

9 February 2018

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Dear Arek

**RE Review of Operating Environment Factors (OEFs) used to adjust efficient operating expenditure for economic benchmarking**

TasNetworks welcomes the opportunity to respond to the draft report prepared for the Australian Energy Regulator (AER) by Sapere Research Group and Merz Consulting (**Sapere-Merz**) regarding the OEFs used by the AER to adjust efficient operating expenditure for economic benchmarking.

The benchmarking of complex and often quite diverse electricity network businesses is a challenging exercise, and no benchmarking technique can hope to incorporate every possible factor that might affect a Distribution Network Service Provider's (DNSP) costs. Even when benchmarking metrics are, by necessity, based on a limited range of variables describing attributes which might be considered common to all DNSPs, the results produced by benchmarking models can still be sensitive to the models' specifications.

For example, the AER already acknowledges that the voltage-based distinction made between sub-transmission and distribution lines as inputs to its current benchmarking models does not represent TasNetworks' "comparatively unusual system structure" well, and that TasNetworks raw benchmarking scores suffer as a result. Yet the preferred benchmarking models originally developed for the AER by Economic Insights featured a different treatment of overhead lines and underground cables that meant TasNetworks benchmarked much more favourably against the same metrics. That model specification was only changed (between Economic Insights advising the AER of its preferred models in July 2014 and the release of the first Annual Benchmarking Report in November 2014) after representations to the AER from other DNSPs who considered the models disadvantaged them.

The significant change which occurred in benchmarking results for TasNetworks' transmission network after a single variable was changed prior to publication of the 2017 Annual Benchmarking Report is another good example of the sensitivity of benchmarking results to specification changes. Again, this modification – which involved substituting downstream customer numbers for voltage-weighted connections as an output measure – was made in response to criticisms from other network service providers, who considered TasNetworks' performance against the previous iteration of the model to be an outlier that indicated specification issues with the model.

The recognition and quantification of OEFs and the impact that they have on DNSP costs is, therefore, crucial to identifying whether the often large differences identified between DNSPs, in terms of their efficiency, are actually reflective of efficiency or due to factors which have not been built into the AER's models. TasNetworks, therefore, supports a review of the OEFs which have been used to describe and adjust for exogenous variables that materially impact on DNSP operating expenditure (**opex**) but are not taken into account by the AER's benchmarking when estimating efficient opex.

The consultation paper produced for the AER by Sapere-Merz, however, focusses on the small number of OEFs which have thus far been applied to assessed DNSPs as part of a regulatory decision making process. Given that TasNetworks is a DNSP for which OEF assessments have not previously been made by the AER, it is not surprising that those OEFs describe a range of the environmental factors that do not apply, or are of limited relevance in Tasmania. Neither termite exposure nor cyclones, for example, have any impact on the cost of operating Tasmania's distribution network.

TasNetworks is also concerned that, against the existing range of OEFs, TasNetworks has been assessed by Sapere-Merz as requiring a net reduction in its efficient opex – the largest in percentage and dollar terms for any network – despite the range of obvious environmental disadvantages that the network operates under. Further, while it is reasonable to expect that a network facing an OEF like termite exposure may receive an upward adjustment to its optimised opex in recognition of the additional costs of addressing that OEF, the logic behind reducing a DNSP's optimised opex if it doesn't face termite exposure is not clear to TasNetworks. These counter-intuitive outcomes suggests that there is clearly a need to expand the range of OEFs that are recognised by the AER, so that environmental factors which are relevant to non-assessed DNSPs like TasNetworks can be taken into account in future revenue determinations.

Nonetheless, noting the request from Sapere-Merz for advice from DNSPs in relation to the OEFs used to date, *Attachment A* to this letter provides some commentary from TasNetworks about the OEFs which have been used thus far.

Noting that the stated objectives of the AER's review is to identify the most material factors driving apparent differences in estimated productivity and operating efficiency between DNSPs, *Attachment B* canvasses a range of OEFs that TasNetworks believes should be taken into account in upcoming determinations by the AER. It also provides comments about some of the OEF candidates put forward by other DNSPs.

With TasNetworks having only recently submitted its Revenue Proposal for the 2019-24 period, the opportunity to provide input to the AER's review of OEFs for DNSPs is timely, and we thank the AER for the chance to do so. To discuss the views expressed in this submission or opportunities for further collaboration between TasNetworks and the AER on the subject of OEFs, please contact Chantal Hopwood, Revenue and Pricing Team Leader, at [Chantal.Hopwood@tasnetworks.com.au](mailto:Chantal.Hopwood@tasnetworks.com.au) or on (03) 6271 6511.

Yours sincerely



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## Attachment A – Existing OEFs

OEF	TasNetworks' comments
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<b>Bushfire risk</b>	<p>While bushfire risk does not apply to all DNSPs, nor does it apply equally amongst those to which it is applicable, it is probable that bushfire risk meets the OEF criteria for a significant number of DNSPs, including TasNetworks.</p> <p>As part of its response to the OEF survey conducted by Sapere-Merz (May 2017), TasNetworks submitted that Tasmania is more affected by bushfire than a number of DNSPs in the NEM, and when drought and severe fire weather combine and fires start in areas with extensive eucalypt forest cover, fires at the upper levels of possible severity can and do occur in Tasmania. The 'Dunalley Fires' on the Tasman Peninsula in January 2013 destroyed around 100 homes and approximately 600 timber power poles, cutting off power to over 2,000 homes for approximately 15 days, an event which added significantly to TasNetworks' emergency response expenditure. On a larger scale, bushfires in 1967 resulted in thousands of poles and conductor assets in southern Tasmania requiring replacement and those assets are now becoming due for replacement over a short timeframe. This indicates that bushfires not only have an immediate impact on network businesses but also place pressure on future replacement expenditure programs, as well as putting upward pressure on maintenance costs while those assets remain in service.</p> <p>There is no history of powerlines starting catastrophic bushfires in Tasmania. However, the experience in other jurisdictions is that powerlines can start bushfires. As a result, the risk of TasNetworks' assets and/or operations starting a bushfire is rated as one of the highest risks by the business. As a result, TasNetworks incurs additional opex associated with, amongst other things, the monitoring of asset condition and vegetation around powerlines (noting that our network is predominantly overhead with widespread exposure to trees), insurance, clearing vegetation and undertaking both routine and preventative maintenance.</p> <p>Some Victorian DNSPs have argued that they face a greater bushfire OEF than networks in other jurisdictions because of the introduction of more stringent bushfire related regulations, which were based on the recommendations made by the 2009 Victorian Bushfires Royal Commission. TasNetworks agrees that higher standards relating to bushfire mitigation in that jurisdiction are likely to have added to those networks' opex. TasNetworks also notes, however, that the Tasmanian State Government noted the Royal Commission's recommendations and implemented all but two in Tasmania, reflecting the expectations the Tasmanian community places on TasNetworks to mitigate bushfire risk. This means that DNSPs like TasNetworks also incur additional bushfire related opex as a flow-on effect from events in other jurisdictions, even though they may not face the same level of prescriptive regulation. When the environmental effects of climate change, the emergence of new technologies and asset management techniques, changing work-practices and restrictions on the use of certain work-practices in high bushfire risk areas are added to higher community expectations, bushfire risk is only likely to become an increasingly significant OEF for many networks in the NEM.</p> <p>TasNetworks recognises that quantifying bushfire risk may be difficult, noting the limitations of the Economic Benchmarking RIN data on vegetation density, for example. We encourage the AER to look at the work being undertaken by the Bushfire and Natural Hazards CRC for possible avenues in this area. Expenditure on avoiding and minimising bushfire risk, while forming part of ongoing opex, may also not be captured in emergency response expenditure data. And simple distinctions between rural and urban feeders as an indicator of bushfire risk may also not capture the risks associated with the proximity of many of Tasmania's suburban and even urban areas (including Hobart) to densely forested bushland, meaning that even urban parts of the network in Tasmania could be</p>
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	<p>considered vegetation/bushfire-exposed network.</p> <p>Nonetheless, bushfire risk is an exogenous driver of material opex for some DNSPs that is not currently factored into the AER's benchmarking, making it an OEF candidate which warrants further consideration.</p>
<b>Cyclones</b>	<p>Sapere-Merz note that cyclones require a significant operational response that includes planning, mobilisation, fault rectification and demobilisation. These responses have direct costs and interfere with the business as usual work being delivered in an efficient manner. Sapere-Merz also note that service providers in cyclonic regions may also have higher insurance premiums and / or higher non claimable limits.</p> <p>TasNetworks agrees that cyclones are exogenous events that can materially impact on DNSP's opex and constitute an OEF that is not reflected in the AER's benchmarking. TasNetworks also acknowledges that it has no direct exposure to cyclonic weather conditions and that no adjustment to TasNetworks' efficient opex needs to be made on the basis of any cyclone-related OEF.</p> <p>However, TasNetworks questions whether the implications for DNSP opex associated with cyclones are materially different in nature from the operational responses associated with extreme weather events, and whether the cyclone related OEF should be combined with the extreme weather OEF.</p> <p>Given that cyclones affect only a small number of DNSPs, are comparatively low frequency events, and affected DNSPs can apply to the AER to pass material changes in costs caused by cyclones through to customers, in the form of higher network charges, TasNetworks concurs with a number of other DNSPs that there may be grounds to recognise cyclones as an OEF alongside extreme weather events.</p>
<b>Division of responsibility for vegetation management</b>	<p>A large amount of TasNetworks' assets are located in public forests and the responsibility for vegetation management is shared – although TasNetworks incurs not insignificant opex notifying customers about and managing the rectification of vegetation defects on private property that are the responsibility of the property owner to remedy.</p> <p>Like other predominantly non-urban, overhead networks, TasNetworks faces higher vegetation management opex than many other network operators. TasNetworks considers that those additional costs are material, are driven by exogenous factors, and are not factored into the AER's current benchmarking models, meaning that vegetation management satisfies the criteria for an OEF. Whilst the division of responsibility will have a material impact on vegetation management costs, it is only one of a number of factors that influence cost outcomes for this activity and therefore should not be the only factor that is considered in the quantification of a vegetation management OEF.</p>
<b>Extreme weather events</b>	<p>TasNetworks previously submitted to Sapere-Merz's survey of OEFs that Tasmanian weather is often extreme, with bushfires in summer and high winds and extreme cold (including icing) in the winter. Added to this is the fact that a number of our assets are located in areas that are subject to high rainfall, which causes flooding and erosion of access tracks etc..</p> <p>It is also noted that, unlike the heatwaves experienced in other jurisdictions, the adverse weather events impacting on Tasmania's distribution network predominantly occur in winter (with Tasmania being a winter peaking market), which can increase the costs associated with emergency responses because of the added difficulty associated with accessing assets and restoring supply in harsh winter conditions.</p> <p>TasNetworks concurs with Sapere-Merz that extreme weather (of all kinds) is a likely OEF candidate, as both an exogenous event and an environmental factor outside the AER's econometric benchmarking.</p>
<b>Licence conditions</b>	TasNetworks has no comments in relation to this OEF, but is open to consideration of licence conditions and sub-transmission being combined as a single OEF.
<b>OH&amp;S regulations</b>	TasNetworks does not consider that the OH&S regulations in any jurisdiction satisfy the criteria for recognition as an OEF. TasNetworks notes that all NEM jurisdictions other than Victoria have enacted the model workplace health and safety laws and does not agree with the position taken by SA Power Networks that compliance with the national OH&S requirements represents an OEF.



TasNetworks is not persuaded that the differences in the regulations in place in Victoria are sufficient to contribute to material differences in efficient opex between DNSPs. TasNetworks also notes that at least one Victorian DNSP has submitted that OH&S conditions do not impose a material OEF.

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**Sub-transmission**

The Tasmanian distribution network is relatively unique to the NEM in that it does not operate at the high voltages of other networks but also doesn't have the significant proportion of SWER and low voltage lines that are common in other predominantly rural networks. TasNetworks has previously contended that this leads to higher maintenance costs, particularly in relation to voltage regulation.

While the voltages of the underground and overhead sections of distribution networks are recognised as an input in the AER's benchmarking model, the decision by the AER to delineate between sub-transmission and distribution lines in benchmarking calculations, using a voltage of 33kV as the demarcation point, means the AER's models effectively penalise TasNetworks for operating a network largely comprised of lines with a capacity of less than 33kV, and a network with little in the way of sub-transmission. This also appears to be the case in relation to the existing sub-transmission OEF.

In its past three annual benchmarking reports for DNSPs, the AER has acknowledged the inability of its benchmarking models to properly represent what it describes as TasNetworks' "comparatively unusual system structure" and urged caution when interpreting some of TasNetworks' raw benchmarking scores.

So, while network voltage is factored into benchmarking scores, TasNetworks contends that the structure of its network is both a material and exogenous OEF candidate. It is noted that Powercor also benchmarks poorly against the same partial factor productivity metrics due to the high proportion of 22kV conductors making up its networks (although the proportion of 22kV conductors is still significantly lower than TasNetworks).

The analysis undertaken by Sapere-Merz, and the relatively substantial reduction in TasNetworks' optimised opex under the current sub-transmission OEF, implies that TasNetworks operates a distribution network which should be inherently cheaper to run because of its network design. However, no evidence has been provided in support of this view, with Sapere-Merz appearing to rely on an assessment made by the AER in 2014 that *"subtransmission lines over 66kV are likely to have opex requirements... that are around twice as high as other DNSP lines."*

TasNetworks does not support this view. TasNetworks also notes that the adjustment of efficient opex based on power line voltages is also selective, in that no adjustment is made to DNSP's efficient opex in relation to their use of SWER, for example, which is arguably less costly to operate because its single conductor requires fewer poles and pole top assets and a narrower corridor. SA Power's network is comprised of 41 per cent overhead SWER whilst Powercor's network is made up of 31 per cent overhead SWER – vastly different to TasNetworks' 2 per cent. Given that there are legitimate cost differences in operating a network at different voltages, and these cost differences are not represented in the use of a circuit length variable in the AER's econometric models, the OEF for sub-transmission/distribution should be broader, in order to factor in a range of voltages, and based on robust cost factors.

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**Taxes and levies**

Sapere-Merz observe that a number of jurisdictions require the payment by DNSPs of State taxes, as well as levies that are not classified as jurisdictional schemes, and that their exclusion from the OPEX reported for economic benchmarking purposes could adversely affect productivity scores. It was also noted that the AER has previously accepted that jurisdictional taxes and levies represent an OEF in Queensland.

Despite being a State-Owned Company, TasNetworks is required to pay all state and local government taxes and charges.

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**Termite exposure**

Termite exposure does not represent a driver of higher opex for TasNetworks' distribution network. Nonetheless, TasNetworks recognises that for DNSPs with exposure to termites, termite exposure is likely to contribute to higher opex and at least some of that cost is likely to be beyond the control of those DNSPs and not accounted for in the AER's economic benchmarking.

In the long-term, however, TasNetworks agrees with Sapere-Merz that the risk to assets posed by termites falls within the control of DNSPs through, for example, the use of metal and/or concrete poles and termite proof cables – noting that most of the additional costs associated with the use of termite proof infrastructure is likely to be capital in nature.

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<b>Backyard reticulation</b>	TasNetworks has no comments in relation to this OEF which is specific to the Australian Capital Territory.
<b>Capitalisation practices</b>	<p>TasNetworks agrees that differences between DNSPs in capitalisation and depreciation policies, as well as trade-offs between opex and capex solutions, can potentially influence the AER's benchmarking outcomes and the assessment of efficient opex. It is noted that a number of DNSPs have, in recent years, changed their cost allocation methodologies and brought them into closer alignment with those of other DNSPs – which has included a recasting of the historical RIN data affected by the changes in methodology.</p> <p>TasNetworks notes that the use of total cost (Totex) benchmarking has the potential to avoid the comparability issues associated with looking at capex and opex separately, but acknowledges that totex benchmarking is difficult to do.</p> <p>Noting the statement by Sapere-Merz that the AER is reviewing differences in cost allocation and capitalisation policies between DNSPs, and their effect on benchmarking, TasNetworks will await the outcome of that review and any findings that suggest the presence of an OEF relating to capitalisation practices.</p>
<b>Service classification</b>	TasNetworks has no comments in relation to this OEF.

## Attachment B – OEF candidates

OEF Candidate	TasNetworks' comments
<b>Vegetation management requirements</b>	<p>Sapere-Merz note that vegetation management opex represents around 20 per cent of total OPEX for a number of DNSPs, notably: Essential Energy, Powercor, Ausnet and SAPN. For other DNSPs like CitiPower and ActewAGL, vegetation management opex was cited as being less than three per cent of total opex.</p> <p>In 2016-17, based on the opex expenditure reported by TasNetworks through the Economic Benchmarking RIN, 24.5 per cent of TasNetworks' opex related to Standard Control Services was spent on vegetation management, although in the two preceding years vegetation opex represented 17 per cent of Standard Control opex. This suggests that against any vegetation management OEF, TasNetworks is amongst the DNSPs most affected, in terms of incurring additional opex.</p> <p>In its response to the Sapere-Merz survey of OEFs in 2017, TasNetworks submitted that the cost of managing vegetation in Tasmania is negatively impacted by the terrain as a high percentage of our assets are located within high vegetation growth areas. The Queenstown to Strahan feeders were cited as examples of assets spanning difficult terrain.</p> <p>Powercor, in arguing its own case for a vegetation management OEF, has submitted to the survey of OEFs conducted by Sapere-Merz in 2017 that, unlike in Victoria, powerline clearances are not prescribed in Tasmania, enabling a more risk-based, more cost effective, approach to be taken to vegetation clearance. TasNetworks has not reviewed the powerline clearances that apply in Victoria but notes that the Tasmanian Electricity Code (specifically Chapter 8A) sets out the requirements relating to distribution power line vegetation management in Tasmania, which include clearance spaces for a range of conductors, voltages and span lengths, in both low and high fire risk areas. The management of vegetation is not, however, confined to the clearance and regrowth spaces set out in the Tasmanian Electricity Code. In the interests of reducing safety and bushfire ignition risks, TasNetworks also monitors and treats a significant number of 'hazard trees' around the State, which have been identified as having the potential to fall across overhead powerlines, many of which are located outside of prescribed clearance zones around those lines.</p> <p>Tasmania is home to some of the fastest growing hardwood tree species in the world and has highly favourable conditions for vegetation growth. TasNetworks' service can, therefore, be characterised as having a high exposure to trees which typically require repeated treatments throughout their lifespans to prevent interaction with network assets.</p> <p>It is also noted that in addition to vegetation growth (and regrowth) as a driver of vegetation management costs, tree populations in some areas are senescent, dying, afflicted by health issues, and/or subject to damage vectors (such as drought, dieback, fungal decay and insect attack) which weaken limbs and/or stems increasing their susceptibility to damage from natural events.</p> <p>With vegetation management opex ranging from less than five per cent of opex for some networks and nearly 25 per cent for others (despite being an activity that is largely out-sourced by DNSPs) it is clear that environmental factors are driving different expenditure outcomes, rather than differences in efficiency. In the absence of a vegetation management OEF, there is an argument for excluding vegetation management from the AER's opex benchmarking entirely and treating it separately during the regulatory determination process, as is the case with replacement and augmentation capital expenditure. This could be achieved by removing vegetation management expenditure from the opex values used in the opex partial factor productivity benchmarks.</p> <p>TasNetworks recognises that quantifying a vegetation management OEF may be difficult, noting the limitations of the Economic Benchmarking RIN data on vegetation density, for example. Nonetheless, TasNetworks supports the development and quantification of a means of recognising a vegetation management OEF as a matter of priority and notes Energy Networks Australia's representations in this regard.</p>

**Coastal corrosion**

TasNetworks contends that proximity to the sea results in a more corrosive environment for network assets and, in turn, higher costs to maintain those assets, along with increased outage-response costs.

In the benchmarking paper submitted in support of TasNetworks' 2019-24 regulatory proposal, it was noted that "As a small island, many of our assets are also located in close proximity to the coast (by virtue of having more of our population living near the coast than any other state ), which increases the corrosion and degradation rate of assets. For example, between 2012 and 2017 the frequency of interruptions in coastal areas due to issues associated with power poles was approximately double that for poles located in inland areas, which was reflected in the relative contribution each 'category' of pole made to our system-wide SAIFI (frequency of interruption)."

Based on data released by the Australian Bureau of Statistics in 2004, Tasmania had the largest proportion of its population living within 50kms of the coastline of all Australian States (99.5 per cent).

The Office of Gas and Electricity Markets (OFGEM) in the United Kingdom recognises the relationship between coastal proximity and reduced asset lives as part of its Network Asset Health Methodology. As part of OFGEM's calculation of asset health indices the normal expected life (and probability of failure rates) of assets are altered to take into account locational factors that include proximity to the coast, and levels of corrosion.

In the absence of recognition in the AER's benchmarking models of the impact that exposure of assets to corrosive factors has on network opex, TasNetworks supports the recognition of an OEF as a material and exogenous driver of increased opex.

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**Bark interference**

Another network has put forward bark interference as an OEF. TasNetworks considers that this falls within the broader category of a vegetation management OEF, and that to whatever extent – if any – falling bark imposes additional opex on any network, the calculation of any vegetation management OEF adjustment would reflect that exposure, making it unnecessary to define an OEF specific to bark interference.

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**Terrain**

In its response to the OEF survey, TasNetworks submitted that the cost of managing vegetation in Tasmania is negatively impacted by the terrain. The Queenstown to Strahan feeders were put forward as examples of assets spanning difficult terrain.

In the benchmarking paper attached to TasNetworks' regulatory proposal for the 2019-24 regulatory control period, it was noted that Tasmania's natural environment is characterised by mountainous and heavily forested terrain, and that access to assets is a constant challenge for TasNetworks because of this.

TasNetworks recognises that quantifying a terrain related OEF may be difficult, noting that distinguishing between rural and urban circuit length, for example, does not describe this OEF candidate, as not all rural network service areas encompass difficult terrain. The Standard Vehicle Access data supplied by TasNetworks to the AER through the RIN process is also of limited use, as TasNetworks' GIS information does not explicitly record network assets as being "accessible" (or otherwise), in line with the AER's definitions.

Accessibility is also affected by seasonal factors, with many of the assets that make up TasNetworks distribution network which are readily accessible in the warmer, drier months, becoming less accessible during wetter, colder periods of the year, due to frost, rain and snowfall. This potentially introduces added complexity to the assessment of the impact that terrain and accessibility may have on opex.

Nonetheless, terrain – as it affects access to network assets – is not currently accounted for in the AER's models and, if assessed as having a material impact on DNSP opex, would meet the AER's OEF criteria.

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**Ground conditions  
(rock)**

This issue of rocky ground was raised by another DNSP as an OEF candidate, citing significantly increased costs of earthworks and construction, due to the requirement to remove rock when installing underground assets and use specialised equipment. TasNetworks considers that the additional civil and construction costs associated with ground rock are of likely to be largely capital in nature, and that an OEF reflecting the geological attributes of DNSPs services areas would not be appropriate.

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<b>High proportion of wooden poles and pole top structures</b>	TasNetworks does not support the application of an OEF based on the proportion of wooden poles and pole top structures, on the basis that most networks currently utilise a higher proportion of wooden poles than poles constructed from other materials, and that in the long-term, the extent to which a network is comprised of wooden poles and pole top structures falls within the control of DNSPs.
<b>Dense urban network, proximity to critical infrastructure, lack of easements, building regulations and congestion by other utilities</b>	TasNetworks considers that most DNSPs are likely to serve customers, including the operators of critical infrastructure and facilities like hospitals, that rely on the delivery of electricity in order to operate continuously. While this may increase the cost of undertaking a range of operational activities when compared to the cost of undertaking the same activities for customers with similar loads but greater flexibility around the timing of works and greater tolerance of planned outages, TasNetworks does not consider that the proposed OEF is warranted.
<b>Replacement of 6.6kV by 22kV lines</b>	The replacement of 6.6kV lines with 22kV lines is a capital expenditure item. TasNetworks does not support the proposed OEF candidate.
<b>Bats, protected species and termites</b>	<p>The issue of termite exposure is addressed in another OEF candidate.</p> <p>TasNetworks acknowledges that some DNSPs, particularly those operating in rural and regional areas, are likely to incur additional expenditure both responding to and preventing animal interactions with power infrastructure.</p> <p>Tasmania is home to a number of protected, threatened and endangered bird species which have interactions with network assets, including Wedge-tailed Eagles, Sea Eagles, Grey Goshawks and Black Swans. Some of TasNetworks infrastructure is also situated in locations which provide habitat to native animal species, including Brushtail Possums, which are also known to interact with electrical infrastructure.</p> <p>TasNetworks incurs expenditure of both a capital and operational nature through attending animal interactions with our assets and restoring supply, as well as through our efforts to reduce or prevent further interactions by replacing pole configurations and conductors which are hazardous to animals, and installing mitigation measures such as perches, insulator and line covers, bird diverters, and pole guards.</p> <p>It should be noted that protected species is not limited to fauna, and includes flora.</p> <p>As a precursor to working on many parts of our network, TasNetworks will investigate the likelihood of weeds in the area and identify measures to prevent the spread of weeds, identify threatened plants and threatened plant communities and plan the work in such a way as to avoid negatively impacting on or destroying those species.</p> <p>Weeds and diseases represent serious threats to Tasmania's environment, primary producers and forest industries and it is important that TasNetworks activities do not contribute to the spread of weeds or disease, for example, by becoming attached to vehicles, tools and footwear. TasNetworks vehicles working in weed infested areas are typically inspected and cleaned before leaving the depot to go on site, after being in weed infested areas and at the end of the day, which adds additional costs to many jobs.</p> <p>As of 2017 there were 458 plant species in Tasmania protected by the <i>Threatened Species Conservation Act 1994</i>. Even road reserves – in which power lines are often located – can have significant plant species present, and result in TasNetworks taking action like shifting the location of a proposed pole in order to avoid impacting on an endangered plant.</p> <p>TasNetworks activities also potentially pose risks to Tasmania's aboriginal and non-indigenous heritage.</p> <p>While all of these factors suggest that TasNetworks is one DNSP that is likely to incur additional opex in relation to the protection of natural and heritage</p>

values, and the causes of those additional costs are likely to meet the AER's criteria for an OEF in terms of being exogenous and non-duplicative, it is not clear how such an OEF may be described and quantified.

<b>Capex / opex trade-offs</b>	TasNetworks concurs with the assessment by Sapere-Merz of the capex / opex trade-off OEF candidate put forward by SA Power Networks that opex versus capex may continue to require attention in the AER's opex benchmarking process.
<b>Penetration of Distributed Energy Resources (DER)</b>	<p>TasNetworks agrees that the growing take-up of solar PV generation is an exogenous environmental factor which is driving increased expenditure for Australian DNSPs. TasNetworks has, for example, already incurred significant capex upgrading transformers to address power quality issues caused by the intermittent nature of the output from solar panels.</p> <p>It is arguable that the number of customer connections taken into account as an output in the AER's benchmarking does not recognise the additional cost and complexity associated with servicing a customer with distributed energy resources, compared to a customer without.</p> <p>On this basis, there appears to be an argument that the take-up of solar panels, as a driver of increased opex, meets the AER's criteria for an OEF, being both exogenous and non-duplicative, and (potentially) material. Were the take-up of DER to be investigated further as an OEF, it is likely that reliable data about the installed DER customer base would be available for all DNSPs.</p>
<b>Network density</b>	<p>In the benchmarking paper attached to its regulatory proposal, TasNetworks contends that it has to contend with a very low load density – which increases costs – due to the spread of the population outside of the State's major population centre, Hobart. This population dispersion means that a greater quantity of assets are required to reach many load centres, but that those individual loads are not particularly high, which results in low load density.</p> <p>TasNetworks is required to carry relatively low loads over long distances. As a result, a large proportion of the Tasmanian distribution network is comprised of radial feeders passing through areas of low energy and low demand density.</p> <p>In multiple submissions to the AER regarding the metrics presented in its Annual Benchmarking Report, TasNetworks has argued that its raw MTFP and Capital PFP scores are materially lowered by the relatively high transformer capacity as an input to the AER's models, relative to the outputs in the models like Maximum Demand and Energy Delivered.</p> <p>TasNetworks has a significant number of transformers located on rural feeders which are underutilised in terms of their capacity. On average, transformers on our long rural feeders serve only 3.5 customers each, compared to 41 customers for transformers on urban feeders. We also have around 3,500 transformers on long rural feeders which serve a single customer each. Many transformers in rural settings have to be over sized in order to accommodate start-up currents associated with motors in dairies and sawmills, as well as irrigation pumps.</p> <p>TasNetworks concurs with SA Power Networks argument that while the AER's benchmarking approach makes some allowance for customer density by way of customer numbers and line length, the AER's approach does not adequately account for the fact that costs to serve customers in rural / regional areas are greater than those in denser metropolitan areas, and that the inputs – relative to outputs – are necessarily greater.</p> <p>As noted by SA Power Networks, long rural feeders cause increased travel time to reach sites and make it more difficult to bundle larger volumes of work together to create scheduling efficiencies.</p>
<b>Jurisdictional differences in regulatory and legislative requirements</b>	TasNetworks submitted that it is obliged to undertake tasks such as the maintenance of private poles and funding of a grandfathered solar feed in tariff at the request of the State Government. Furthermore, Tasmanian environmental, planning and building regulations are more stringent than some other jurisdictions.

<b>Asset age</b>	While it is arguable that older assets generally require increased maintenance, and that the asset age profile of most, if not all DNSPs' reflects decades' worth of decisions made by the network operators that preceded them, the differences in asset age between networks is considered unlikely to be sufficient to represent a material OEF. It is also noted that in terms of the potential for increased opex to be driven by older assets, the extent to which this is the case for any DNSP will reflect contemporary decisions regarding the trade-of between replacement capex versus expenditure on maintenance, meaning that the driver of increased maintenance opex is not entirely exogenous.
<b>Cultural heritage</b>	TasNetworks' has exposure to environment and heritage legislation. The most significant exposure is causing environmental harm or impacting on cultural heritage without carrying out an adequate risk assessment and implementing reasonable controls. This issue is discussed in more detail in relation to the OEF candidate "Bats, protected species and termites".
<b>Economies of scale</b>	The Tasmanian distribution network is quite small compared to many others in the NEM and TasNetworks is unable to benefit from the economies of scale that some other DNSPs enjoy. TasNetworks has reservations about whether the AER's benchmarking measures adequately represent the diseconomies of scale which impact on its businesses.
<b>Geographic isolation</b>	Being an island, and an island with a population of only 0.5 million people, Tasmania is quite unique in the NEM. Bass Strait shipping costs affect the cost of assets and the materials needed to build and maintain the network. Much of the equipment required for an electricity network can only be shipped in to Tasmania and the shipping rates vary from approximately \$600 per container to as much as \$1,200 per container. Tasmania's geographic isolation and inherent lack of scale also impacts on the availability of a sufficiently competitive and cost effective contractor pool.
<b>Network access</b>	A potentially significant (unquantified) percentage of our distribution network assets are scattered across parts of the state with accessibility issues. This issue is discussed under the "Terrain" OEF candidate in this attachment.
<b>Climate</b>	Tasmania's climate presents challenges to the management of our network. A significant proportion of our assets are located above the snow line, exposed to high winds, or in areas of high rainfall and high bushfire risk. These factors all contribute to higher likelihood of asset failure or damage, as well as to accessibility challenges, which all impact on TasNetworks' opex. Some of these climatic factors are potentially captured in other OEF candidates such as "Extreme weather events" and "Bushfire risk".