the AER must take into account in its assessment, which include (but are not limited to) the most recent annual benchmarking report published by the AER, and the benchmark opex that would be incurred by an efficient TNSP over the relevant regulatory control period.[5]

The annual benchmarking report is a report that the AER is required to prepare and publish, and which is intended to describe, in reasonably plain language, the relative efficiency of each TNSP in providing prescribed network services over a 12 month period.[6]

[3] National Electricity Rules (hereafter NER), clause 6A.6.6(a).

[4] NER, clause 6A.6.6(c).

[5] NER, clause 6A.6.6(e).

[6] NER, clause 6A.31(a).

We describe the role of benchmarking in relation to informing the AER's decision on efficient base year opex, in the context of the AER's base-step-trend approach below (section 2.2). We further describe the role of benchmarking in estimating the productivity adjustment applied to opex over the regulatory period in section 2.3. However it is important to recognise that the AER's consideration of both the efficiency of base year opex, and its derivation of an appropriate productivity adjustment takes place within the context of the incentive mechanisms included in the regulatory framework, and so we first elaborate on the EBSS incentive scheme that applies to TNSP's opex.

2.1.1 Efficiency benefit sharing scheme

The Rules require the AER to develop and publish a scheme (the EBSS) that provides for a 'fair sharing' between the TNSP and network users of gains (losses) derived from the TNSP's operating expenditure if it is less (more) than the forecast opex accepted or substituted by the AER for a regulatory control period.[7]

The EBSS was designed to counteract the incentives that would otherwise exist for a TNSP operating under a revenue cap to make inefficient expenditure decisions towards the end of a regulatory control period directed at maximising its future revenue allowances. Absent an EBSS, reliance on outturn opex to guide the determination of a TNSP's future opex allowance could create incentives for a TNSP to undertake strategic behaviour, by, say, inflating its opex allowance in the base year or by delaying the implementation of efficiency enhancing measures until the next regulatory period, in order to increase the gains the TNSP retains from making efficiency improvements.

The current form of the EBSS applies in conjunction with the ex-ante nature of the regulatory framework, the 'no claw-back' principle (that allows TNSPs to retain any difference between their regulatory expenditure allowance and their actual expenditure) and the revealed cost approach to forecasting opex. Taken together, this framework removes the inconsistent incentives described above. The EBSS was designed such that:

- both temporary and permanent gains and losses arising from underspending and overspending relative to forecast opex are shared between TNSPs and customers; and
- the rate of retention of any gains or losses is invariant as to the timing within a regulatory period at which those gains/losses occurred.

These arrangements provide TNSPs with an increased share of the benefits of any gains – by delaying the sharing of these gains with customers – thereby increasing the incentive on the TNSP to make cost savings.

The timing component of the EBSS means that TNSPs are incentivised to make opex cost savings throughout the regulatory period, including any year which is to represent the proposed base year for the following regulatory period. In other words, the EBSS provides an incentive for TNSPs to make opex cost savings even in proposed base years. This in turn allows for a presumption that the TNSPs revealed outturn costs are efficient.

This presumption is reflected in the AER's expenditure forecast assessment guidelines, which state that:[8]

> For recurrent expenditure [such as opex], we prefer to use revealed (past actual) costs as the starting point for assessing and determining efficient forecasts. If a TNSP operated under an effective incentive framework, actual past expenditure should be a good indicator of the efficient expenditure the NSP requires in the future. The ex-ante incentive regime provides an incentive to improve efficiency (that is, by spending less than the AER's allowance) because TNSPs can retain a portion of cost savings made during the regulatory control period.

Similarly, in a recent transmission determination, the AER stated:[9]

[7] NER, clause 6A.6.5.

[8] AER, *Expenditure forecast assessment guideline for electricity transmission*, Better regulation, November 2013, p 8.

[9] AER, *Draft decision TransGrid transmission determination 2018 to 2023*, Attachment 7 – Operating expenditure, September 2017, p 21.

> Typically, where a service provider is subject to these incentives [ie, the regulatory framework, including the EBSS], we are satisfied there is a continuous incentive for a service provider to make efficiency gains and it does not have an incentive to increase its opex in the proposed base year.

2.2 Role of benchmarking in setting base year opex

The AER generally assesses opex forecasts on the basis of the 'base-step-trend' approach.[10] This involves the following three steps:

- determining an efficient base year opex;
- trending base year opex forward by applying a rate of change that accounts for growth in input prices, outputs and productivity over the regulatory period; and
- accounting for any step changes, which involve opex costs not captured in base year opex or the rate of change (ie, new regulatory obligations).

The AER's assessment of both the efficiency of proposed base year opex and the appropriate productivity trend change in opex includes consideration of the results of its benchmarking analysis, considered with this being one of the expenditure factors set out in the Rules.

The benchmarking model adopted by the AER calculates the following types of TNSP benchmarks:[11]

- partial performance indicators (PPIs);
- multilateral partial factor productivity (MPFP) of capital and opex; and
- multilateral total factor productivity (MTFP).

The PPI analysis involves the development of a range of performance metrics or partial performance indicators. Each PPI connects the quantity of a single input with each unit of output produced by a TNSP.

In addition to the PPIs, the AER also calculates the following two MPFPs:

- capital MPFP, which examines the productivity of the TNSP's use of overhead lines, underground cables and transformers; and
- opex MPFP, which examines the productivity of the TNSP's use of opex.

The AER's MTFP analysis compares the relative performance of different TNSPs in totality. A MTFP index is a measure of productivity over time, formed as a ratio of the outputs of a business to the inputs of the business. Once estimated, these indices may be used as a basis for comparing the performance of TNSPs relative to one another.

The AER states that it uses economic benchmarking as one of a number of factors it considers in assessing and amending TNSPs' expenditure proposals.[12] Specifically, benchmarking provides the AER with insights into:[13]

- the relative efficiency of a TNSP's opex, capex and total expenditure against its peers; and
- changes in a TNSP's expenditure efficiency through time.

[10] AER, *Framework and approach Powerlink regulatory control period commencing 1 July 2022*, July 2020, pp 18-19; AER, *Expenditure forecast assessment guideline for electricity transmission*, Better regulation, November 2013, p 22.

[11] AER, *Annual benchmarking report electricity transmission network service providers*, November 2020.

[12] AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, footnote 38, p 10.

[13] AER, *Expenditure forecast assessment guideline for electricity transmission*, Better regulation, November 2013, p 13.

The AER has regard to each of these indicators when assessing whether the TNSP's audited base year opex costs are efficient.

It is relevant to note that the AER's approach to considering benchmarking in determining efficient base year opex for TNSPs differs from its assessment for DNSPs. Specifically, the AER does not calculate an efficiency stochastic frontier for TNSPs, nor does it calculate explicit adjustments for exogenous Operating Environment Factors (OEFs). As a result, the link between the outcomes of the AER's benchmarking model and its assessment of the efficiency of base year opex is much less mechanistic.

Rather, the AER describes the use of benchmarking for TNSPs as important for a 'first pass' assessment to identify areas that may warrant further review (although noting that it may also use the benchmarking beyond this first assessment).[14] This is consistent with the AER's recognition of the limitations of its benchmarking analysis for TNSPs (discussed further below).

Consistent with the use of benchmarking in this capacity, the AER has generally applied an expectation that the regulatory framework (including the EBSS) provides incentives for TNSPs to operate efficiently and thus the presumption that revealed opex is efficient and a suitable basis to use for determining the opex allowance for forthcoming regulatory periods (see discussion in section 2.1.1). Based on this presumption, the AER would be expected to adjust base year opex from revealed opex only if the benchmarking results suggested that there was a reason to consider that the revealed opex may be 'materially inefficient' (to use the AER's terminology), triggering a need for more forensic analysis of revealed cost outcomes.

For example, in its most recent transmission determination, the AER stated that:[15]

> Taking into account the above, we are satisfied that TasNetworks' estimate of its opex in 2017–18 is not **materially inefficient**, and represents an appropriate starting point for forecasting opex for the 2019–24 regulatory control period. [emphasis added]

Similarly, its expenditure forecast assessment guidelines state that:[16]

> We intend to not rely on the expenditure of a particular base year when we identify **material inefficiencies** in that expenditure. [emphasis added]

If the benchmarking results do not highlight any cause to consider that a TNSP's revealed opex is materially inefficient, then the need for further detailed assessment of opex outcomes can be avoided, and the AER would be expected not to adjust revealed opex when determining base year opex for a forthcoming regulatory period.[17]

2.3 Role of benchmarking in determining the change in opex over time

The AER also uses the benchmarking analysis to calculate the rate of change of opex for a given year as:[18]

$$\Delta\, Opex = \Delta\, Price + \Delta\, Output - \Delta\, Productivity$$

where:

- $\Delta\, Opex$ is the proportional change in opex in that year;
- $\Delta\, Price$ is the proportional change in input prices in that year;

[14] AER, *Expenditure forecast assessment guideline for electricity transmission*, Better regulation, November 2013, p 11.

[15] AER, *Draft decision TasNetworks transmission determination 2019 to 2024, Attachment 6 – Operating expenditure*, September 2018, p 15.

[16] AER, *Expenditure forecast assessment guideline for electricity transmission*, Better regulation, November 2013, p 22.

[17] For example, the AER expresses a preference for using revealed costs, unless it identifies material inefficiencies, in which case it 'may adjust the base year or substitute an appropriate base year.' See: AER, *Expenditure forecast assessment guideline for electricity transmission*, Better regulation, November 2013, p 22.

[18] AER, *Expenditure forecast assessment guideline for electricity transmission*, Better regulation, November 2013, p 23.

- $\Delta\ Output$ is the proportional change in measured outputs in that year; and
- $\Delta\ Productivity$ is the proportional change in productivity in that year.

The AER has estimated the proportional change in outputs and the proportional change in productivity using results from its benchmarking analysis.

To estimate the output rate of change, the AER has previously taken a weighted average of the forecast change in each of the TNSP's outputs, ie, delivered energy, maximum demand, end-user customer numbers, and circuit length. The output weights have been derived from the benchmarking analysis and essentially determine the relative contribution of specific outputs to a TNSP's costs.[19]

To estimate the proportional change in productivity, the AER has previously estimated the trend in productivity across all five TNSPs in the National Electricity Market (NEM) (as an industry) over the period for which data is available. The AER has derived the change in productivity using one of the results of the benchmarking analysis, ie, the opex partial factor productivity (PFP) index.

2.4 Limitations of the AER's benchmarking for TNSPs

The AER recognises that there are limitations to the use of its benchmarking for TNSPs:[20]

> … while transmission networks have undertaken cost benchmarking for a number of years, top-down (whole of business) benchmarking of electricity transmission networks is relatively new. Compared to electricity distribution networks there have not been many top-down benchmarking studies of transmission networks and, consequently, MTFP analysis for transmission networks is still in a relatively early stage of development. The small number of electricity transmission networks in Australia (five) also makes efficiency comparisons at the aggregate expenditure level difficult.

Given this limitation, the AER has had regard to other factors in addition to benchmarking in assessing the efficiency of base year opex, such as the extent of relative efficiency improvements over time, to determine whether the TNSP is responding to the financial incentives in the regulatory framework, such as the EBSS.[21]

The AER's benchmarking provides useful information relating to the absolute and relative efficiencies of each TNSP. However, when comparing TNSPs, it is important to take into account OEFs that may be specific to one or a subset of TNSPs.

For example:

- TNSPs may apply different capitalisation policies – there are instances where one TNSP may incorporate expenditure into opex where another would capitalise it;
- differences in network terrain may influence the expenditure necessary to maintain the network; and
- differences in the geographic nature of networks may mean some TNSPs need to invest in particular infrastructure that another TNSP would not.

As a consequence of these limitations, as noted above, the AER does not use benchmarking as a mechanistic tool for assessing efficient opex, but one of the range of factors to which it has regard in making its assessment.

[19] We note that Economic Insights has significantly revised the output weights in its 2019/20 benchmarking report, in which it says that "the corrected output weights are consistent with what we would expect conceptually." Powerlink's MTFP results were less affected than other TNSPs and its relative ranking improved as a result of the worsening MTFP results of AusNet and TransGrid. See: Economic Insights, *Economic benchmarking results for the Australian Energy Regulator's 2020 TNSP annual benchmarking report*, 15 October 2020, p 2; AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, p 5.

[20] AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, p 11.

[21] See, for example: AER, *TasNetworks transmission determination 2019 to 2024*, Attachment 6 operating expenditure, September 2018, pp 11-12.

3. Powerlink's revealed opex for 2018/19 represents an efficient base year level of opex

This section focuses on the efficiency of Powerlink's revealed 2018/19 opex. We discuss:

- the conclusions that can be drawn from the AER's most recent benchmarking report, and
- whether these conclusions are challenged by a more detailed assessment of Powerlink's historical opex (both over time and compared to its peers), on a total basis and by major opex category.

3.1 Implications from AER's benchmarking analysis for the efficiency of Powerlink's revealed 2018/19 opex

Given the difference in capitalisation policies between the TNSPs, as well as the trade-offs between opex and capex, in assessing the efficiency of Powerlink's 2018/19 opex it is relevant to consider the benchmarking outcomes for total costs (ie, MTFP), as well as the relativities and movements in both opex and capex MPFPs.

In this section, we present Powerlink's benchmark outcomes across each measure together with our assessment of the implications for the efficiency of Powerlink's revealed opex for 2018/19, before presenting our overall assessment of the conclusions that can be drawn from the AER's benchmarking analysis in relation to the efficiency of Powerlink's 2018/19 opex.

3.1.1 MTFP

Figure 3.1 below shows that Powerlink's MTFP improved modestly in 2018/19, and that Powerlink improved its ranking to fourth, up from fifth in 2017/18. It also shows that (with the exception of TasNetworks) the TNSPs are closely grouped in terms of MTFP outcomes. In summary, the AER's benchmarking analysis shows that Powerlink's MTFP is aligned closely with the other TNSPs (with the exception of TasNetworks), and has improved since 2016/17.

The AER noted in its 2020 benchmarking report that Powerlink and TransGrid were the only two TNSPs to record MTFP improvements over the last two consecutive years.[22] It also noted that the growth in productivity for these two TNSPs 'can be linked to improvement in opex efficiency levels.'[23]

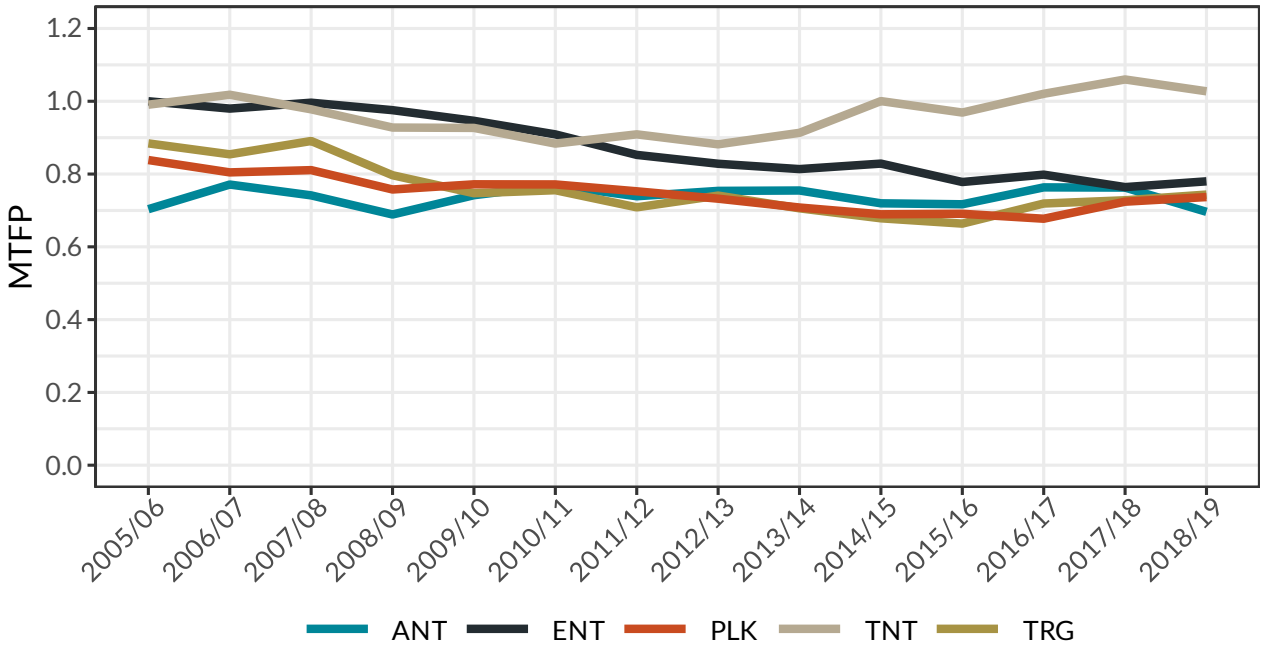
We also note that Powerlink's 2018/19 MTFP has improved relative to its 2014/15 performance, when its base year opex was deemed efficient by the AER.[24]

[22] AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, p iv.

[23] AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, p 20.

[24] After accounting for efficiency adjustments proposed by Powerlink. AER, *Powerlink transmission determination 2017-18 to 2021-22, Attachment 7 – operating expenditure*, Draft decision, September 2016, p 16.

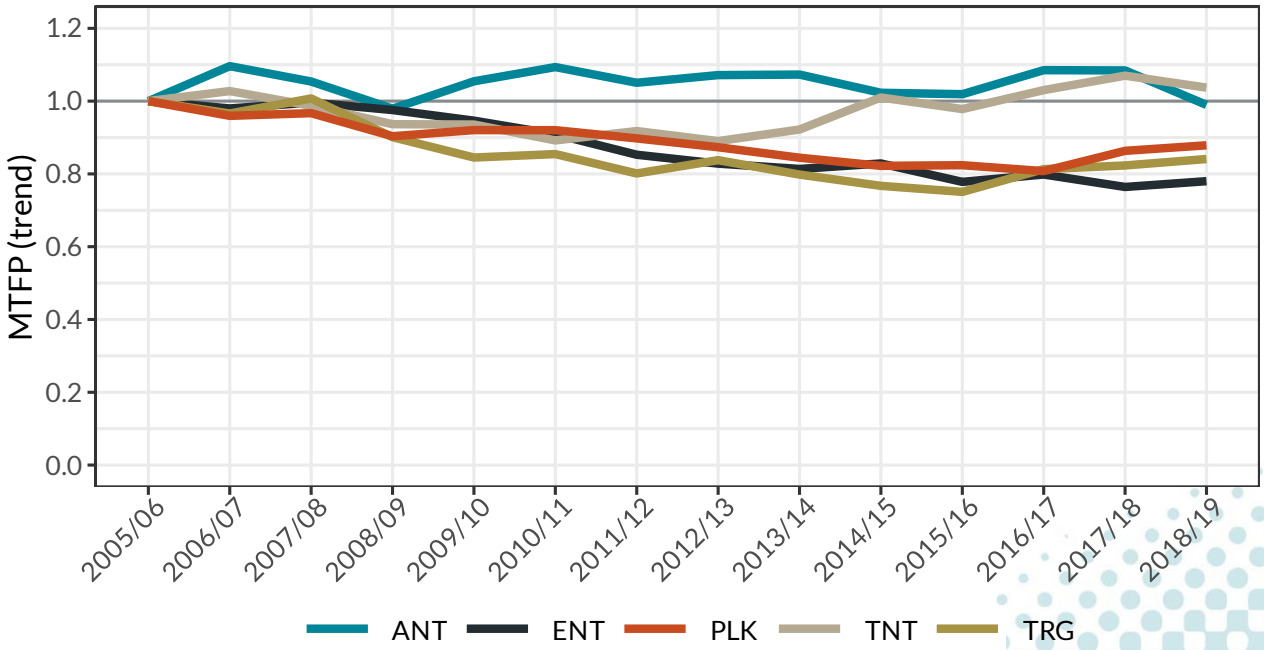
Figure 3.1: TNSP MTFP, 2005/06 to 2018/19



Source: HoustonKemp analysis of Economic Insights, Economic Insights AER TNSP benchmarking data files, 15 October 2020.

In trend terms, Powerlink's MTFP improved approximately in line with TransGrid and ElectraNet in 2018/19. This indicates that Powerlink is continuing to respond to the efficiency incentives in the regulatory framework, including the EBSS. In contrast, the MTFP for AusNet and TasNetworks declined in 2018/19.

Figure 3.2: TNSP MTFP (trend), 2005/06 to 2018/19



Source: HoustonKemp analysis of Economic Insights, Economic Insights AER TNSP benchmarking data files, 15 October 2020.

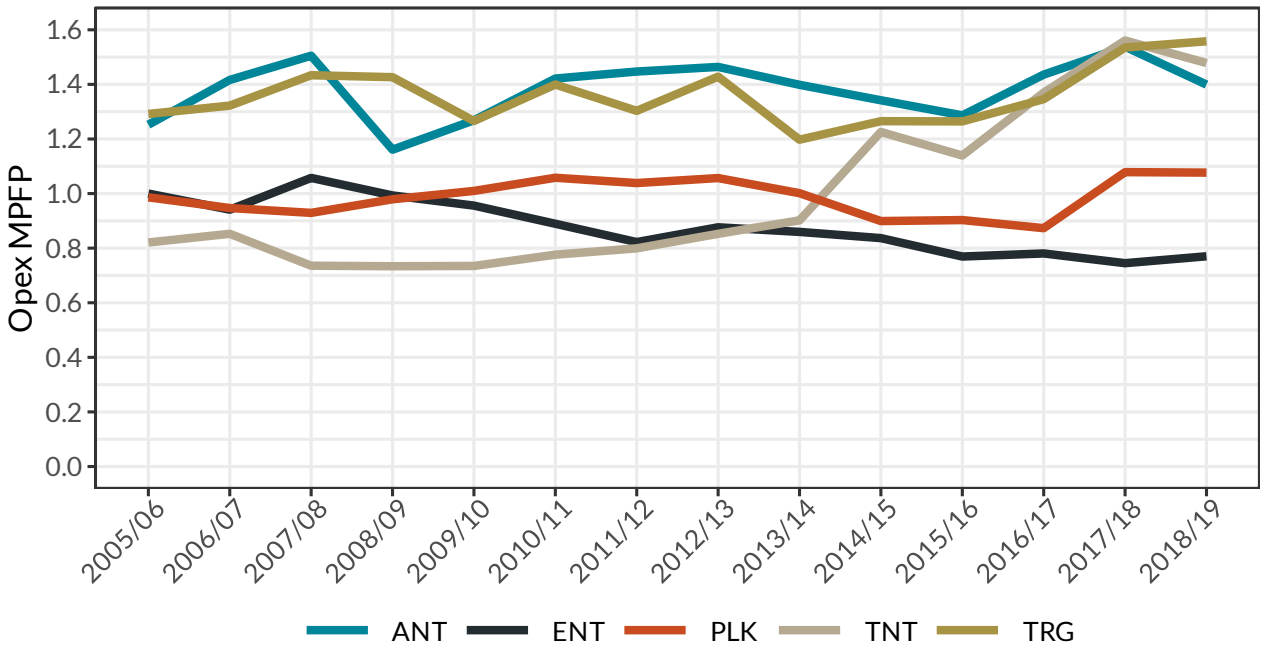
Powerlink's relative MTFP performance therefore places it within relatively close proximity to the outcomes for other TNSPs (with the exception of TasNetworks, whose performance reflects the outcome of the merger of transmission and distribution business and is therefore not representative of the outcomes for a stand-alone TNSP – as discussed further below), and shows improvement over time consistent with the incentives it faces under the regulatory framework.

3.1.2 Opex MPFP

Figure 3.3 shows that Powerlink's opex MPFP remained approximately flat in 2018/19, after an improvement in 2017/18. We understand from Powerlink that the improvement in 2017/18 arose from restructuring the business and the write back of provisions not required for the restructure, and therefore is not expected to be recurrent in nature. As a consequence, the steady-state outcome in 2018/19 is not unexpected.

The recent improvement in Powerlink's MTFP discussed above is almost entirely due to its improvement in opex MPFP. This strongly supports the conclusion that Powerlink is responding to the incentives in the regulatory framework, and that revealed 2018/19 opex can be presumed to be efficient.

Figure 3.3: TNSP Opex MPFP, 2005/06 to 2018/19



Source: HoustonKemp analysis of Economic Insights, Economic Insights AER TNSP benchmarking data files, 15 October 2020.

We note that TasNetworks improved its opex MPFP performance the most over the period considered in the AER's benchmarking analysis. In particular, TasNetworks' opex MPFP performance has improved significantly since 2014/15, coinciding with the merger of Tasmania's DNSP (Aurora Energy) and TNSP (Transend) to form TasNetworks. The AER notes in its latest benchmarking report that:[25]

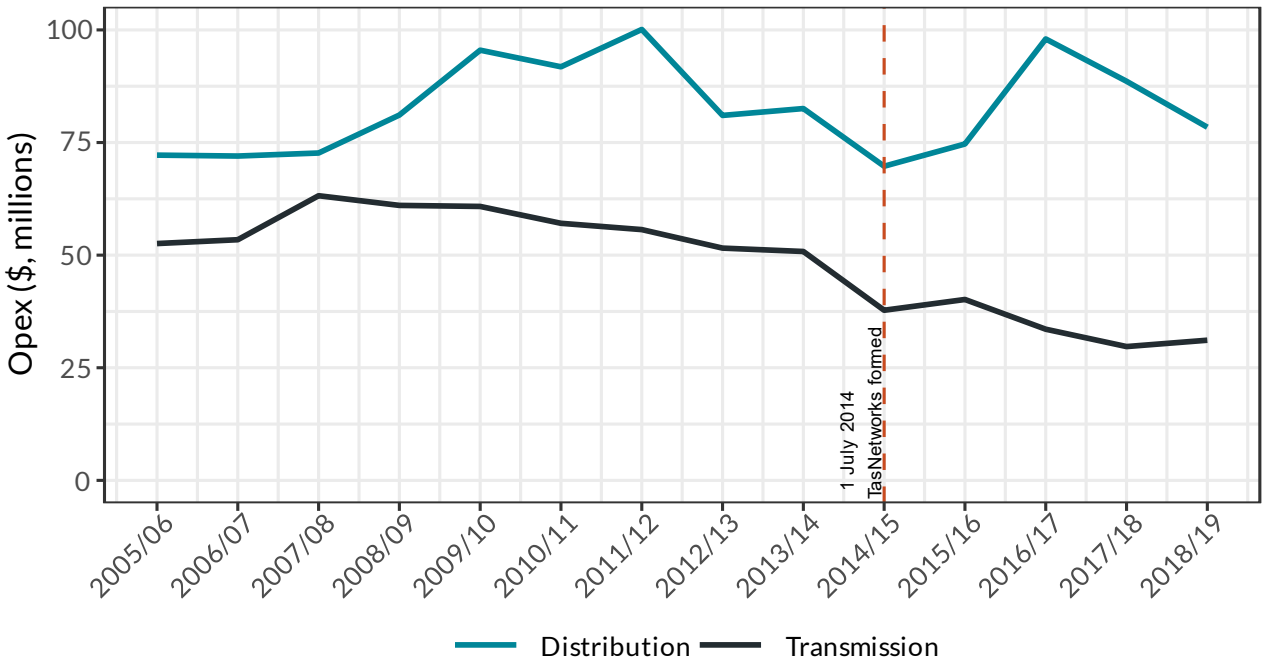
> The positive trend [in TasNetworks' MTFP performance (and therefore its opex MPFP performance, since capital MPFP performance worsened)] from 2015 likely reflects efficiencies resulting from the merger of Tasmanian distribution and transmission networks.

[25] AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, p 20.

TasNetworks has adopted a 'one business' strategy, focused on delivering 'synergies and efficiencies though the rationalisation and removal of duplicated functions across [its] business operations.'[26] Figure 3.4 shows that:

- TasNetworks materially reduced both transmission and distribution opex in the year of the merger;
- transmission opex has fallen further in the following years; and
- distribution opex has not shown the same trend (suggesting that some of the observed trend in transmission opex outcomes may reflect a reallocation of costs due to the changed nature of the merged business, rather than overall cost reductions across the business as a whole).

Figure 3.4: TasNetworks opex by NSP type



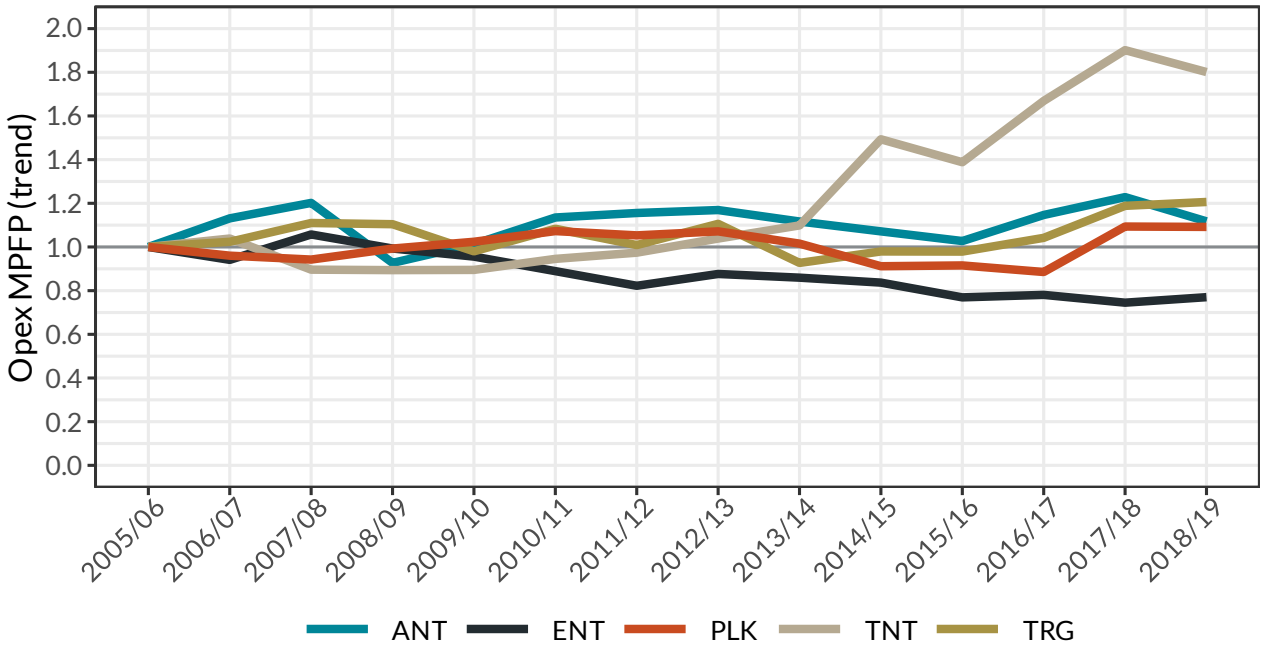
Note: Distribution opex includes standard control services only, ie, it does not include alternative control services. Values have been inflated to 2019 dollars using the composite labour, materials and service price index constructed by Economic Insights. See: Economic Insights, Economic benchmarking results for the Australian Energy Regulator's 2020 TNSP annual benchmarking report, 15 October 2020, p 7.
Source: HoustonKemp analysis of TasNetworks economic benchmarking RINs, 2005/06 to 2018/19; Economic Insights, TNSP opex price index (2019 update), 15 October 2020.

The efficiency gains made by TasNetworks resulting from the merger, reflected in its TNSP benchmarking results, do not represent gains that are also available to a stand-alone TNSP such as Powerlink. As a consequence, it is most relevant to compare Powerlink's benchmarking outcomes to the other TNSPs excluding TasNetworks. The lack of comparability between the efficiency gains made by TasNetworks and those available to stand-alone TNSPs also has implications for the use of the benchmarking data to calculate the appropriate productivity factor for the regulatory period (discussed further in section 4).

[26] TasNetworks, *Transmission Cost Allocation Methodology and Distribution Cost Allocation Method*, June 2015, p 4.

Figure 3.5 shows that none of the TNSPs showed significant improvement in opex MPFP in trend terms in 2018/19.

Figure 3.5: TNSP Opex MPFP trend, 2005/06 to 2018/19



Source: HoustonKemp analysis of Economic Insights, Economic Insights AER TNSP benchmarking data files, 15 October 2020.

Consistent with its relative MTFP performance, Powerlink's relative opex MPFP performance places it within relatively close proximity to the outcomes for other TNSPs (with the exception of TasNetworks, whose performance is not representative of the outcomes for a stand-alone TNSP).

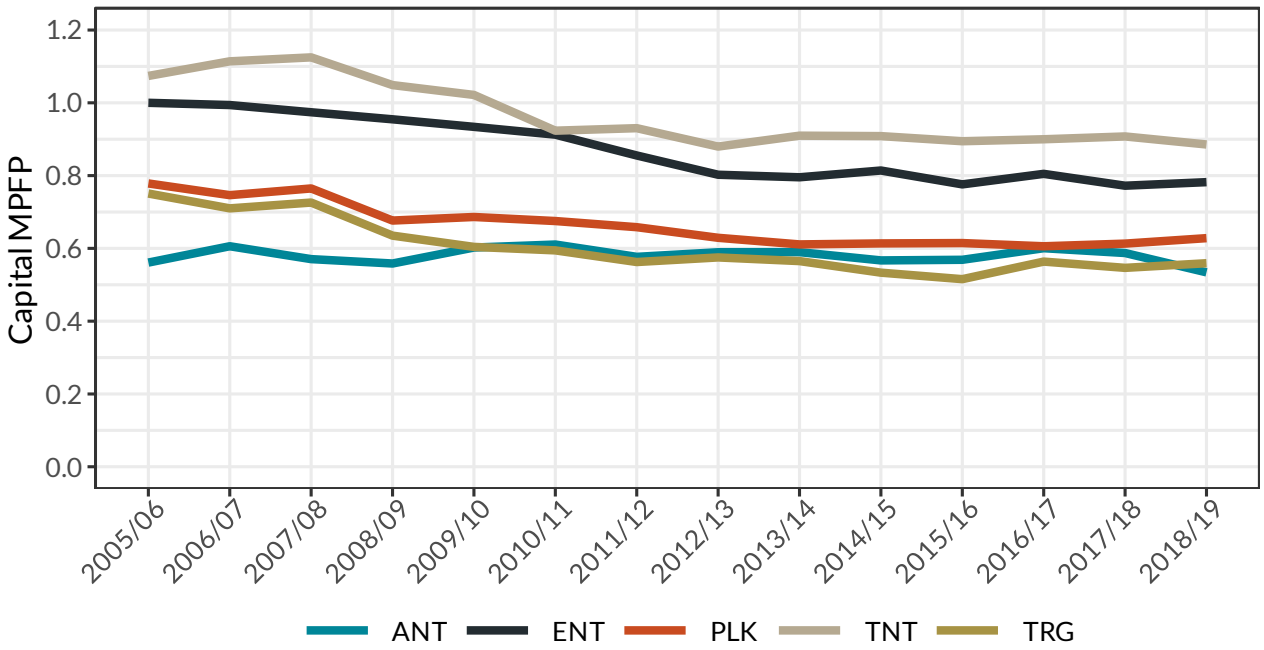
Further, Powerlink's opex MPFP shows improvement over time, consistent with Powerlink responding to the incentives it faces under the regulatory framework.

Based on this outcome, there are no 'red flags' that would indicate Powerlink's revealed opex for 2018/19 is not efficient.

3.1.3 Capital MPFP

Powerlink's capital MPFP improved marginally in 2018/19. However, its overall level of outturn capital MPFP performance has remained relatively flat over the last five years.

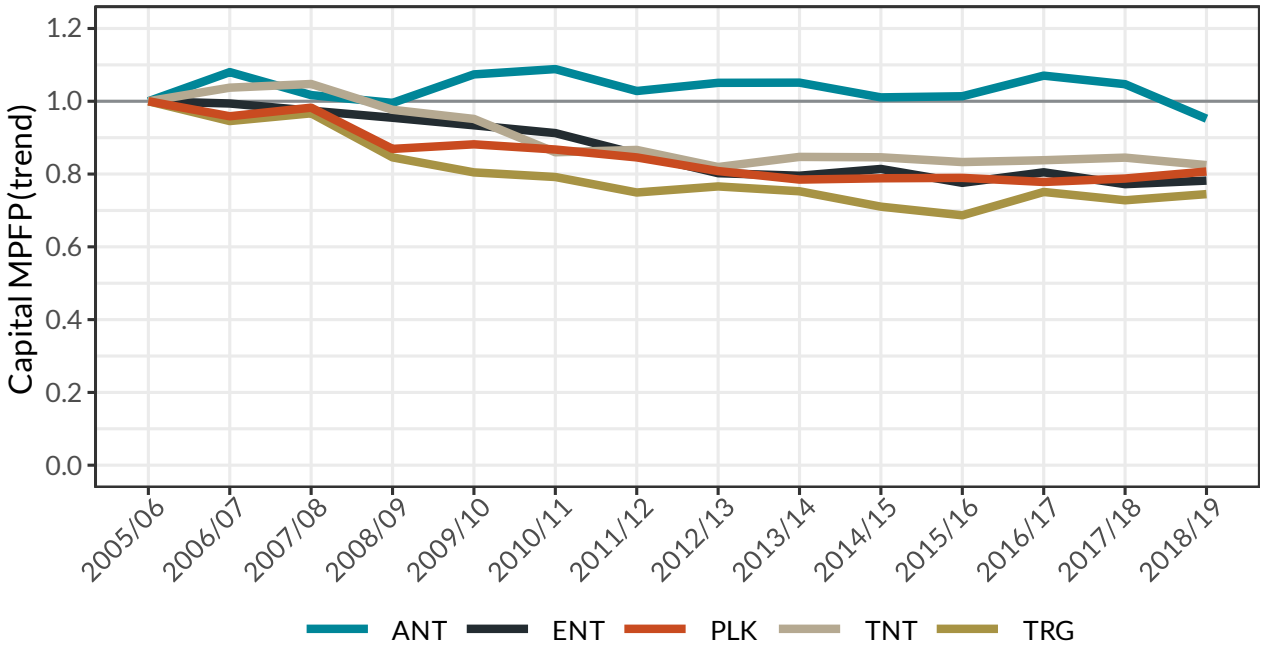
Figure 3.6: TNSP capital MPFP, 2005/06 to 2018/19



Source: HoustonKemp analysis of Economic Insights, Economic Insights AER TNSP benchmarking data files, 15 October 2020.

In trend terms, the capital MPFP performance of the TNSPs are closely grouped, with the exception of AusNet. AusNet operates under a different network planning model in Victoria compared to that applying to other TNSPs, whereby it does not undertake material augmentation expenditure as part of its regulated activities, and its capital MPFP performance is therefore different to other TNSPs.

Figure 3.7: TNSP capital MPFP trend, 2005/06 to 2018/19



Source: HoustonKemp analysis of Economic Insights, Economic Insights AER TNSP benchmarking data files, 15 October 2020.

Powerlink's benchmark performance for capital MPFP is relevant to the assessment of the efficiency of 2018/19 opex only to the extent that it may provide indications of the efficiency of the capex/opex trade-off made by Powerlink relative to other TNSPs. There is nothing in the latest benchmarking analysis to suggest that there are any concerns with this trade-off, as evidenced by the generally consistent capital MPFP outcomes between Powerlink and the other TNSPs, and Powerlink's relative performance overall under the AER's MTFP analysis (discussed earlier).

3.1.4 Partial performance indicators

The AER's benchmarking report also presents a number of partial performance indicators.[27]

For its 2020 annual benchmarking report for TNSPs (which draws on data up to 2018/19), the AER examined the following PPIs:[28]

- total cost per end user;
- total cost per km of transmission circuit length;
- total cost per mega volt amp (MVA) of non-coincident maximum demand; and
- total cost per MWh of energy transported.

PPIs do not take interrelationships between outputs into account and the AER acknowledges that they should therefore be assessed alongside the other benchmarking results.[29]

[27] AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, section 4.2.

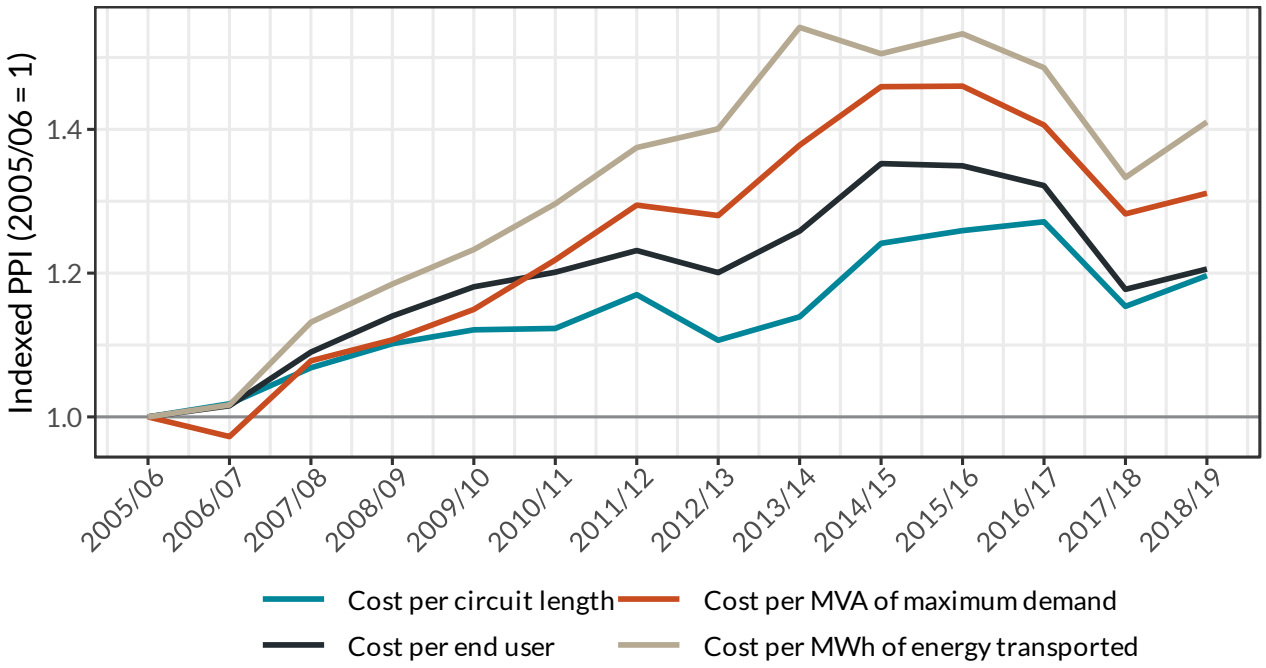
[28] AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, pp 24-28.

[29] AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, p 24.

The AER's benchmarking report analyses Powerlink's PPI performance relative to its peers and we do not reproduce its analysis here.[30]

Figure 3.8 shows Powerlink's relative PPI performance over time, in particular showing that Powerlink's performance in 2018/19 was substantially improved over its 2014/15 results (Powerlink's previous base year).

Figure 3.8: Powerlink's PPI performance over time, 2005/06 to 2018/19



Source: HoustonKemp analysis of AER, Annual benchmarking report electricity transmission network service providers, November 2020, section 4.2.

The AER's PPI analysis shows that although Powerlink has the second-highest total cost per end user, this is consistent with it having the second lowest connection density (end users per circuit length),[31] and therefore an unsurprising outcome. The PPI analysis also shows that Powerlink's total cost per end user has been falling since 2014/15, although it did increase slightly in 2018/19 (in the order of two per cent).[32]

Powerlink ranks third in total cost per circuit length and total cost per MVA of maximum demand served, improving its cost per MVA ranking in 2018/19.[33] Its performance, once adjusted to reflect its network characteristics, is therefore not an outlier on either of these metrics.

Powerlink has generally reduced its costs per MWh of energy transported since 2013/14, although there was a modest increase in this metric in 2018/19 (in the order of less than six per cent). Even with this change Powerlink's cost per MWh of energy has decreased by nine per cent since 2013/14.[34]

[30] See: AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, section 4.2.

[31] AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, p 25.

[32] AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, p 25.

[33] AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, pp 26-27.

[34] AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, p 28.

We note that reliability is the only output for which there is no corresponding PPI. In 2018/19, Powerlink was the only TNSP to record zero energy not supplied (ENS).[35] Economic Insights' economic benchmarking model was not able to account for the unprecedented positive reliability outcome and the model subsequently had to be adjusted to allow for zero ENS.[36]

We note that Powerlink's PPI performance worsened slightly in 2018/19. However, consistent with AER's acknowledgement that PPIs only provide a partial indication of TNSP performance, the PPIs, together with Powerlink's overall MTFP and opex MPFP don't suggest material inefficiency in 2018/19 to warrant further detailed assessment of opex outcomes.

To summarise, taken together, there is nothing in the AER's PPI analysis that would give rise to a concern that Powerlink's 2018/19 outturn opex is materially inefficient, warranting further detailed analysis of revealed costs.

3.1.5 Conclusion: AER benchmarking results

We discussed in section 2 that Powerlink operates under a regulatory framework, including the EBSS, which provides incentives for it to make efficiency gains over time and does not provide incentives for it to increase its opex in its proposed base year.

Powerlink's productivity benchmarking results, both in absolute and trend terms, suggest that it is operating relatively efficiently when compared to other TNSPs in the NEM,[37] particularly taking into account the non-comparability of TasNetworks' benchmarking outcomes. It also shows that Powerlink has been improving its opex performance over time, which is consistent with it responding to the incentives in the regulatory framework.

In other words, consistent with the AER's application of the benchmarking framework for TNSPs and its recognition of its limitations,[38] there is nothing to indicate that Powerlink's 2018/19 revealed opex is materially inefficient or that the incentive framework is not working as intended. That is, the latest benchmarking results suggest that as a 'first pass' there is nothing to raise concerns that Powerlink's opex expenditure in its proposed base year is inefficient.

Powerlink's benchmarking results have also improved relative to its 2014/15 performance, when its base year opex was deemed efficient by the AER.[39] Further, we have re-estimated the outcomes of the benchmarking for 2014/15 taking into account Economic Insight's correction to the benchmarking model output weights. This analysis does not materially change Powerlink's relative performance in 2014/15, and so the AER's conclusion about the efficiency of Powerlink's 2014/15 opex would be unlikely to have changed had the corrected analysis been available.

Our conclusion based on the consideration of the AER's benchmarking results is that there is nothing to indicate that Powerlink's proposed 2018/19 base year opex is materially inefficient, and that as a consequence the presumption should remain that revealed actual opex reflects efficient levels, consistent with the ex-ante design of the regulatory framework and the incentive schemes.

[35] AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, p 18.

[36] Economic Insights, *Economic benchmarking results for the Australian Energy Regulator's 2020 TNSP annual benchmarking report*, 15 October 2020, footnote 5, p 37.

[37] We note that the AER drew a similar conclusion regarding relative efficiency from its benchmarking results in the case of TransGrid at the time of its determination. See: AER, *Draft decision TransGrid transmission determination 2018 to 2023*, Attachment 7 – Operating expenditure, September 2017, p 21.

[38] See, for example: AER, *Draft decision TransGrid transmission determination 2018 to 2023*, Attachment 7 – Operating expenditure, September 2017, p 21.

[39] After accounting for efficiency adjustments proposed by Powerlink. AER, *Draft decision Powerlink transmission determination 2017-18 to 2021-22,* Attachment 7 – operating expenditure, p 16. Powerlink's relative ranking improved as a result of the revised output weights. See: Economic Insights, *Economic benchmarking results for the Australian Energy Regulator's 2020 TNSP annual benchmarking report*, 15 October 2020, p 2; AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, p iv.

3.2 Opex category analysis

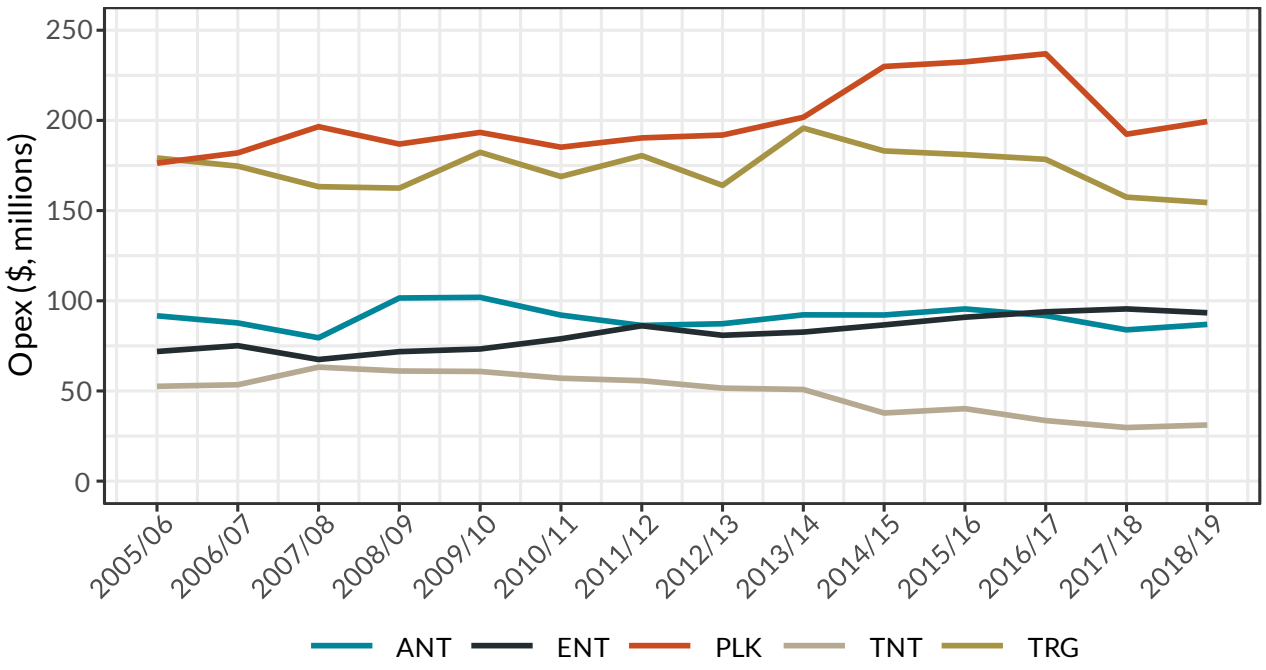
Notwithstanding our conclusion above, we have undertaken further analysis of Powerlink's opex category performance in order to confirm that there is nothing that would become apparent in a more granular assessment that would lead to concerns around the efficiency of the proposed 2018/19 base year opex.

We note that the AER has recognised that businesses experience fluctuations in particular opex categories and so the composition of total opex changes from year to year, even when total opex is not volatile.[40] Therefore, it is important to consider changes in opex categories in the context of total opex changes.

Economic benchmarking RIN data

Figure 3.9 below shows that Powerlink's opex has trended up over time, but that it reduced its opex significantly in 2017/18, and its 2018/19 expenditure was lower than in 2014/15 (which was determined by the AER to be efficient). As noted earlier, TasNetworks has reduced its opex notably since 2013/14, coinciding with the merger of Tasmania's DNSP (Aurora Energy) and TNSP (Transend) to form TasNetworks.

Figure 3.9: TNSP opex (economic benchmarking), 2005/06 to 2018/19 ($2019)



Note: Values have been inflated to 2019 dollars using the composite labour, materials and service price index constructed by Economic Insights. See: Economic Insights, Economic benchmarking results for the Australian Energy Regulator's 2020 TNSP annual benchmarking report, 15 October 2020, p 7.
Source: HoustonKemp analysis of Economic Insights, Economic Insights AER TNSP benchmarking data files, 26 June 2020; Economic Insights, TNSP opex price index (2019 update), 15 October 2020.

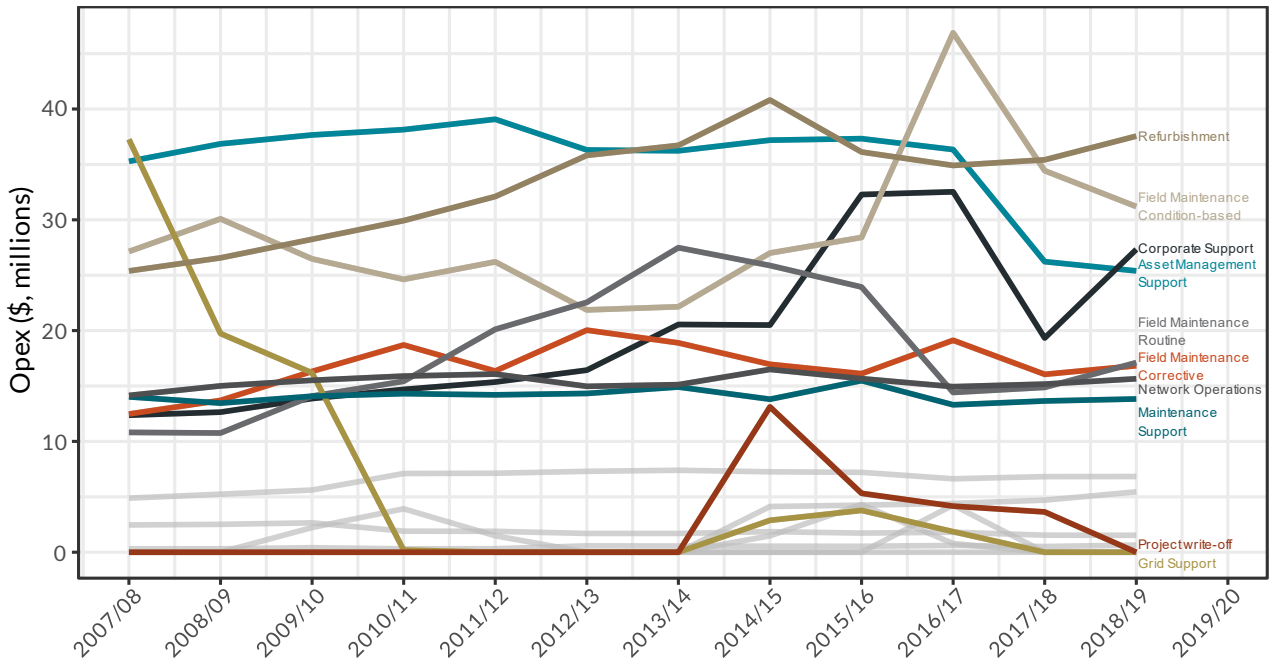
Powerlink provides information regarding its opex by category as part of its economic benchmarking Regulatory Information Notice (RIN) returns to the AER. It is instructive to review this breakdown, since it is the opex data that underlies the benchmarking model (which only considers total opex).

[40] AER, *Draft decision | TransGrid transmission determination 2018 to 2023*, Attachment 7 – Operating expenditure, September 2017, p 14.

Figure 3.10 shows that expenditure has fallen or remained relatively flat since 2007/08 in many of Powerlink's opex categories, but has increased in others. For example:

- condition-based field maintenance has fallen over the last two years, after a peak in 2016/17;
- asset management support reduced materially in 2017/18 and remained flat in 2018/19;
- corporate support costs were reduced significantly in 2017/18, but this has been partially offset by a rise in 2018/19.

Figure 3.10: Powerlink opex by category (economic benchmarking), 2007/08 to 2018/19 ($2019)



Note: Categories in colour are those which had a value of at least $10 million in at least one year. Values have been inflated to 2019 dollars using the composite labour, materials and service price index constructed by Economic Insights. See: Economic Insights, Economic benchmarking results for the Australian Energy Regulator's 2020 TNSP annual benchmarking report, 15 October 2020, p 7.
Source: HoustonKemp analysis of Powerlink economic benchmarking RIN returns to the AER, 2007/08 to 2018/19; Economic Insights, TNSP opex price index (2019 update), 15 October 2020.

We understand from Powerlink that:

- the increase in condition-based field maintenance in 2016/17 relates to the decommissioning and dismantlement of an aged transmission line, which also impacted expenditure in 2017/18. Powerlink also changed its vegetation management strategy from 2016/17 to have no vegetation-related outages, consequently reducing its routine field maintenance and shifting expenditure into condition-based maintenance;
- the reduction in asset management support since 2016/17 was the result of deliberate cost reductions which are expected to be retained into the future, with some costs transferred to corporate support to leverage efficiencies in licensing and support of Powerlink's IT platforms;
- the increase above trend in corporate support costs in 2015/16 and 2016/17 arose from restructuring the business, whilst the significant reduction in 2017/18 arose from the write back of provisions not required for the restructure (which is therefore a one-off event); and
- the trend of increasing refurbishment costs over time relates to the increasing age of Powerlink's network and specific refurbishment programmes that respond to common failure modes.

The observed changes in Powerlink's major opex categories can therefore be explained and traced back to changes occurring within the business (which has resulted in some costs moving between categories, or reductions in costs due to restructuring initiatives which represent one-off changes), or changes to the environment in which it is operating (eg, aging assets). These changes are therefore likely to represent efficient within-category changes to opex over time, in the context of Powerlink's overall opex performance.

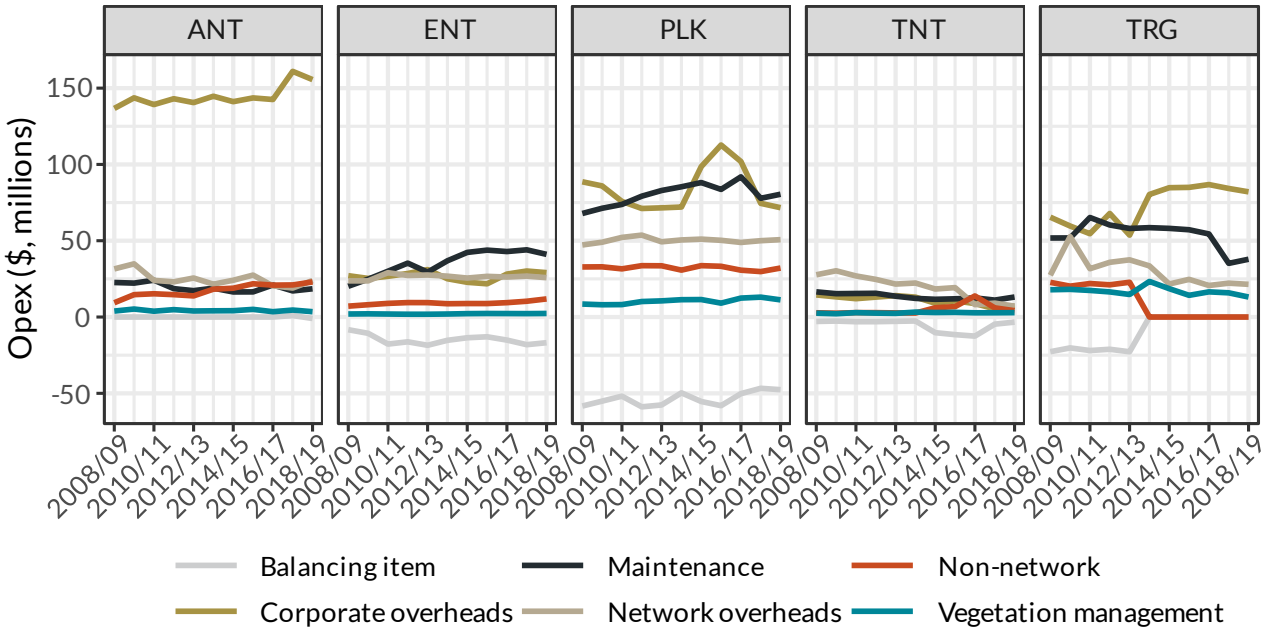
Category analysis RIN data

TNSPs do not report their opex categories consistently in their economic benchmarking RIN responses, and so we are not able to undertake a comparative category analysis based on the economic benchmarking RIN responses. However TNSPs do report opex categories consistently in their category analysis RIN responses to the AER, and so we have used these to undertake a comparative assessment.

There do remain some difficulties in comparing expenditure across TNSPs even using these RIN responses, due to the different accounting and reporting requirements across the RINs and regulatory accounts. For example, category analysis RINs include a 'balancing item' to align different reporting practices and ensure there is no double counting.[41]

Figure 3.11 below shows that TNSPs spend materially different amounts on different categories and report materially different balancing items.

Figure 3.11: TNSP opex (category analysis) by category, 2008/09 to 2018/19 ($2019)



Note: Values have been inflated to 2019 dollars using the composite labour, materials and service price index constructed by Economic Insights. See: Economic Insights, Economic benchmarking results for the Australian Energy Regulator's 2020 TNSP annual benchmarking report, 15 October 2020, p 7.
Source: HoustonKemp analysis of TNSP category analysis RINs, 2008/09 to 2018/19; Economic Insights, TNSP opex price index (2019 update), 15 October 2020.

To assess opex category performance more closely across TNSPs, we therefore first undertook an indicative 'adjustment' to account for the effect of specific accounting items and the balancing item. In particular, we:

[41] Powerlink includes a balancing item equal to around -$50 million per annum. Powerlink sets out the components of its balancing item for 2018/19 in Powerlink, *Category analysis regulatory information notice basis of preparation 2018/19*, October 2019, Appendix A.

- removed an easement land tax from AusNet's corporate overheads, since it is a 'pass-through' cost for AusNet, ie, it receives an equivalent amount as revenue from the Australian Energy Market Operator (AEMO);[42]
- reduced TransGrid's non-network costs by an amount equal to the size of its balancing item from 2008/09 to 2012/13, consistent with its treatment of non-network opex as network and corporate overheads from 2014;[43]
- deducted the 'non-network included in overheads' component of ElectraNet's balancing item to its non-network category, and made corresponding adjustments to its balancing item;[44]
- deducted the 'labour in vegetation management' component of ElectraNet's balancing item to its vegetation maintenance category, and made corresponding adjustments to its balancing item; [45]
- deducted the 'vegetation management in maintenance' component of ElectraNet's balancing item to its maintenance category, and made corresponding adjustments to its balancing item; [46]
- deducted the 'capitalised corporate overheads' component of Powerlink's balancing item from its corporate overheads;[47]
- deducted the 'alignment to RIN requirements' component of Powerlink's balancing item from its corporate overheads, for the period 2008/09 to 2012/13;[48] and
- deducted the 'double counting' component of Powerlink's balancing item from its non-network opex.[49]

As a further step, to better compare across TNSPs who all operate in different environments, we evaluated the three most significant opex categories (after the adjustments described above) on a per-output basis. In particular, figure 3.12 below presents:

- corporate and network overheads per end user, reflecting that overhead costs are 'spread across' end users; and
- maintenance costs per km of circuit length, reflecting that maintenance costs may be more closely tied to lines than to other output measures.

This assessment is similar to the PPI analysis undertaken by the AER, but undertaken on a more granular basis. The same limitations that the AER recognises regarding the interpretations that can be drawn from its PPI analysis therefore also apply to this analysis.

[42] AusNet Services, *2018 tax transparency report*, p 5, available at https://www.ausnetservices.com.au/-/media/Files/AusNet/Investor-Centre/Reports/Tax-Transparency-Report-2018.ashx.

[43] TransGrid, *Category analysis RIN response – basis of preparation*, 31 October 2014, p 9.

[44] ElectraNet, *AER Category analysis – basis of preparation*, October 2019, p 10.

[45] ElectraNet, *AER Category analysis – basis of preparation*, October 2019, p 10.

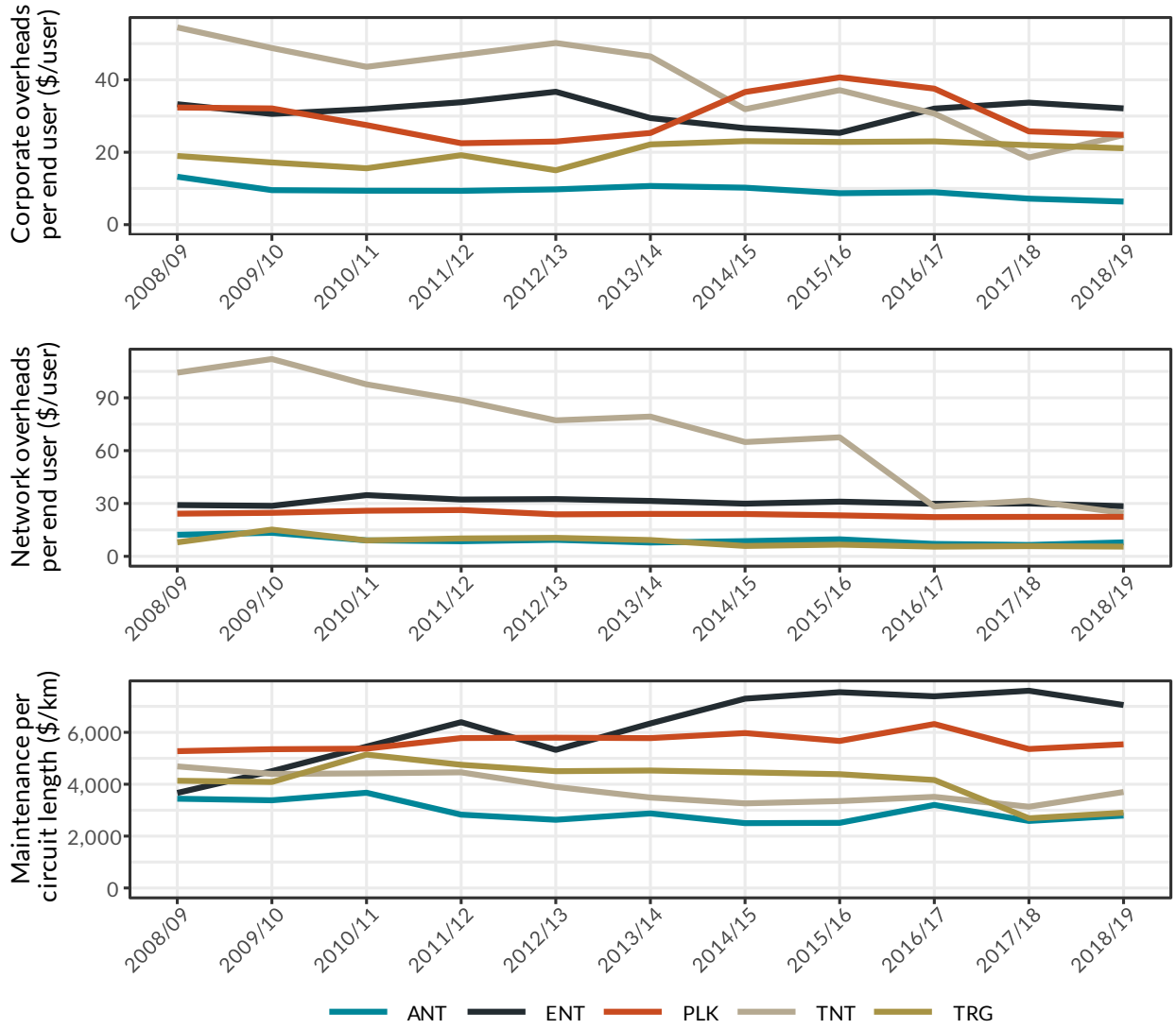
[46] ElectraNet, *AER Category analysis – basis of preparation*, October 2019, p 10.

[47] Powerlink, *Category analysis regulatory information notice basis of preparation 2018/19*, October 2019, p 55.

[48] Powerlink, *Category analysis regulatory information notice basis of preparation*, June 2014, p 74.

[49] Powerlink, *Category analysis regulatory information notice basis of preparation 2018/19*, October 2019, p 55.

Figure 3.12: TNSP opex (category analysis) by key category, adjusted, 2008/09 to 2018/19 ($2019)



Note: Values have been inflated to 2019 dollars using the composite labour, materials and service price index constructed by Economic Insights. See: Economic Insights, Economic benchmarking results for the Australian Energy Regulator's 2020 TNSP annual benchmarking report, 15 October 2020, p 7.
Source: HoustonKemp analysis of TNSP category analysis RINs, 2008/09 to 2018/19; Economic Insights, TNSP opex price index (2019 update), 15 October 2020.

The adjusted opex category analysis shows that:

- Powerlink's corporate overheads on a per end user basis were lower in 2018/19 in real terms than in 2008/09. Powerlink's increase above trend in corporate support costs in 2015/16 and 2016/17 arose from restructuring the business, whilst the significant reduction in 2017/18 arises from the write back of provisions not required for the restructure.
- Powerlink's corporate overheads per end user in 2018/19 were significantly lower than ElectraNet and in line with TasNetworks and TransGrid. AusNet has the lowest corporate overheads per end user over the entire period.
- Powerlink's network overheads per end user were lower in 2018/19 in real terms than in 2008/09.

- Network overheads per end user in 2018/19 were approximately equal for Powerlink, TasNetworks and ElectraNet, which is consistent with these three TNSPs having the lowest connection density (ie, the lowest number of end users per circuit length).[50]
- Powerlink's maintenance costs per circuit length are approximately five per cent higher in 2018/19 in real terms than in 2008/09, consistent with the increasing age of Powerlink's network over time.
- Since 2008/09, Powerlink's ranking has improved as its maintenance per circuit length is lower than that of ElectraNet.

Other than the reduction in corporate overheads since 2015/16, the category analysis data show no material changes to Powerlink's opex trend, and its opex category performance broadly aligns with other TNSPs on a per-output basis, taking into account the different operating environments faced by each TNSP.

3.2.1 Conclusion: opex category analysis

Powerlink's opex has trended up over time, but it has reduced its opex significantly in 2017/18, and its 2018/19 expenditure was lower than in 2014/15 (when the AER concluded that Powerlink's revealed opex was efficient).

Further, other than the reduction in corporate overheads since 2015/16, the category analysis data show no material changes to Powerlink's opex trend, and its opex category performance broadly aligns with other TNSPs on a per-output basis, taking into account the different operating environments faced by each TNSP.

The category analysis shows that there is nothing to indicate that Powerlink's 2018/19 revealed opex is materially inefficient, which would warrant overturning a presumption that revealed costs are efficient.

3.3 Overall conclusion on the efficiency of Powerlink's 2018/19 opex

We noted in section 2 that Powerlink operates under an ex-ante regulatory framework, which provides continuous incentives (including via the EBSS) for it to make efficiency gains over time and does not provide it with an incentive to increase its opex in its proposed base year.

We also noted that the AER has typically used its benchmarking analysis for TNSPs as a 'first pass' to assess whether there is any reason to investigate the efficiency of revealed opex in more detail. The AER's use of benchmarking in this manner is consistent with the recognised limitations in benchmarking for the TNSPs, given the small sample size.

Where the benchmarking results suggest that a TNSP's revealed opex is not materially inefficient, and the TNSP's performance over time suggests that it is responding to the incentives in the regulatory framework, then the AER would be expected not to adjust revealed opex when determining base year opex for a forthcoming regulatory period. In other words, the incentive mechanisms in the regulatory framework lead to a presumption that revealed opex is an accurate reflection of efficient expenditure.

Powerlink's productivity benchmarking results, both in absolute and trend terms, suggest that it is operating relatively efficiently in comparison to its peers and is responding to incentives, as evidenced by the improvement in its opex performance over time. In other words, consistent with the AER's application of the benchmarking framework for TNSPs and the conclusions it has drawn from its benchmarking analysis for other TNSPs,[51] there is nothing to indicate that Powerlink's 2018/19 revealed opex is materially inefficient, which would warrant overturning a presumption that its revealed costs are efficient.

[50] AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, p 25.

[51] See, for example: AER, *Draft decision TransGrid transmission determination 2018 to 2023*, Attachment 7 – Operating expenditure, September 2017, p 21.

Further, Powerlink's benchmarking results have improved relative to its 2014/15 performance, when its base year opex was deemed efficient by the AER.[52]

Our assessment of Powerlink's opex performance by category does not contain any 'red flags' that would indicate a need to overturn the presumption that revealed costs are efficient. The observed trends in Powerlink's opex per category are able to be explained, and reflect changes occurring within the business (with some costs moving between categories, and one-off reductions in costs due to restructuring initiatives), or changes to the environment in which Powerlink is operating (in particular its aging assets).

Further, other than the reduction in corporate overheads since 2015/16, the category analysis data show no material changes to Powerlink's opex trend, and its opex category performance broadly aligns with other TNSPs on a per-output basis, taking into account the different operating environments faced by each TNSP.

Our conclusion based on the consideration of the AER's benchmarking results and our category analysis is that there is nothing to indicate that Powerlink's proposed 2018/19 base year opex is materially inefficient, and that as a consequence the presumption should remain that Powerlink's revealed actual opex reflects efficient levels.

[52] After accounting for efficiency adjustments proposed by Powerlink. AER, *Draft decision Powerlink transmission determination 2017-18 to 2021-22,* Attachment 7 – operating expenditure, p 16. Powerlink's relative ranking improved as a result of the revised output weights. See: Economic Insights, *Economic benchmarking results for the Australian Energy Regulator's 2020 TNSP annual benchmarking report*, 15 October 2020, p 2; AER, *Annual benchmarking report electricity transmission network service providers*, November 2020, p iv.

4. Productivity growth factor for Powerlink

We explained in section 2.2 that the AER estimates a TNSP's efficient opex by way of a 'base-step-trend' forecasting approach, which includes a productivity growth factor over the regulatory period.

The AER explains that the productivity growth factor it applies:[53]

> …reflects our expectation of the productivity an efficient service provider in the transmission industry can achieve.

The forecast productivity growth factor represents the AER's estimate of the shift in the 'efficiency frontier' of the transmission industry.[54] As a consequence, it is the industry productivity that is relevant for calculating the productivity growth factor, not the changes in productivity of any given individual TNSP. Individual TNSPs are incentivised to make further efficiency gains by the EBSS.

Table 4.1 below shows that the productivity growth factors currently applying to the five TNSPs are either zero or 0.2 per cent.

Table 4.1: Current TNSP productivity growth factor determinations

TNSP	Regulatory period	Productivity growth factor
Powerlink	2017/18 to 2021/22	0.2%
AusNet	2017/18 to 2021/22	0%
ElectraNet	2018/19 to 2022/23	0.2%
TransGrid	2018/19 to 2022/23	0.2%
TasNetworks	2019/20 to 2023/24	0%

Source: AER, Draft decision ElectraNet transmission determination 2018 to 2023, Attachment 7 – Operating expenditure, October 2017, p 21; AER, Draft decision Powerlink transmission determination 2017-18 to 2021-22, Attachment 7 – Operating expenditure, September 2016, p 18; AER, Final decision AusNet Services transmission determination 2017 to 2022, Attachment 7 – Operating expenditure, April 2017, p 32 ; AER, Draft decision TasNetworks transmission determination 2019 to 2024, Attachment 6 – Operating expenditure, September 2018, p 15; AER, Draft decision TransGrid transmission determination 2018 to 2023, Attachment 7 – Operating expenditure, September 2017, p 21.

We note that changes in observed industry opex productivity do not just capture improvements in the productivity frontier of efficient networks (ie, the improvement in productivity of efficient networks due to improvements in technology and processes). Potentially, past changes in opex MPFP may reflect a network moving towards the efficient frontier (ie, a previously inefficient network catching up to the productivity of efficient networks), rather than a movement in the frontier itself.[55]

This distinction between a TNSP 'catching up' and increasing the frontier is that:

- if a firm that is currently less efficient than other networks improves its productivity, this does not represent an increase in the efficiency frontier, but rather a 'catch up' towards an efficient level; whereas
- if a firm that represents an efficient firm improves its productivity, then this represents an increase in the efficiency frontier.

[53] AER, *Draft decision | TransGrid transmission determination 2018 to 2023*, Attachment 7 – Operating expenditure, September 2017, p 33.

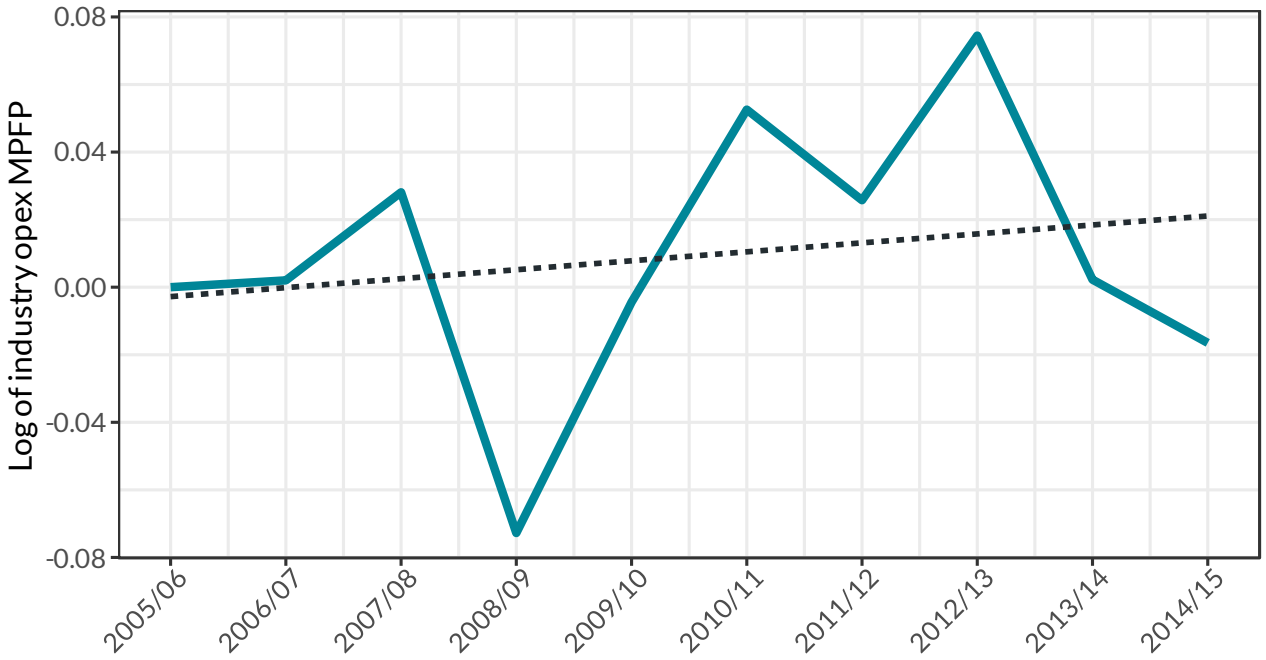
[54] AER, *Draft decision | TransGrid transmission determination 2018 to 2023*, Attachment 7 – Operating expenditure, September 2017, p 15.

[55] See, for example, HoustonKemp, *Pre-emptive productivity adjustments*, 8 May 2018, pp 8-9, which explains the difference between 'catch-up' and a shift in the frontier for distribution network service providers (DNSPs).

As shown in the table above, the AER has previously adopted a 0.2 per cent opex productivity factor for TNSPs and in Powerlink's previous determination (with the exception of AusNet and TasNetworks, with the latter's determination being more recent, see below). This productivity factor was calculated by Economic Insights from the trend change in opex MPFP over the period 2005/06 to 2014/15.[56]

Put simply, the AER's current approach calculates the opex productivity factor as the slope of the 'line of best fit' to the industry opex MPFP over time.[57] Figure 4.1 shows that over the period from 2005/06 to 2014/15, the opex productivity factor calculated by this method was positive.

Figure 4.1: Industry opex MPFP trend 2005/06 to 2014/15, 2016 data



Note: The value of 0.2 per cent applied by the AER in recent determinations is based on advice from Economic Insights from 26 April 2016. The data underlying this calculation are not available. The data presented above are those that supported the AER's 2016 benchmarking report.
Source: HoustonKemp analysis of Economic Insights, Economic Insights AER TNSP industry prod results, Excel spreadsheet, 7 November 2016.

However, the estimated opex productivity factor (0.27 per cent) based on the data presented in figure 4.1 is not statistically significant.[58] In particular, the *p*-value associated with the relevant coefficient is 0.58.[59] Based on even the most permissive commonly applied threshold for statistical significance – ten per cent – there is no evidence that the opex productivity factor is different from zero.

Moreover, a mechanistic application of the AER's 2016 methodology would have suggested a negative productivity growth factor if the underlying data and model were that used by Economic Insights in its most recent benchmarking analysis (which has been corrected for some methodological issues). Figure 4.2 shows that, for the same time period but using the revised data, the line of best fit is downward sloping. This

[56] Economic Insights, *Memorandum: TNSP MTFP Results*, 29 April 2016, p 5.

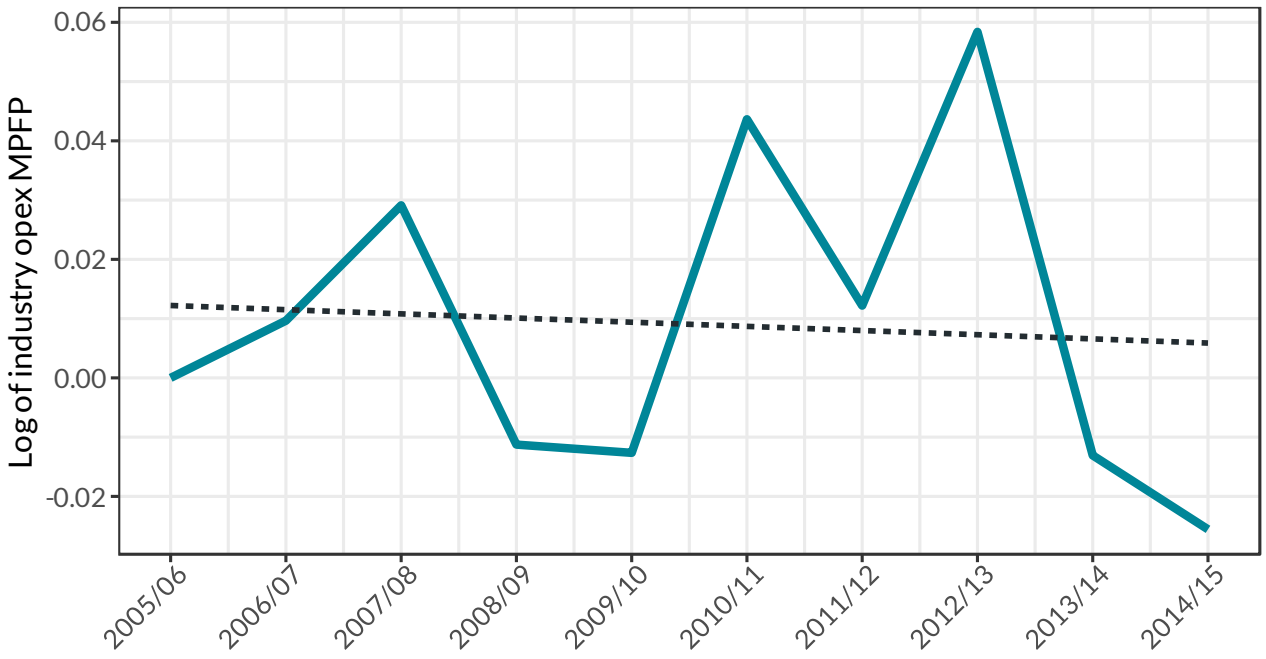
[57] We note that the AER had previously applied a point-to-point method for calculating productivity growth. See: Economic Insights, *Memorandum: TNSP MTFP Results*, 29 April 2016.

[58] HoustonKemp analysis of Economic Insights, *Economic Insights AER TNSP industry prod results*, Excel spreadsheet, 7 November 2016.

[59] HoustonKemp analysis of Economic Insights, *Economic Insights AER TNSP industry prod results*, Excel spreadsheet, 7 November 2016.

suggests that had the AER based its assessment on Economic Insights' revised modelling, it is likely that it would have adopted a value of zero for the productivity factor in its earlier determinations.

Figure 4.2: Industry opex MPFP trend 2005/06 to 2014/15, revised data



Note: The slope of the line of best fit is not statistically significant. The p-value associated with the relevant coefficient is 0.83.
Source: HoustonKemp analysis of Economic Insights, Economic Insights AER TNSP industry prod results, Excel spreadsheet, 21 June 2020.

This is consistent with the AER's more recent decision for TasNetworks, in which it found that opex MPFP growth over the period from 2006 to 2016 was negative at the industry level, and based on earlier advice from Economic Insights it applied a productivity growth factor of zero.[60]

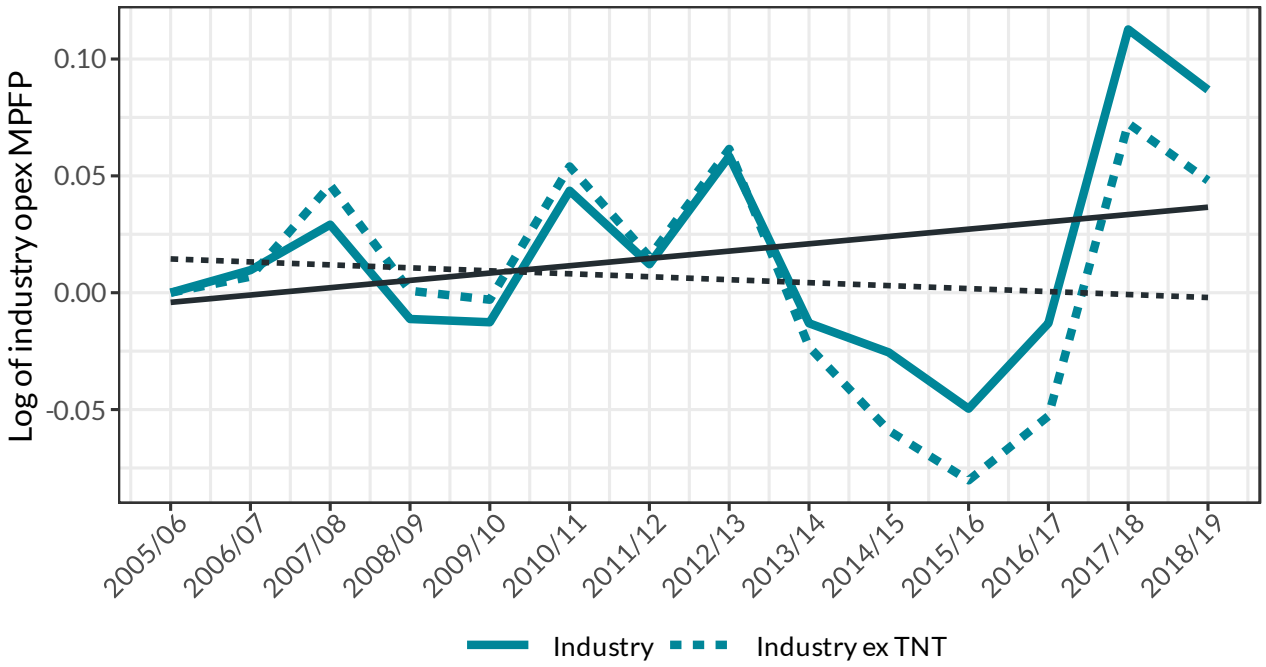
Notwithstanding these findings, we have updated the AER's trend analysis to incorporate data from 2015/16 to 2018/19. We have also considered to what extent this trend analysis may be impacted by movements for individual TNSPs which do not reflect a movement of the efficiency frontier. In particular, as discussed earlier, TasNetworks' improvements in opex performance for its transmission business are likely not to be reflective of an increase in the productivity frontier for an efficient stand-alone TNSP, since they appear to reflect synergies achieved as a consequence of the formation of the merged business as well as a reallocation of costs in line with the changed nature of the business. In other words, TasNetworks' opex MPFP improvements are likely to represent gains that are not available to Powerlink or other stand-alone TNSPs.[61] We have therefore also calculated the implied industry opex productivity growth factor excluding TasNetworks' contribution to industry opex and output.

Figure 4.3 shows that, including TasNetworks, the calculated industry productivity growth factor is positive (0.31 per cent), but becomes negative if TasNetworks is excluded (-0.13 per cent). Table 4.2 presents the opex growth factors in detail, and highlights that the coefficients are not statistically significant. That is, there is no statistical evidence that the slope is different from zero.

[60] AER, *Draft decision TasNetworks transmission determination 2019 to 2024*, Attachment 6 operating expenditure, September 2018, pp 18-19.

[61] See section 3.2.

Figure 4.3: Industry opex MPFP trend 2005/06 to 2018/19, with and without TasNetworks



Sources: HoustonKemp analysis of Economic Insights, Economic Insights AER TNSP industry prod results, Excel spreadsheet, 7 November 2016; Economic Insights, Economic Insights AER TNSP benchmarking data files, 26 June 2020.

Table 4.2: Opex productivity factors

Model	2005/06 to 2014/15 (November 2016 Economic Insights model)	2005/06 to 2014/15 (October 2020 Economic Insights model)	2005/06 to 2018/19 (October 2020 Economic Insights model)
Industry	0.27% (0.58)	-0.07% (0.83)	0.31% (0.32)
Industry excluding TNT		-0.34% (0.43)	-0.13% (0.70)

Note: p-values are shown in parentheses next to the relevant coefficient. None of the industry results are statistically significant at the one, five or ten per cent levels. In other words, there is no statistical evidence that the slope is different from zero.
Sources: HoustonKemp analysis of Economic Insights, Economic Insights AER TNSP industry prod results, Excel spreadsheet, 7 November 2016; Economic Insights, Economic Insights AER TNSP industry prod results, Excel spreadsheet, 15 October 2020; Economic Insights, Economic Insights AER TNSP benchmarking data files, 15 October 2020.

4.1.1 Conclusion: productivity growth factor for Powerlink

Taken together, this analysis suggests that the benchmarking data provide little evidence to apply a positive opex productivity factor for Powerlink for the forthcoming regulatory period. Put simply, the benchmarking data suggest that the productivity factor applied for Powerlink should be zero.

Notwithstanding the application of a productivity factor of zero, the incentives provided by the design of the ex-ante regulatory framework applying to TNSPs, including the EBSS, provide a continuous incentive for Powerlink to make efficiency gains over time and can be expected to drive further efficiencies in the next regulatory period.

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