FINAL DECISION

TasNetworks
Distribution determination
2019–20 to 2023–2024

Attachment 5
Capital expenditure

April 2019

AUSTRALIAN ENERGY REGULATOR

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Note

This attachment forms part of the AER's final decision on TasNetworks' 2019–24 distribution determination. It should be read with all other parts of the final decision.

The final decision includes the following attachments:

Overview

Attachment 1 – Annual revenue requirement

Attachment 2 – Regulatory asset base

Attachment 4 – Regulatory depreciation

Attachment 5 – Capital expenditure

Attachment 6 – Operating expenditure

Attachment 7 – Corporate income tax

Attachment 9 – Capital expenditure sharing scheme

Attachment 10 – Service target performance incentive scheme

Attachment 15 – Alternative control services

Attachment 18 – Tariff structure statement

Attachment B - Negotiating Framework

Contents

Shortened forms

Shortened form	Extended form
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AMS	asset management systems
augex	augmentation expenditure
capex	capital expenditure
CCP13	Consumer Challenge Panel (sub-panel 13)
CESS	capital expenditure sharing scheme
DER	distributed energy resources
EBSS	efficiency benefit sharing scheme
ICT	information and communications technology
MDMS	Meter Data Management System
NEL	National Electricity Law
NEM	National Electricity Market
NEO	National Electricity Objective
NER	National Electricity Rules
NPV	net present value
NSP	network service provider
RAB	regulatory asset base
repex	replacement expenditure
SAIDI	system average interruption duration index
SAIFI	system average interruption frequency index
SCADA	supervisory control and data acquisition
STPIS	service target performance incentive scheme
TasCOSS	Tasmanian Council of Social Service
TMEC	Tasmanian Minerals and Energy Council
TSBC	Tasmanian Small Business Council

5 Capital expenditure

Capital expenditure (capex) refers to the investment made in the network to provide standard control services. This investment generally relates to assets with long lives (30–50 years is typical) and these costs are recovered over several regulatory periods.

On an annual basis, the financing and depreciation costs associated with these assets are recovered (return of and on capital) as part of the building blocks that form TasNetworks' total revenue requirement.[1]

This attachment sets out our final decision on TasNetworks' revised total capex forecast. Further detailed analysis is provided in the following appendices:

- Appendix A – Assessment techniques
- Appendix B – Assessment of capex drivers
- Appendix C – Repex modelling approach
- Appendix D – Engagement process

5.1 Final decision

In assessing forecast capital expenditure, we are guided by the National Electricity Objective and underpinning capex criteria and objectives set out in the NER. We must accept a distributor's capex forecast if we are satisfied that the total forecast for the regulatory control period reasonably reflects the capex criteria.[2]

These criteria outline that a distributor's capex forecast must reasonably reflect the efficient costs of achieving the capex objectives, the costs that a prudent operator would require to achieve the capex objectives, and a realistic expectation of the demand forecast and cost inputs required to achieve the capex objectives.[3]

The capex objectives relate to a distributor's ability to meet and manage demand, and to comply with regulatory obligations and maintain the quality, reliability and security of supply of standard control services.[4]

Where a distributor is unable to demonstrate that its proposal complies with the capex criteria and objectives, the NER requires us to set out a substitute estimate of total capex that we are satisfied reasonably reflects the capex criteria, taking into account the capex factors.[5]

TasNetworks has not justified that its revised total capex forecast of $703.0 million ($2018–19) reasonably reflects the capex criteria. In coming up with a view on

1 NER, cl. 6.4.3(a).
2 NER, cl. 6.5.7(c) and (e).
3 NER, cl. 6.5.7(c)(1).
4 NER, cl. 6.5.7(a).
5 NER, cl. 6.12.1(3)(ii).

TasNetworks' total capex forecast, we have assessed TasNetworks' individual 'capex drivers' (e.g. augmentation, replacement and connections). Based on our review, we have included an amount of $651.1 million ($2018–19) in our substitute estimate of total capex, which is 8 per cent above the $608.6 million that TasNetworks is expected to spend over the 2014–19 regulatory years.

In coming up with our substitute estimate, we have accepted TasNetworks' forecast for most of its capex drivers, apart from three capex drivers, namely replacement expenditure (repex), the additional expenditure associated with the asset management systems (AMS) and capitalised overheads. Our substitute estimate was based on the following;

- we have relied on the repex model threshold as a basis for our substitute estimate for modelled repex. This is consistent with our approach in recent draft determinations. The repex modelling results were validated through a bottom-up engineering and trend analyses
- we have maintained our draft decision position on TasNetworks' forecast for non-network capex, in particular the asset management systems (AMS) capex. Our draft decision accepted TasNetworks' initial proposed forecast for non-network capex
- we have made proportional adjustments to TasNetworks' capitalised overheads, which are based on our direct capex adjustments to repex and non-network capex at the program and project level.

Based on the information before us, we are satisfied that our substitute estimate reasonably reflects the capex criteria. Table 5-1 outlines TasNetworks' revised total capex forecast and our final decision.

Table 5-1 – Final decision on TasNetworks' total net capex forecast ($2018–19, million)

	2019–20	2020–21	2021–22	2022–23	2023–24	Total
TasNetworks' revised proposal	152.3	142.3	130.0	137.5	140.9	**703.0**
AER final decision	140.3	131.6	119.6	127.8	131.8	**651.1**
Difference	-12.0	-10.7	-10.4	-9.7	-9.1	**-51.9**
Percentage difference	-8%	-8%	-8%	-7%	-6%	**-7%**

Source: TasNetworks' revised PTRM and AER analysis.

Note: Numbers may not add due to rounding.

Our findings on the capex drivers are part of our broader analysis and should not be considered in isolation. We do not approve an amount of forecast expenditure for each individual capex driver. However, we use our findings on the different capex drivers to assess a distributor's proposal as a whole and arrive at a substitute estimate for total capex where necessary.

Our assessment highlighted that TasNetworks' revised total capex forecast does not reasonably reflect the capex criteria, taking into account the capex factors and the

revenue and pricing principles.[6] As set out in appendix B, TasNetworks has not demonstrated that its revised total capex forecast forms part of an overall distribution determination that will contribute to achieving the National Electricity Objective to the greatest degree. Table 5-2 below summarises our findings and the reasons for our final decision by capex driver

Table 5-2 – Summary of AER findings and reasons

Issue	Reasons and findings
Total capex forecast	TasNetworks proposed a total capex forecast of $703.0 million ($2018–19) in its revised proposal. TasNetworks has not established that its revised proposal reasonably reflects the capex criteria. Several stakeholder submissions noted that TasNetworks' revised distribution capex forecast is still a significant increase compared to the previous five years and this increase has not been sufficiently justified. We are satisfied that our substitute estimate of $651.1 million ($2018–19) reasonably reflects the capex criteria. Our substitute estimate is 7 per cent lower than TasNetworks' revised proposal.
Forecasting methodology, key assumptions and past capex performance	We consider TasNetworks' investment governance processes have been inconsistently applied. Our assessment of TasNetworks' revised proposal revealed systemic data reporting and consistency issues that significantly affected our ability to assess TasNetworks' revised proposal. Section 5.2.2 and appendices B and D expand on these issues.
Augmentation capex	We accept TasNetworks' revised augex forecast of $45.3 million ($2018–19). TasNetworks has sufficiently demonstrated that its forecast augex would form part of a total capex forecast that reasonably reflects the capex criteria. It is consistent with the drivers of expenditure in this category, including continuing flat or declining maximum demand in the forecast period. It is also consistent with maintaining the reliability and quality of supply.
Customer connections capex	We accept TasNetworks' revised net customer connections capex forecast of $64.9 million ($2018–19). TasNetworks has demonstrated that its forecast customer connections capex is prudent and efficient, and would form part of a total capex forecast that reasonably reflects the capex criteria. TasNetworks' revised proposal corrected an error identified in its initial forecast of connections capex, and also included an updated forecast of customer contributions based on the latest available actual data. We consider that TasNetworks' customer connection forecasting methodology is reasonable and likely to produce a realistic forecast.
Replacement capex (repex)	We do not accept TasNetworks' revised repex forecast of $274.2 million ($2018–19). We have included an amount of $244.9 million ($2018–19) in our substitute of total capex. TasNetworks has not justified that its repex forecast is prudent and efficient, and it would not form part of a total capex forecast that reasonably reflects the required expenditure for this driver. Although TasNetworks reduced its repex forecast by 21 per cent from its initial proposal, its modelled repex forecast is higher than our repex model threshold. Our repex modelling approach compares distributors' asset categories on both unit costs and expected replacement lives. We also conducted a bottom-up review of the proposed repex programs and found that TasNetworks has applied conservative input assumptions in its cost-benefit analysis models, which significantly overstates the risks associated with its replacement programs. Therefore, TasNetworks has not adequately justified the repex forecast for its proactive replacement programs.

[6] NER, cl. 6.5.7(c),(d) and (e); NEL, ss. 7A and 16(2).

Non-network capex	We do not accept TasNetworks' revised non-network (including asset management systems) capex forecast of $145.0 million ($2018–19). We have included an amount of $134.2 million ($2018–19) in our substitute estimate of total capex. TasNetworks has not demonstrated that its forecast asset management systems capex is prudent and efficient, and it would not form part of a total capex forecast that reasonably reflects the capex criteria. Our final decision provides for a lower estimate of required capex for the asset management information system project, in line with TasNetworks' initial proposal and our draft decision.
Capitalised overheads	We do not accept TasNetworks' revised capitalised overheads forecast of $177.4 million ($2018–19). We have included an amount of $169.7 million ($2018–19) in our substitute estimate of total capex. We have reduced TasNetworks' capitalised overheads forecast by $5.1 million due to our direct capex adjustments to repex and non-network capex at the program and project level. In addition, we have reduced TasNetworks' variable capitalised overheads forecast by 5 per cent. The reasons for this additional adjustment are outlined in sections 5.4 and B.6.
Modelling adjustments	We have updated the inflation and real price escalation assumptions in TasNetworks' underlying revised capex model. Overall, these adjustments have reduced TasNetworks' total net capex forecast by $4.1 million ($2018–19). More information can be found in our final decision capex model, which has been published in conjunction with this final decision.

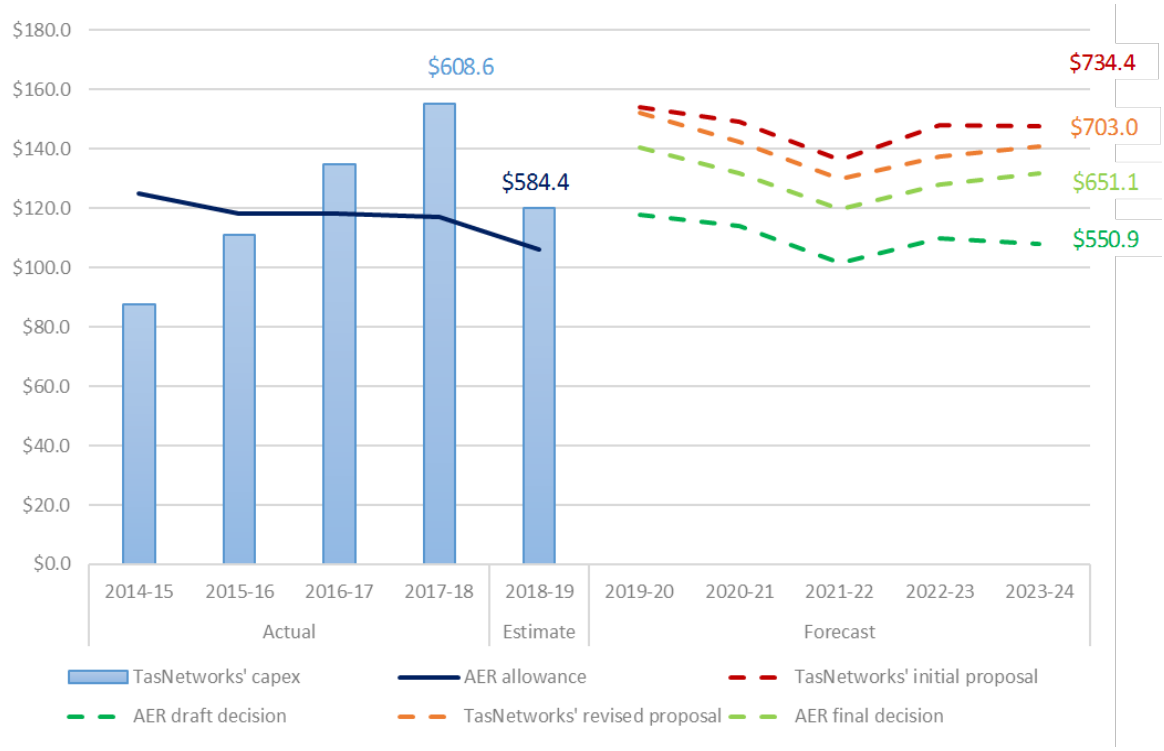
Source: AER analysis.

5.2 TasNetworks' revised proposal

In its revised proposal, TasNetworks proposed total forecast net capex of $703.0 million ($2018–19) for the 2019–24 regulatory control period. This forecast is $94.4 million (16 per cent) higher than its actual and estimated capex of $608.6 million ($2018–19) over the 2014–19 period.

TasNetworks' revised total capex forecast is $31.4 million (4 per cent) lower than its initial total capex forecast of $734.4 million ($2018–19). Figure 5-1 outlines TasNetworks' historical capex trend, its initial and revised forecasts for the 2019–24 regulatory control period, and our draft and final decisions.

Figure 5-1 – TasNetworks' historical vs forecast capex snapshot ($2018–19, million)



Source: AER analysis.

5.2.1 Background

The key drivers of TasNetworks' revised capex proposal are:

- Augmentation – $45.3 million (6 per cent)
- Net customer connections – $64.9 million (9 per cent)
- Replacement – $274.2 million (39 per cent)
- Non-network capex – $145.0 million (21 per cent)
- Capitalised overheads – $177.4 million (25 per cent)

The reasons for our final decision, including a summary of these capex drivers, are outlined in section 5.4. More detailed analysis of each of these drivers is outlined in appendix B.

5.2.2 Data consistency issues

During our assessment of TasNetworks' revised proposal, we discovered several data reporting inconsistencies between different revised proposal documents and information request responses. In an effort to understand these data reporting issues, we also discovered that these inconsistencies related to TasNetworks' initial proposal. As a result, the numbers presented in this final decision may not necessarily reconcile with the numbers presented in TasNetworks' initial proposal and our draft decision, particularly at the capex driver level.

The capex driver forecasts relied on in our assessment and referred to in this final decision were provided in response to information request 41.[7] We appreciate that TasNetworks engaged with us on these data discrepancy and presentation issues and helped us arrive at a resolution. Appendix D outlines, in detail, our engagement with TasNetworks during the revised proposal stage and also provides a full explanation of the data reporting issues we have identified. We consider that having clear and consistent data sources is crucial for stakeholders to develop a full and accurate understanding of a distributor's capex forecast.

We observe that TasNetworks' presentation of its capex driver forecasts in both its initial and revised proposal may have been confusing to different stakeholders. For example, the main revised proposal document outlined TasNetworks' augex forecast of $38.5 million ($2018–19, including overheads),[8] while other sources including TasNetworks' capex model outlined an augex forecast of $63.3 million ($2018–19, including overheads)[9]. While we now understand that one source was based on forecasting methodologies and the other was based on reset RIN capex categories, this would not have been clear to stakeholders, particularly the ones who provided submissions in response to TasNetworks' initial and revised proposals. Many of the submissions did not refer to specific data points and remained relevant to the corrected revised proposal, and we have had regard to these submissions where appropriate.

5.3 Assessment approach

In determining whether TasNetworks' proposal reasonably reflects the capex criteria, having regard to the capex factors, we use various qualitative and quantitative assessment techniques to assess the different elements of TasNetworks' proposal.

More broadly, we also take into account the revenue and pricing principles set out in the NEL.[10] In particular, we take into account whether our overall capex forecast provides TasNetworks with a reasonable opportunity to recover at least the efficient costs it incurs in:

- providing direct control network services; and
- complying with its regulatory obligations and requirements. [11]

When assessing capex forecasts, we also consider that:

- the efficiency criteria and the prudency criteria in the NER are complementary. Prudent and efficient expenditure reflects the lowest long-term cost to consumers

7 TasNetworks, *Response to AER information request 041,* 18 January 2019.

8 TasNetworks, *Tasmanian Transmission and Distribution Revised Revenue Proposals 2019–24*, 29 November 2018, p. 48.

9 TasNetworks, *Capex forecast model,* November 2018.

10 NEL, ss. 7A and 16(2).

11 NEL, s. 7A.

for the most appropriate investment or activity required to achieve the expenditure objectives[12]

- past expenditure was sufficient for the distributor to manage and operate its network in previous periods, in a manner that achieved the capex objectives.[13]

5.3.1 Considerations in applying our assessment techniques

Appendix A outlines our assessment approach and appendix B details how we came to our position on TasNetworks' revised capex forecast. In summary, some of these assessment techniques focus on total capex, while others focus on high-level, standardised sub-categories of capex. Importantly, while we may consider certain programs and projects in forming a view on the total capex forecast, we do not determine which programs or projects a distributor should or should not undertake.

This is consistent with our ex-ante incentive based regulatory framework. Our approach is based on approving an overall ex-ante revenue requirement that includes an assessment of what we find to be a prudent and efficient total capex forecast.[14] Once the ex-ante allowance is established, distributors are incentivised to provide services at the lowest possible cost because their returns are determined by the actual costs of providing services. If distributors reduce their costs to below the estimate of efficient costs, the savings are shared with consumers in future regulatory periods.

This ex-ante incentive-based regulatory framework recognises that the distributor should have the flexibility to prioritise its capex program given its circumstances over the course of the regulatory control period. The distributor may need to undertake programs or projects that it did not anticipate during the distribution determination process. The distributor may also not need to complete some of the programs or projects it proposed during the forecast regulatory control period if circumstances change. We consider a prudent and efficient distributor would consider the changing environment throughout the regulatory control period and make decisions accordingly.

Therefore, recognising the interplay between the broader incentive framework and program and project investment considerations, we use a combination of bottom-up and top-down assessment techniques when reviewing a capex forecast. Bottom-up assessments are an informative way to establish whether the forecast capex at the program or project level is prudent and efficient. Many of the techniques we apply at this level encompass the capex factors that we are required to consider. However, we are also mindful that a narrow focus on only a bottom-up assessment may not itself provide sufficient evidence that the forecast is prudent and efficient. Bottom-up approaches tend to overstate required allowances, as they do not adequately account for interrelationships and synergies between programs, projects or areas of work.

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12 AER, *Better regulation: Expenditure forecasting assessment guideline for electricity distribution*, November 2013, pp. 8–9.

13 AER, *Better regulation: Expenditure forecasting assessment guideline for electricity distribution*, November 2013, p. 9.

14 AEMC, *Final rule determination: National electricity amendment (Economic regulation of network service providers) Rule 2012*, 29 November 2012, p. vii.

Thus, we also review the prudency and efficiency of aggregate expenditure areas or the total capex forecast.[15] Top-down analysis provides us with assurance that the entire expenditure program is prudent and efficient, and allows us to consider a distributor's total capex forecast. We use holistic assessment approaches that include a suite of techniques such as trend analysis, predictive modelling and detailed technical reviews. Consistent with our holistic approach, we take into account the various interrelationships between the total capex forecast and other components of a distributor's distribution determination, such as forecast opex and STPIS interactions.[16]

In the event we are not satisfied a distributor's proposed capex forecast reasonably reflects the capex criteria, we are required to determine a substitute estimate. We do so by applying our various assessment techniques. We then use our judgement to weigh the results of these techniques case-by-case, in light of all the relevant information available to us.

Broadly, we give greater weight to techniques that we consider are more robust in the particular circumstances of the assessment. By relying on several techniques, we ensure we consider a wide variety of information and take a holistic approach to assessing the distributor's capex forecast. Where our techniques involve the use of a consultant, their reports are considered when we form our position on total forecast capex.

Importantly, our decision on the total capex forecast does not limit a distributor's actual spending. We set the forecast at the level where the distributor has a reasonable opportunity to recover their efficient costs. As noted previously, a distributor may spend more or less on capex than the total forecast amount specified in our decision in response to unanticipated expenditure needs or changes.

The regulatory framework has a number of mechanisms to deal with these circumstances. Importantly, a distributor does not bear the full cost where unexpected events lead to an overspend of the approved capex forecast. Rather, the distributor bears 30 per cent of this cost if the expenditure is subsequently found to be prudent and efficient. Further, the pass through provisions provide a means for a distributor to pass on significant, unexpected capex to customers, where appropriate.[17]

Similarly, a distributor may spend less than the capex forecast because it has operated at a more efficient level than expected. In this case, the distributor will keep on average 30 per cent of this reduction over time, with the remaining benefits shared with its customers.

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15 For example, see AER, *Draft decision: Ergon Energy determination 2015−16 to 2019−20: Attachment 6 − Capital expenditure*, October 2015, p. 21; AER, *Draft decision: SA Power Networks determination 2015−16 to 2019−20: Attachment 6 − Capital expenditure*, October 2015, pp. 20–21.

16 NEL, s. 16(1)(c).

17 NER, cl. 6.6.1.

5.3.2 Safety and reliability considerations

Our position in this final decision is that our approved capex forecast will provide for a prudent and efficient service provider in TasNetworks' circumstances to maintain performance at the targets set out in the STPIS. Therefore, it is appropriate to apply the STPIS, as set out in attachment 10. The STPIS provides incentives to distributors to further improve the reliability of supply only where customers are willing to pay for these improvements.

Our analysis in appendix B outlines, where relevant, how our assessment techniques factor in network safety and reliability. We consider our final decision will allow TasNetworks to maintain the safety, service quality and reliability of its network, consistent with its legislative obligations.

5.3.3 Interrelationships

In coming to a position on TasNetworks' revised capex proposal, we have taken into account the various interrelationships between the total capex forecast and other constituent components of the determination, such as forecast opex and STPIS interactions.[18]

For some elements, such as capitalised overheads, we consider the proposed capital expenditure in the context of total expenditure. For other elements, such as capability growth, we may consider any opex-capex trade-offs to determine whether the capital expenditure will result in a net benefit to electricity customers.

5.4 Reasons for final decision

TasNetworks has not demonstrated that its revised total capex forecast of $703.0 million ($2018–19) reasonably reflects the capex criteria. Its forecast is $94.4 million (16 per cent) higher that its actual and estimated capex of $608.6 million ($2018–19) over the 2014–19 period. Several stakeholder submissions noted that TasNetworks' revised distribution capex forecast is still a significant increase compared with the previous five years:

- CCP13 questioned whether the revised repex proposal is sufficiently justified. CCP13 evaluated one of TasNetworks' supporting NPV analysis documents and identified that, consistent with our assessment, TasNetworks double counts the program benefits in its NPV calculations[19]
- Tasmanian Minerals and Energy Council (TMEC) expressed concern at the level of capex spending in TasNetworks' revised proposal, suggesting it would be wasteful investment. TMEC claimed that TasNetworks has, in some cases, made imprudent decisions with regards to its network investments in the current period. It questioned why forecast distribution spending has increased since the last

[18] NEL, s. 16(1)(c).

[19] CCP13, *TasNetworks' electricity network revised revenue proposal 2019–24*, January 2019, p. 13.

proposal. TMEC noted that TasNetworks' proposed repex is trending towards the spending profile of the "gold-plated era"[20]

- Aurora acknowledged TasNetworks' actions to reduce its total revenue requirement since its original proposal. However, while Aurora supported TasNetworks' efforts to reduce its revised distribution capex by 4 per cent from the initial proposal, Aurora noted the revised proposal is an increase from current period expenditure[21]
- The Tasmanian Small Business Council (TSBC) noted that it does not accept TasNetworks' arguments to increase its repex allowance beyond our draft decision. The TSBC expects that a mature network with low utilisation rates, such as TasNetworks, would have a relatively stable level of repex and in fact, given the previous period of overinvestment, TSBC would expect a reduction in repex, which would increase its utilisation rates.[22]

We applied the assessment approach set out in section 5.3 and appendix A to TasNetworks. Table 5-3 below sets out the capex amounts by driver that we are satisfied reasonably reflect the capex criteria. Our findings and reasons for each capex driver are summarised below.

Table 5-3 – Assessment of required capex by driver for the 2019–24 regulatory control period ($2018–19, million)

Driver	2019–20	2020–21	2021–22	2022–23	2023–24	Total
Augmentation	12.6	7.9	8.6	8.4	7.7	45.3
Net connections	11.8	13.0	12.8	13.5	13.8	64.9
Replacement	52.4	50.9	46.4	48.1	47.2	244.9
Non-network	30.8	27.1	19.3	25.7	31.4	134.2
Capitalised overheads	34.4	34.3	33.9	33.7	33.4	169.7
Modelling adjustments	-0.9	-0.8	-0.7	-0.8	-0.8	-4.1
Gross capex	**150.5**	**142.7**	**130.7**	**139.9**	**143.4**	**706.6**
Less capital contributions	9.4	10.3	10.4	10.7	10.9	51.6
Less disposals	0.8	0.8	0.8	0.8	0.8	3.8
Net capex	**140.3**	**131.6**	**119.6**	**127.8**	**131.8**	**651.1**

Source: AER analysis.

Notes: Numbers may not add due to rounding.

Net capex = gross capex less capital contributions and less disposals.

Modelling adjustments relate to forecast inflation and labour price escalation assumptions.

[20] Tasmanian Minerals & Energy Council, *Submission on TasNetworks' revised proposal,* January 2019.

[21] Aurora Energy, *Submission to AER draft decision and TasNetworks revised proposal,* 11 January 2019.

[22] Tasmanian Small Business Council, *Submission on TasNetworks' revised proposal,* January 2019.

Augmentation:

- TasNetworks has demonstrated that its revised augmentation capex forecast of $45.3 million ($2018–19) is prudent and efficient, and would form part of a total capex forecast that reasonably reflects the capex criteria
- our draft decision accepted TasNetworks' forecast augex as a reasonable estimate of prudent and efficient capex requirements in this category. TasNetworks' revised proposal included an additional project for supply to Crotty Dam, and capex related to projects commenced but not completed in the current regulatory control period. A number of projects assessed as repex in our draft decision are now also included in TasNetworks' augex forecast in line with the underlying expenditure drivers and forecasting methodologies
- based on our review of the information provided by TasNetworks in support of its revised augex proposal, including responses to our information requests, we consider that TasNetworks' forecast augex is a reasonable estimate of prudent and efficient capex requirements for this category.

Customer connections capex:

- TasNetworks has established that its revised net customer connections capex forecast of $64.9 million ($2018–19) is prudent and efficient, and would form part of a total capex forecast that reasonably reflects the capex criteria
- TasNetworks' revised net customer connections capex forecast reflects an updated (increased) forecast of customer contributions as foreshadowed in our draft decision. TasNetworks also corrected an error in its initial connections capex forecast which had the effect of understating required customer connections capex in the 2019–24 regulatory control period. We consider that TasNetworks' revised net customer connections capex forecast reflects prudent and efficient expenditure requirements for this category and a realistic expectation of forecast demand.

Repex:

- TasNetworks' revised repex proposal of $274.2 million ($2018–19) does not appear to be a reasonable estimate of the prudent and efficient costs required for this capex category. We have included an amount of $244.9 million ($2018–19) in our substitute estimate of total capex
- in our draft decision, we highlighted that TasNetworks' forecast for modelled repex was significantly higher than our repex model threshold. In addition, our bottom-up review highlighted that TasNetworks had not sufficiently justified its proposed proactive replacement programs for the overhead conductor, service line and underground cable asset groups
- in its revised proposal, TasNetworks reduced its repex forecast from $349.2 million ($2018–19) to $274.2 million ($2018–19) (21 per cent). In addition, TasNetworks provided cost-benefit analysis for several key programs, most notably its proactive overhead conductor, service line and underground cable programs. We commend TasNetworks for responding to our engagement and draft decision by providing cost-benefit analysis with risk quantification in support of its revised repex forecast
- however, TasNetworks' revised repex forecast remains 18 per cent higher than our draft decision. TasNetworks' revised modelled repex forecast of $263.8 million

($2018–19), although lower than its initial proposal, still lies $49.0 million higher than our updated repex model threshold of $214.9 million. In addition, our assessment of TasNetworks' cost-benefit analysis highlighted that TasNetworks has applied conservative input assumptions in its cost-benefit analysis models, which overstates the risks associated with its replacement programs

- we have derived our substitute repex estimate by adjusting ten overhead conductor programs and three service line programs using our revised repex model results. Our program and project level adjustments are outlined in detail in our final decision capex model. These reductions produce a substitute repex estimate of $244.9 million, which is $29.2 million ($2018–19) (11 per cent) lower than TasNetworks' revised repex forecast. Our substitute repex estimate is consistent with TasNetworks' actual repex spend of $240.1 million over the 2014–19 period. As we assessed that TasNetworks has not sufficiently justified its forecast increase in repex, we consider a repex allowance consistent with its business-as-usual spend is reasonable
- TasNetworks proposed $65.2 million for bushfire mitigation related repex programs in its initial proposal. It reduced this amount to $40.9 million in its revised proposal. Three of the ten overhead conductor programs referenced above ($16.4 million) relate to TasNetworks' bushfire mitigation program. We acknowledge that addressing a level of bushfire risk is an important consideration in establishing a prudent and efficient level of capex for the 2019–24 regulatory control period. However, TasNetworks has not adequately established that its overhead conductor forecast, which includes bushfire mitigation programs, is prudent and efficient.

Non-network capex:

- TasNetworks' proposed non-network capex (including asset management systems) of $145.0 million ($2018–19) is not in our view a reasonable estimate of the efficient costs required for this capex category. TasNetworks has not demonstrated that this non-network capex forecast would form part of a total capex forecast that reasonably reflects the capex criteria. We have included an amount of $134.2 million ($2018–19) in our substitute estimate of total capex
- specifically, we have not accepted TasNetworks' revised proposal forecast capex for its AMS, a component of the operational support systems category, which is $24.1 million ($2018–19). TasNetworks has not adequately explained how the underlying drivers and need for the expenditure have changed between its initial and revised proposals. Our substitute estimate of TasNetworks' forecast distribution AMS capex is $13.1 million. This is in line with our draft decision for this capex category.

Capitalised overheads:

- we do not accept TasNetworks' revised capitalised overheads forecast of $177.4 million ($2018–19). We have included an amount of $169.7 million ($2018–19) in our substitute estimate of total capex. We have reduced TasNetworks' capitalised overheads forecast by $7.7 million in total
- we have reduced TasNetworks' capitalised overheads forecast by $5.1 million due to our direct capex adjustments to repex and non-network capex at the program and project level. In addition, in its revised proposal, TasNetworks reduced its total

direct capex forecast from its initial proposal by 5 per cent. However, it did not reduce its total capitalised overheads forecast and assumed that its total capitalised overheads forecast was fixed and not variable, i.e. its forecast does not vary depending on the amount of direct capex that is required

- this is inconsistent with our standard capitalised overheads assessment approach, where we assume that some proportion of overheads is variable. As a result, we have reduced TasNetworks' variable capitalised overheads forecast by 5 per cent. This results in a $2.6 million ($2018–19) (1.4 per cent) reduction to TasNetworks' total capitalised overheads forecast.

Modelling adjustments:

- We have updated the inflation and real price escalation assumptions in TasNetworks' underlying revised capex model. Overall, these adjustments have reduced TasNetworks' total net capex forecast by $4.1 million ($2018–19). Its capital contributions forecast has also been reduced by $0.4 million. More information can be found in our final decision capex model, which has been published in conjunction with this final decision.

Demand forecast:

- TasNetworks has relied on AEMO's Tasmanian connection point demand forecasts for the 2019–24 regulatory control period. As outlined in our draft decision, we consider TasNetworks' demand forecasts are likely to reflect a reasonable expectation of forecast demand due to the following factors:
    - AEMO's independent demand forecast is likely to be unbiased and reflect a reasonable demand forecasting methodology;
    - maximum demand forecasts across Tasmania are forecast to be flat, trending slightly upwards over the 2019–24 period; and
    - maximum demand is not a significant driver of forecast capex in the 2019–24 regulatory control period.

A Assessment techniques

This appendix describes the approaches we applied in assessing whether TasNetworks' total capex forecast reasonably reflects the capex criteria. Appendix B set out in greater detail the extent to which we relied on each of these assessment techniques.

The assessment techniques that we apply in capex are necessarily different from those we apply when assessing opex. This is reflective of differences in the nature of the expenditure that we are assessing. We therefore use some assessment techniques in our capex assessment that are not suitable for assessing opex and vice versa. We outline this in the Expenditure Forecasting Assessment Guideline (the Guideline).[23] Below we outline the assessment techniques we used to assess TasNetworks' revised capex forecast.

A.1 Trend analysis

We consider past trends in actual and forecast capex as this is one of the capex factors under the NER.[24] We also consider trends at the asset category level to inform our view on the prudency and efficiency of a distributor's capex forecast.

Trend analysis involves comparing a distributor's forecast capex and volumes against historical levels. Where forecast capex and volumes are materially different to historical levels, we seek to understand the reasons for these differences. We also assess whether the historical levels of expenditure are indicative of the required expenditure moving forward. In doing so, we consider the reasons the distributor provides in its proposal, as well as any potential changing circumstances.

In considering whether the total capex forecast reasonably reflects the capex criteria, we need to consider whether the forecast will allow the distributor to meet expected demand and comply with relevant regulatory obligations.[25] Demand and regulatory obligations (specifically, service standards) are key capex drivers. More onerous standards or growth in maximum demand will increase capex. Conversely, reduced service obligations or a decline in demand will likely cause a reduction in the amount of capex the distributor requires.

Maximum demand is a key driver of augmentation or demand-driven expenditure. Augmentation (augex) often needs to occur prior to demand growth being realised. Forecast demand, rather than actual demand, is therefore most relevant when a distributor is deciding the augmentation projects it will require in the forecast regulatory control period. However, to the extent that actual demand differs from forecast demand, a distributor should reassess project needs. Growth in a distributor's network

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23 AER, *Better regulation: Expenditure forecasting assessment guideline for electricity distribution*, November 2013, p. 8.

24 NER, cl. 6.5.7(e)(5).

25 NER, cl. 6.5.7(a).

will also drive connections-related capex. For these reasons, it is important to consider how capex trends, particularly for augex and connections, compare with trends in demand and customer numbers.

For service standards, there is generally a lag between when capex is undertaken (or not) and when the service improves (or declines). This is important when considering the expected effect of an increase or decrease in capex on service levels. It is also relevant to consider when service standards have changed and how this has affected the distributor's capex requirements. We analysed capex trends across a range of levels including at the total capex level and the category level (e.g. augex, connections, repex and non-network). We also compared these with demand trends and any relevant changes in service standards.

A.2 Category analysis

Expenditure category analysis allows us to compare expenditure across distributors, and over time, for various levels of capex. The comparisons we analyse include:

- overall costs within each category of capex;
- unit costs across a range of activities;
- volumes across a range of activities; and
- expected asset replacement lives across a range of repex asset categories.

Using standardised reporting templates, we collect data on augex, repex, connections, non-network capex, overheads and forecast demand for all distributors in the NEM. Using standardised category data allows us to make direct comparisons across distributors. Standardised category data also allows us to identify and scrutinise different operating and environmental factors that affect the amount and cost of works that distributors incur and how these factors may change over time.

A.3 Predictive modelling

Background

Our repex model is a statistical model that forecasts repex for various asset categories based on their condition (using age as a proxy) and unit costs. We use the repex model to only assess forecast repex that can be modelled. This typically includes high-volume, low-value asset categories and generally represents a significant component of total forecast repex. The repex model is only used to forecast modelled repex for electricity distributors.

The repex model forecasts the volume of assets in each category that a distributor would expect to replace over a 20-year period. The model analyses the age of assets already in commission and the time at which, on average, these assets would be expected to be replaced, based on historical replacement practices. We refer to this as the calibrated expected asset replacement life. We derive a total replacement expenditure forecast by multiplying the forecast replacement volumes for each asset category by an indicative unit cost.

We can use the repex model to advise and inform us where to target a more detailed bottom-up review and define a substitute estimate if necessary. We can also use the model to compare a distributor against other distributors in the NEM.[26] In coming to our position, we also had regard to feedback from distributors on some of the underlying assumptions and modelling techniques.

Scenario analysis

Our repex modelling approach analyses four scenarios that consider both a distributor's historical replacement practices and the replacement practices of other distributors in the NEM. In contrast to previous determinations, the current approach considers intra-industry comparative analysis for unit costs and expected asset replacement lives, rather than only analysing inter-company historical performance. The four scenarios analysed are:

1. historical unit costs and calibrated expected replacement lives;
2. comparative unit costs and calibrated expected replacement lives;
3. historical unit costs and comparative expected replacement lives; and
4. comparative unit costs and comparative expected replacement lives.

Comparative unit costs are the minimum of a distributor's historical unit costs, its forecast unit costs and the median unit costs across the NEM. Comparative replacement lives are the maximum of a distributor's calibrated expected replacement life and the median expected replacement life across the NEM.

The 'cost, lives and combined' scenarios rely on a comparative analysis technique that compares the performance of all distributors in the NEM. The technique analyses the two variable repex model inputs – unit costs and expected replacement lives. The 'cost scenario' analyses the level of repex a distributor could achieve if its historical unit costs were improved to comparative unit costs. The 'lives scenario' analyses the level of repex a distributor could achieve if its calibrated expected replacement lives were improved to comparative expected replacement lives.

Previous distribution determinations where we have used on the repex model have primarily focused on the 'historical scenario'. This scenario forecasts a distributor's expected repex and replacement volumes based on its historical unit costs and asset replacement practices (which are used to derive expected replacement lives). Our refined comparative analysis repex modelling approach builds on this previous analysis and now introduces the historical performances of other distributors in the NEM into the forecast period.

Repex model threshold

Our 'repex model threshold' is defined taking these results and other relevant factors into consideration. For the 2019–24 determinations, our approach is to set the repex

[26] This includes Power and Water Corporation.

model threshold equal to the highest result out of the 'cost scenario' and the 'lives scenario'.[27]

This approach considers the inherent interrelationship between the unit cost and expected replacement life of network assets. For example, a distributor may have higher unit costs than other distributors for particular assets, but these assets may in turn have longer expected replacement lives. In contrast, a distributor may have lower unit costs than other distributors for particular assets, but these assets may have shorter expected replacement lives. Further details about our repex model are outlined in appendix C.

A.4 Assessment of bottom-up and top-down methodologies

In assessing whether TasNetworks' revised capex forecast is prudent and efficient, we examined the forecasting methodology and underlying assumptions used to derive its forecast. In particular, some of the evidence that we can use to justify the prudency and efficiency of a bottom-up forecast at the program or project level is:

- identifying and quantifying all reasonable options in a cost-benefit analysis, including deferral or 'do nothing' scenarios;
- cost-benefit analysis that incorporates a quantified risk assessment, where the most beneficial program or project is selected, or clear and justified reasoning as to why another option was chosen; and
- reasons to support the expenditure timing for the forecast regulatory control period, particularly if the expenditure may have been deferred in previous regulatory control periods.

Our industry practice application note,[28] which relates to asset replacement planning, aims to assist network businesses with this bottom-up forecast. In addition to a bottom-up build, a holistic and strategic consideration or assessment of the entire forecast capex portfolio would be evidence that some discipline has been applied at the top-down level. In particular, a top-down challenge would give us confidence that:

- the bottom-up builds have been subject to overall checks against business governance and risk management arrangements;
- synergies between programs or projects have been identified, which may reduce the need for, scope or cost of some programs or projects over the forecast regulatory control period;
- subjectivity from the bottom-up forecasts has been addressed; and
- the timing and prioritisation of capital programs and projects have been determined over both the short and long term, such that delivery strategy has been considered.

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[27] Our modelling approach means the 'historical scenario' will always be higher than the 'cost scenario' and the 'lives scenario', and the 'combined scenario' will always be lower than the 'cost scenario' and the 'lives scenario'.

[28] This application note does not replace published guidelines. Rather, it supplements the guidelines by outlining principles and approaches that accord with good asset management and risk management practices.

A.5 Economic benchmarking

Economic benchmarking is one of the key outputs of our annual benchmarking report.[29] The NER requires us to have regard to the annual benchmarking report, as it is one of the capex factors.[30] Economic benchmarking applies economic theory to measure the efficiency of a distributor's use of inputs to produce outputs, having regard to the operating environment and network characteristics.[31]

Economic benchmarking allows us to compare the performance of a distributor against its own past performance and the performance of other distributors. It also helps to assess whether a distributor's capex forecast represents efficient costs.[32] The AEMC stated:

> Benchmarking is a critical exercise in assessing the efficiency of an NSP.[33]

Several economic benchmarks from the annual benchmarking report are relevant to our capex assessment. These include measures of total cost efficiency and overall capex efficiency. In general, these measures calculate a distributor's efficiency with consideration given to its inputs, outputs and its operating environment.

We consider each distributor's operating environment in so far as there are factors outside of a distributor's control that affects its ability to convert inputs into outputs. Once we consider these exogenous factors, we expect distributors to operate at similar efficiency levels. One example of an exogenous factor we consider is customer density.

A.6 Other assessment factors

We considered several other factors when assessing TasNetworks' revised total capex forecast. These factors include:

- safety and reliability statistics (SAIDI and SAIFI);
- internal technical and engineering review;
- external consultant review of TasNetworks' initial proposal;
- submissions made by various stakeholders; and
- other information provided by TasNetworks.

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29 AER, *Annual benchmarking report: Electricity distribution network service providers*, November 2018.

30 NER, cl. 6.5.7(e)(4).

31 AER, *Better regulation: Expenditure forecasting assessment guidelines for electricity distribution – explanatory statement*, November 2013, p. 78.

32 NER, cl. 6.5.7(c).

33 AEMC, *Final rule determination: National electricity amendment (Economic regulation of network service providers) Rule 2012*, 29 November 2012, p. 25.

B Assessment of capex drivers

This appendix outlines our detailed analysis of the categories of TasNetworks' revised capex forecast for the 2019–24 regulatory control period. These categories are augmentation capex (augex), customer connections capex, replacement capex (repex), non-network capex and capitalised overheads.

As we discuss in the capex attachment, TasNetworks has not justified that its revised total capex forecast reasonably reflects the capex criteria. In this appendix, we set out further analysis in support of this view and the different assessment techniques we relied on to form this view. The structure of this appendix is:

- Section B.1 – substitute estimate;
- Section B.2– forecast augex;
- Section B.3– forecast customer connections capex;
- Section B.4 – forecast repex;
- Section B.5 – forecast non-network capex; and
- Section B.6 – forecast capitalised overheads.

B.1 Substitute estimate

Our substitute estimate of TasNetworks' revised total capex forecast for the 2019–24 regulatory control period is $651.1 million ($2018–19). We analysed TasNetworks' revised proposal and determined that it has not established that its forecast reflects the capex criteria. Table B.1.1 below outlines our final decision.

Table B.1.1 – Final decision on TasNetworks' total net capex forecast ($2018–19, million)

	2019–20	2020–21	2021–22	2022–23	2023–24	Total
TasNetworks' revised proposal	152.3	142.3	130.0	137.5	140.9	**703.0**
AER final decision	140.3	131.6	119.6	127.8	131.8	**651.1**
Difference	-12.0	-10.7	-10.4	-9.7	-9.1	**-51.9**
Percentage difference	-8%	-8%	-8%	-7%	-6%	**-7%**

Source: TasNetworks' revised PTRM and AER analysis.

Note: Numbers may not add due to rounding.

We are satisfied that our substitute estimate of total capex reasonably reflects the capex criteria, taking into account the capex factors.[34] We have based our substitute estimate on the assessment techniques explained in section 5.3 and appendix A.

[34] NER, cl. 6.5.7(e).

B.2 Forecast augex

Augmentation is typically triggered by the need to build or upgrade the network to address changes in demand and network utilisation. However, it can also be triggered by the need to upgrade the network to comply with quality, safety, reliability and security of supply requirements.

B.2.1 TasNetworks' revised proposal

TasNetworks' revised proposal included forecast augex of $45.3 million ($2018–19) for the 2019–24 regulatory control period. As noted in section 5.2.2, this augex forecast is different from the initial augex forecast considered in our draft decision. This augex forecast reflects an allocation correction from repex to augex (in particular augex to maintain reliability and quality of supply) compared with our assessment of TasNetworks' initial proposal.[35] Our engagement with TasNetworks regarding this reallocation is discussed in more detail in Appendix D.

TasNetworks' initial proposal included forecast augex of $32.4 million ($2018–19, including overheads), which we accepted in our draft decision. Apart from the reallocation issue discussed above, TasNetworks submitted that $1.3 million of the increased augex in its revised proposal related to an additional project to provide electricity supply to Crotty Dam, which was identified following the submission of its initial proposal.[36]

The addition of the Crotty Dam project did not fully explain the proposed increase in forecast augex in TasNetworks' revised proposal. We sought further information from TasNetworks to justify the remainder of the proposed augex increase. TasNetworks also identified a new augex category for works in progress ($3.6 million ($2016–17)), which it had not included in its initial proposal.[37]

B.2.2 Final decision position

TasNetworks has demonstrated that its forecast augex of $45.3 million ($2018–19) is prudent and efficient, and would form part of a total capex forecast that reasonably reflects the capex criteria. We have therefore included this amount in our substitute estimate of total forecast capex for the 2019–24 regulatory control period.

This conclusion reflects our assessment of the information available to us, including further information we sought in relation to the augex to maintain reliability and quality of supply and works in progress that was not included as part of TasNetworks' proposed augex in its initial proposal.

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35 TasNetworks, *Response to AER information request 047 – Capex*, 21 February 2019.

36 TasNetworks, *Revised regulatory proposals 2019–24*, November 2018, p. 46.

37 TasNetworks, *Response to AER information request 047 – Capex*, 21 February 2019, p. 10.

B.2.3 Reasons for our decision

We have applied several assessment techniques to assess TasNetworks' revised augex forecast against the capex criteria. In reaching our position, we:

- assessed trends comparing historical actual and forecast augex as well as trends in maximum demand and connection point utilisation; and
- reviewed TasNetworks' expenditure forecasting methodology, including a review of key inputs and assumptions and the project documentation supporting TasNetworks' proposal.

Trend analysis

Trend analysis allows us to draw general observations about how a business is performing. In addition, one capex factor that we must have regard to is the actual and expected capital expenditure during any preceding regulatory control period.[38]

Our trend analysis allows us to gauge how TasNetworks' actual augex compares with forecast augex for the 2019–24 regulatory control period. Where past expenditure was sufficient to achieve the capex objectives, this can be a reasonable indicator of whether an amount of forecast augex is likely to be efficient and prudent, and therefore contributes to a forecast of total capex that reasonably reflects the capex criteria.[39]

Our analysis shows TasNetworks' forecast augex for the 2019–24 regulatory control period is higher than the 2017–19 regulatory control period, but lower than the previous regulatory control period between 2012–13 and 2016–17.

We consider that our analysis of historical trends is useful in confirming that the underlying requirement for augex remains stable and is consistent with the overall trends in maximum demand and utilisation. However, localised areas of demand growth and the need to address compliance with network technical requirements can drive the need for specific projects.

Crotty Dam

TasNetworks submitted the following in its revised proposal in relation to the proposed Crotty Dam project:

- there are two locations at Crotty Dam that have been supplied by a Remote Area Power Supply (RAPS) system since 2014, being the dewatering site and the intake gate site
- the primary sources of power at both sites are diesel generators. These mainly charge a lead acid battery bank, but they are sized for the maximum load. Since

[38] NER, cl. 6.5.7(e)(5).

[39] AER, *Better regulation: Expenditure forecasting assessment guideline for electricity distribution,* November 2013, pp. 7–9.

the installation of the RAPS in 2014, the baseload at both sites has increased. The change in load has caused the RAPS system at the intake site to start failing.

- the original intake site diesel generator failed in March 2018. A generator was hired to maintain supply and a replacement generator has now been installed, but a permanent sustainable solution is needed. TasNetworks has investigated four long-term solutions, being two RAPS alternatives and two overhead power line options. TasNetworks' investigations concluded that the optimal solution is the installation of an overhead 22 kV power line between John Butters Power Station and the Crotty Dam site, and the decommissioning of the existing RAPS system.

We consider that TasNetworks has justified its proposed augex investment for Crotty Dam of $1.3 million. TasNetworks evaluated a number of alternative solutions and its proposal provides for a long-term permanent solution to maintain supply to Crotty Dam. We consider that the installation of an overhead 22 kV power line between John Butters Power Station and the Crotty Dam site, and the decommissioning of the existing RAPS system, is a prudent and efficient investment to maintain electricity supply at Crotty Dam.

Augex to maintain reliability and quality of supply

During discussions with TasNetworks, we were informed that a number of distribution augex projects and programs (in particular augex to maintain reliability and quality) were assessed as repex in our draft decision.[40] We requested TasNetworks to provide further supporting information for a sample of the most material projects and programs not previously assessed as augex projects. In particular, we requested TasNetworks to provide information that supports the need, scope, and cost of a number of these projects, including:

- Power Quality (PQ) Capital Program – LV Transformer Augmentation Component ($7.2 million)[41]
- Endangered Species Protection Program ($5.5 million)[42]; and
- Augment HV Feeder – TRIP P ($1.7 million).[43]

Power Quality Capital Program – LV Transformer Augmentation Component

TasNetworks submitted that the Power Quality Capital Program – LV Transformer Augmentation Component is the major element of its Power Quality Capex Program and provided a copy of its Investment Evaluation Summary for this program.[44] TasNetworks submitted that the objective of the Power Quality Capex Program is to finance the full range of network corrections undertaken in response to power quality issues, primarily identified through customer complaints. TasNetworks stated that it represents the base cost of maintaining network performance and regulatory power

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40 TasNetworks, *Response to AER information request 046 – Capex*, 4 February 2019.
41 TasNetworks, *Response to AER information request 047 – Capex*, 21 February 2019, p. 8.
42 TasNetworks, *Response to AER information request 046 – Capex*, 7 February 2019, pp. 9–12.
43 TasNetworks, *Response to AER information request 047 – Capex*, 21 February 2019, p. 8.
44 TasNetworks, *Response to AER information request 047 – Capex*, 21 February 2019, p. 8.

quality requirements at its historic levels. TasNetworks submitted that the program is designed to align with the following specific business requirements:[45]

- maintaining network performance, both in controlling local issues and managing power quality overall; and
- compliance with the NER, Tasmanian Electricity Code and Australian Standards.

TasNetworks submitted that the upcoming scale and impact of PV penetration within the Tasmanian distribution system is currently unknown, but that the increasing penetration of PV generation will almost certainly result in an increasing number of LV transformer upgrades to maintain current power control levels.[46]

Endangered Species Protection Program

TasNetworks submitted that the endangered species program is targeted at reducing TasNetworks' impact on threatened birds, particularly the Tasmanian wedge-tailed eagle. The program is to install bird mitigation devices including bird flight diverters and bird perches to reduce TasNetworks environmental impact, and therefore the associated legal and reputational risks. The areas chosen for mitigation works are areas that have experienced previous threatened bird strikes and near-miss sightings (about 10 per cent of TasNetworks' single circuit high voltage network).[47]

TasNetworks estimated that one thousand Tasmanian wedge-tailed eagles remain, and that with a two per cent population increase possible per year, 33 electrocutions per year create environmental, legal and reputational risks for TasNetworks that must be managed. TasNetworks submitted that it has prioritised sites for mitigation works that surround spans that have previously electrocuted a Tasmanian wedge-tailed eagle and have land characteristics that are likely to attract wedge-tailed eagle populations. TasNetworks reported that there have been 64 reported wedge-tailed eagle electrocutions since the 2015–16 financial year, and assuming a conservative 25 kilometre radius of hunting for each wedge-tailed eagle, around 1,600 kilometres of its network is classed as the highest risk.[48]

TasNetworks considers that the 10 per cent figure is a conservative estimate used to ensure it is not overstating the risk. TasNetworks submitted that it is waiting for the finalisation of the Eagle Strike Risk Model being developed by an external contractor, which will provide a detailed estimate, including locations, of the network that provides the highest risk to the Tasmanian Wedge-tailed eagle. TasNetworks considers that this model will provide an estimate greater than 10 per cent for the highest risk areas.[49]

Augment HV Feeder – TRIP P

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45 TasNetworks, *Revised regulatory proposal 2019–24 – Investment evaluation summary: Power quality capex program*, November 2018.

46 TasNetworks, *Revised regulatory proposal 2019–24 – Investment evaluation summary: Power quality capex program*, November 2018.

47 TasNetworks, *Response to AER Information request 046 – Capex*, 7 February 2019, p. 11.

48 TasNetworks, *Response to AER Information request 046 – Capex*, 7 February 2019, p. 11.

49 TasNetworks, *Response to AER Information request 046 – Capex*, 7 February 2019, p. 10.

This program is designed to address poor performing communities and feeders within the 2019–24 regulatory control period.[50] TasNetworks submitted an investment evaluation summary for this program.[51]

TasNetworks submitted that this reinforcement program manages network risk associated with operational limitations of distribution elements that contribute to poor feeder, community (via the Tasmanian Electricity Code) and system (STPIS) performance. TasNetworks proposes to target augmentation development projects to restore the performance of the poorest performing reliability communities and worst performing feeders towards the performance thresholds as described in the Tasmanian Electricity Code. Reinforcement works under the Trip-P and Trip-S programs are intended to address and maintain reliability performance, including:

- addressing the worst performing HV feeders;
- addressing the poorest performing Reliability Communities; and
- maintaining Reliability Category performance at a system level.[52]

Conclusion

On the basis of the information provided by TasNetworks, we consider that TasNetworks has established the need, scope, and cost of its proposed augex to maintain the reliability and quality of its electricity supply.

Works in Progress

We requested TasNetworks provide further details in regards to the new augex category not included in its initial capex proposal for works in progress. In its response, TasNetworks stated that the works in progress amount of $3.6 million ($2016–17) is driven by delays caused by severe weather events in May and August 2018, and that the works will not be completed in the current financial year. TasNetworks also supplied a spreadsheet providing further details of the augex projects included as works in progress.[53]

We consider that the weather events described by TasNetworks that occurred in May and August 2018 are likely to have caused delays to a number of TasNetworks' augex projects. TasNetworks' forecast augex of $3.6 million for works in progress relates to specific projects identified by TasNetworks as commenced but not able to be completed in the current regulatory control period. We consider TasNetworks' forecast capex for works in progress is therefore prudent and efficient, and would form part of a total capex forecast for the 2019–24 regulatory control period that reasonably reflects the capex criteria.

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50 TasNetworks, *Response to AER Information request 047 – Capex*, 21 February 2019, p. 8.

51 TasNetworks, *Response to AER Information request 047 – Investment evaluation summary: Augment HV feeder – TRIP-P*, 21 February 2019.

52 TasNetworks, *Response to AER Information request 047 – Investment evaluation summary: Augment HV feeder – TRIP-P*, 21 February 2019, p. 3.

53 TasNetworks, *Response to AER Information request 047*, 21 February 2019.

Conclusion

On the basis of our review of TasNetworks' justification for its proposed augex program, we consider TasNetworks has demonstrated that its proposed augex is efficient and prudent, and would form part of a total capex forecast that reasonably reflects the capex criteria. We have included TasNetworks' forecast of required augex in our substitute estimate of total forecast capex required to achieve the capex objectives.

B.3 Forecast customer connections capex

Connections capex relates to costs incurred in relation to the connection of new customers or changes to existing connections.

B.3.1 TasNetworks' revised proposal

TasNetworks proposed forecast gross customer connections capex of $116.9 million ($2018–19) in its revised proposal. As noted in section 5.2.2, this connections capex forecast is slightly different from the initial connections capex forecast considered in our draft decision.

Our draft decision accepted TasNetworks' initial forecast for gross distribution customer connections capex of $123.0 million ($2018–19, including overheads) as part of our substitute estimate of total forecast capex.[54] In its revised proposal, TasNetworks increased forecast gross connections capex by $38.3 million ($2018–19, including overheads) or 31 per cent to $161.3 million over the 2019–24 regulatory control period.[55] TasNetworks' forecast direct costs (excluding overheads) are $116.9 million (gross connections capex) and $64.9 million (net connections capex) after adjusting for $52.0 million in capital contributions.

TasNetworks attributed the significant increase in gross distribution connections capital expenditure to correcting an error made in preparing its initial proposal whereby forecast direct capex for connections was incorrectly split between direct capex and overheads.[56] This resulted in an understatement of both direct connections capex and overheads allocated to this category of expenditure.

TasNetworks also proposed a significant increase in forecast capital contributions of approximately $20.6 million ($2018–19) to $52.0 million over the 2019–24 regulatory control period. This is a 66 per cent increase from its initial of $31.2 million. In our draft decision, we noted our expectation that TasNetworks would submit a revised (higher) forecast of customer contributions in its revised proposal in light of updated actual customer contributions data from 2017–18.

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54 TasNetworks, *Tasmanian Transmission and Distribution Revenue Proposals 2019–24,* 31 January 2018, p. 116.

55 TasNetworks, *Tasmanian Transmission and Distribution Revised Revenue Proposals 2019–24, 29* November 2018, p. 44.

56 TasNetworks, *Tasmanian Transmission and Distribution Revised Revenue Proposals 2019–24, 29* November 2018, p. 46.

B.3.2 Final decision position

TasNetworks has demonstrated that its forecast net connections capex of $64.9 million ($2018–19) is prudent and efficient, and would form part of a total capex forecast that reasonably reflects the capex criteria. We have therefore included this amount in our substitute estimate of total forecast capex for the 2019–24 regulatory control period.

B.3.3 Reasons for our decision

In our draft decision, we concluded that TasNetworks had demonstrated that its forecast gross connections capex was efficient and prudent, and would form part of a total capex forecast that reasonably reflects the capex criteria. We considered that:

- TasNetworks' customer connections capex forecasting methodology appears reasonable and likely to produce a realistic forecast; and
- TasNetworks' forecast is consistent with the underlying expenditure trend and macroeconomic drivers of new connections activities in Tasmania.

In its revised proposal, TasNetworks amended its customer connections capex forecast to correct an error in its initial proposal. TasNetworks' submitted that its initial forecast of customer connections capex inadvertently excluded overheads.[57] In its submission, the TSBC sought confirmation from us that the increased forecast for connections expenditure was appropriate.[58]

We sought additional information from TasNetworks to explain the nature of the error identified in its initial customer connections capex forecast. TasNetworks advised that its initial proposal incorrectly split the forecast of direct expenditure for customer connections capex between direct and overhead expenditure. This error under-estimated both the direct expenditure and allocated overheads components of forecast customer connections capex. The revised proposal allocated the forecast direct expenditure for customer connections correctly. As a result, TasNetworks' revised proposal customer connections capex reflects both an increase in direct connections capex and a reallocation of total overheads based on the changes in direct capex.[59]

Based on the information provided by TasNetworks, we are satisfied that the forecast of customer connections capex in the 2019–24 regulatory control period included in TasNetworks initial regulatory proposal and accepted in our draft decision reflected an error and was therefore understated. TasNetworks has corrected this error in its revised proposal. We therefore consider TasNetworks' revised proposal is more likely to reflect an accurate forecast of actual expenditure requirements in this category in 2019–24 regulatory control period.

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57 TasNetworks, *Tasmanian Transmission and Distribution Revised Revenue Proposals 2019–24, 29* November 2018, p. 46.

58 Tasmanian Small Business Council, *Submission on TasNetworks' revised proposal,* January 2019, p. 40.

59 TasNetworks, *Response to AER information request 041*, 29 January 2019, pp. 11–12.

Importantly, in correcting the error identified in its initial proposal, TasNetworks did not change its underlying forecasting methodology, which in our draft decision we found to be robust and capable of producing a realistic and unbiased forecast of connections volumes. We therefore maintain our view, as set out in our draft decision, that TasNetworks' customer connections capex forecasting methodology appears reasonable and likely to produce a realistic forecast.

We recognise that, in part, our draft decision to accept TasNetworks' forecast customer connections capex was based on trend analysis that suggested that expenditure in this category was forecast to remain low compared with historical levels of investment. TasNetworks' revised customer connections capex forecast, while no longer below longer term historical levels, remains in line with recent actual levels of capex in this category and reflective of the macroeconomic drivers of new connections activities in Tasmania.

For these reasons, we have therefore included TasNetworks' corrected forecast for customer connections capex in our substitute estimate of total forecast net capex for the 2019–24 regulatory control period.

Customer contributions

In our draft decision, we found that TasNetworks' customer contribution forecast was significantly lower than the historical actual contributions received during the previous five year period. However, we made no adjustment to TasNetworks' forecast customer contributions in the expectation that TasNetworks would submit a revised (higher) forecast in its revised proposal.

TasNetworks' revised proposal included a significant increase in forecast customer contributions of approximately $20.6 million ($2018–19) to $52.0 million over the 2019–24 regulatory control period, a 66 per cent increase from its initial proposal forecast. This partially offsets the increase in gross customer contributions capex discussed above. TasNetworks submitted that, as foreshadowed in our draft decision, it had amended its forecast customer contributions for the 2019–24 regulatory control period in light of updated actual data from 2017–18.

We consider that TasNetworks' revised forecast of customer contributions in the 2019–24 regulatory control period is reasonable. As the TSBC submitted, TasNetworks' updated forecast for customer contributions of $52.0 million is approximately in line with the previous five year period, totalling $57.1 million.[60] As a basis for estimation, the 2017–18 year is the latest available historical data and is the first year of application of TasNetworks' current connection policy. It is therefore likely to reasonably reflect the expected level of customer contributions as a proportion of gross connections capex in the 2019–24 regulatory control period. We have therefore included TasNetworks' revised forecast of customer contributions in our substitute estimate of total forecast capex for the 2019–24 regulatory control period.

[60] Tasmanian Small Business Council, *Submission on TasNetworks' revised proposal,* January 2019, p. 44.

B.4 Forecast repex

Replacement capital expenditure (repex) must be set at a level that allows a distributor to meet the capex criteria. Replacement can occur for a variety of reasons, including when:

- an asset fails while in service or presents a real risk of imminent failure;
- a condition assessment of the asset determines that it is likely to fail soon (or degrade in performance, such that it does not meet its service requirement) and replacement is the most economic option;[61]
- the asset does not meet the relevant jurisdictional safety regulations and can no longer be safely operated on the network; and
- the risk of using the asset exceeds the benefit of continuing to operate it on the network.

The majority of network assets will remain in efficient use for far longer than a single five-year regulatory control period (many network assets have economic lives of 50 years or more). As a result, a distributor will only need to replace a portion of its network assets in each regulatory control period. Our assessment of repex seeks to establish the proportion of TasNetworks' assets that will likely require replacement over the 2019–24 regulatory control period and the associated capital expenditure.

B.4.1 TasNetworks' revised proposal

TasNetworks proposed forecast repex of $274.2 million ($2018–19) in its revised proposal. As noted in section 5.2.2, this repex forecast is different from the initial repex forecast considered in our draft decision. This revised forecast is $34.1 million (14 per cent) higher that its actual and estimated repex of $240.1 million ($2018–19) over the 2014–19 period.

Following our draft decision, TasNetworks submitted a revised total repex forecast that is $75.0 million (21 per cent) lower than its initial total repex forecast of $349.2 million ($2018–19). However, TasNetworks' revised repex forecast remains 18 per cent higher than our draft decision.

In response to our draft decision and following extensive engagement, TasNetworks provided cost-benefit analysis for several key programs, most notably its proactive overhead conductor, service line and underground cable programs. We commend TasNetworks for seeking to engage with us on these issues and responding to our draft decision by providing cost-benefit analysis with risk quantification in support of its revised repex forecast.

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[61] A condition assessment may relate to assessment of a single asset or a population of similar assets. High-value/low-volume assets are more likely to be monitored on an individual basis, while low-value/high-volume assets are more likely to be considered from a total asset population perspective.

B.4.2 Final decision position

We do not accept TasNetworks' revised repex forecast of $274.2 million ($2018–19). We have included an amount of $244.9 million ($2018–19) in our substitute estimate of total capex. TasNetworks has not demonstrated that its repex forecast is prudent and efficient, and it would not form part of a total capex forecast that reasonably reflects the required expenditure for this driver. Table B.4.1 below highlights our final decision.

Table B.4.1 – Final decision on TasNetworks' revised repex forecast ($2018–19, million)

	2019–20	2020–21	2021–22	2022–23	2023–24	Total
TasNetworks' revised proposal	59.2	56.9	52.2	53.4	52.4	**274.2**
AER final decision	52.4	50.9	46.4	48.1	47.2	**244.9**
Difference	-6.9	-6.0	-5.8	-5.3	-5.2	**-29.2**
Percentage difference	-12%	-11%	-11%	-10%	-10%	**-11%**

Source: TasNetworks' revised capex model and AER analysis.

Note: Numbers may not add due to rounding.

Although it may appear that TasNetworks reduced its repex forecast by 21 per cent from its initial proposal, it is important to note that approximately one third of the reduction in repex from the initial proposal is an allocation correction from repex to overheads and augex in the revised proposal. Our engagement with TasNetworks regarding this reallocation is discussed in more detail in Appendix D. The actual repex reduction from the initial to the revised proposal is 15 per cent.

Despite the repex reduction, TasNetworks' modelled repex forecast is still higher than our repex model threshold. We also conducted a bottom-up review of several key repex programs and found that TasNetworks has applied conservative input assumptions in its cost-benefit analysis models, which overstates the risks associated with its replacement programs. TasNetworks also has not provided sufficient reasoning, such as quantitative evidence, to support its forecast repex increase. Therefore, TasNetworks has not adequately justified the repex forecast for its proactive replacement programs.

Our substitute repex estimate, informed by our repex modelling results, is consistent with TasNetworks' actual repex spend of $240.1 million over the 2014–19 period. As we assessed that TasNetworks has not sufficiently justified its forecast increase in repex, we consider a repex allowance consistent with its business-as-usual spend is reasonable.

B.4.3 Reasons for our decision

Similar to our draft decision, we have applied several assessment techniques to assess TasNetworks' revised repex forecast against the capex criteria, as well as considering stakeholder submissions. These techniques include:

- trend analysis;

- repex modelling;
- bottom-up engineering assessment; and
- other considerations.

Trend analysis

Trend analysis of a distributor's past expenditure allows us to make general observations about how a distributor is performing, as well as to provide a check against our predictive modelling results. This is consistent with the capex factor that requires us to have regard to the actual and expected capital expenditure during any preceding regulatory control period.[62]

For some aspects of our assessment where we have not relied on predictive modelling, we have considered historical levels of expenditure to assess forecast repex. In particular, where past expenditure was sufficient to achieve the capex objectives, this can be a reasonable indicator of whether an amount of forecast repex is prudent and efficient, and whether we would be satisfied this amount forms part of a total capex forecast that reasonably reflects the capex criteria.[63]

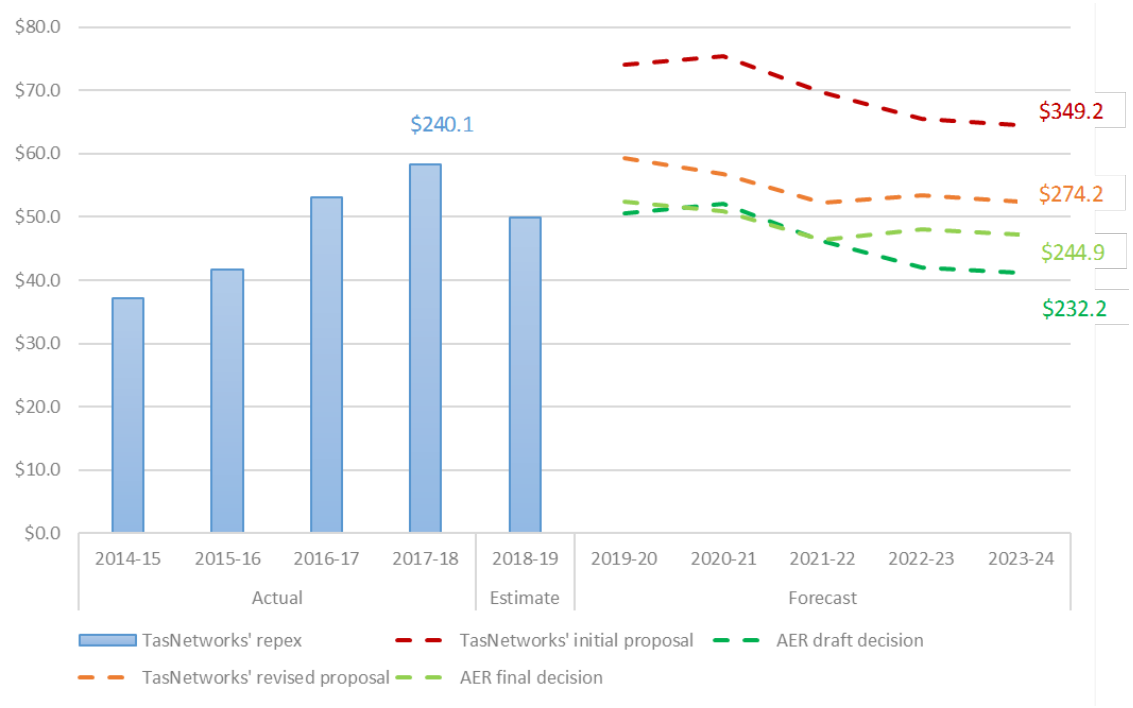
In forming our position, we had regard to the following trends:

- TasNetworks' revised repex forecast for the 2019–24 regulatory control period relative to its actual spend in the last five years and its initial repex forecast (figure B.4.1); and
- historical versus forecast repex and replacement volume trends at both the asset group and asset category level.

62 NER, cl. 6.5.7(e)(5).

63 AER, *Better regulation: Expenditure forecasting assessment guideline for electricity distribution,* November 2013, pp. 7–9.

Figure B.4.1 – TasNetworks' historical vs forecast repex snapshot ($2018–19, million)

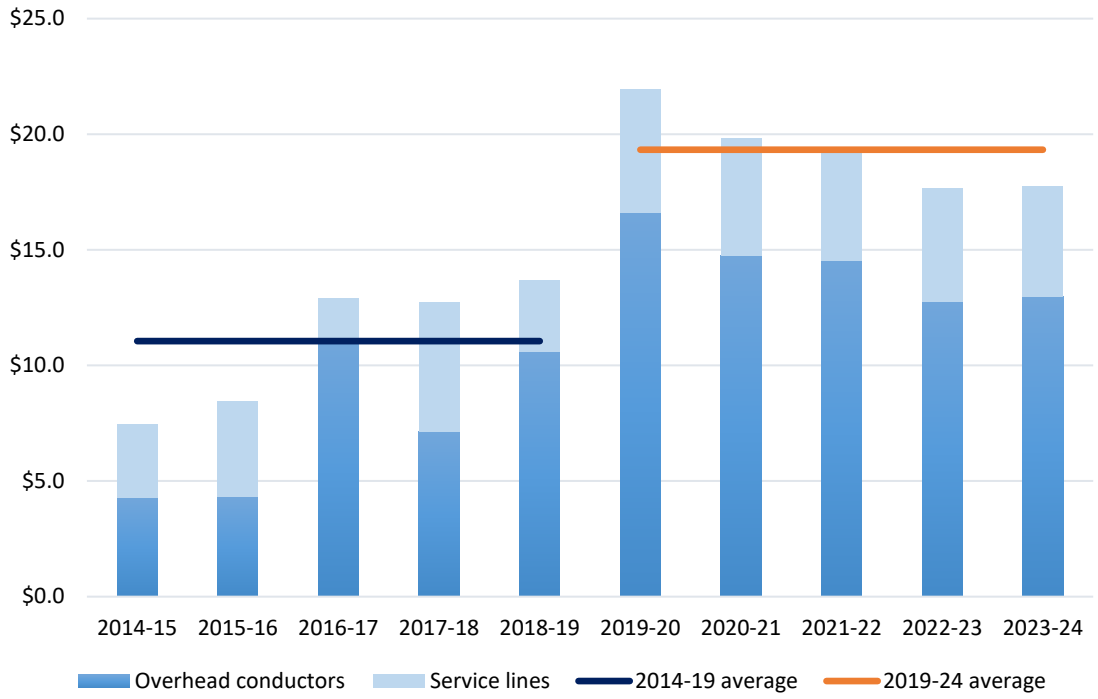


Source: AER analysis.

Figure B.4.1 highlights that although TasNetworks' revised repex forecast is lower than its initial repex forecast, TasNetworks is still forecasting an increase in repex in the 2019–24 regulatory control period. Total repex is forecast to increase from $240.1 million over the 2014–19 period[64] ($48.0 million per annum) to $274.2 million over the 2019–24 regulatory control period ($54.8 million per annum).

[64] Note: this encompasses two regulatory control periods due to TasNetworks' two-year transitional arrangement for the 2017–19 period.

Figure. B.4.2 – TasNetworks' repex snapshot – overhead conductors and service lines ($2018–19, million)



Source: AER analysis.

Figure B.4.2 compares TasNetworks' actual and estimate repex on its overhead conductor and service line asset groups, with its revised forecasts for the 2019–24 regulatory control period. Figure B.4.2 highlights that TasNetworks has forecast a significant increase in repex for the overhead conductor and service line asset groups over this period. Its actual and estimated repex on these two asset groups in the 2014–19 period totals $55.3 million ($2018–19), while it is forecasting to spend $96.6 million ($2018–19) on these two groups in the 2019–24 regulatory control period. This represents a 75 per cent increase.

The repex modelling results (discussed below) also identified these two asset groups as areas requiring additional assessment given that TasNetworks performs above the industry median on unit costs and below the industry median on expected asset replacement lives for these asset groups.

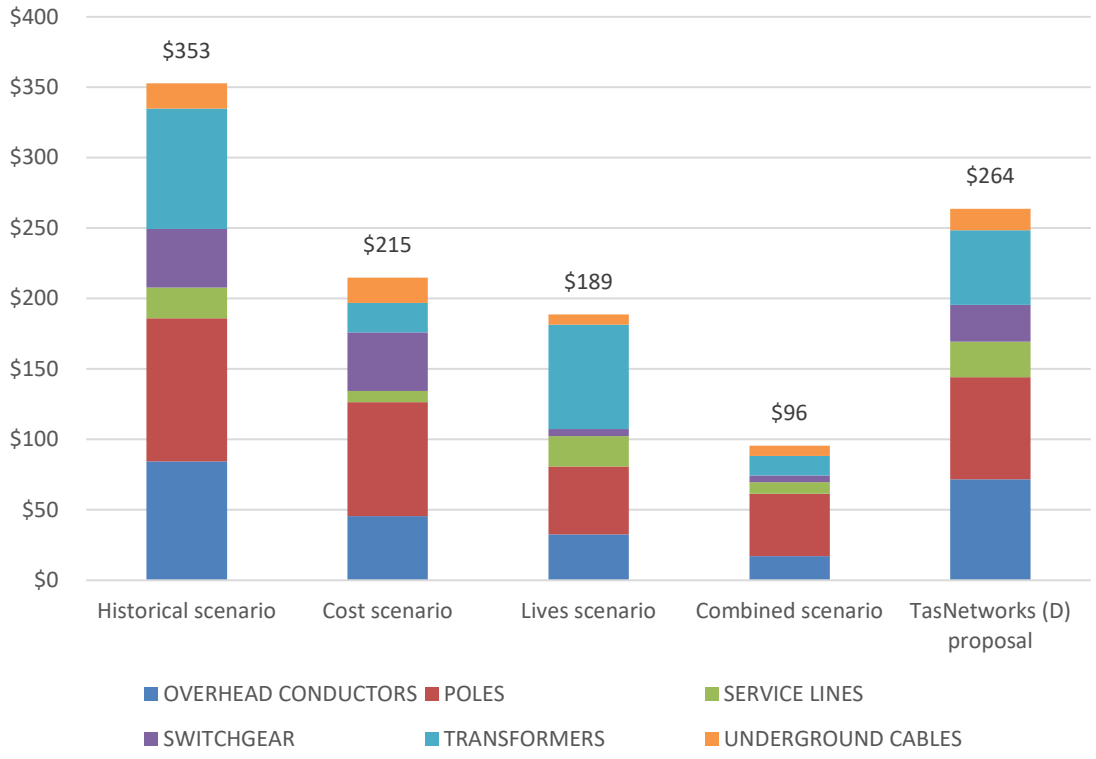
Repex modelling

In our draft decision, we presented our initial repex modelling results against TasNetworks' initial modelled repex forecast. Our draft decision highlighted that TasNetworks' modelled repex forecast differed most significantly from our repex modelling results in the overhead conductor, service line and underground cable asset

groups.[65] TasNetworks' proposed repex for these asset groups exceeded both the 'cost scenario' and the 'lives scenario', which indicated that its forecasts for these asset groups had, on average, higher unit costs and lower expected replacement lives than other distributors. These three asset groups were therefore a specific focus of our bottom-up review.

In its revised proposal, TasNetworks reduced its modelled repex forecast by $63.0 million (19 per cent) in response to our draft decision. Figure B.4.3 outlines our updated repex modelling results compared with TasNetworks' revised modelled repex forecast. Our updated results include new annual category analysis RIN data that was submitted for 2017–18 for nine of the 14 distributors. This new data has not materially affected our four modelled scenarios for TasNetworks.

Figure B.4.3 – Revised repex modelling results ($2018–19, million)



Source: AER analysis.

Figure B.4.3 outlines that, in response to our draft decision, TasNetworks has reduced its modelled underground cable forecast below our updated repex model threshold. This is primarily due to a reduction in TasNetworks' low-voltage CONSAC cable replacement program, which we highlighted as an issue in our draft decision.

However, similar to our draft decision, figure B.4.3 highlights that TasNetworks' forecasts for the overhead conductor and service line asset groups differ most

[65] AER, *TasNetworks distribution determination 2019–24 – Attachment 5*, September 2018, p. 40.

significantly from our repex model threshold (cost scenario). We therefore focused our bottom-up engineering assessment (discussed below) on individual replacement programs and projects that fall into these two assets groups.

TasNetworks' remaining repex forecast cannot be modelled using the repex model and is therefore assessed as non-modelled repex. In our draft decision, we highlighted that TasNetworks' non-modelled repex forecast was prudent and efficient, and would form part of a total capex forecast that reasonably reflected the capex criteria.[66] This position has not changed in our final decision.

Bottom-up engineering assessment

Below is a summary of our bottom-up assessment of TasNetworks' forecasts for the overhead conductor and service live asset groups. Overall, our bottom-up review of a sample of overhead conductor and service line programs revealed systemic issues with TasNetworks' cost-benefit analysis modelling and overly risk-averse input parameters.

Our bottom-up assessment of TasNetworks' supporting cost-benefit analysis models highlighted a systemic issue where the proposed benefits, i.e. the proposed risk reduction of the replacement option, were double counted in each model. As a result, the proposed amount of repex that could be spent to address the replacement need was overstated in each program and project. CCP13 highlighted the same concern in its analysis of TasNetworks' revised proposal and subsequent submission.[67]

On 21 December 2018, we met with TasNetworks staff to discuss our preliminary assessment of its cost-benefit analysis models and outlined that its models double counted the proposed benefits of each replacement option. We initially flagged these concerns with TasNetworks via email on 13 December 2018.[68]

In this meeting, TasNetworks acknowledged our concerns with its cost-benefit analysis modelling and acknowledged that it had double counted the benefits. However, TasNetworks noted that this double counting did not change its preferred replacement option for most of its capex programs and projects.[69] Consistent with this view, TasNetworks reviewed its repex cost-benefit analysis, but it did not change any of its preferred replacement options except for its CONSAC cable replacement program, where it accepted our draft decision in response to information request 47.[70] For two other programs,[71] TasNetworks included additional costs and concluded that its preferred option remain unchanged. TasNetworks did not submit an updated repex forecast.

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66 AER, *TasNetworks distribution determination 2019–24 – Attachment 5*, September 2018, p. 41.

67 CCP13, *TasNetworks' electricity network revised revenue proposal 2019–24*, January 2019, p. 13.

68 AER, *TasNetworks' distribution repex cost-benefit analysis,* 13 November 2018.

69 TasNetworks, *Response to information request 047 – Capex*, 12 February 2019.

70 TasNetworks, *Response to information request 047 – Capex*, 12 February 2019.

71 The two programs are the ground mounted substation replacement program and the high-voltage switchgear replacement project. See TasNetworks, *Response to information request 047 – Capex*, 12 February 2019, p .8.

Following TasNetworks' response, we identified that for some programs, the forecast replacement volumes should have been altered once the double counting issue had been removed. However, as the models are not constructed to test the replacement volumes that would optimise the net benefit, we could not rely on TasNetworks' models to come up with a substitute estimate. Therefore, we have relied on our repex modelling results to determine our substitute estimate. This is discussed in more detail below where we outline how we have derived our substitute estimate.

Overhead conductors

TasNetworks proposed ten overhead conductor programs over the 2019–24 regulatory control period. Three of these programs relate specifically to addressing bushfire risk.

TasNetworks submitted that there is an increase in failure rates that necessitates a replacement program for its overhead conductor assets.[72] Its total revised forecast for this asset group is $71.6 million, compared with actual and estimated repex of $37.5 million over the 2014–19 period. This represents a forecast increase of $34.1 million (91 per cent).

Arup, in its review of TasNetworks' initial proposal for the overhead conductor asset group, noted that TasNetworks' options analysis does not appear to consider the optimal rate of replacement or asset condition. Arup's review suggested that the causes of asset performance were not well understood and that it is not reasonable to conclude that TasNetworks' preferred investment option will address the problem. Arup therefore concluded that it could not be confident that the selected option represents the prudent and efficient approach.[73]

For its copper overhead conductor program, TasNetworks has considered three options:

1. a 'do nothing' option;
2. replace a pre-determined volume of defective copper overhead conductor (its preferred option); or
3. defer replacement of copper overhead conductor for 5 years.[74]

In its revised proposal, TasNetworks undertook a similar options analysis, but there is no explanation as to why its preferred option is chosen, except that it has the highest benefit when compared with a 'do nothing' option. TasNetworks' preferred choice appears to be back-solved, with no sensitivity analysis to assess whether a change in key parameters might change the forecast volume chosen. We typically see other businesses undertaking sensitivity analysis to demonstrate the prudency and efficiency of its chosen option.

We have reviewed a sample of the cost-benefit analysis spreadsheets that were provided as part of TasNetworks' revised proposal in support of the overhead

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72 TasNetworks, *BFM – Replace aged deteriorated copper conductor*, November 2018, p. 4.

73 Arup, *Review of TasNetworks' capex proposal for 2019–24,* August 2018, pp.101–108.

74 TasNetworks, *BFM – Replace aged deteriorated copper conductor*, November 2018, p. 9.

conductor asset group. Our analysis has identified that the underlying modelling for TasNetworks' copper and galvanised iron replacement programs assumes that the assets will fail with an exponential growth rate. Table B.4.2 below outlines actual versus TasNetworks' forecast failure rates for two of its overhead conductor replacement programs.

Table B.4.2 – Actual and forecast failure rate for copper and galvanised iron overhead conductors (failures per year per 100kms)

	Actual failure rate – 2006–14	Forecast failure rate – 2019–24
Copper overhead conductors	0.574	1.679
Galvanised iron overhead conductor	0.256	0.526

Source: AER analysis.

Note: The failure rates presented are for both bushfire and non-bushfire areas.

Table B.4.2 highlights that TasNetworks is forecasting a 200 to 300 per cent acceleration in failure rates. This is a key driver of its forecast overhead conductor replacement volumes. In response to our request for evidence to explain the forecast increase in failure rates, TasNetworks stated that the exponential fit, which is fitted to the historical failure rates, is deemed appropriate as the asset fleet is approaching its end-of-life phase and the rates are rising at an increasing rate. No quantitative evidence was provided in support of this statement.[75]

We consider that there is insufficient reasoning to support such an acceleration, as modelled with an exponential function, in failure rates rather than remaining at a failure rate more consistent with observed historical rates. We therefore cannot be confident that TasNetworks' forecast volumes for overhead conductors are prudent and efficient.

Service lines

TasNetworks' proposed repex forecast for service lines is intended to address safety-related issues on its network.[76] TasNetworks noted that low-voltage service lines represent the highest volume of fault responses in the network and if the service lines are in poor condition, they have the potential to harm the community.[77] TasNetworks also submitted that it has limited information on its service line assets but has established that its preferred option for the overhead service line program is to execute a state-wide audit, which would proactively replace all of its 10mm overhead service lines and equipment over seven years.[78]

Based on an audit completed in 2016, TasNetworks noted that 56 per cent of all LV service line failures are caused by 10mm copper wires, suggesting that it is the predominant cause of failure and safety risk. Therefore, TasNetworks argued that the

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75 TasNetworks, *Response to information request 047 – Capex*, 12 February 2019, p. 14.

76 These safety-related issues relate to the risk of electric shock and do not relate to bushfire risk.

77 TasNetworks, *Replace overhead LV services – Investment evaluation summary,* November 2018, p. 3.

78 TasNetworks, *Replace overhead LV services – Investment evaluation summary,* November 2018, p. 8.

audit and the increasing failures necessitates a change to its current strategy of replacing faults on failure.

Arup, in its review of TasNetworks' initial repex forecast, established that there is insufficient evidence to validate that the 10mm service line is the driver of faults or failures, particularly given the lack of information that TasNetworks has on its assets.[79] Arup concluded that it may be prudent for TasNetworks to postpone this investment until it has increased its data capability.[80]

In response to our draft decision, TasNetworks reduced its proposal by 34 per cent from its initial forecast and provided an updated cost-benefit analysis to justify its proactive replacement strategy over the next seven years. Its revised forecast for service lines is still an increase of 41 per cent from the 2014–19 period.

We have reviewed TasNetworks' revised proposal and its supporting cost-benefit analysis. Our review has identified that TasNetworks overstates the risks associated with its service lines by overstating the expected failure rates across the network. It has not provided any material to support the reasoning for its forecast failure rate assumptions.

For example, TasNetworks forecasts 6,092 failures per year over the forecast period, which is approximately 380 per cent higher than average actual failures of 1,610 in 2015 and 2016.[81] This overstated probability of failure overstates the risks associated with these assets. TasNetworks' proposed replacement option therefore overstates the expected risk reduction, which represents the expected benefits of its replacement option. Therefore, TasNetworks has not demonstrated that its proposed repex forecast for the service line asset group is prudent and efficient.

Other considerations

In our draft decision, we highlighted that we were unable to test the effectiveness of TasNetworks' top-down optimisation of 5 per cent for distribution capex in its initial proposal.[82] We agreed with Arup's observation that TasNetworks' top-down 'optimisation' was arbitrary in nature and it was unable to identify specific efficiencies in program delivery. In its revised proposal, TasNetworks stated:

> We have also revisited our proposed optimisation, which imposes a 'top-down' reduction to our total forecast capital expenditure, and highlighted the initiatives that we expect to achieve these savings.[83]

TasNetworks also noted:

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79 TasNetworks noted that it doesn't have information of its LV service assets in its spatial data warehouse. Therefore, it is unknown how many of each type of LV service wire are in the network. See TasNetworks, *Replace overhead LV services – Investment evaluation summary,* November 2018, p .3.

80 Arup, *Review of TasNetworks' capex proposal for 2019–24,* August 2018, pp. 81–86.

81 TasNetworks, *Response to information request 019 – Brady Lake Audit Report,* June 2018, p. 3.

82 AER, *TasNetworks distribution determination 2019–24 – Attachment 5,* September 2018, p. 37.

83 TasNetworks, *Tasmanian Transmission and Distribution Revised Revenue Proposals 2019–24,* 29 November 2018, p. 28.

> We accept the AER's comments in its draft decision that our proposed cost savings have not been explicitly calculated. Nevertheless, we have identified a number of initiatives that support future improvements in our program delivery. These initiatives combined with the expected benefits from SAP implementation, will realise cost savings from improved process efficiencies.[84]

TasNetworks identified specific expected cost savings from improved process efficiencies relating to:

- pole asset management;
- wood pole rectification timeframes;
- program planning and execution; and
- bushfire mitigation programs.[85]

As we noted in our draft decision, in its review of TasNetworks' initial proposal, Arup concluded that TasNetworks was unable to identify how its expected savings would be delivered over the forecast period.[86] Although it is still unclear why the distribution capex optimisation amount is five per cent rather than a higher or lower amount, TasNetworks appears to have identified specific programs and operational measures to generate cost savings and reduce its capex forecast from its initial proposal.

How we have derived our substitute estimate

In constructing a substitute estimate, we can review a business' bottom-up build and identify if certain parameters can be adjusted to produce a different repex forecast. However, we were not able to use TasNetworks' bottom-up cost-benefit analysis models to determine a substitute estimate. As noted above, in addition to the concerns with several key parameters, such as the assumed failure rates, we were not able to adjust the underlying input parameters in the models due to the way they were constructed.

Based on the information available to us, we determined that using the repex model was the best way to derive our substitute estimate. Our substitute repex estimate of $244.9 million has been determined by adjusting TasNetworks' repex forecast for ten overhead conductor programs and three service line programs. Our adjustments bring TasNetworks' proposed repex for overhead conductors and service lines to the industry median level.

For example, our substitute estimate for overhead conductors is derived by applying the percentage difference between TasNetworks' revised forecast and the 'cost scenario' in the revised repex modelling results (figure B.4.3) for that asset group. Table B.4.3 below summarises these calculations.

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84 TasNetworks, *Tasmanian Transmission and Distribution Revised Revenue Proposals 2019–24,* 29 November 2018, p. 60.

85 TasNetworks, *Tasmanian Transmission and Distribution Revised Revenue Proposals 2019–24,* 29 November 2018, p. 60.

86 AER, *TasNetworks distribution determination 2019–24 – Attachment 5, September 2018,* p. 50.

Table B.4.3 – Derivation of substitute estimate for overhead conductors and service lines ($2018–19, million)

	TasNetworks' historical expenditure	TasNetworks' revised forecast	Final decision position	Percentage difference
Overhead conductors	$37.5	$71.6	$45.6	-36%

Source: AER analysis.

We have applied the adjustments outlined in Table B.4.3 to ten overhead conductor and three service line programs in TasNetworks' revised capex model.[87] These adjustments are demonstrated in our final decision capex model.[88] The consistent application across all 13 programs is appropriate on this occasion as it addresses the systemic issues that we have identified with TasNetworks' cost-benefit analysis models, such as the double counting of benefits and the consistent overestimation of forecast failure rates.

Interrelationship between our final decision and TasNetworks' bushfire mitigation programs

TasNetworks proposed $65.2 million for bushfire mitigation related repex programs in its initial proposal. It reduced this amount to $40.9 million in its revised proposal. Three out of the total of ten overhead conductor programs (forecast at $16.4 million) referenced above relate to TasNetworks' bushfire mitigation program. We acknowledge that addressing a certain level of bushfire risk is an important consideration in establishing a prudent and efficient level of capex for the 2019–24 regulatory control period.

Adjusting the amount of repex for all overhead conductor programs, including the three related to TasNetworks' bushfire mitigation programs, produces a substitute estimate of $10.4 million, a difference of $6.0 million. From a total program perspective, our substitute estimate of repex for TasNetworks' bushfire mitigation program is $35.0 million. Table B.4.4 below summarises our position on TasNetworks' bushfire mitigation repex forecast.

Table B.4.4 – TasNetworks' bushfire mitigation repex forecasts ($2018–19, million)

	Initial proposal	Revised proposal	Final decision position
Bushfire mitigation repex related to overhead conductors	$23.5	$16.4	$10.4
Bushfire mitigation repex not related to overhead conductors	$41.7	$24.5	$24.5
Total forecast bushfire mitigation	**$65.2**	**$40.9**	**$35.0**

87 TasNetworks, *Capex forecast model,* November 2018.

88 AER, *TasNetworks distribution – 2019–24 final decision capex model,* April 2019.

Source: AER analysis.

Note: Numbers may not add due to rounding.

To justify its repex forecast relating to bushfire mitigation programs, TasNetworks relied heavily on demonstrating the potential consequences of bushfires in Tasmania, although not necessarily bushfires caused by TasNetworks' electrical assets. It used different sources of information, including the Victorian 2011 Bushfire Safety Taskforce Final report,[89] and an assessment of the potential consequence of bushfires using the Phoenix RapidFire bushfire simulation model,[90] and sought independent legal advice.[91]

The supporting information mostly outlines the consequences of a bushfire in Tasmania. For example, the independent legal advice states that Tasmania has a history of catastrophic fire in 1967 and severe bushfires in 2013 and 2017. The memorandum of advice added that our draft decision provided no explanation why the AER would not accept the high bushfire loss consequence area (HBLCA) as a bushfire area as determined through the Phoenix model, which establishes areas of high and severe bushfire consequence.

We agree with TasNetworks that the consequences of a bushfire are serious and that some expenditure is required to address bushfire risk. However, similar to the conclusion in the Tolhurst report, which was provided in support of TasNetworks' repex forecast, we agree that for risk management to be effective, both the likelihood of exposure and the potential consequence need to be considered together.[92] As noted above, our main concerns are around the likelihood of exposure, specifically the joint probability of an asset failing during a high bushfire danger day, which would lead to a bushfire, rather than the consequence of the bushfire itself.

Overall, TasNetworks has not adequately established that the full $40.9 million is a prudent and efficient amount of repex to address bushfire risk. Our review has identified that the quantitative analysis overstates the probability of failure of its overhead conductors (an asset prone to starting bushfires) by 200 to 300 per cent, relative to actual failure rates. This change (increase) in risk is not supported by any reasoning or evidence.

In addition, the $10.4 million for bushfire mitigation programs that relate to overhead conductors included in our substitute estimate is additional to TasNetworks' existing business-as-usual spending on its overhead conductor replacement programs in high bushfire loss consequence areas.

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89 The report was established to consider how the Victorian Government should implement the recommendation of the Victorian bushfire royal commission.

90 The report concluded that the analysis in the report related to the potential consequence of bushfire. The report adds that the likelihood of exposure has not been considered in detail in the analysis. See TasNetworks, *Response to information request 046 – Tolhurst,* August 2017, p. 25.

91 TasNetworks, *Response to Information request 046 – Memorandum of advice*, November 2018.

92 TasNetworks, *Response to information request 046 – Tolhurst,* August 2017, p. 25.

We consider that this increase is reasonable given that TasNetworks has not demonstrated that there is likely to be an increase in the probability that one of its assets will cause a bushfire over the forecast regulatory control period. There has also been no change in regulatory obligations relating to bushfire mitigation to suggest that the risk of a bushfire will increase over this period. Finally, TasNetworks is currently spending repex on overhead conductors to mitigate bushfires and our substitute estimate provides TasNetworks with an additional amount on top of its current spending levels.

B.5 Forecast non-network capex

Non-network capex relates to expenditure on information and communications technology (ICT) assets, fleet, land and buildings. We have also assessed TasNetworks' forecast capex for the Asset Management Systems (AMS) component of operational support systems and innovation capex as part of this category.

B.5.1 TasNetworks' revised proposal

TasNetworks' revised proposal included forecast non-network capex of $145.0 million ($2018–19). As noted in section 5.2.2, this non-network capex forecast is different from the initial non-network capex forecast considered in our draft decision.

Within the non-network capex category, TasNetworks' revised proposal included forecast ICT capex of $93.1 million ($2018–19) for the 2019–24 regulatory control period, a reduction of $10.7 million ($2018–19) from its initial proposal but an increase of 17 per cent above our draft decision.[93] This reflected a significant reduction in forecast capex for the market data management system project, offset by an increased requirement for ICT security capex.[94]

TasNetworks also proposed an increase to its forecast operational support systems capex, which we had accepted in our draft decision. TasNetworks' revised proposal increased the AMS component of operational support systems capex by $11.0 million ($2018–19) to $24.1 million over the 2019–24 regulatory control period. This is an 85 per cent increase from TasNetworks' initial AMS capex proposal, and our draft decision, of $13.1 million.

TasNetworks' revised proposal explicitly identified a category of 'innovation' capex, including four projects totalling $4.7 million ($2018–19, including overheads).[95] The other categories of non-network capex (fleet, land and buildings) remained essentially unchanged from TasNetworks' initial proposal, which we accepted in our draft decision.

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93 TasNetworks, *Tasmanian Transmission and Distribution Revenue Proposals 2019–24,* 31 January 2018, pp. 56–58.

94 TasNetworks, *Tasmanian Transmission and Distribution Revenue Proposals 2019–24,* 31 January 2018, pp. 57–58.

95 TasNetworks, *Tasmanian Transmission and Distribution Revenue Proposals 2019–24,* 31 January 2018, p. 58.

B.5.2 Final decision position

We do not accept TasNetworks' revised non-network capex forecast of $145.0 million ($2018–19). We have included an amount of $134.2 million ($2018–19) in our substitute estimate of total capex. TasNetworks has not demonstrated that its non-network capex forecast is prudent and efficient, and it would not form part of a total capex forecast that reasonably reflects the capex criteria. Table B.5.1 below outlines our final decision on TasNetworks' non-network capex forecast.

Table B.5.1 – Final decision on TasNetworks' non-network capex forecast ($2018–19, million)

	2019–20	2020–21	2021–22	2022–23	2023–24	Total
TasNetworks' revised proposal	33.4	29.4	21.5	27.7	32.9	**145.0**
AER final decision	30.8	27.1	19.3	25.7	31.4	**134.2**
Difference	-2.6	-2.3	-2.2	-2.1	-1.6	**-10.8**
Percentage difference	-8%	-8%	-10%	-8%	-5%	**-7%**

Source: TasNetworks' revised capex model and AER analysis.

Note: Numbers may not add due to rounding.

B.5.3 Reasons for our decision

Our assessment and conclusions for each category of non-network capex are set out below.

Non-network ICT capex

In our draft decision, TasNetworks did not adequately demonstrate that its forecast non-network ICT capex would form part of a total forecast capex allowance that reasonably reflects the capex criteria.

TasNetworks' revised proposal included forecast ICT capex of $93.1 million ($2018–19) for the 2019–24 regulatory control period, a reduction of $10.7 million ($2018–19) from its initial proposal.[96] TasNetworks' revised ICT capex forecast for the 2019–24 regulatory control period is a 4 per cent increase from actual and estimated non-network ICT capex for the previous five-year period.[97]

Our concerns in the draft decision centred on the Meter Data Management System (MDMS) replacement project. TasNetworks had estimated the total cost of this project in its initial proposal at $63 million, of which $30 million was included in TasNetworks'

[96] TasNetworks, *Tasmanian Transmission and Distribution Revenue Proposals 2019–24,* 31 January 2018, p. 112, and TasNetworks, *Tasmanian Transmission and Distribution Revised Revenue Proposals 2019–24,* 29 November 2018, p. 44.

[97] TasNetworks, *Tasmanian Transmission and Distribution Revenue Proposals 2019–24,* 31 January 2018, pp. 111–112.

forecast capex for the 2019–24 regulatory control period.[98] TasNetworks had not appropriately considered different investment options, quantified the potential benefits of the investment, or developed sufficiently detailed and supported cost estimates for the project.

In its revised proposal, TasNetworks responded to the concerns set out in our draft decision and reduced the total capex for this project by $30.2 million (48 per cent) to $32.5 million in total. As this investment spans two regulatory periods, the impact on the 2019–24 period was a reduction of $13.2 million. The reduction in forecast capex for the MDMS project was partially offset by increased non-network ICT capex in other areas, principally ICT security additional $5.0 million.

We received a number of submissions that touched on TasNetworks' forecast ICT capex. CCP13 expressed concern that this significant amount of expenditure was being undertaken in a concentrated market for software solutions and ongoing maintenance and that there was a lack of confidence that the costs would be efficient.[99] The TSBC submitted that TasNetworks' revised proposal for ICT capex was excessive and inefficient.[100] However, TasCOSS acknowledged TasNetworks' submission of further detail regarding its proposed ICT expenditure and efforts to reduce this expenditure from its initial proposal.[101]

Final decision position

TasNetworks has demonstrated that its revised proposal for non-network ICT capex of $93.1 million is prudent and efficient, and would form part of a total capex forecast that reasonably reflects the capex criteria. We have therefore included this amount in our substitute estimate of total forecast capex for the 2019–24 regulatory control period.

Reasons for our decision

In relation to the MDMS replacement project, our draft decision identified the following concerns with TasNetworks' justification for this investment:

- insufficient transparency in the justification for selecting TasNetworks' preferred option for the MDMS replacement project, which was not the lowest cost or highest NPV credible option considered;
- a lack of identification and quantification of expected project benefits; and
- insufficient justification for using 'order of magnitude' estimates instead of detailed costings when determining project option costs, such that it was not clear that cost estimates reasonably reflected the efficient costs of achieving the capex objectives, or a realistic expectation of the cost inputs required to achieve the capex objectives as required by the NER.

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98 TasNetworks, *Initial regulatory proposals 2019–24,* January 2018, pp. 56–57.

99 CCP13, *TasNetworks' electricity network revised revenue proposal 2019–24,* January 2019, p. 5.

100 Tasmanian Small Business Council, *Submission on TasNetworks' revised proposal,* January 2019, p. 2.

101 Tasmanian Council of Social Service, *Submission on AER draft decision on TasNetworks determination 2019–24,* December 2018, p. 5.

TasNetworks engaged constructively with our draft decision and sought to address these concerns, including by providing an updated investment evaluation summary and NPV analysis to support its revised capex forecast for the project.

In assessing TasNetworks' revised proposal for the MDMS project, we have found that:

- replacement of the MDMS is required, given the risks posed by ongoing operation of the current platform;
- refinement of the project scope and cost estimates since the initial proposal has resulted in a significant reduction in forecast capex for the project, including a reduction of $13.2 million in the 2019–24 regulatory control period;
- the preferred option for the MDMS replacement project provides the highest NPV of the credible options considered;
- TasNetworks' NPV analysis for the MDMS replacement project now includes quantified benefits associated with the investment; and
- TasNetworks has significantly improved the level of accuracy and basis of estimation for the cost estimates for the project through engagement with external vendors and detailed internal resource planning.

On the basis of the additional supporting information provided by TasNetworks in support of its revised proposal for the MDMS replacement project, we are satisfied that TasNetworks has sufficiently demonstrated that its forecast capex for the MDMS replacement project reasonably reflects the capex criteria.

We also consider that TasNetworks' revised proposal for increased ICT security capex is required to meet the capex objectives, and reasonably reflects the capex criteria. TasNetworks' revised ICT capex proposal included approximately $5.0 million ($2018–19) in additional capex to address cyber security risks.

In assessing this aspect of TasNetworks' revised proposal, we reviewed the investment evaluation summary and NPV analysis submitted by TasNetworks in support of the proposed ICT security capex. We also sought further information from TasNetworks to support the need and estimated cost of the proposed ICT security initiatives.

In response to our information request, TasNetworks provided information to demonstrate that additional capex is required to deliver specific ICT security projects and programs. This follows an assessment of TasNetworks' cyber security maturity level as part of an AEMO investigation into the cyber security maturity of energy market operators. On the basis of the information provided, we are satisfied that this additional capex is required to raise TasNetworks' ICT security standards to the anticipated AEMO targets in accordance with the Australian Energy Sector Cyber Security Framework.

In summary, based on our assessment of the information provided by TasNetworks in support of its revised proposal as discussed above, we are satisfied that TasNetworks' revised forecast non-network ICT capex of $93.1 million ($2018–19) is prudent and efficient, and would form part of a total capex forecast that reasonably reflects the

capex criteria. We have therefore included this amount in our estimate of total forecast capex for the 2019–24 regulatory control period.

In making this decision, we recognise the concerns expressed by some stakeholders that it can be difficult to identify or quantify specific benefits to customers delivered by some ICT investments. We therefore encourage TasNetworks to conduct post implementation reviews of the ICT capex projects it undertakes in the 2019–24 regulatory control period. This will assist in ensuring that the intended outcomes and benefits of ICT capex programs and projects are achieved and more transparently demonstrated to customers and stakeholders.

Operational support systems

Operational support systems capex relates to network control capex for SCADA and associated operational information systems as well as asset management systems. TasNetworks' requirements for operational support systems are considered across the transmission and distribution networks as a whole.[102] Asset management systems capex, a component of the operational technology category, is included in our assessment of forecast non-network capex. The distribution component of the AMS capex is considered in this section.

Asset Management Systems

In our draft decision, we accepted TasNetworks' forecast capex of $13.1 million ($2018–19) for asset management systems (AMS) as part of our substitute estimate of total forecast capex.[103] In its revised proposal, TasNetworks increased its forecast distribution AMS capex by $11.0 million ($2018–19) to $24.1 million over the 2019–24 regulatory control period. This is an increase of 85 per cent from TasNetworks' initial capex forecast (and our draft decision) for AMS capex of $13.1 million.

TasNetworks submitted that the increased AMS capex related specifically to its Asset Management Information System (AMIS) and was required to lift its asset management maturity to a level commensurate with industry peers and good industry practice. TasNetworks considered that its proposed additional expenditure responded to opportunities for improvement we identified in our draft decision regarding TasNetworks' asset management systems and practices. The proposed expenditure would enable TasNetworks to apply condition-based risk management systems and practices to an additional 30 asset classes.

Final decision position

TasNetworks has not established that its revised proposal for AMS capex of $24.1 million ($2018–19) is prudent and efficient, and it would not form part of a total capex forecast that reasonably reflects the capex criteria. We have included an amount of

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[102] TasNetworks, *Tasmanian Transmission and Distribution Revised Revenue Proposals 2019–24,* 31 January 2018, pp. 95–96.

[103] TasNetworks' requirements for asset management systems are considered across the transmission and distribution networks as a whole.

$13.1 million ($2018–19) for AMS capex as part of our substitute estimate of total capex, in line with our draft decision.

TasNetworks has not sufficiently justified the increase in forecast AMS capex above the level initially proposed and accepted in our draft decision. TasNetworks has not adequately explained how the underlying drivers and need for the expenditure have changed between its initial and revised proposals. Further, TasNetworks has not justified the basis of its revised cost estimates or quantified the benefits provided by the additional expenditure. Table B.5.2 below outlines our final decision on TasNetworks' distribution AMS capex forecast.

Table B.5.2 – Final decision on TasNetworks' forecast AMS capex ($2018–19, million)

	2019–20	2020–21	2021–22	2022–23	2023–24	Total
TasNetworks' revised proposal	5.8	5.3	5.0	4.7	3.5	**24.1**
AER final decision	3.0	2.8	2.8	2.8	1.7	**13.1**
Difference	-2.8	-2.5	-2.2	-1.9	-1.7	**-11.0**
Percentage difference	-48%	-47%	-44%	-40%	-50%	**-46%**

Source: AER analysis.

Note: Numbers may not add due to rounding.

Reasons for our decision

Our assessment of TasNetworks' revised AMS capex forecast has focused on the justification provided by TasNetworks for increased AMIS costs above the scope of its initial proposal, which we found in our draft decision to represent a prudent and efficient level of expenditure for this category.

In assessing this aspect of TasNetworks' revised proposal, we reviewed the investment evaluation summaries and NPV analyses submitted by TasNetworks in support of the revised AMIS capex proposal. We also sought further information from TasNetworks through information requests, with a particular focus on:[104]

- the nature of the increased AMIS capex cost components and the justification for increased costs above the scope initially proposed;
- the basis of the AMIS capex cost estimates submitted in the revised proposal; and
- the nature and quantum of benefits provided by the additional AMIS capex proposed.

TasNetworks provided additional information regarding the drivers for the increased AMIS expenditure proposed, including that the increase in AMIS capex will see the application of condition based risk management systems and practices extended to

[104] TasNetworks, *Response to AER information request 047 – Capex*, 21 February 2019, pp. 25–28.

include an additional 30 asset classes.[105] TasNetworks considered that quantification of risk across these asset classes will strategically support the demonstration of prudency and efficiency of future revenue proposals.

TasNetworks submitted that it had not yet quantified the benefits of the increased AMIS expenditure. TasNetworks considered that this was difficult to do before the improved program had been applied in practice. TasNetworks did identify qualitative benefits that it considered would be provided by the increased AMIS capex, including:[106]

- improved trust in the accuracy, completeness and integrity of network asset information and processes resulting in improved uptake;
- increased confidence to make decisions that are based on high quality and reliable asset information;
- improved network asset information and processes to support revenue determination submissions;
- enhanced asset management processes embedded into daily activities;
- improved asset information accuracy, integrity, quality and availability that supports best appropriate practice asset management decision making; and
- reduction in the number/duration of outages due to improved network availability resulting from improved asset information and processes.

It was not clear, from the information provided by TasNetworks, the extent to which some or all of these qualitative benefits are incremental or would also be provided, in whole or in part, by its initial proposal for AMIS capex in the 2019–24 regulatory control period. We expect this would be the case, given TasNetworks' revised proposal has simply scaled up the initial capex proposal rather than identifying specific new cost components or initiatives.

Based on our assessment of the information available, TasNetworks has not sufficiently demonstrated that its revised AMIS capex proposal reasonably reflects the capex criteria. Our assessment of the investment evaluation summary, NPV analysis and other supporting information submitted by TasNetworks in support of the AMIS capex project identified a number of concerns regarding TasNetworks' justification for this expenditure. Specifically, we found:

- the amended investment evaluation summary submitted with TasNetworks' revised proposal was largely unchanged from the version submitted with TasNetworks' initial proposal and did not provide persuasive information or analysis to explain the revised project scope or justify the proposed increase in costs.
- a lack of transparency in the justification for selecting the preferred investment option, as no alternative options (such as a deferral option) were considered in the investment and NPV analysis.

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[105] TasNetworks, *Response to AER information request 047 – Capex*, 21 February 2019, pp. 25–26.

[106] TasNetworks, *Response to AER information request 047 – Capex*, 21 February 2019, pp. 27–28.

- a lack of identification and quantification of expected project benefits:
    - TasNetworks' NPV analysis did not quantify any benefits associated with the investment. In the absence of a thorough cost-benefit analysis, it is not clear that additional costs should be borne by consumers unless justified by identified project benefits such as operating efficiency savings or avoided network expenditure.
- insufficient justification for project cost estimates used to determine the revised forecast AMIS capex:
    - TasNetworks' high-level cost breakdowns reflect an assumed split between broad cost components but do not provide detailed cost component information or specific justifications for increased costs;
    - the revised proposal cost estimates include an arbitrary contingency of 20 per cent and have not been informed by market testing or detailed vendor engagement; and
    - it is not clear that these cost estimates reasonably reflect the efficient costs of achieving the capex objectives, or a realistic expectation of the cost inputs required to achieve the capex objectives as required by the NER.[107]

The lack of justification for the AMIS capex increases proposed by TasNetworks was also observed by the TSBC, which submitted that it was inconceivable for TasNetworks to require a further increase in capex above its initial proposal.[108]

On the basis of the issues outlined above, TasNetworks has not demonstrated that its revised AMIS capex forecast is efficient and prudent, and it would not form part of a total forecast capex allowance that reasonably reflects the capex criteria. While the additional investments in asset management system capability may provide some benefits in terms of improved asset management capability in future, TasNetworks has not demonstrated that these benefits are necessarily sufficient to justify the increase capex in the 2019–24 regulatory control period. We have therefore maintained our draft decision in relation to this category of forecast capex. Our substitute estimate of total forecast capex includes $13.1 million ($2018–19) for AMS capex the 2019–24 regulatory control period, in line with our draft decision.

Innovation capex

TasNetworks' revised proposal introduced an 'innovation' capex category. The majority of this 'innovation' capex is for new projects, not included in TasNetworks' initial proposal. TasNetworks identified four innovation projects totalling $2.9 million ($2018–19) relating to:[109]

- automated asset condition identification;

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107 NER, cl. 6.5.7(c).

108 Tasmanian Small Business Council, *Submission on TasNetworks' revised proposal,* January 2019, pp. 27–28.

109 TasNetworks, *Tasmanian Transmission and Distribution Revised Revenue Proposals 2019–24*, 29 November 2018, p. 58.

- pre-emptive asset failure detection pilot implementation;
- standalone power systems (pilot program); and
- distribution service operator early stage implementation (network adaptation to manage distributed energy resources).

The pre-emptive asset failure detection pilot implementation program was included in TasNetworks' initial capex forecast. The stand-alone power systems project represents more than half of the total proposed innovation capex. While this is a long standing area of investment for TasNetworks, the program has been included in the revised proposal in the context of the AEMC's recent work on developing a national framework for the provision of stand-alone power system supply by distribution businesses as an efficient alternative to traditional network investment.

Final decision position

We are satisfied that TasNetworks has demonstrated that its revised proposal for innovation capex of $2.9 million ($2018–19) is prudent and efficient, and would form part of a total forecast capex allowance that reasonably reflects the capex criteria.

Reasons for our position

TasNetworks submitted investment evaluation summaries in support of each of the proposed innovation projects. We also sought and reviewed further information from TasNetworks in relation to this expenditure, to determine whether it was likely to provide benefits to consumers and reasonably reflects the capex criteria.

The TSBC submitted that this additional innovation expenditure should not be approved as consumers should not have to pay an additional amount to enable innovation to happen.[110] An anonymous submission also argued that innovation is an activity that affects investment decisions across the entire business, rather than being a standalone activity, and introducing an explicit forecast for innovation expenditure in the revised regulatory proposal runs counter to the requirement of the NER.[111]

Based on the information available, we consider TasNetworks' revised proposal innovation capex forecast is reasonable, and likely to be prudent and efficient in accordance with the capex criteria. While the purpose of the forecast capex is to support the deployment of innovative technologies, typically through small-scale pilot or test programs, the investment evaluation summaries submitted by TasNetworks in support of the projects generally show that the projects are intended to deliver tangible benefits. For example, the automated asset condition identification program aims to support the deferral of CONSAC cable replacement capex and reduce cable failure and maintenance costs.[112] The standalone power systems program aims to avoid

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110 Tasmanian Small Business Council, *Submission on TasNetworks' revised proposal,* January 2019, p. 42.

111 Anonymous, *Submission on TasNetworks' revised proposal*, January 2019, p. 2.

112 TasNetworks, *Investment evaluation summary – Automated asset condition identification program*, November 2018, p. 12.

costs associated with replacing long rural SWER lines at specific sites, as well as vegetation management and asset failure costs.[113]

We are also satisfied that the forecast innovation capex is required to achieve the capex objectives, including to meet or manage expected demand for standard control services, and to maintain the safety of the distribution system.

For these reasons, we consider TasNetworks has demonstrated that its forecast innovation capex of $2.9 million ($2018–19) is prudent and efficient, and would form part of a total forecast capex allowance that reasonably reflects the capex criteria. We have therefore included this amount in our substitute estimate of total forecast capex for the 2019–24 regulatory control period.

Non-network other capex

Non-network other capex includes expenditure on fleet, land and buildings assets. Our draft decision accepted TasNetworks' forecast $25.9 million ($2018–19) for distribution non-network other capex (fleet, and land and buildings).[114] TasNetworks' revised proposal is essentially unchanged, apart from some minor allocative changes between distribution and transmission non-network other capex ($0.3 million).[115]

For the reasons set out in our draft decision, TasNetworks has demonstrated that its forecast non-network other capex of $25.9 million is prudent and efficient, and would form part of a total forecast capex allowance that reasonably reflects the capex criteria. We have therefore included this amount in our substitute estimate of total forecast capex for the 2019–24 regulatory control period.

B.6 Forecast capitalised overheads

In our draft decision, we made no specific adjustment to forecast capitalised overheads, but rather made a consequential changes reflecting the adjustments made to categories of direct capex, most notably repex, based on the fixed and variable components of overheads allocated to those categories. We have taken a similar approach for the final decision and our capitalised overheads adjustments reflect adjustments made to direct capex.

B.6.1 TasNetworks' revised proposal

TasNetworks proposed forecast capitalised overheads of $177.4 million ($2018–19) in its revised proposal.[116] Forecast capitalised overheads in the revised capex model are different from the initial capitalised overheads forecast. We sought additional information from TasNetworks to clarify and reconcile the treatment of capitalised overheads across the initial and revised proposals.[117]

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113 TasNetworks, *Investment evaluation summary – Standalone power systems*, November 2018, pp. 4–8.

114 AER, *TasNetworks distribution determination 2019–24 – Attachment 5,* September 2018, p. 60.

115 TasNetworks, *Response to information Request 041*, January 2019, p. 13.

116 TasNetworks, *Capex forecast model,* November 2018.

117 TasNetworks, *Response to AER information request 047*, 21 February 2019, pp. 28–29.

As noted in section 5.2.2, capitalised overheads were considered and assessed in each capex driver in our draft decision, but for the sake of data consistency and clarity, each capex driver has now been presented in direct cost terms and capitalised overheads have been separated from these drivers in our final decision.

As discussed in section B.3, TasNetworks indicated that its initial proposal incorrectly allocated forecast direct expenditure for customer connections between direct expenditure and overheads. While TasNetworks' revised proposal reallocates total overhead expenditure across all expenditure categories to correct for this error, it does not reduce overheads to account for its lower total capex forecast. Table B.6.1 outlines our final decision on TasNetworks' revised capitalised overheads forecast.

Table B.6.1 – Final decision on TasNetworks' capitalised overheads forecast ($2018–19, million)

	2019–20	2020–21	2021–22	2022–23	2023–24	Total
TasNetworks' revised proposal	36.0	35.9	35.5	35.2	34.8	**177.4**
AER final decision	34.4	34.3	33.9	33.7	33.4	**169.7**
Difference	-1.6	-1.5	-1.6	-1.5	-1.5	**-7.7**
Percentage difference	-4%	-4%	-5%	-4%	-4%	**-4%**

Source: TasNetworks' revised capex model and AER analysis.

Note: Numbers may not add due to rounding.

B.6.2 Final decision position

We do not accept TasNetworks' revised capitalised overheads forecast of $177.4 million ($2018–19). We have included an amount of $169.7 million ($2018–19) in our substitute estimate of total capex.

B.6.3 Reasons for our decision

We have reduced TasNetworks' capitalised overheads forecast by $5.1 million due to our direct capex adjustments to repex and non-network capex at the program and project level. In addition, in its revised proposal, TasNetworks reduced its total direct capex forecast from its initial proposal by 5 per cent. However, it did not reduce its total capitalised overheads forecast and assumed that its total capitalised overheads forecast was fixed and not variable, i.e. its forecast does not vary depending on the amount of direct capex that is required.

This is inconsistent with our standard capitalised overheads assessment approach, where we assume that some proportion of overheads are variable. As a result, we have reduced TasNetworks' variable capitalised overheads forecast by 5 per cent. This results in a $2.6 million ($2018–19) (1.4 per cent) reduction to TasNetworks' total capitalised overheads forecast.

C Repex modelling approach

This section provides a guide to our repex modelling process. It sets out:

- relevant background information;
- the data used to run the repex model;
- the key assumptions underpinning our repex modelling approach; and
- the repex model outcomes under different scenarios.

C.1 Background to predictive modelling

In 2012, the AEMC published changes to the National Electricity and National Gas Rules.[118] Following these rule changes, the AER undertook a "Better Regulation" work program, which included publishing a series of guidelines setting out our approach to regulation under the new rules.

The Guideline describes our approach, assessment techniques and information requirements for setting efficient expenditure allowances for distribution network service providers (distributors).[119] It lists predictive modelling as one of the assessment techniques we may employ when assessing a distributor's repex. We first developed and used our repex model in our 2009–10 review of the Victorian electricity distributors' 2011–15 regulatory proposals and have also used it in subsequent electricity distribution decisions.

The technical underpinnings of the repex model are discussed in detail in the replacement expenditure model handbook.[120] At a basic level, the AER's repex model is a statistical tool used to conduct a top-down assessment of a distributor's replacement expenditure forecast. Discrete asset categories within six broader asset groups are analysed using the repex model. These six asset groups are poles, overhead conductors, underground cables, service lines, transformers and switchgear.

The repex model forecasts the volume of assets in each category that a distributor would be expected to replace over a 20-year period. The model analyses the age of assets already in commission and the time at which, on average, these assets would be expected to be replaced, based on historical replacement practices. A total replacement expenditure forecast is derived by multiplying the forecast replacement volumes for each asset category by an indicative unit cost.

The repex model can be used to advise and inform us and our consultants where to target a more detailed bottom-up review, and define a substitute repex forecast if

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118 AEMC, *Final rule determination: National electricity amendment (Economic regulation of network service providers) Rule 2012,* 29 November 2012,

119 AER, *Better regulation: Expenditure forecasting assessment guideline for electricity distribution,* November 2013.

120 AER, *Electricity network service providers: Replacement expenditure model handbook*, November 2013.

necessary. The model can also be used to benchmark a distributor against other distributors in the NEM.[121]

As detailed in the AER's repex handbook, the repex model is most suitable for asset groups and categories where there is a moderate to large asset population of relatively homogenous assets. It is less suitable for assets with small populations or those that are relatively heterogeneous. For this reason, we exclude the SCADA and other asset groups from the modelling process and do not use predictive modelling to directly assess the asset categories within these groups.

Expenditure on and replacement of pole top structures is also excluded, as it is related to expenditure on overall pole replacements and modelling may result in double counting of replacement volumes. In addition, distributors do not provide asset age profile data for pole top structures in the annual category analysis RINs, so this asset group cannot be modelled using the repex model.

C.2 Data collection

The repex model requires the following input data:

- the age profile of network assets currently in commission;
- expenditure and replacement volume data of network assets; and
- the mean and standard deviation of each asset's expected replacement life.

This data is derived from distributors' annual regulatory information notice (RIN) responses, and from the outcomes of the unit cost and expected replacement life benchmarking across all distribution businesses in the NEM. The RIN responses relied on are:

- annual category analysis RINs that are issued to all distributors in the NEM; and
- reset RINs that distributors are required to submit with their regulatory proposal.

Category analysis RINs include historical asset data and reset RINs provide data corresponding to distributors' proposed forecast repex over the upcoming regulatory control period. In both RINs, the templates relevant to repex are sheets 2.2 and 5.2. Our current approach of adopting a standardised approach to network asset categories provides us with a dataset suitable for comparative analysis and better equips us to assess the relative prices of cost inputs as required by the capex criteria.[122]

C.3 Scenario analysis

In this section we set out the broad assumptions used to run a series of scenarios to test distributors' modelled repex forecasts. The specific modelling assumptions applied for each distributor are outlined in each individual repex modelling workbook. The four scenarios analysed are:

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[121] This includes Power and Water Corporation.

[122] NER, cl. 6.5.7(c).

1. historical unit costs and calibrated expected replacement lives;
2. comparative unit costs and calibrated expected replacement lives;
3. historical unit costs and comparative expected replacement lives; and
4. comparative unit costs and comparative expected replacement lives.

Comparative unit costs are the minimum of a distributor's historical unit costs, its forecast unit costs and the median unit costs across the NEM. Comparative replacement lives are the maximum of a distributor's calibrated expected replacement life and the median expected replacement life across the NEM.

C.4 Calibration

The calibration process estimates the average age at replacement for each asset category using the observed historical replacement practices of a distributor. The length of the historical period analysed during this process is referred to as the 'calibration period'. The inputs required to complete the calibration process are:

- the age profile of network assets currently in commission; and
- historical replacement volume and expenditure data for each asset category.

The calibrated expected replacement lives as derived through the repex model differ from the replacement lives that distributors report. During the calibration process, we assume the following:

- the calibration period is a historical period where a distributor's replacement practices are largely representative of its expected future replacement needs;[123]
- we do not estimate a calibrated replacement life where a distributor did not replace any assets during the calibration period, because the calibration process relies on actual historical replacement volumes to derive a mean and standard deviation; and
- where a calibrated replacement life is not available, we substitute the value of a similar asset category.

C.5 Comparative analysis approach

Previous distribution determinations where we have used on the repex model have primarily focused on the 'historical scenario'. This scenario forecasts a distributor's expected repex and replacement volumes based on its historical unit costs and asset replacement practices, which are used to derive expected replacement lives.

Our refined comparative analysis repex modelling approach builds on this previous analysis and now introduces the historical performances of other distributors in the NEM into the forecast period. The 'cost, lives and combined' scenarios rely on a comparative analysis technique that compares the performance of all distributors in the

[123] Each distributors' specific repex modelling workbook outlines more detailed information on the calibration period chosen.

NEM. The technique analyses the two variable repex model inputs – unit costs and replacements lives.

The 'cost scenario' analyses the level of repex a distributor could achieve if its historical unit costs were improved to comparative unit costs. The 'lives scenario' analyses the level of repex a distributor could achieve if its calibrated expected replacement lives were improved to comparative expected replacement lives.

Unit costs

The comparative analysis technique compares a distributor's historical unit costs, forecast unit costs and median unit costs across the NEM. Historical unit costs are derived from a distributor's category analysis RIN and forecast unit costs are derived from a distributor's reset RIN, which is submitted as part of its regulatory proposal.

The median unit costs across the NEM are based on each distributor's historical unit cost for each asset category. The median unit cost is used for comparative analysis purposes because this approach effectively removes any outliers, either due to unique network characteristics or data reporting anomalies.

The United Kingdom's Office of Gas and Electricity Markets (Ofgem) has a similar approach to unit cost benchmarking, where Ofgem applies a unit cost reduction where the distributor's forecast unit cost was higher than industry median.[124] The unit cost input used in the 'cost' and 'combined' scenarios is the minimum of a distributor's historical unit costs, its forecast unit costs and the median unit costs across the NEM.

Expected replacement lives

For expected replacement lives, the comparative analysis technique compares a distributor's calibrated replacement lives (based on historical replacement practices) and the median expected replacement lives across the NEM. Median expected replacement lives are based on each distributor's calibrated replacement lives for each asset category. Once again, using the median value effectively accounts for any outliers.

The expected replacement life input used in the 'lives' and 'combined' scenarios is the maximum of a distributor's calibrated replacement life and the median replacement life across the NEM.

Repex model threshold

Our 'repex model threshold' is defined taking these results and other relevant factors into consideration. For the 2019–24 determinations, our approach is to set the repex model threshold equal to the highest result out of the 'cost scenario' and the 'lives

[124] Ofgem, *Strategy decisions for the RIIO-ED1 electricity distribution price control – tools for cost assessment*, 4 March 2013.

scenario'.[125] This approach gives consideration to the inherent interrelationship between the unit cost and expected replacement life of network assets. For example, a distributor may have higher than average unit costs for particular assets, but these assets may in turn have longer expected replacement lives. In contrast, a distributor may have lower than average unit costs for particular assets, but these assets may have shorter expected replacement lives.

C.6 Non-like-for-like replacement

The staking of a wooden pole is the practice of attaching a metal support structure (a stake or bracket) to reinforce an aged wooden pole.[126] The practice has been adopted by distributors as a low-cost option to extend the life of a wooden pole. These assets require special consideration in the repex model because, unlike most other asset types, they are not installed or replaced on a like-for-like basis.

Replacement expenditure is normally considered to be on a like-for-like basis. When an asset is identified for replacement, it is assumed that the asset will be replaced with its modern equivalent and not a different asset.[127] The repex model forecasts the volume of old assets that need to be replaced, not the volume of new assets that need to be installed. This is simple to deal with when an asset is replaced on a like-for-like basis – the old asset is simply replaced by its modern equivalent. Where like-for-like replacement is appropriate, it follows that the number of assets that need to be replaced matches the number of new assets that need to be installed.

However, where old assets are commonly replaced with a different asset, we cannot simply assume the cost of the new asset will match the cost of the old asset's modern equivalent. As the repex model forecasts the number of old assets that need to be replaced, it is necessary to make adjustments for the asset's unit cost and calibrated replacement life. For modelling purposes, the only category where this is significant is wooden poles.

Staked and unstaked wooden poles

Staked wooden poles are treated as different assets to unstaked poles in the repex model. This is because staked and unstaked poles have different expected replacement lives and different unit costs.

There are two asset replacements options and two associated unit costs that may be made by a distributor – a new pole could replace the old one or the old pole could be staked to extend its life.[128]

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[125] Our modelling approach means the 'historical scenario' will always be higher than the 'cost scenario' and the 'lives scenario', and the 'combined scenario' will always be lower than the 'cost scenario' and the 'lives scenario'.

[126] The equivalent practice for stobie poles is known as "plating", which similarly provides a low-cost life extension. SA Power Networks carries out this process. For simplicity, this section only refers to the staking process.

[127] For example, conductor rated to carry low voltage will be replaced with conductor of the same rating, not conductor rated for high-voltage purposes.

[128] When a wooden pole needs to be replaced, it will either be staked or replaced with a new pole. The decision on which replacement type will be carried out is made by determining whether the stake will be effective in extending

There are also circumstances where an in-commission staked pole needs to be replaced. Staking is typically a one-off process. When a staked pole needs to be replaced, a new pole must be installed in its place. The cost of replacing an in-commission staked pole is assumed to be the same as the cost of a new pole.

Unit cost blending

We use a process of unit cost blending to account for the non-like-for-like asset categories. For unstaked wooden poles that need to be replaced, there are two appropriate unit costs – the cost of installing a new pole and the cost of staking an old pole. We use a weighted average between the unit cost of staking and the unit cost of pole replacement to arrive at a blended unit cost.[129]

For staked wooden poles, we ask distributors for additional historical data on the proportion of staked wooden poles that are replaced. The unit cost of replacing a staked wooden pole is a weighted average based on the historical proportion of staked pole types that are replaced. Where historical data is not available, we use the asset age data to determine what proportion of the network each pole category represented and use this information to weight the unit costs.

Calibrating staked wooden poles

Special consideration also has to be given to staked wooden poles when determining their calibrated replacement lives. This is because historical replacement volumes are used in the calibration process. The RIN responses provide us with information on the volume of new assets installed over the calibration period. However, the repex model forecasts the volume of old assets being replaced. Since the replacement of staked poles is not on a like-for-like basis, we make an adjustment during the calibration process.

We need to know the number of staked poles that reach the end of their economic life and are replaced over the calibration period, so an expected replacement life can be calibrated. The category analysis RINs currently only provide us with information on how many poles were staked each year, rather than how many staked poles were actually replaced. This additional information is provided by each of the distributors. Where this information is not available, we estimate the number of staked wooden poles replaced over the calibration period based on the data we have available.

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the pole's life and is usually based on the condition of the pole base. If the wood at the base has deteriorated significantly, staking will not be effective and the pole will need to be replaced. If there is enough sound wood to hold the stake, the life of the pole can be extended and the pole can be staked, which is a more economically efficient outcome.

[129] For example, if a distributor replaces a category of pole with a new pole 50 per cent of the time and stakes this category of the pole the other 50 per cent of the time, the blended unit cost would be a straight average of the two unit costs. If the mix was 60:40, the unit cost would be weighted accordingly.

D Engagement process

D.1 Engagement with TasNetworks

Information requests

TasNetworks submitted its revised proposal on 29 November 2018. Throughout our assessment of TasNetworks' revised proposal, we requested further information via several information requests. We sent five information requests relating to TasNetworks' revised distribution capex forecast.

These questions aimed to test our understanding of the revised material provided and to clarify capex-related issues, particularly data reporting and consistency issues that were outlined in section 5.2.2. These issues are explained in more detail in section D.2 below.

Engagement

We have engaged with TasNetworks on numerous occasions throughout our assessment of its revised proposal. These interactions are summarised below:

- 21 December 2018 – We met with TasNetworks staff to discuss our preliminary assessment of the cost-benefit analysis models that TasNetworks submitted as part of its revised proposal. We outlined that its analysis double counted the expected benefits of its proposed replacement options. This double counting is discussed in more detail in section B.4.3. We initially flagged these concerns with TasNetworks via email on 13 December 2018.
- 16 January 2019 – We met with TasNetworks staff to discuss data reconciliation issues that we uncovered during our assessment of TasNetworks' revised proposal. We noted these issues in section 5.2.2 and they are explained in more detail in section D.2 below.
- 4 February 2019 – We met with TasNetworks staff to discuss data reporting and reconciliation issues. Following this meeting and two follow-up emails (also on 4 February 2019), we were able to clarify the data inconsistency issue outlined below under 'capex driver discrepancies'.
- 14 February 2019 – We met with TasNetworks staff to discuss TasNetworks' bushfire mitigation programs and strategy, in response to an information request. Following the meeting, TasNetworks outlined that it would respond with advice that clarified the information that was provided in relation to our information request, and with additional supporting information on fire starts caused by TasNetworks' assets.[130]
- 14 February 2019 – We met with TasNetworks staff to provide an update on our likely positions on TasNetworks' revised distribution capex forecast. We provided

[130] TasNetworks, *Bushfire mitigation follow-up email,* 14 February 2018.

information relating to our own internal timeframes and advised TasNetworks of the cut-off date when we would be unable to consider any additional information.

- 28 February 2019 – We emailed TasNetworks staff directly to clarify a minor data reconciliation concern between TasNetworks' revised PTRM and capex model. TasNetworks responded promptly and provided the additional data that resolved the issue.

D.2 Data consistency issues

During our assessment of TasNetworks' revised proposal, we discovered several data reporting inconsistencies between different revised proposal documents and information request responses. In an effort to understand these data reporting issues, we also discovered that these inconsistencies related to TasNetworks' initial proposal. These issues are discussed below.

Capitalised overheads

During our revised proposal assessment, we asked TasNetworks to provide updated reset RIN worksheets 2.1 and 2.2, which are required for us to complete our assessment.[131] TasNetworks' response[132] provided updated capex driver-level forecasts for repex, connections capex, augex, non-network capex, capitalised overheads and capital contributions. However, the updated expenditure summary provided in worksheet 2.1 did not reconcile with TasNetworks' revised PTRM.[133]

In response to an information request (information request 41), TasNetworks highlighted that its first response included a 'gross-up labour' cost component as direct expenditure, but that this component should have been included in its capitalised overheads forecast.[134] This response also highlighted that the same gross-up labour component was treated as direct expenditure in TasNetworks' initial proposal and subsequently our draft decision, but this component is now correctly treated as capitalised overheads in TasNetworks' revised proposal and our final decision.

The total capitalised overheads forecast we have assessed in our final decision is $177.4 million ($2018–19),[135] compared with the initial amount of $142.1 million ($2018–19) that was submitted in TasNetworks' initial reset RIN.[136]

Capex driver discrepancies

Additional analysis highlighted that the updated capex driver forecasts provided in response to information request 41 did not reconcile with table 5-9 of TasNetworks' revised proposal, which provides a breakdown of its 2019–24 capex forecasts for each

131 AER, *Information request 038,* 12 December 2018.
132 TasNetworks, *Response to information request 038,* 19 December 2018.
133 TasNetworks, *TN-post tax revenue model (PTRM) standard control distribution,* November 2018.
134 TasNetworks, *Response to information request 041,* 18 January 2019.
135 TasNetworks, *Capex forecast model,* November 2018.
136 TasNetworks, *TN-reset RIN final template 1 – Regulatory determination distribution,* January 2018.

capex driver.[137] In addition, the updated forecasts did not reconcile with TasNetworks' revised capex model.[138] We highlighted these capex driver discrepancies with TasNetworks in an information request.[139]

In response, TasNetworks stated that its response to information request 41 outlined the correct capex driver forecasts. It advised that the capex drivers identified in its proposal and capex model were based on its forecasting methodologies, which were not the same as the capex driver categories listed in the reset RIN template.[140] However, two capex categories identified in TasNetworks' proposal documents and capex model, connections and augmentation capex (augex), exactly match two of the capex categories listed in the reset RIN template.

In several follow-up meetings and emails, TasNetworks clarified why the connections and augex forecasts in its revised proposal and capex model, $161.3 million and $38.5 million ($2018–19, including overheads),[141]respectively, differed from the connections and augex forecasts in information request response, $161.8 million and $63.3 million ($2018–19, including overheads),[142] respectively. The two connections forecasts differ immaterially, but the two augex forecasts are significantly different.

TasNetworks indicated that the capex drivers outlined in its proposal documents and capex model referred to the forecasting methodology used for particular capex programs and projects, but this capex forecast was not necessarily mapped to the same reset RIN category, even if they have the same name.[143] For example, TasNetworks identified an individual project that was forecast using its 'augmentation' forecasting methodology, but was mapped to the 'repex' reset RIN category. Similarly, it identified several programs and projects that were forecast using its 'reliability and quality maintained' forecasting methodology, but were mapped to the 'augex' reset RIN category.

Following further analysis, we identified that these capex driver level discrepancies were also evident in TasNetworks' initial proposal and subsequently our draft decision. Therefore, the capex driver forecasts referred to in this final decision may not reconcile with the equivalent forecasts referred to in our draft decision. As noted in section 5.2.2, the capex driver forecasts relied on in our assessment and referred to in this final decision were provided in response to information request 41.

We appreciate that TasNetworks engaged with us on this data discrepancy and presentation issue over the course of several information requests, teleconferences and emails, and helped us arrive at a resolution. We consider that having clear and

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137 TasNetworks, *Tasmanian Transmission and Distribution Revised Revenue Proposals 2019–24,* 29 November 2018, p. 44.

138 TasNetworks, *Capex forecast model,* November 2018.

139 AER, *Information request 044,* 22 January 2019.

140 TasNetworks, *Response to information request 044,* 31 January 2019.

141 TasNetworks, *Tasmanian Transmission and Distribution Revised Revenue Proposals 2019–24,* 29 November 2018, p. 44.

142 TasNetworks, *Response to information request 044,* 31 January 2019.

143 TasNetworks, *Response to information request 046,* 4 February 2019.

consistent data sources is crucial for stakeholders to develop a full and accurate understanding of a distributor's capex forecast.

However, TasNetworks' presentation of its capex driver forecasts in both its initial and revised proposals may have been confusing to different stakeholders. For example, as noted above, one revised proposal document outlined an augex forecast of $38.5 million ($2018–19, including overheads), while another source outlined an augex forecast of $63.3 million ($2018–19, including overheads). While we now understand that one source was based on forecasting methodologies and the other was based on reset RIN capex categories, this may not have been immediately clear to many stakeholders, who have provided submissions on TasNetworks' initial and revised proposal. Many of the submissions did not refer to specific data points and remained relevant to the corrected revised proposal, and we have had regard to these submissions where appropriate.